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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded sixty-two 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 digging 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.

The National Geographic Society-U. S. Army Air Forces Expedition, from a camp in southern Brazil, photographed and observed the solar eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

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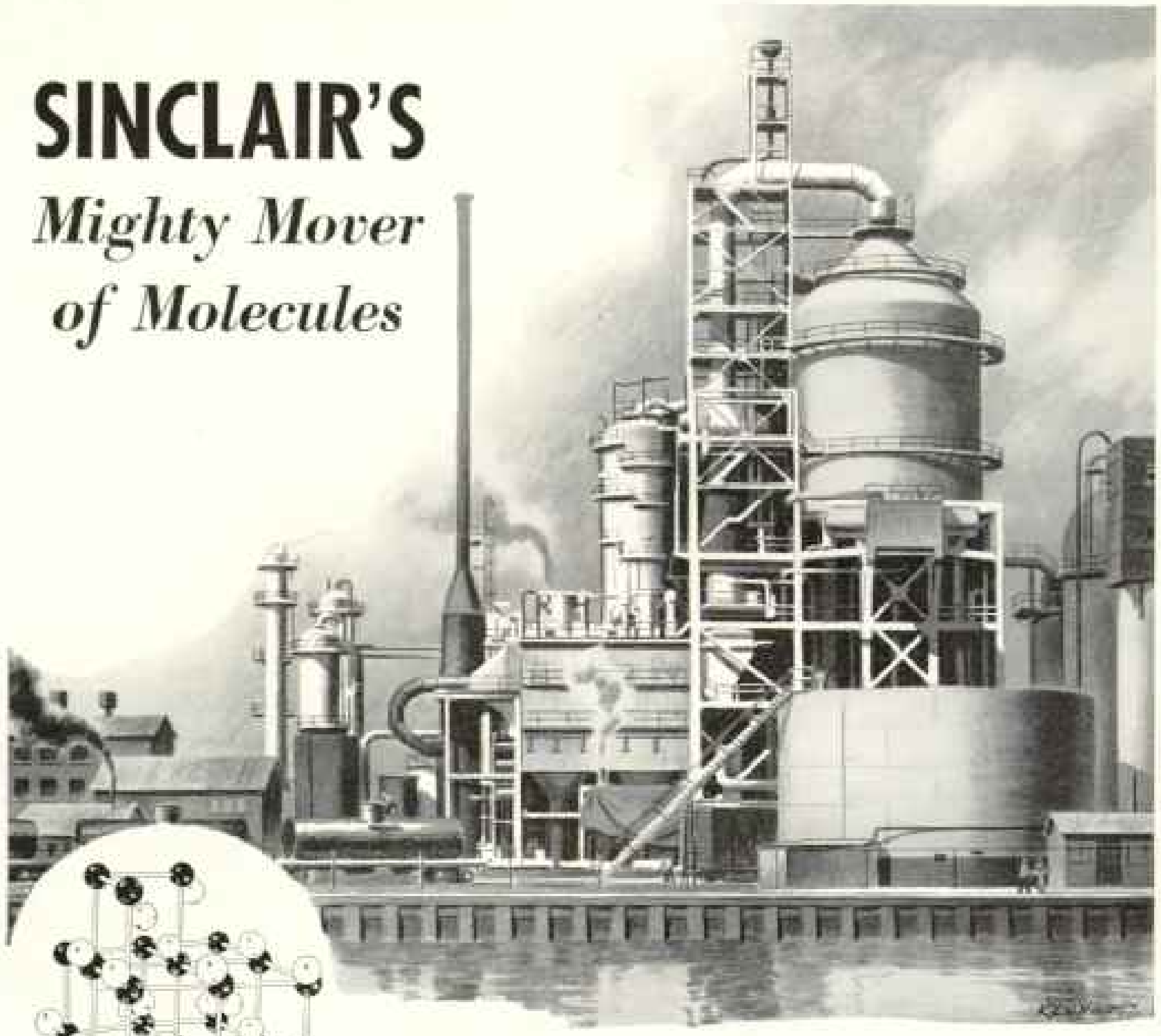

Molecular model demonstrating the crystal structure of a catalyst used in petroleum refining.

This complex giant, the "cat cracker" that towers 220 feet above the East Chicago (Indiana) Refinery, is one reason why Sinclair gets 60% more gasoline from crude oil than was possible 30 years ago.

This giant's official name, Fluid Catalytic Cracking Still, is a shorthand description of its method and purpose. It refines petroleum by taking big hydrocarbon molecules and cracking them up into little ones.

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RDC, introduced a year ago, is the new all-stainless steel, self-propelled Budd *rail diesel car*. It is good looking, quiet, smooth riding. It is comfortable, clean and air-conditioned.

The New York Central now has two Budd RDC's operating in express service between Springfield and Boston, and a third providing local service between western Massachusetts and Albany.

Western Pacific has two RDC's covering the 924 miles which separate Oakland and Salt Lake City.

Pennsylvania-Reading Seashore Lines have just placed six RDC's in operation between Camden, Ocean City, Wildwood and Cape May. They leave Camden as a six-car train and end up as two-car trains at each of the three Jersey seashore cities.

Chicago & North Western has three RDC's in commuter service; the Baltimore & Ohio will soon have two and New York, Susquehanna & Western, four.

These varied uses to which RDC is being put cover almost every kind of service a railway passenger coach can render.

The general acceptance of the Budd all-stainless steel RDC suggests that the development of railway passenger coach equipment may be headed in a new direction.

The Budd Company
Philadelphia, Detroit, Gary.

Budd

WORLD-RENOWNED Conrad Hilton, famed owner of fine hotels, says, "Running the Waldorf-Astoria, Palmer House and new Caribe Hilton keeps me on the move. I guess I've flown in nearly every kind of air transport, and I certainly enjoy the Douglas DC-6. It has that rugged feeling of dependability that makes for peace of mind."

Mr. CONRAD HILTON says:

"At home or overseas ...I like to travel DC-6!"

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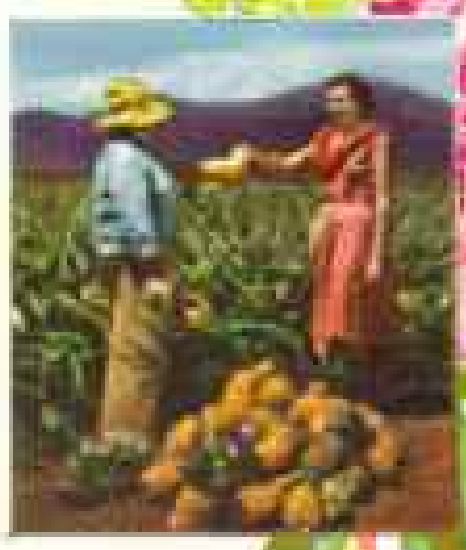
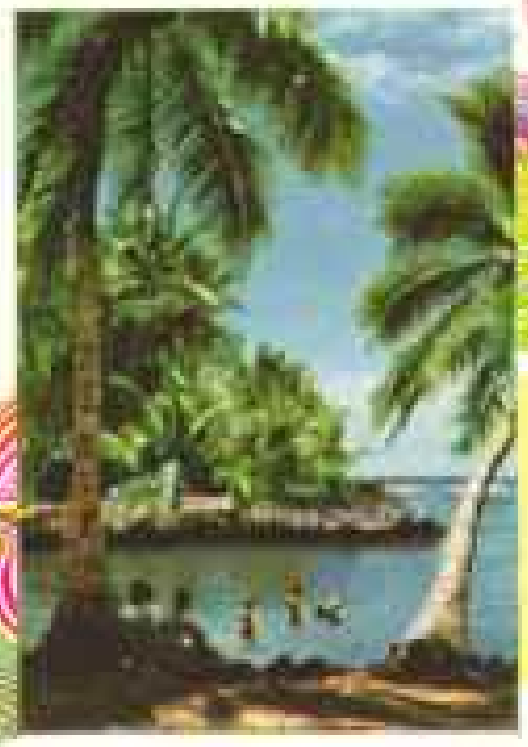


Where Yuletide Glows with South Sea Romance

Hawaii

...and Santa Claus wears an Aloha shirt! While the frost is on the pumpkin back home, the sun is glorifying orchids in tropical Hawaii. You can sunbathe on Waikiki Beach Thanksgiving Day and dinner-dance on Christmas under the stars. • Bring your golf and tennis clothes . . . you can play every day. Riding surfboards, outrigger canoeing, deep-sea fishing . . . outdoor fun goes on the year 'round. You won't need any passport and you'll enjoy all your accustomed travel facilities. Yet you'll find yourself in a new world . . . as strange as any foreign land. • In picturesque temples, bazaars and tea houses you see the Orient. In quaint legends, handicrafts and historic spots you discover ancient Polynesia. • 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 or round trip by either. • From Honolulu, island of Oahu, you can fly in about an hour or less to any of the other major Hawaiian islands — Maui, Hawaii, Kauai. Let your Travel Agent help you plan to include them. You can see them all at moderate cost.



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Frees your hands from dishpan soaking!

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With many superb *new* features—a combination of features you can't get in *any* other dishwasher—it'll spare you over 200 hours of hard, disagreeable work every year, give you over 200 long hours of *extra* leisure time!

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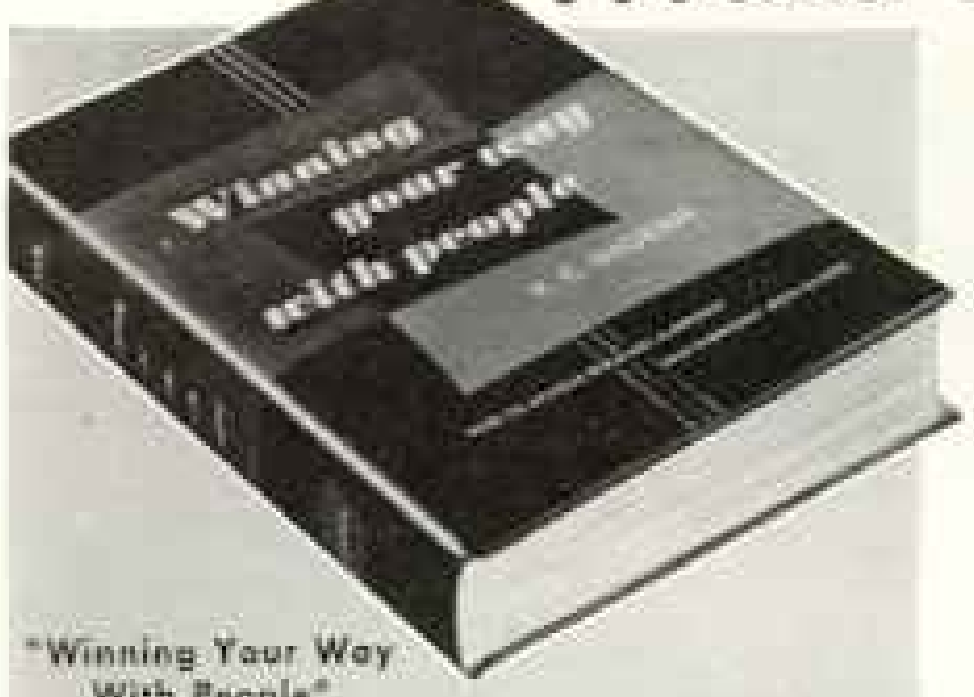

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JOHN D. Rockefeller, Sr. once said: "I will pay more for the ability to deal with people than for any other ability under the sun."

A group of top executives recently put "ability to handle people" above technical skill, capacity for decision and any other personal quality which contributed to their success.

Yes—the one *success secret* upon which every authority agrees is the ability to influence and direct the efforts of others. And "Winning Your Way With People"—the practical, proven guide to handling people—is yours FREE when you mail coupon below.

Top salaries are paid to those who have the ability to influence and direct the efforts of others. Mediocre jobs, failure to achieve one's rightful station in life, and a colorless, indifferent social existence practically always "trademark" people who do not understand how to get along with those who work with them or for them, or with those who come in contact with them after business hours.

Here, at last, is a guide to handling people successfully. Prepared by K. C. Ingram, assistant to the President of the Southern Pacific Railroad, it reveals the psychology of making people *listen* to you, *think well* of you, agree with you and *remember* you. In simple language, it explains how to gain poise and confidence, how to put your ideas across, how to think on your feet, how to make better speeches, write more compelling letters, increase your selling efficiency. Dr. Henry C. Link, Vice-President of The Psychological Corporation, says of it: "Management will want to put this book into the hands of every supervisor and salesman."

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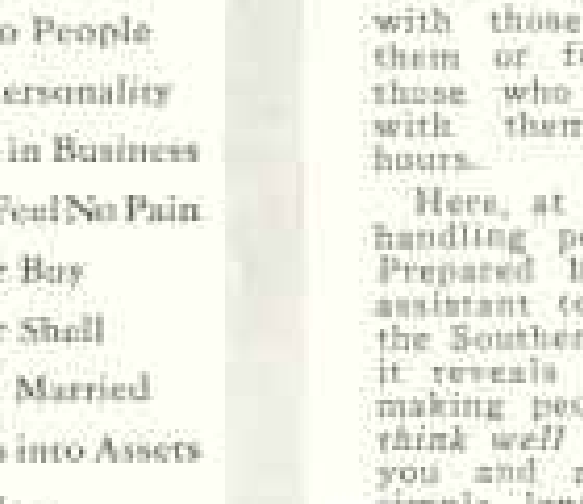

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NEW YORK CENTRAL SYSTEM

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Above, New Zenith® "Aldrich" Console TV. New 165 sq. in. 2-in-1 "Selecto-Screen" with Duplex Picture Control for a choice of circular or rectangular type pictures. New "Super-Range" Chassis for clearer reception especially in weak signal areas. Pre-tuned, built-in Pictureangler Antenna. Built-in provision for tuner strips to receive proposed ultra-high frequencies on present standards. Period cabinet of Mahogany veneers and hardwoods.

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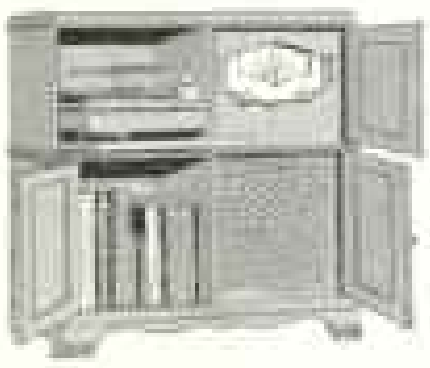

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Theater-quality projection. Clear, natural sound. Ease of operation. These qualities make the Bell & Howell Filmosound truly a family circle movie theater! Weighing only 35½ pounds, it can be set up in a matter of minutes—in your recreation room, living room, or any other suitable place! And the youngsters can operate it!

With a Filmosound in your home, you can arrange your own sound movie programs! For the family. For 'teen age get-togethers! For grownup parties! The list at left gives you an idea of the many types of excellent professional releases available for home showing. And, of course, you can show your own 16mm movies at their very finest, too! This year, make a Filmosound your family Christmas gift!

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The *flair of the future* is in their brilliant new styling, and in such dramatic advances as Elgin's exclusive DuraPower Mainspring. Made from a wholly new alloy of metals, this miracle mainspring has proved to be *the most dependable power for accurate timekeeping ever put into any watch!*

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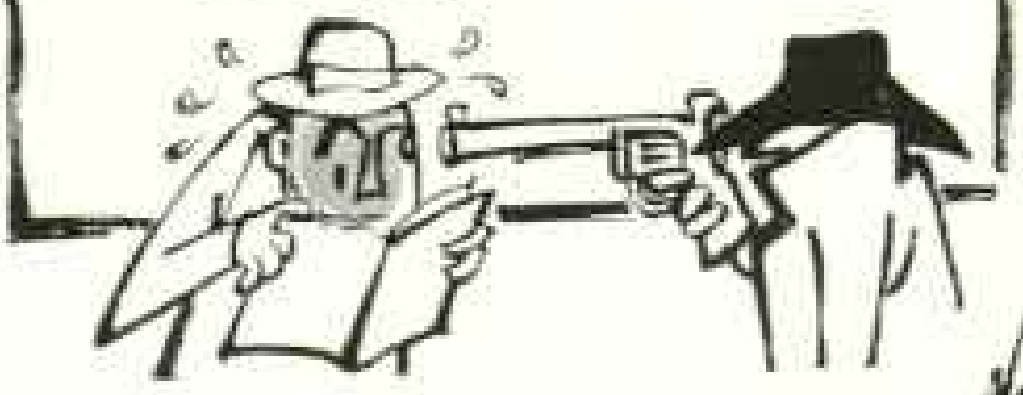
How to behave while *being* robbed



BURGLAR IN THE BEDROOM Even though you hate to give in to a crook, don't reach for a gun. He might beat you to the draw. Pretend to be asleep until he leaves the room, then yell for help . . . but loud!

HOLDUP ON THE STREET Don't resist! The one thing you can't afford to lose is *your life*. Hand over your valuables as ordered. But *study* the holdup man. What is he wearing? Any unusual features? You may have a chance to identify him later.

PICKPOCKET IN A CROWD Don't accuse the person next to you unless you're sure. Pickpockets usually work in pairs, so keep your eye peeled for an accomplice. During the confusion, he probably will try to escape with your wallet.

What to do before being robbed

See an Agent of one of the North America Companies. If you do not know who he is in your community, write us, and we will see that he gets in touch with you. The few minutes you spend with him may save you hundreds of dollars. He'll show you how little it costs to have the broadest protection against Theft, including Burglary and Holdup. Also, he'll give you friendly, competent advice regarding your Fire, Automobile, Accident or Liability insurance. And you'll feel safer knowing that your insurance will be placed in one of America's oldest, strongest and most progressive organizations.

Your North America Agent wants to save you money and protect you against loss. See him soon, won't you?

Insurance Company of North America, founded 1792 in Independence Hall, is the oldest American stock fire and marine insurance company. It heads the "North America" Companies which meet the public demand for practically all types of Fire, Marine and Casualty insurance, including Automobile, Accident, Aviation and Liability insurance; Fidelity and Surety Bonds. Sold only through Agents or Brokers.

1792 PROTECT WHAT YOU HAVE

INSURANCE COMPANY OF

NORTH AMERICA

COMPANIES, *Philadelphia*

Insurance Company of North America
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Compact industrial television system—developed at RCA Laboratories—lets us see the unseeable in safety!

Eye-witness reports from a fiery furnace!

Something's gone wrong in a big blast furnace, and heat is too high for engineers to approach. Focus the Vidicon camera of an RCA Industrial Television System on the flames and the furnace can be studied on a television receiver.

This is only one suggested use, for RCA's compact industrial television system is as flexible as its user's ingenuity. "Eye" of the tiny camera—small enough to be held in one hand—is the sensitive Vidicon tube. Extremely simple, the only other equipment needed is the Vidicon camera's suitcase size control cabinet, which operates anywhere on ordinary household current.

The Vidicon camera could be lowered under water where divers might be endangered—or stand watch on atomic chain reactions, secure from deadly radiations. And it is entirely practical to arrange the RCA Industrial Television system in such a way that observers can see a 3-dimensional picture . . . sharp, clear and real as life!

See the latest wonders of radio, television, and electronics in action at RCA Exhibition Hall, 36 West 49th St., N. Y. Admission is free. Radio Corporation of America, Radio City, New York.

Here's RCA's Vidicon system at work beside a steaming vat. Note how the compact television camera is getting a safe "close-up" of the action.

RADIO CORPORATION of AMERICA

World Leader in Radio—First in Television

Mention the National Geographic—It identifies you

Give An Esterbrook Pen

with the point you know they're sure to like

From the world's largest variety of point styles, choose the right points for everyone on your Christmas list. All Esterbrook Points are instantly interchangeable, instantly renewable.

Should the point ever become damaged, the user simply unscrews the old point and screws in a new one. All pen counters sell Renew-Points for Esterbrook Fountain Pens—35c and 85c.

To select or replace here's all you do

MATCH THE PEN WITH AN ESTERBROOK PUSH PENCIL

A push on the top feeds new lead as needed. Holds two feet of lead and writes for months without reloading.

Matched Pen and Pencil Sets
$4.00 to **$6.50**

Above are shown only a few of the most popular points

DIP-LESS 444 DESK PEN SET

Fill it once...write for months! Always ready to write. Base holds full ounce of ink. "Ink-Locked" against accidental spillage. Your choice of Renew-Points. Sets priced from $3.75 to $10.00.

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AMERICA'S FIRST PEN MAKER

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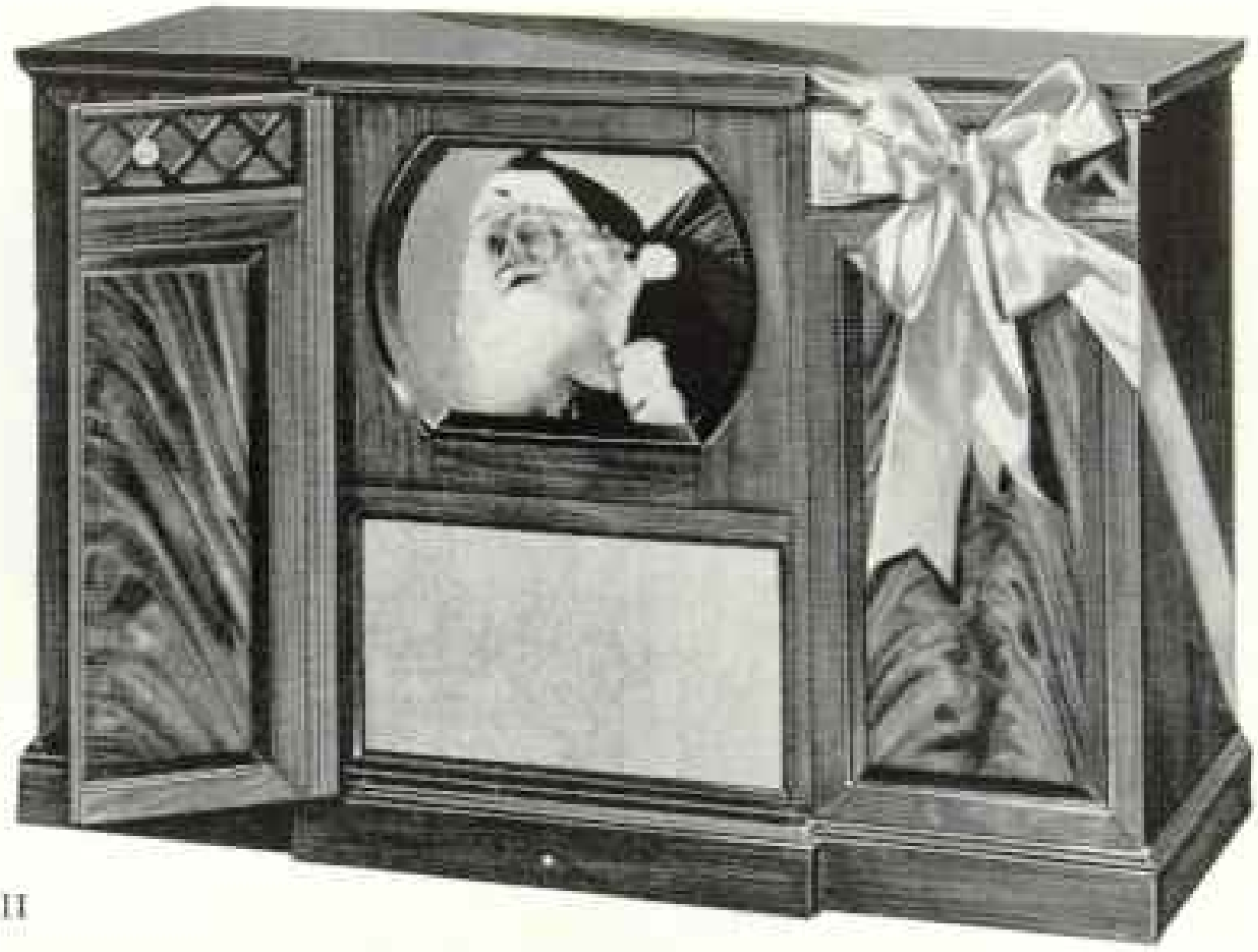

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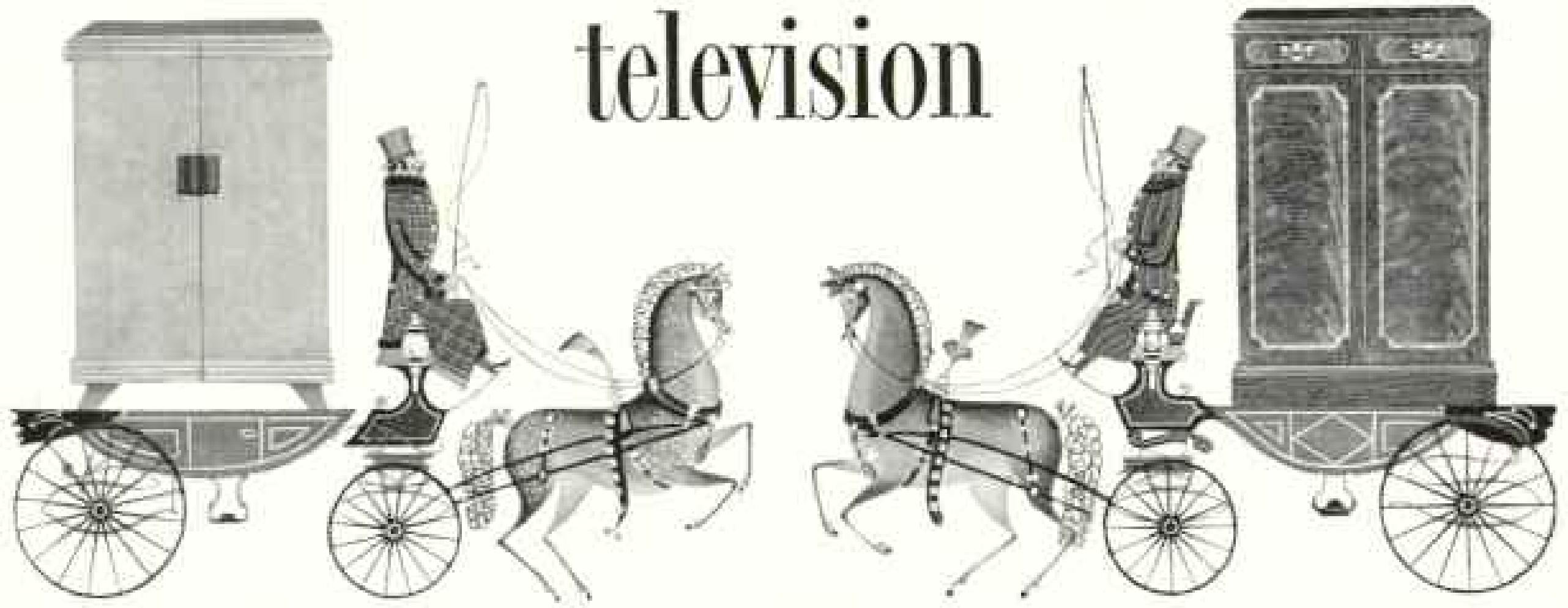
BY DU MONT
19-inch Life-Size picture. Built-in AM-FM radio.
Automatic time clock control. Automatic 3-speed phonograph. Tape recorder.

The Present with a Future...

1951 DuMont television

No less than wonderful! Here is Du Mont's most advanced thinking...brilliantly designed, built with craftsman's pride, and engineered to give you better, longer-lived performance.

Du Mont—developer of the television picture tube, builder of the first home television sets and the first television network—brings you the newest and best in television enjoyment.



THE BURLINGAME BY DU MONT
17-inch Rectangular picture.
Built-in FM radio.
Plug-in for record player.

THE ANDOVER BY DU MONT
17-inch Rectangular picture.
Plug-in for record player.

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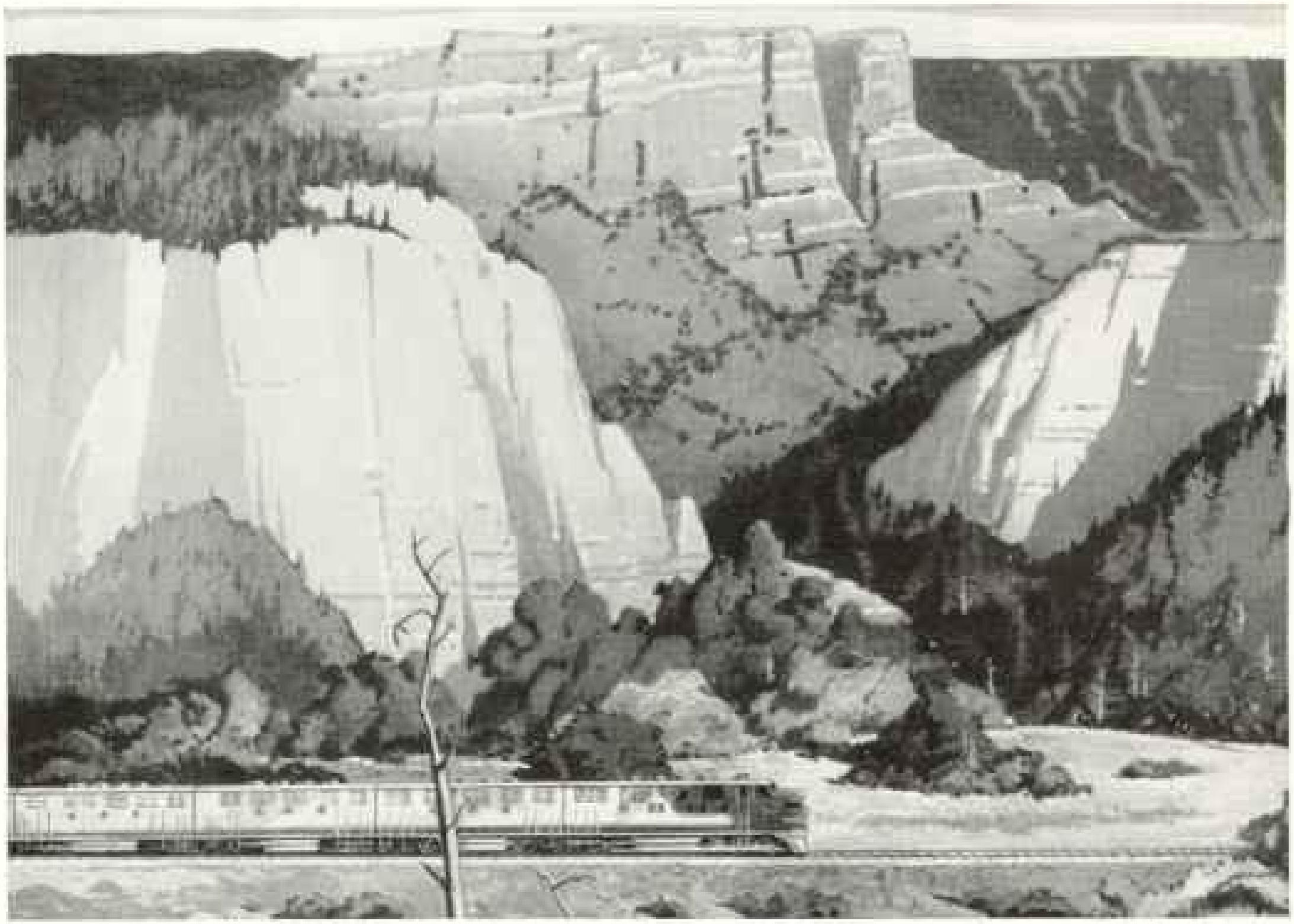
First with the finest in Television

Copyright 1950, Allen B. Du Mont Laboratories, Inc., Television Receiver Division, East Paterson, N. J. and the Du Mont Television Network, 515 Madison Avenue, New York 22, N. Y.

WESTMINSTER SERIES II AND ANDOVER CABINETS DESIGNED BY HERBERT ROSENDORF — BURLINGAME CABINET DESIGNED BY HARRY FEEBLE, JR.



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Ride Great Trains through a Great Country

Something western and wonderful happens to you on a Santa Fe trip through the great Southwest.

Via Santa Fe you enjoy this colorful land at eye level . . . experience it close up.

On any one of Santa Fe's fleet of trains, you get privacy . . . room to roam around . . . solid comfort. You choose accommodations to suit yourself . . . select your meals from a Fred Harvey menu.

And, of course, you board the Santa Fe at a downtown station . . . leave on schedule regardless of the weather . . . arrive relaxed, refreshed.

Yes, for a wonderful trip and for the memories you keep, go Santa Fe—*all the way!*

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Wallace creates the only Sterling Silver patterns with Third Dimension Beauty

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You can own a work of art . . . proudly possess sculpture in Sterling Silver . . . have a treasure at your fingertips, with your Wallace Sterling "Third Dimension Beauty" pattern. For, Wallace Sterling is truly precious silver . . . like sculpture . . . lovely from every possible view. Only Wallace Sterling has "Third Dimension Beauty" —an exquisite design not only in front, but in profile, and back as well.

Like every masterpiece a Wallace pattern grows more beautiful each time it graces your table. Top to bottom: Romance of the Sea, Rose Point, Stradivari, Grand Colonial, Sir Christopher and Grande Baroque. Six piece settings priced from $27.40 to $37.50 including tax.

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Whether he has one pen or several—you can be sure he wants New Parker "51" ... only pen with the Aero-metric Ink System

For this pen, he'll gladly forsake all his others!

New "51" is the world's most-wanted gift pen . . . treasured by discerning men and women. The heart of its fame is the *Aero-metric Ink System*, the new way to *draw in, store, safeguard, and release ink.*

New "51" writes on the instant! No fits of temperament disrupt the glide of its Plathenium-tipped point. Dawdle over personal notes . . . drive through work-day writing, the ink is metered into a skip-free line. And New "51" writes *dry* with Superchrome Ink. No blotters needed! You can, of course, use ordinary ink.

Filling has been made faster, easier. *And this pen contains no rubber parts.* The new reservoir is made of special *Pli-glass* with a 30-year life expectancy. It holds far more ink and makes the supply *visible.*

Try the New "51" at your Parker dealer's. It's a gift to keep you remembered. 8 colors. Lustraloy or gold-filled caps. Pens, $13.50 up. Pen and pencil sets, $19.75 up. The Parker Pen Company, Janesville, Wis., U. S. A.; Toronto, Can.

MORE NEW PARKER PENS, FROM $3.00

NEW PARKER "51" SPECIAL—$10.00. *Smooth Octanium point. 4 colors. Lustraloy caps. Gift boxed. Set, $15.00.*

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NEW PARKER MAGNETIX PEN SETS—$8.75 to $75.00. *For desk or table. Beautiful onyx, crystal, or marble bases.*

NOTE: *No F. E. tax on pens listed above.*

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World's most wanted pen!

WINNER 1950 FASHION ACADEMY AWARD

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1850 "FOR 100 YEARS PROTECTING THE AMERICAN HOME" 1950

"That's where Daddy is . . ."

"...right there. They call it California—C-a-l-i-f-o-r-n-i-a—and it's just become a state. Think of it, that makes thirty-one states in all. How this great country of ours is growing! And if Daddy finds there's enough trade there for his ships, we may all be moving to California one of these days . . ."

In the century that has elapsed since 1850, our Federal Union has continued to expand and prosper. Today, the stars of forty-eight states twinkle on our flag's azure field. And, with Hawaii and Alaska knocking at the door, it seems probable we shall be adding two more in the near future.

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Accept this Free Picture Book with Our Compliments —"THE STORY OF OLD VERMONT"— new edition of National Life's popular picture book. Features famous figures and events from New England's historic past—interesting, educational, inspiring. For your free copy, address a postcard to:
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NEW! Resorts, dude ranches.

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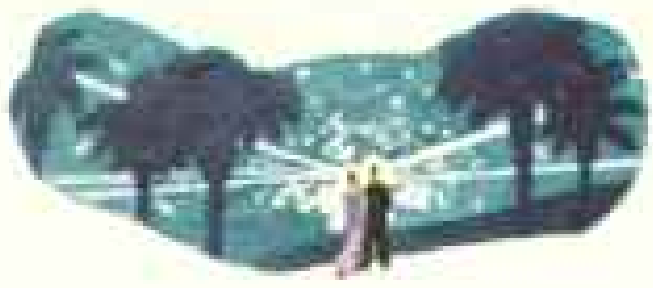
NEW! Scenic highways, improved accommodations.

THE PACIFIC...white sails, flying fish, submarine gardens.
NEW! Beaches, yacht harbors, seaside cottages.

SUBTROPICAL VALLEYS...orange groves, date palms, avocados. Shirt-sleeve golf, tennis.
NEW! Horse-racing almost year-round. Missions restored.



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NEW! Ultra-modern buildings, super-highways. Seven live television stations add to the fun.

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This sunny, dry subtropical climate lets you enjoy Los Angeles County and all Southern California in winter, spring, summer or fall. COME ON OUT AND JOIN THE FUN... ANY TIME.

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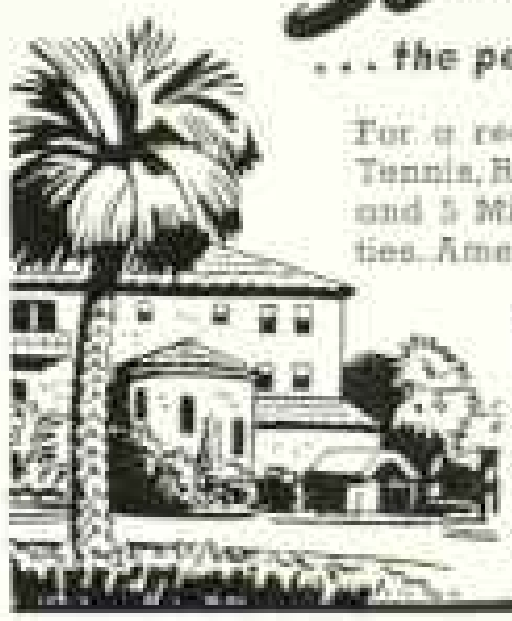

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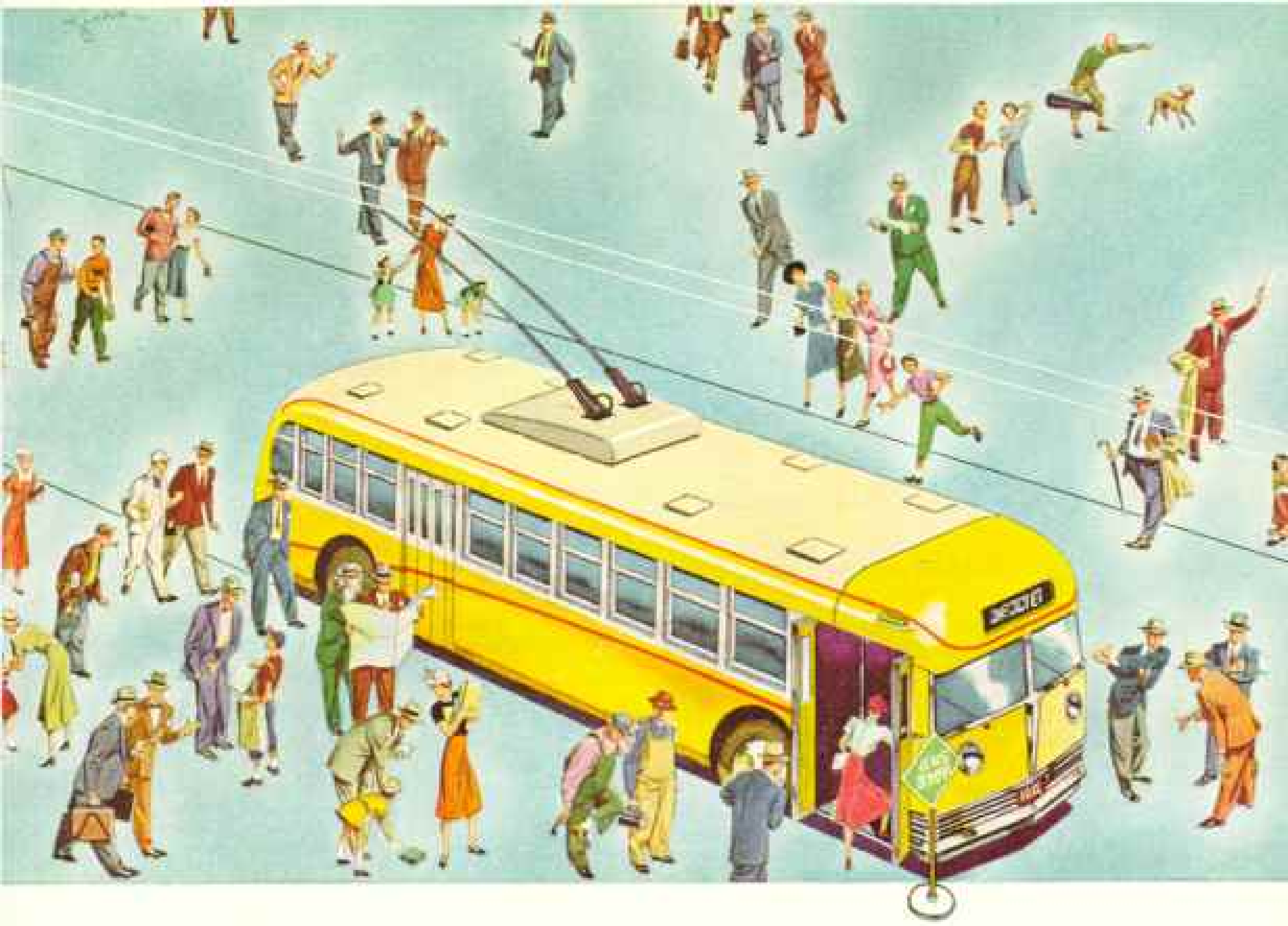

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These 43 people are all going downtown for a total fare of $1.46.

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That's management with a capital M. Be proud of it. And remember that if in your city the actual figures are a bit higher, your transit management has particularly tough problems to meet.

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ENJOY TRUE WESTERN HOSPITALITY. Tucson offers plentiful accommodations at sensible rates—smart resort hotels, friendly guest ranches, ultra-modern motels, apartments and cottages. Youngsters grow strong and brown attending one of Tucson's accredited public or ranch schools; University of Arizona. Plan to swim in outdoor pools. Ride horseback. Golf at fine country clubs. Drive down the new paved highway to Guaymas in colorful old Mexico for marvelous fishing, hunting. Come early—spend the winter in Tucson's glorious sunshine. Save your shopping until you get here.

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New crop is ready!
And now you can have 4 choice Texas Ruby-Red grapefruit weekly, twice-monthly or monthly. Join Sanborn's Texas Grapefruit Club. It's a sensible gift idea, too!
Mail $1 for postpaid sample box of 4 all-different varieties of Texas grapefruit (1 Red, 1 White, 2 kinds of Pinks) and we will send you full information about our "club."
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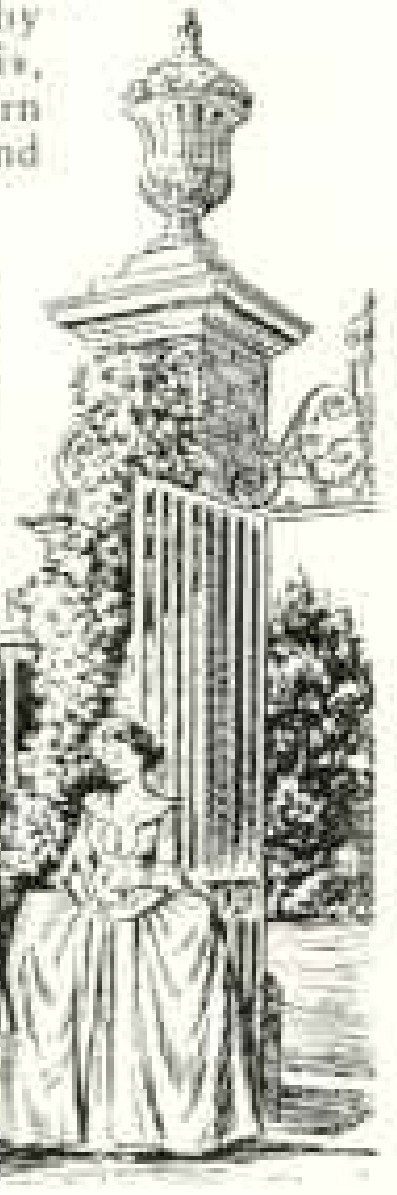

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Why take chances? Give your business the protection it needs with a Mosler "A" Label Record Safe certified by the Underwriters' Laboratories, Inc., against the hazards of fire, impact and explosion.

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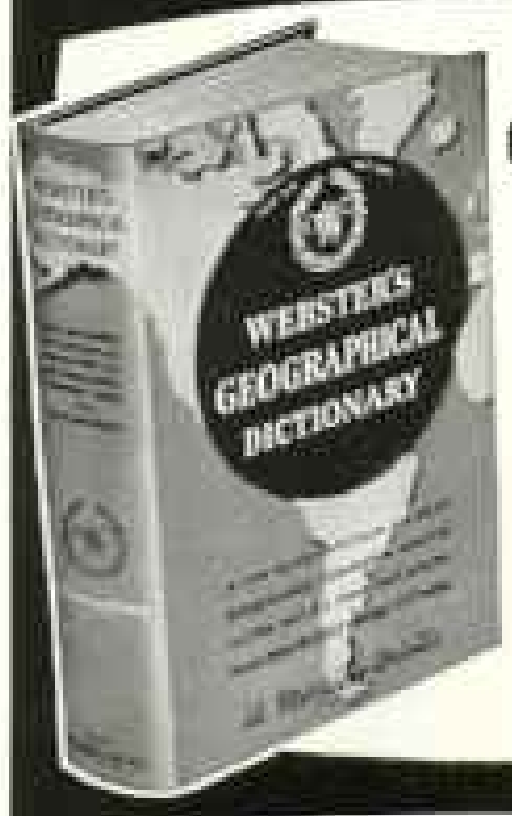

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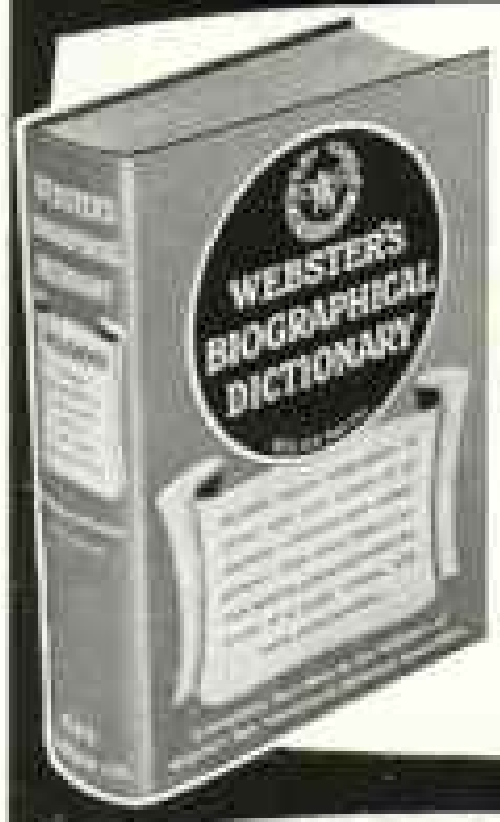

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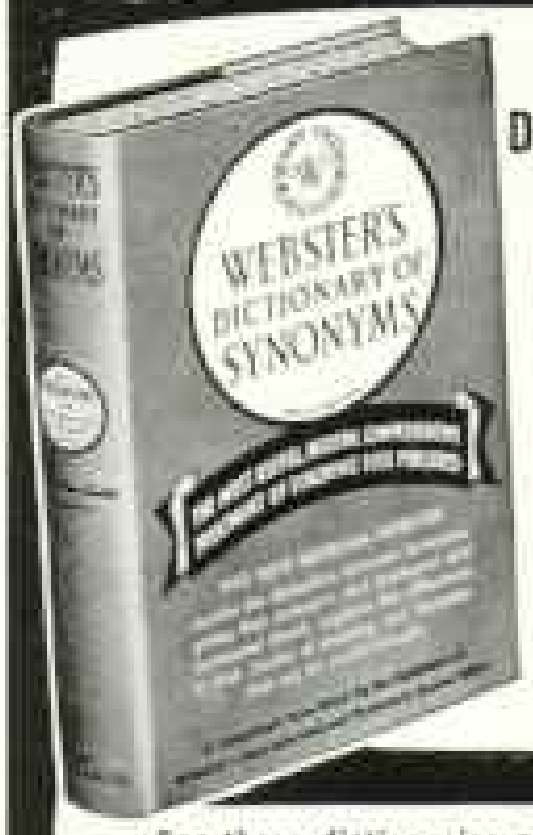

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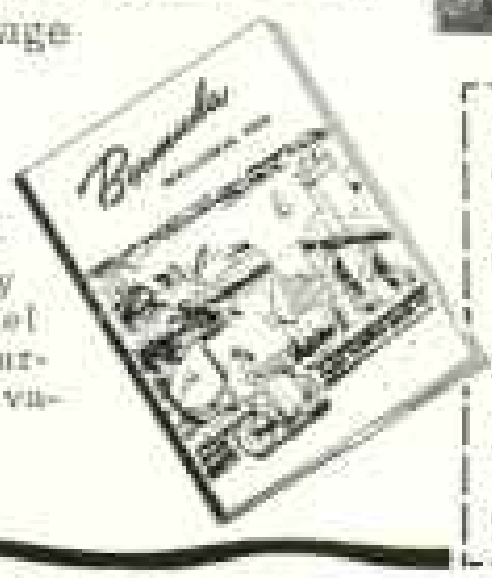

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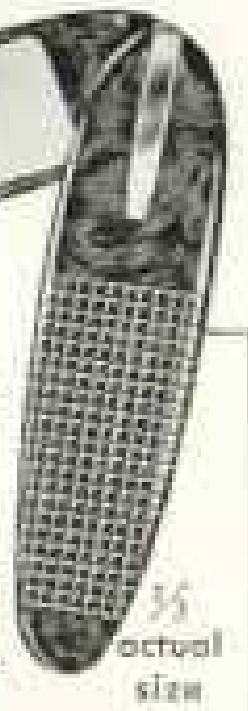

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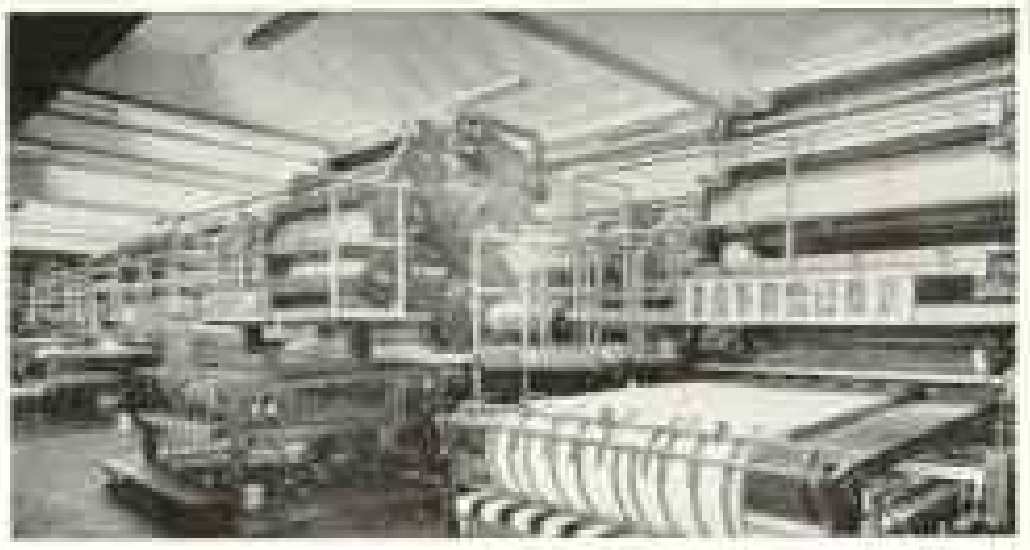

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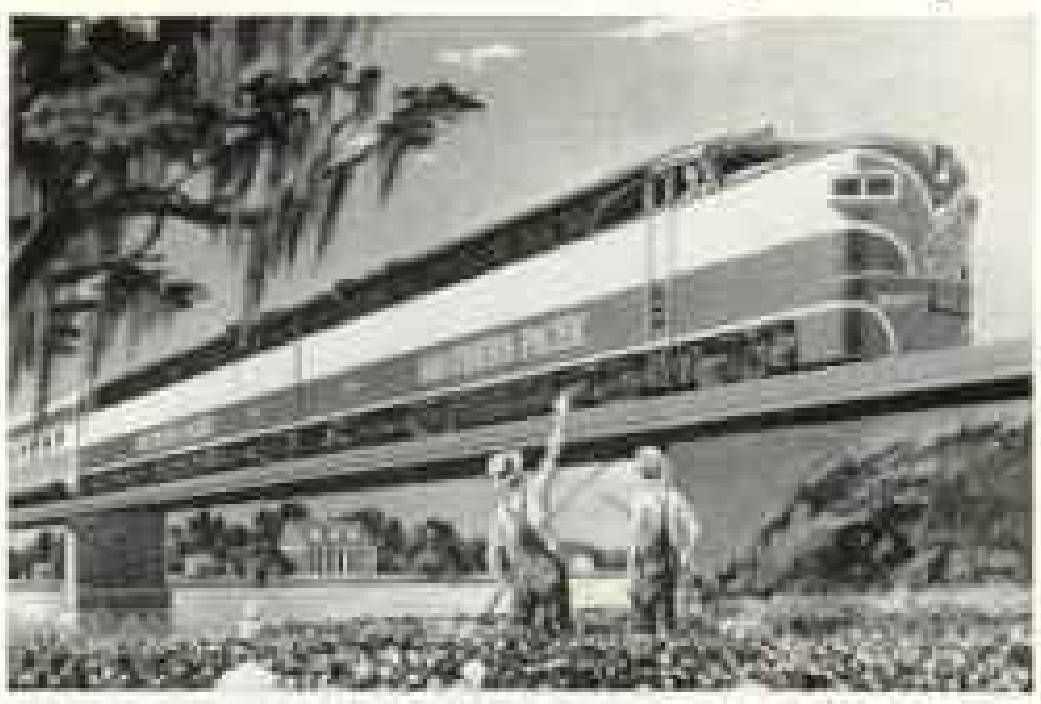

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Some simple facts about

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Diabetes is a condition in which the body is unable to utilize properly the sugars and starches in food. This condition is due to a deficiency in the body's supply of insulin. However, the use of insulin, made from the pancreas of animals, has made the treatment of diabetes increasingly effective. As a result, diabetics usually live long and nearly normal lives. In fact, life expectancy for the average diabetic today is double what it was before insulin was discovered, and has increased even more for young diabetics.

1 RESEARCH *promises more effective treatments for diabetics*

Medical science is constantly improving the treatment of diabetes. Different types of insulin, which vary in speed and duration of action, have been developed to meet the varying requirements of patients. A new type of insulin, now under trial, combines fast action with long-lasting effect.

There is continuing research on other phases of the disease. Work with radioactive isotopes and other studies offer the hope for further progress in treatment, and perhaps for the prevention of some cases of the disease.

2 DETECTION *is quick, and easily accomplished*

Having periodic medical examinations that include a check for diabetes helps to insure early diagnosis. If proper treatment is started at once, serious complications can usually be avoided.

It is now possible for anyone who suspects diabetes to make a simple, inexpensive test at home for sugar in the urine—one of the signs of diabetes. Kits for this test may be obtained at most drug stores. If the results of the test are positive, a doctor should be consulted for a complete examination.

3 TREATMENT *is largely the patient's responsibility*

Cooperation between patient and doctor is essential. Only the physician can determine whether or not insulin is required, and in what dosage. He will also prescribe proper diet and advise about necessary exercise.

Once the correct treatment is established, the patient should be careful and faithful in following the prescribed instructions, and he should be alert for signs of possible complications. If the average diabetic observes these and other precautions, he can usually look forward to living a long life with almost undiminished activity.

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The frog that's born in a beeswax bowl

FOR THE Amazonian tree frog, *Hyla resinifictrix*, building a home is the hardest part of raising a family.

The frog selects a hollow in a tree trunk, situated so as to catch the rain. Then it waterproofs the cavity by lining it with beeswax from the comb of a friendly species of bee found abundantly in the jungle.

Once the beeswax bowl is filled with rainwater, Hyla lays her eggs—and the job of bringing up the young is practically done.

For not only does the young family have a snug home; but each pollywog is born with its own food supply: an *extra-fleshy tail*. As the young change from tadpoles to frogs, their tails are absorbed to furnish nutriment for growing bodies. And until they're able to hop about and rustle up their own meals, they need no other food.

If your job of raising a family were as simple as Hyla's, you'd have less to worry about. But your children need plenty of food, good clothes to wear, and an education—as well as a home. So isn't this the wise thing to do?

After you've set up a home for your family, make sure you have protection through insurance for the income that's needed to keep every home going. By investing now a small fraction of your income in life and accident insurance, you can fix it so your family will never lack the care they're bound to need.

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VOL. XCVIII, No. 5 WASHINGTON NOVEMBER, 1950

THE NATIONAL GEOGRAPHIC MAGAZINE

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Miami's Expanding Horizons

By WILLIAM H. NICHOLAS

IN WEATHERED slacks and sneakers the professor knelt on the deck of the cabin cruiser, working intently over a small object. He looked up, then extended a penknife in my direction. On the open blade rested a small quantity of a yellowish substance.

"Have some sea urchin caviar," he invited. With some misgivings I tasted the offering. It was rich and fatty. He was slightly disappointed at my lack of enthusiasm.

"Too bad it comes in such small amounts," he said. "It's delicious. But one sea urchin yields only about half a teaspoonful. Maybe you would find raw conch more to your taste."

He handed over a slice. To me it had the consistency of a piece of inner tube, with about the same degree of succulence.

"It's better," he said, "in a salad, with vinegar."

New Food Sources in the Sea

The professor, Dr. F. G. Walton Smith, Director of the Marine Laboratory of the University of Miami, turned to eight bronzed young men and a girl who surrounded us.

"There are lots of things in the sea, like urchin roe and conch, which are edible and nourishing," he told his small audience. "Most people simply don't know about them."

Many Floridians are acquainted with the edible qualities of conch, or "conk," serving it in salads, or marinated, or with steaks.

Each of the earnest youngsters carefully examined his own queer loot, retrieved a few moments before from the floor of Biscayne Bay. They scribbled hurriedly in their notebooks. The group was a marine biology class at the University of Miami, aboard the *Megalopa*, one of the Marine Laboratory boats, anchored off Ragged Key some 10 miles southeast of Miami (page 575).

Thousands of northern visitors were splashing in the surf or lolling on the sands of Miami Beach. Crowds thronged Lincoln Road, its fashionable shopping thoroughfare.

Barkers for sight-seeing and deep-sea fishing boats extolled the merits of their craft to crowds on Miami's Bayfront Park docks. Winter guests clad in flaming sports attire strolled up and down Flagler Street.

Sailboats darted in and out from private docks of Coconut Grove homes fringing the bay. Automobiles bearing license plates from half the States in the Union parked along Coral Gables' "Miracle Mile." Racing enthusiasts converged on Hialeah Park and its flamingo-dotted oval.* The Greater Miami area was living up to its reputation as a vast all-year playground.†

But the little marine biology class, poring over sea urchins, filefish, sponges, coral, and shamefaced crabs (so-called because they insist on hiding their faces with their claws), represented a different, and highly audible, note in the Miami symphony.

University Sparks Cultural Life

With half a million permanent residents, and more constantly coming, the Miami area is weaving an unmistakable culture pattern. Sparking this pronounced trend is the astonishing University of Miami.

I drove out toward the University from Coral Gables, passing through its tree-lined streets, and then by broad highways into open countryside. Suddenly I saw before me a streamlined mass of steel, concrete, glass, and

* See "Flame-Feathered Flamingos of Florida," by W. A. Watts, NATIONAL GEOGRAPHIC MAGAZINE, January, 1941.

† See "Florida—The Fountain of Youth," by John Oliver La Gorce, NATIONAL GEOGRAPHIC MAGAZINE, January, 1950.

fieldstone—a group of spectacular and distinctly modern-type buildings rising in open pineland and rubbing shoulders with several low wooden structures resembling army barracks.

I did not have to look at the sign to identify the scene as the new main campus of the University of Miami (page 581).

Born in the midst of the fabulous Florida land boom of the 20's, and almost wrecked in the collapse and general depression that followed, the University survived hurricanes, both physical and financial, to become one of the Southland's outstanding educational institutions.

The University was chartered in 1925 and opened its doors the next year. The skeleton of a huge building was erected on a 160-acre campus one mile south of Coral Gables' business center, and 966 citizens pledged nearly $9,000,000 to the fledgling seat of learning.

Then, on September 18, 1926, Miami's worst hurricane struck with devastating fury.*

The land boom collapsed. Nearly all of the pledges went unredeemed. Title to all but 40 acres of the campus melted away.

How the University survived these blows, and the general depression which followed, is a story of a struggle won chiefly through the indomitable courage of its president, then and now Dr. Bowman Foster Ashe (page 570).

As recently as 1942 the University was conducting its courses in one three-story building, once a hotel in Coral Gables, and housing its students in an adjoining structure.

Enrollment Today Exceeds 11,000

Today, eight years later, it has an enrollment of some 11,000 students and operates on three campuses.

The heart and glory of the University of Miami is its main campus of 260 acres, built around the 40 acres left over from the depression, along with its "skeleton" of steel and concrete.

When World War II ended, the main campus was a wild stretch of palmettos and Caribbean pines, transected by an unused tidal canal. To this unprepossessing location wartime barracks from Florida military camps were hauled, other temporary buildings were erected, and classrooms and administrative offices were installed. Then it was that new building began.

Planners of the University have developed the campus in the spirit of Caribbean Florida's new architecture. All buildings have natural cross circulation of air. Sheltered galleries, walkways, and breezeways flank the outer walls. And they are built to withstand hurricanes. The architecture is startling to an observer accustomed to cloistered halls and ivy-covered walls on a university campus.

The new "dormitories" are not really dormitories at all, but modern apartment houses containing 533 apartments which accommodate from three to seven students each, and smaller units for the married GI student and his family (page 588). The project covers 60 acres of campus fronting on Dixie Highway.

"How much use do the boys make of their electric stoves and refrigerators?" I asked one of the University's administrative officers as we inspected several of these well-furnished apartments.

"We wondered about that ourselves at first," he answered. "But, surprisingly enough, the kitchen equipment of nearly every one is put to use. Of course the girls do their own cooking, and so do the boys. New boys usually stock up first with things they shouldn't, things their mothers never provided at home. But they soon discover that after all Mother knew something about preparing meals. They find their innovations either cost too much, thus wrecking their budget, or that their meals are not very well balanced. Then they settle down and get along nicely on about $5 to $7 a week apiece.

"When half a dozen new boys take an apartment, they require several weeks to iron out their housekeeping routine. Somebody *must* take out the garbage; beds *must* be made every day. But they soon learn to apportion the work."

The first new educational structure to be erected was the Memorial Classroom Building (page 574). Year-round temperature in its airy lecture rooms averages 75.2°. Then came the Student Club, bordering and partly overhanging an irregular lake made by widening a portion of the old canal (page 569).

This striking and popular meeting place includes the University cafeteria, a soda bar, lounging and reading rooms, and dancing terraces—a complete community recreation area. With a well-stocked tray from the cafeteria, I made my way to one of the pavilions stretching out over the water and ate a substantial meal there to the accompaniment of music drifting out from the soda bar's juke box.

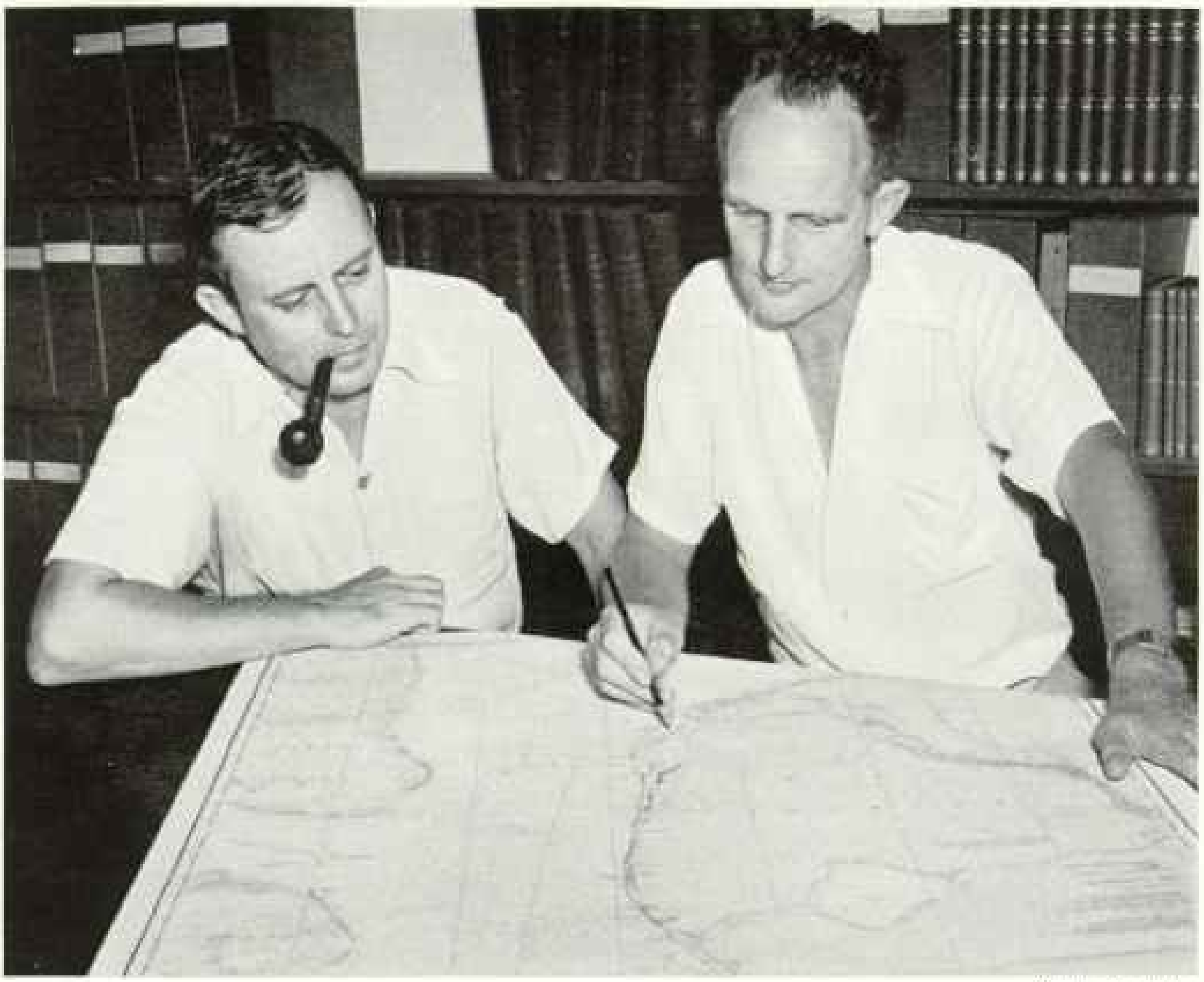
All the time this new building was going on, the 23-year-old "skeleton" still rose stark and gaunt. Last autumn the architects turned their attention to it and, with a few adaptations, they used the original concrete and steel framework to erect the most imposing

* See "Men Against the Hurricane," by Andrew H. Brown, NATIONAL GEOGRAPHIC MAGAZINE, October, 1950.

Miami Beach News Bureau

Miami Beach's Luxury Hotels in Unbroken Line Front Atlantic's Sand and Surf

Hostelries in this winter playground have jumped from 61 to 365 in 20 years. The city plays host to 1,500,000 guests annually. Collins Avenue parallels the beach. Upper left: Bayshore Golf Course.



William Rossmaker

Marine Biologists Chart a Voyage to Study Mysterious Pastures of the Sea

The National Geographic Society and the University of Miami have jointly launched a long-range research program to study plankton, the drifting meadows of microscopic fodder on which most sea life depends for existence. Field of operations will be the Atlantic between southern Florida and the Bahamas. Dr. F. G. Walton Smith (left), head of the Marine Laboratory at University of Miami, directs the study. His associate is Dr. Hilary B. Moore, another top-ranking oceanographer on the Laboratory's staff (page 368).

structure on the campus, the Merrick Building (pages 581 and 585).

Ground soon will be broken for the new Law School building. Much of the money for this project is being raised by the law students and faculty members themselves.

A dozen more buildings must rise before the University plant reaches the minimum expectations of its loyal supporters. Meanwhile, the cultural impact of this lusty infant on Miami and, in the field of research, over a much wider area, daily becomes more pronounced.

German Dramatist's Play Presented

Miami, for example, has no legitimate theater. The University supplies that need. The Drama Department last season staged three major productions in its conventional Box Theater and four in its Ring Theater, with minimum runs of 12 performances each. More than 40,000 persons attend in a single season.

In the Box Theater I saw a presentation of *The Ascension of Hannele*, one of the plays of Gerhart Hauptmann, German dramatist who received the Nobel Prize for Literature in 1912. More or less rugged fare for the average American theatergoer, the production represented a highly successful effort to bring before a Miami audience a work by a playwright highly considered on the German-speaking stage but not too well known in the United States.

Later, in the Ring Theater, I saw the opening of Edmond Rostand's *Cyrano de Bergerac*, with a long-nosed Cyrano worthy of Broadway (page 587). John Behney, a University law student, gave a sterling interpretation of Cyrano before a sparkling first-night audience.

Gatuel

"Don't Fear This Harmless Florida King Snake"

Mrs. John Goggin, Jr., of the Miami Junior Museum, holds the reptile to demonstrate that it is nothing to be afraid of. The Miami Junior League opened the Museum in January, 1950, to acquaint youngsters, particularly newcomers from the North, with subtropical flora and fauna. Soon 3,000 school children a month were pouring through its doors (page 578).

The Ring, as its name implies, is a circular theater, with a small stage in the center, no scenery, and a minimum of furniture, props, and lighting. So intimate is the effect of this staging, with the players almost in the laps of the audience, that the onlookers seem to participate in the action.

Fred Koch, Jr., head of the Drama Department, told me of an incident which occurred during one Ring play. At a certain juncture a character lighted a cigarette. One night his lighter failed to work after repeated attempts. Casually, a spectator in the first row held out his own lighter, the actor took a puff, and the play went on. This all seemed such a natural thing to do that no one considered it an interruption.

The idea of the modern arena theater was developed by Glenn Hughes at the University of Washington, Seattle, in 1932. Now New York, Miami Beach, Atlanta, Dallas, and an increasing number of smaller towns have them.

Growing pains account for the fact that University of Miami's Ring is housed in a tent. The original quarters were entirely too small. Soon a new theater building will arise.

Symphony Presents Eminent Artists

The School of Music plays a leading role in the cultural life of Greater Miami. Of the 90 members of the University of Miami Symphony Orchestra, two-thirds are students and the remainder professional musicians. Last season large audiences heard its nine pairs of concerts, starring as soloists such distinguished artists as Helen Traubel, soprano; Lauritz Melchior, tenor; Jesus Maria Sanroma, pianist; Jean Bedetti, cellist; and Frank Edwinn, basso. The University also presented the Budapest String Quartet in recital.

The University Band (page 576) and the Chorale add to the community's musical fare.

Miami News Bureau

Bayfront Park's New $80,000 Band Shell Creates the Illusion of a Giant Sea Shell
The stage accommodates 200 performers; the orchestra pit, 150 musicians; outdoor seats hold 10,000 persons. Gunite, a cement and sand mixture, covers the steel frame with a smooth, white finish (page 583).

One wing of the new Merrick Building houses the art galleries, where the Art Department presents frequent showings of loan collections (page 570). I saw a representative group of contemporary American paintings lent by the Whitney Museum of American Art, the Museum of Modern Art, and other well-known galleries.

The University is keenly aware of its proximity to Latin America. Its closest big college and friendly neighbor, even closer than the University of Florida at Gainesville, is Cuba's venerable University of Havana.

More than 140 students from Latin America and two score from Puerto Rico are enrolled at Miami. Intellectually and socially, these boys and girls fit well into the student body from the time of their arrival. At first they naturally tend to clique in a language group, but as they learn to speak English they engage in their share of campus activities.

The University's Hispanic-American Institute is well known for its published Hispanic-American Studies. Inquiries from other universities are numerous and include two received on the same day from such distant points as Wellington, New Zealand, and Tomsk, Siberia. Institute lecturers include prominent South American educators.

The University of Miami boasts the first endowed chair of Human Relations in the country, and it also was the first school to offer a course in Human Relations as an undergraduate major. The chair was established by Mr. and Mrs. Benjamin E. Bronston, of Miami Beach.

The students plunge into discussions of dynamite-laden situations and let off steam by engaging in practical ventures, such as raising eight tons of food and clothing as Christmas gifts last year for two-thirds of Florida's Seminole Indians. Their approach to social problems, however, is that of students and learners, not reformers.

Books by the Truckload

Nothing better illustrates the rapid growth of the University of Miami than the upbuilding of its library. In 1940 volumes numbered 53,861. Five years later the figure had grown to 85,545. Today books total a quarter of a million on a wide variety of subjects.

While I was making this survey, the librarians were awaiting a shipment of 33,000 volumes purchased from a Boston bookstore. This will be the last general consignment bought, since any more large orders doubtless would contain too many duplicates.

The University has contracted to purchase the large collection of Floridiana acquired by Dr. Mark F. Boyd of Tallahassee over a long period of years. Books in this assortment are available now to students upon request. It rivals in importance the Floridiana collections owned by the State Library and the University of Florida.

The University also has a collection of 800 rare Spanish volumes, obtained from a California estate.

Developing an Improved Battery

In the general field of research the University makes important contributions. The Electronics Research Laboratory, for example, is perfecting a battery to which water need never be added. Copper plates have been substituted for lead. When completed, the battery is permanently sealed, so that it never gives off any noxious gases. Those generated are recombined into water. Value of such a battery for either airplanes or submarines is obvious.

I was shown also a small hearing-aid battery designed on the same principle. As in the larger batteries, use of copper plates means reduction in weight to half that of a standard battery. More important, it can be recharged at inconsequential cost.

The Electronics Research Laboratory is testing an ozone treatment to preserve bananas, citrus fruits, potatoes, and other produce during shipment. Surprisingly successful results have been obtained by introducing ozone into refrigerator cars just after they have been loaded with perishables.

Different but also significant approaches are under way on the south campus—an extensive research program in tropical foods.

Mango, guava, Barbados cherry, carissa, and soursop have been made into purees and used to flavor ice cream. The research men themselves constitute a taste panel and sample the new food products to determine whether they like them and whether they serve best as "toppings" or as component parts of ice cream.

Two years ago the Food Research Laboratory worked out a process for making frozen banana puree. This was not easy, for previous processes darkened the bananas and detracted from their salability. A manufacturer of baby foods is successfully using the new method.

Dr. Arthur I., Stahl, Director of the Laboratory, did important work in frozen orange juice concentrates, now so popular all over the country. Today he is testing other juices in the laboratory's miniature plant model of a juice concentrator. I stood by as he went to work on a gallon of pineapple juice, reducing it to a concentrate by evaporation. Then I tasted it after water had been added. It suited me.

Bean Cooking Made Easy

In another building I saw full-sized factory equipment employed in packaging fresh-frozen stringless beans. One innovation is a nipping machine which not only takes off the ends but cuts the beans up into small lengths, so all that remains for the housewife to do is to transfer them from package to cooking utensil.

Only a few of the wartime buildings on the south campus are in use, but the 2,048 acres, under lease from the U. S. Navy, are being utilized as a nucleus for a future School of Tropical Agriculture. Some 5,000 young trees have been set out—avocados, guavas, white and yellow sapotes, lichees, limes and other citrus fruits, mangoes, and sapodillas. For ease in recording data they are planted in exact geometrical patterns, with a block of 10 acres allotted to each species.

Fruit from the trees eventually will afford an ample supply to the Food Technology Department's processing and packaging units.

Studies of a new pest, a voracious beetle named "heilipus," whose larva gorges itself under the bark of avocado trees with devastating effect, are expected to lead to the saving of many groves in south Florida and elsewhere.

Identifying the Red Tide

Researches of the Marine Biology Department have gained wide acclaim. For example:

In November, 1946, a so-called "red tide" appeared on the west, or Gulf, coast of southern Florida near Naples. Fishermen reported countless dead and dying fish floating in the vicinity and about 10 miles offshore. The sea water was strangely discolored.

By the end of January, 1947, the red tide had moved as far north as the bays and beaches of Fort Myers, Sanibel Island, and near-by areas. During the summer of 1947 the mysterious scourge broke out again, causing even greater losses of fish and reaching north almost to Tarpon Springs. By the end of August it had disappeared and has not returned to date.

Many conflicting theories as to the nature of the red tide were advanced. But the University's Marine Laboratory definitely established the immediate cause. The reddish color and the slimy consistency of the water occurred from the presence of a

previously undescribed microscopic form of life, now known as *Gymnodinium brevis*. It is little more than one thousandth of an inch across. With the aid of two whiplike threads attached to its tiny body, it moves jerkily through the water. Normally it is present in sea water in harmless quantities of less than 1,000 to the quart.

But during the red tide more than 60 million of the little pests were concentrated in a single quart of sea water, and in such density became violently poisonous to fish.

How or why the abnormal concentration occurs at irregular intervals is still the subject of searching scientific inquiry.

The Marine Laboratory was established in 1927 as a tropical marine station readily accessible to the educational and scientific centers of the United States. South Florida climate permits study of marine biology under favorable year-round conditions. Terrific competition for food and space on the coral reefs and the enormous variety of marine species engaged in this struggle provide a living classroom and workshop. Along Miami Beach and the Florida Keys the Gulf Stream is but four miles offshore.*

I made several trips to the reefs on Marine Biology boats. On one occasion members of a class took turns descending to the floor of Biscayne Bay in a diving helmet (page 575). On the bottom they picked up coral and numerous other types of marine life.

My activities were confined to helping man the air pump and inspecting the specimens retrieved from the bottom. But photographer Justin Locke, more adventurous, donned the helmet himself and enjoyed his brief underwater experience.

The inoffensive marine life thus disturbed by the youthful researchers usually takes its uprooting calmly and makes no fuss when it is hauled aboard. But there are exceptions.

Locke was anxious to make a close-up of a few specimens held in the palm of Dr. Charles E. Lane's right hand. The doctor obligingly complied with the request and artistically arranged a sea urchin, some coral, bits of sponge, a small conch, and a shamefaced crab in his hand, which he held out over the gunwale. Locke was about to release the shutter of his camera when the crab so far forgot its embarrassment as to give Dr. Lane a mighty nip in his thumb.

More quickly than the speed camera could record it, Dr. Lane jumped backward, lustily crying "Ouch!" at the same time. Presto! All the specimens, including the crab, were en route to the bottom of the sea once more.

The researches of the Marine Biology Department are interesting and varied, as a partial list of its publications shows: *Hints on Smoking Fish and Other Seafood, Florida Crawfish Research, Biological Aspects of a Potential Sardine Industry in the Caribbean Area, Survey of the Sponge Grounds North of Anclote Light, A Fisheries Program for Florida, Atlantic Reef Corals, Sea Turtles and the Turtle Industry, The Spiny Lobster Industry of the Caribbean and Florida, The Commercial Shrimp Industry of Florida, Check List of the Florida Game and Commercial Fishes.*

Long-range Study of Plankton

Latest scientific investigation of the Marine Biology Department is a joint study with the National Geographic Society of oceanic plankton, the drifting "meadows" of microscopic plant and animal life which sustain most of the fish population of the world (page 564). Work will be conducted on a year-round basis in the Atlantic between southern Florida and the Bahamas.

Under a high-powered microscope the sea creatures to be studied present a weird assortment of odd shapes and often delicately beautiful coloring—a surrealist menagerie of infinite variety. The name "plankton" is derived from the Greek word for "wandering," which describes the drifting life of these minute organisms.

To the fishes of the sea, large or small, plankton is as indispensable to survival as the grasses are to the animals which range the land. When plankton pastures dwindle, the fish are fewer. When they are lush, the fish teem.

How do these plankton meadows materialize? Why do they migrate from time to time? These are two of the many questions to which answers will be sought.

The University's research boat *Megalopa* (page 575) will periodically spend 24 hours on station to give a round-the-clock check on the way the plankton pastures move up toward the surface with clocklike regularity at nightfall and descend again to lower depths with the coming of day. What causes this mysterious movement? †

False echoes caused by this shift of infinitesimal creatures gave trouble to the Navy's

*See, in the National Geographic Magazine: "Coral Castle Builders of Tropic Seas," by Roy Waldo Miner, June, 1934; "Life on a Coral Reef," by W. H. Longley, January, 1927; "Treasure House of the Gulf Stream," by John Oliver La Gorce, January, 1921.

†See "Exploring the Mid-Atlantic Ridge," by Maurice Ewing, National Geographic Magazine, September, 1948.

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Kodachrome by Justin Locke

Lakeside Pavilions of U. of Miami's Student Club Lure Undergrads All Year Round

The streamlined recreation center on the Main Campus at Coral Gables, Florida, houses a large cafeteria, snack bar, lounge rooms, and dancing areas.

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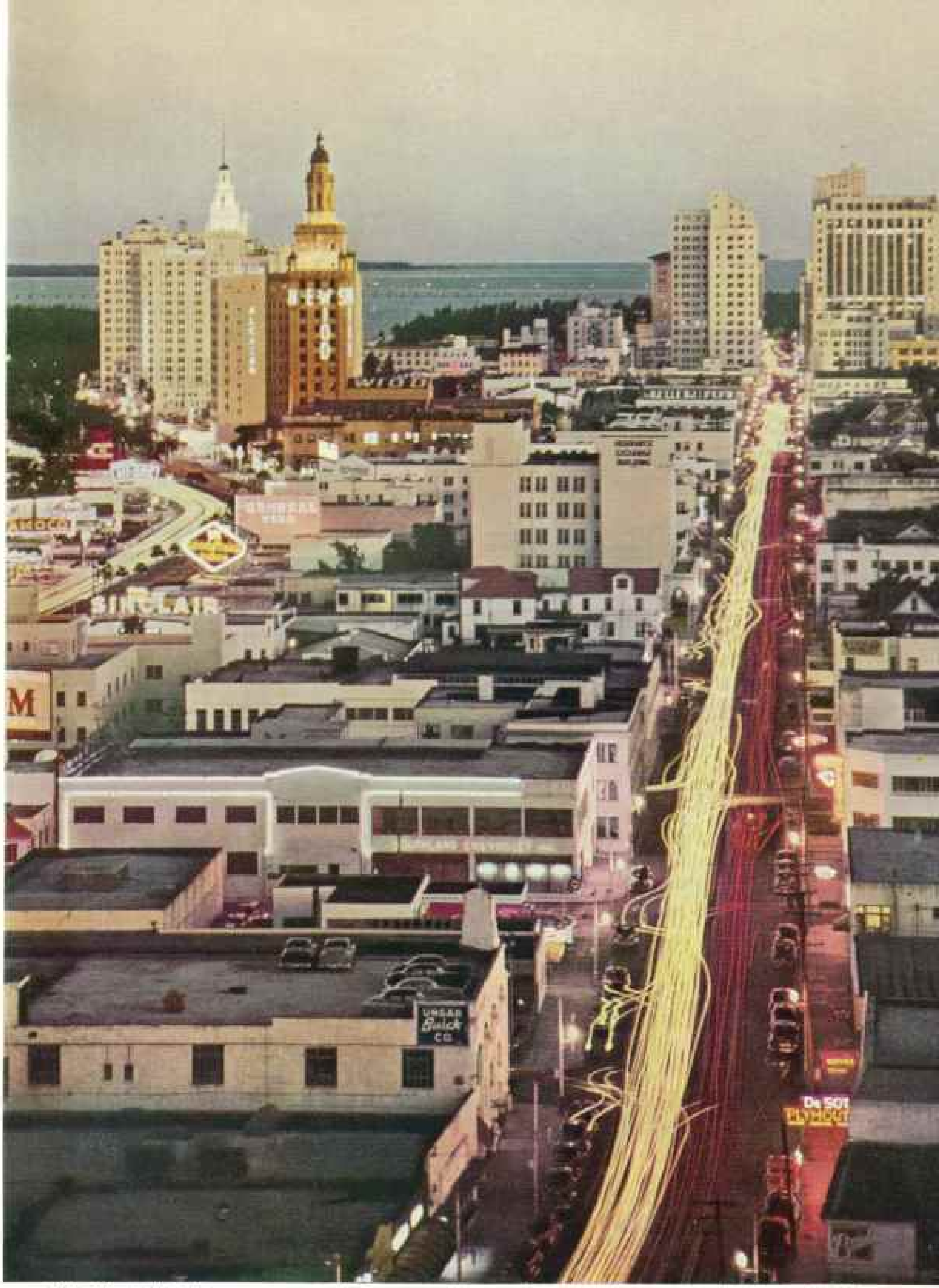
University of Miami's President Previews a New Painting for the Art Gallery

Dr. Bowman F. Ashe, left, looks on as Virgil Barker, Gallery Director, unpacks Reginald Marsh's *Afternoon at the Beach*. On the wall, left to right, *Carnival at Night* (Kester), *New York Night Scene* (Gottlieb), and *Transmission Towers* (Hallman).

How Wavy Are a Coed's Brain Waves? This Electric Gadget Finds Out

The model relaxes in a chamber enclosed by copper screening. Through electrodes in contact with her scalp, brain wave lengths and impulses are recorded on the tape. This electroencephalograph is used by the University's Guidance center in diagnosing brain disorders.

Photographs by Willard R. Culver



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Kodachrome by Justin Locke

Headlights at Night Flash a Trail of Light in Downtown Miami's Second Avenue

At left, beyond the wide curve in Biscayne Boulevard, cluster the Miami News Building and a group of towering hotels. The Alfred I. du Pont Building rises at right. The new Rickenbacker Causeway in background.

Merrill Palm Fruit Might Be Mistaken for Big Olives

People of Coron and Palawan Islands in the Philippines, homeland of the Merrill or Manila Palm, chew the berries. This decorative palm, named for Dr. E. D. Merrill, Emeritus Professor of Botany at Harvard, and authority on Philippine plants, thrives in Fairchild Tropical Garden. Its Latin name—*Adonidia merrillii Becc.*

"Ouch!" Puerto Rico's Spiny Club Palm Feels as Sharp as It Looks

The thorns keep land crabs and rats from climbing the trunk to get at the fruit. Scientists know the tree, which sometimes grows to a height of 30 feet, as *Aiphanes acanthophylla Mart. Burret.* It is one of more than 300 species of palms growing in Miami's Fairchild Tropical Garden. In 12 years this 83-acre tract has been transformed from a wilderness into a botanical paradise, with more than 1,000 varieties of plants from all parts of the Tropics. Col. and Mrs. Robert H. Montgomery of Coral Gables established the garden in 1938.

© National Geographic Society

Kodachromes by Willard R. Culver

Dr. David Fairchild, Eminent Plant Explorer, Inspects a Flowering Queen Palm in the Tropical Garden Named for Him in Miami

The young flower cluster has just emerged from the woody, boat-shaped spathe above, in which it developed. At right, the girl holds a cluster of half-matured fruits from the same feather-leaved species *(Arecastrum romanzoffianum (Cham.) Becc.)* native to southern Brazil, Uruguay, and Paraguay. Many of the trees in the garden were introduced to North America by Dr. Fairchild. He has been a member of the Board of Trustees of the National Geographic Society since 1905.

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Kodachromes by Willard R. Culver

Open-air Decks Lead Students to Classrooms in One of U. of Miami's New Halls of Learning

Visitors to the Main Campus of the University come upon a breath-taking mass of steel, concrete, and glass rising from open pineland. The buildings are designed to meet the demands of a subtropical climate.

No interior halls wind through this new Memorial Classroom Building. Breezes sweep into the lecture rooms across the open decks, keeping average indoor temperatures in this tropical climate at 75.2° F. Each new structure was located on the Campus with the flow of the Southeast Trade Winds in mind. All are hurricane-proof.

Ultimate plans call for the erection on the Main Campus of 29 educational and additional apartment buildings. Also charted, is an outdoor concert amphitheater on the edge of the lake opposite the Student Club (page 569). A new School of Law building and a modern theater soon will be under construction.

Architects Robert Law Weed, Marion I. Manley, and Robert M. Little designed this revolutionary style for a subtropical university.

© National Geographic Society

Illustrations by William B. Culver

Clutching a Starfish, a Helmeted U. of Miami Marine Biology Diver Rises from Biscayne Bay

Girls as well as boys in the class aboard the *Megalopa*, Marine Laboratory boat, take turns donning the helmet and descending to the coral-sand bottom to collect strange sea life. They soon become accustomed to the slight increase in air pressure beneath the hood. Bay water is shallow. Back on board, they identify their finds.

The keys and coral reefs of Biscayne Bay and the nearness of the Gulf Stream (four miles offshore) afford University of Miami an unparalleled outdoor laboratory for all-year-round marine biology work. Latest research project is a study, in cooperation with the National Geographic Society, of plankton. This curious microscopic vegetable and animal life in the sea supplies food for the world's fish population.

In the palm of the instructor's hand, below, lie two spiny sea urchins at right (*Lytechinus variegatus*); another sea urchin beyond (*Moira atropos*); and a dark bit of inorganic matter.

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Kodachrome by Volkmar Wentzel

Kodachrome by Justin Locke

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Kodachrome by Justin Locke

At Miami Football Games They Huff and Puff; in the Brass Orchestra They Play Bach

electronic sound-ranging instruments during World War II submarine hunting.

Results of the study will, when completed, become available both in nontechnical articles in the NATIONAL GEOGRAPHIC MAGAZINE and in technical reports to be contributed to world knowledge through universities and colleges at home and abroad.

The Medical Research Unit of the University functions in cooperation with the U. S. Veterans Administration and occupies quarters in the huge Veterans Hospital in Coral Gables, formerly the fashionable Miami-Biltmore Hotel. The Unit is built up as a nucleus for a school of medicine, long a dream at the University of Miami.

Although the administrative office is lost in a corner of the ornate ballroom of the former hotel, researches are conducted in modern laboratories completed this year. A corps of eminent researchers now is engaged in studies of compounds capable of prolonging the action of adrenaline secreted by the adrenal glands; compounds effective as antidotes to barbiturates introduced into the human body in overdoses of sleeping pills; the effect of various drugs when used with insulin; transplantation of endocrine glands; effect of shock on kidneys; and causes of various tropical diseases.

Somewhat overwhelmed with the scope of the University's activities, its meteoric growth, and its impact on Miami, I sought out Dr. Ashe to learn his views on the University's role in this ever-growing area.

Students from 46 States, 20 Countries

The University maintnins a president's modern office in downtown Miami's chief office building, the Du Pont. Here also is the large room in which meetings of the Board of Trustees are held when the time element demands a downtown location.

But Dr. Ashe's principal administrative work is performed in the Administration Building, erected on the main campus by combining two old Army barracks. It was here that I found him.

"We have now been in existence 24 years," he said. "We have some 9,000 full-time students from 46 States and 20 countries, and approximately 2,000 students in the evening Adult Division.

"We have built on a permanent and well-placed campus of 260 acres several major educational buildings, several minor ones, and modern dormitory facilities. In addition to regular instruction in the College of Arts and Sciences, the School of Business Administration, the School of Law, the School of Education, the School of Engineering, the School of Music, and the Graduate School, we have developed important research activities. These are in the fields of tropical agriculture and horticulture, experimental medicine, marine biology, and several of the laboratory sciences.

"Over the next few years we expect to push further many of these basic researches and to add several additional schools. We must build a number of new educational buildings on the main campus, including a great new library building. Our library is growing at a terrific rate. We must have the first large unit of a spacious science building, a large auditorium, and adequate quarters for our students in music, drama, and art.

"Then we need adequate endowments to help support the University. We are not tax-supported and earn most of our income.

"The community is growing very rapidly, and has changed its character from purely a winter resort to a commercial and industrial metropolis. Agriculture in the back country has multiplied probably ten times in the last 20 years.

"It apparently will be necessary for this University to become quite large. We consider the first 24 years a period in which the University was established. The next few years should be a period of development and improvement."

The decisiveness with which Dr. Ashe summed up his views, his past record as a man undismayed by formidable problems, and the caliber of the men who back him up, his progressive Board of Trustees,* combined to inspire in me the feeling that even bigger things are in store for the University of Miami.

Although the University's influence is widespread, it would be a mistake to assume that it is responsible for all of Miami's cultural life. For example:

An outstanding musical organization in the area is the Miami Civic Music Association. For the last 15 years its president has been Charles H. Crandon, in whose honor the area's newest public recreation park on Key Biscayne has been named (page 582).

This democratic assemblage of music lovers

* Members of the Board of Trustees of the University of Miami: Bowman F. Ashe, Harry Hood Bassett, Samuel Blank, Roscoe Brunstetter, Oscar E. Dooly, Julian S. Eaton, George C. Estill, Gilbert Grosvenor, Edmond A. Hughes, John S. Knight, John Oliver La Gorce, Daniel J. Mahoney, Dr. Bascom H. Palmer, Robert Pentland, Jr., Fleming G. Railey, Daniel H. Redfearn, McGregor Smith, Arthur A. Ungar, and George E. Whitten. Honorary Member, William H. McKenna.

has a membership of 2,200 and a long waiting list. Six or seven concerts by world-famed artists are presented each season. No one connected with the association receives a salary. Last season artists appearing were the Robert Shaw Chorale; the Mariemma Dance Ensemble; Ebe Stignani, soprano; Benno Moiseiwitsch, pianist; the Trieste Chamber Music Trio; Benno Rabinoff, violinist; and Jussi Bjoerling, tenor. Concerts are held in the Miami Edison High School Auditorium.

Miami Hears Grand Opera

The Opera Guild of Miami, under the artistic direction and general management of Dr. Arturo Di Filippi, a member of the University of Miami faculty, has brought grand opera to Miami for ten seasons.

Miami music lovers contribute to its support, subscriptions ranging from $2,000 down to $10 annually. Miami singers and music students from the University make up the chorus and supporting casts; lead roles are sung by Metropolitan Opera stars imported for the occasion.

Last year *Carmen*, *L'Elisir d'Amore*, and *I Pagliacci* coupled with the *Secret of Suzanne* were presented.

Like any other civic opera organization, the Miami group constantly seeks funds to keep solvent. Dr. Di Filippi surmounted one crisis last season when he feelingly proclaimed in the newspapers that a horse fared better in Miami than a singer, and that he wished he were a horse.

"Everybody would dress up and come to see me run," he added. "I would then neigh out an operatic cadenza, with a snort at the end, that would bring me in a subsidy for the Opera Guild that I sorely need. Oh, what an operatic tail that would be!"

The very next day Dr. Di Filippi received a check for $25 from a sympathetic reader who observed, "Who could say neigh to an appeal such as yours?" Other subscriptions followed to save the day.

Then there is the Philharmonic Society of Greater Miami, organized in Coral Gables, which makes it a point to feature south Florida artists and composers.

Barry College, located on an 80-acre campus in a pleasant suburb north of Miami, also makes a contribution to the area's cultural life. A Catholic women's college of liberal arts and sciences, it is celebrating this year the tenth anniversary of its founding.

Barry's Christmas oratorio and pageant, *Christmas Tryptych*, and its Passion oratorio for Palm Sunday, both composed by the head of its Department of Music, attract audiences of more than 1,000. Once a year the Dramatic Department stages a serious play, such as *The Song of Bernadette;* in lighter vein, they give plays such as *Cinderella* for the children of the community.

About 15 percent of Barry's 289 students are from Latin America and Puerto Rico. They don the folk costumes of their countries to participate in Greater Miami's annual Pan-American Day activities (page 589).

The campus is famous for its tropical beauty, highlighted by a long double row of towering royal palms which extend westward from the entrance to a tiny chapel at the other end, and by brilliant, multihued bougainvillea which overhangs the façades of classrooms and dormitories.

Among the thousands who have moved permanently to the Miami area in postwar years are many children, suddenly introduced to a subtropical region totally foreign to them. In most instances their parents find life just as new and hence are unable to answer hundreds of inquiries put to them by their young sons and daughters.

To remedy this situation, Miami's Junior League opened a Junior Museum last January. By May school children were visiting it at the rate of more than 3,000 a month. Also, the museum's natural history curator had lectured to 11,000 children in their schools.

A well-informed young woman accompanied us through the reconverted old mansion which houses the exhibits. Tours take from an hour to an hour and a half.

Sparkles Stars at Junior Museum

Beginning in the Early Florida Man room, visitors move through the Seminole Gallery, always popular with the youngsters; pass through a natural history gallery where Sparkles, a ring-tailed monkey without rings on her tail, is a source of constant delight; and through other rooms devoted to primitive African crafts, Latin-American and Oriental curios, and a coral exhibit. Next year the Museum will have a marine life exhibit.

In nearly every room, to rivet youthful attention, something alive is exhibited, including parakeets, tree snails, and even snakes in well protected cases. But Sparkles' only real rival for the children's affections is Mary, the goat, which is kept out in the yard. Educators are enthusiastic over the whole informative visual project (page 565).

For students and lovers of horticulture a visit to Miami's Fairchild Tropical Garden is an experience not to be duplicated anywhere in the United States (pages 572-3).

Miami Daily News

"He Carved a Great City from a Jungle"—Carl Graham Fisher Memorial

Automobile racer, a builder of the Indianapolis Motor Speedway, sponsor of the Lincoln Highway and the Dixie Highway, and successful businessman, Carl Graham Fisher had made a fortune and retired when he first visited Miami in 1912. He visualized a vast resort city on the seemingly worthless tidal swampland which is now Miami Beach; and, with the courage of his convictions, he became its pioneer developer. Right to left: James M. Cox, former Governor of Ohio; Monsignor William Barry; John Levi, former Mayor of Miami Beach; and Dr. John Oliver La Gorce officially dedicate the memorial erected by Mr. Fisher's friends in the city he built beside the Gulf Stream (page 584).

Colonel and Mrs. Robert H. Montgomery of Coral Gables established the garden in 1938 on a tract of 83 acres not far from their home.

They named it for Dr. David Fairchild, their neighbor, in recognition of his half-century of tireless effort to enlarge the plant life of this country, first as a scientific plant explorer for the United States Department of Agriculture, and later on voyages to the Netherlands Indies and other tropical areas in the Pacific. Here he searched far and wide for little-known plants and trees useful to America in food value, as field crops or as additions to native fruits, or as ornamentals.

Some 300 species of palms and more than 700 species of other tropical trees, shrubs, and vines blanket the well-tended tract, many of them first introduced to America by Dr. Fairchild.

Examples include the acacia tree from the South African veldt; umbrella tree from northeast Australia; baobab tree from Africa; lingaro vine from the Philippines; screw pine, mahogany, agave, cassava, cannon-ball, and sandbox trees.

Others once strangers to the United States are a tree yielding wood so tough it's used to make machine bearings and bowling balls; another so light its wood is highly prized for making rafts and airplanes.

Varieties of mango, papaya, and avocado trees are also included, and those that give perfume, tannin, oil for salves, and fruit rich in scurvy's enemy, vitamin C.

Visitors spend hours acquainting themselves with the unfamiliar foliage, blooms, and fruits of these exotic plants in this unique series of gardens.

Skyscrapers Dot Growing Miami, Fishing Hamlet 50 Years Ago

In 1900 Miami's population was 1,681. Today the city has 247,262 permanent residents, and Dade County, of which Miami is the seat, has 480,858.

Dade County Courthouse's pyramid top (left) rises 360 feet. Top floors house city and county jails. Once a prisoner escaped from his lofty cell, but he was recaptured.

Just opposite tree-lined Bayfront Park small bits of sandy wasteland dot Biscayne Bay. Beyond, MacArthur Causeway stretches across the shallow water to Miami Beach (background). Man-made islands on the other side of the Causeway were dredged from the bay and are studded with hundreds of all-year homes.

On the distant left, Venetian Causeway stretches across Venetian Islands to Miami Beach.

National Geographic Photographer Justin Locke

Dormitories at U. of Miami Make Up a Vast Housing Project

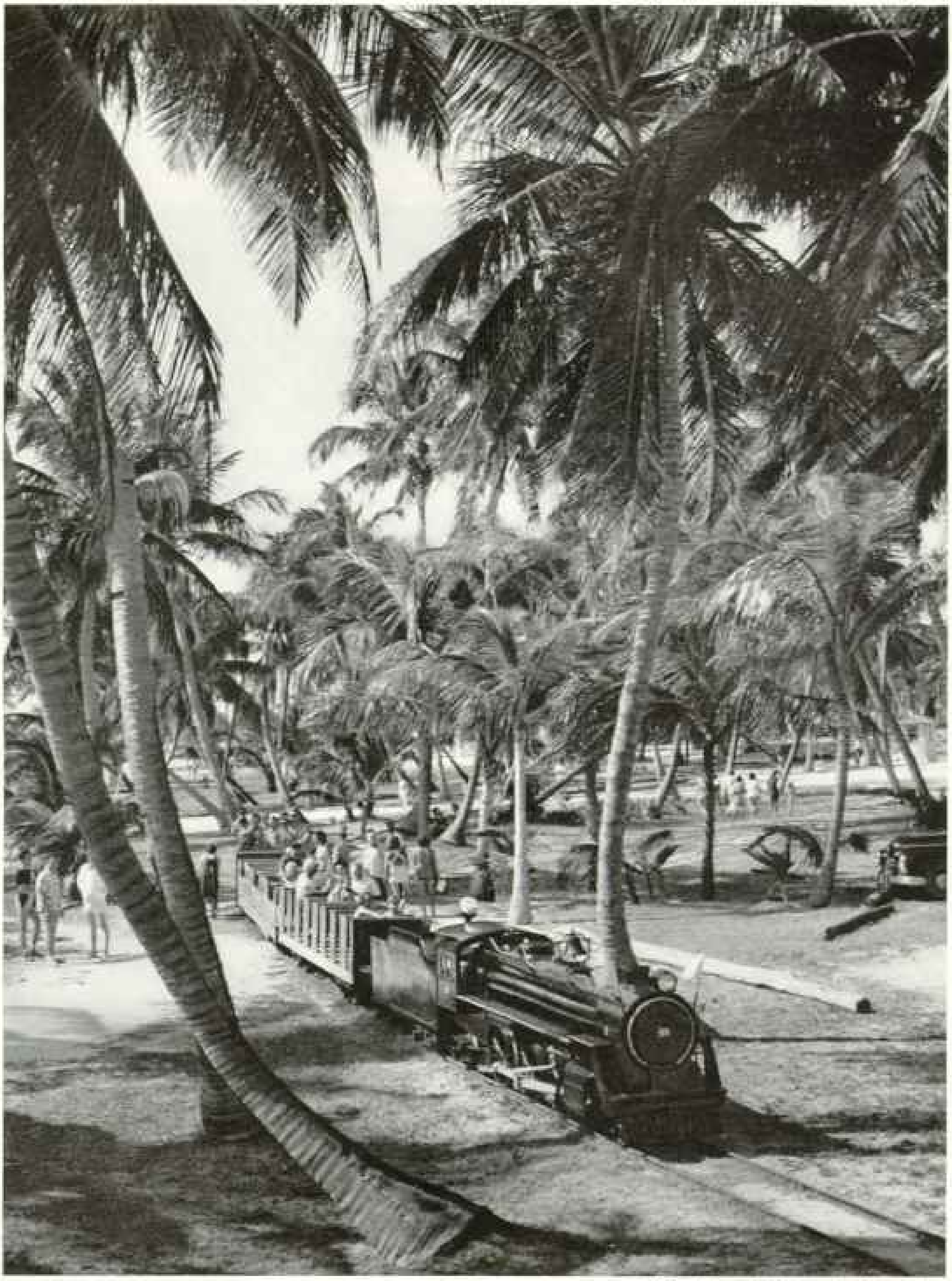
These modern apartment houses rise on a 60-acre section of the main campus in Coral Gables, which parallels the Dixie Highway (extreme lower right). Each of the 533 units accommodates three to seven students.

Every apartment has kitchen, electric stove, and refrigerator. Using these facilities, students cook their own meals and reduce expenses (page 562).

The lake was made by deepening and widening part of a tidal canal that transects the campus.

Beyond the lake stands the new Merrick Building (page 585). At the close of World War II this building was an abandoned steel skeleton rising out of a palmetto jungle. Collapse of the Florida land boom and the 1926 hurricane stopped work on the structure a quarter-century ago. It was completed only this year.

National Geographic Photographer Justin Locke



National Geographic Photographer Justin Locke

Biscayne Bay, Atlantic & Gulf Railroad Winds Through Palm Grove into Primitive Jungle

Children and adults enjoy the scenic ride across Dade County's new Crandon Park on Key Biscayne. This miniature railroad's list of 50 honorary vice presidents and their titles is almost as long as its mile and a half of track. Lily Pons is vice president in charge of whistles.

The Montgomery Museum and Library on the grounds houses the Brett Memorial Library of more than 1,000 books on botany, horticulture, and related subjects. Here too is exhibited a large array of articles made from palms from all parts of the Tropics—blowguns, carved coconut shells, raincoats, hats, musical instruments, fine sailcloths, fish nets, basketwork, and dolls.

Not far away is Matheson Park, stretching between the main roadway from Coral Gables and the shore line of Biscayne Bay. Its palm-shaded bathing beach and pleasant tropical picnic grounds attract thousands of Miamians the year round.

Opposite the park, on the other side of the roadway, lies a large undeveloped tract known as Matheson Hammock, the largest stretch of primitive tropical growth in the Miami area. Thus is it maintained—or rather preserved—in a natural state for botanists to study.

Face Lifting in Bayfront Park

Every visitor to Miami inspects Bayfront Park soon after arrival. It is in the foreground of every skyline picture made from the bay. But changes have been and are being made here to alleviate Miami's cultural growing pains (page 580).

Construction of a $1,000,000 Miami Memorial Library, a two-story building of classical design faced in Georgia marble, is under way. Fifty yards off, a new $80,000 bandstand has been completed (page 566). The front of the new structure gives the general impression of a giant sea shell. The huge stage accommodates more than 200 performers, and the orchestra pit has space for a 150-piece orchestra.

Here free band concerts are heard twice a week during winter and spring and once a week in autumn. Miami boasts that from October 1, 1949, to April 1, 1950, not a single concert was canceled because of rain or cold weather!

Another recent Miami transformation has taken place on Dinner Key, once a palm-shaded bit of land a short distance offshore from Coconut Grove.

Biscayne Bay's original settlement was in Coconut Grove, centering around Dr. Horace Porter's store, opened in 1870. By 1873 the town had a post office. The original settlers often paddled over to Dinner Key for picnic dinners; hence its name. During World War I the War Department filled in the intervening shallow water and made the key part of the mainland. Later it became an active naval base.

Then Pan American Airways arranged to take the key as its International Marine Base, scene of operations of the company's famous flying boats to Cuba, the Bahamas, and South America. During World War II it was turned into a cadet training school where Pan American's seasoned operators taught American and English flying cadets navigation.

Now the city of Miami has acquired Dinner Key and transformed it into a convention site, with an Exposition Building seating 10,000 persons and containing a large restaurant. While I was in Miami, 10,000 Kiwanians descended on Dinner Key for their annual convention. The city also is building a municipal yacht basin at the key.

A stadium, primarily for baseball, seating 9,500 persons, has been completed at a cost of more than $1,000,000. For the first time in stadium construction in the United States, architects covered it with a cantilever roof.

Most popular of all Greater Miami's recent developments for the pleasure of permanent residents and winter guests alike is Crandon Park, on Key Biscayne. Cost of the park, and the 4-mile Rickenbacker Causeway from the mainland, exceeded $10,000,000.

Heirs of the late Dr. W. J. Matheson deeded the north half of Key Biscayne to Dade County for public park use. The tract was named for Charles H. Crandon, long a member of the Board of County Commissioners of Dade County, in which Miami is located, and a tireless worker for the community's civic betterment. Development was delayed by World War II. Park and causeway were formally opened on November 9, 1947.

Fishermen Line Bridge Rails

I drove over the Rickenbacker Causeway one sunny May day, passing scores of fishermen, some of whom were actually catching fish from the railings of the bridges. Located just 10 minutes from downtown Miami, the park stretches along the key for more than two miles. Coconut palms flank the roadway. I turned into one of the huge specially made parking areas, left my automobile, and strolled to the charming ocean-front promenade and palm-shaded beach, which attracts thousands of bathers. Miamians point out that average winter water temperature is 72°.

Opening out in fan shape, on either side of the park's central esplanade, is a group of buildings housing offices and shops, well-ordered refreshment stands, and bathhouses equipped with lockers and rest rooms.

One of the most popular features is a miniature scenic railroad which winds through one and a half miles of tropical jungle (opposite). Bearing the imposing name of Biscayne Bay,

Atlantic & Gulf Railroad, the line has an even more imposing list of 50 honorary vice presidents, each assigned to a particular "duty."

Among the vice presidents are: Bowman F. Ashe, in charge of cowcatchers; Bing Crosby, section gangs; Douglas Fairbanks, whistle stops; David Fairchild, observation cars; Gilbert Grosvenor, rails; H. V. Kaltenborn, cabooses; Capt. Eddie Rickenbacker, traffic; Juan Trippe, communications; Robert R. Young, rolling stock; and, only feminine official, Lily Pons, whistles.

Meteoric Growth of Miami Beach

Most phenomenal growth in the entire south Florida area has taken place at Miami Beach, a strip embracing 7.1 square miles of land and 7 square miles of water, which lies to the east directly across Biscayne Bay from Miami and fronts on the Atlantic Ocean. The city of Miami Beach also includes a group of man-made islands in Biscayne Bay (page 590). Three large causeways connect Miami Beach with the mainland of Miami, two free and one toll.

In 1915 the town was incorporated. Today it is one of the world's greatest winter playgrounds. In 1915 assessed valuation of real property was less than a quarter of a million dollars; today it is $250,000,000!

Twenty years ago Miami Beach had 61 hotels; today its ocean front is solidly flanked by so many huge modern hostelries that one could stay in a different hotel every day for a year (page 563). Nine more, under construction, will bring the total to 374. In addition, there are 1,500 apartment houses.

Since World War II Miami Beach has entertained about 1,500,000 guests each year. They enjoy not only an 8-mile ocean-front beach, but 13 parks, playgrounds, and recreation centers; 138 private and public swimming pools; two public and two private 18-hole golf courses; 13 motion-picture theaters; and 400 establishments licensed to serve food.

In a small park and playground for children at Alton Road and Lakeview Drive stands a memorial of bronze and granite to Carl Graham Fisher, the man whose vision, courage, and millions built a great all-year resort. Its inscription succinctly tells the story of Miami Beach: "He Carved a Great City from a Jungle" (page 579). Before his death in 1939 Fisher had engineered one of the biggest real-estate developments of the eastern seacoast and had lived to see his dream come true.

Miami Beach also has another memorial, this one built on an island offshore in Biscayne Bay, to another intrepid Florida pioneer. Both island and memorial were raised by pioneer developer Carl Fisher to the memory of Henry M. Flagler, who brought the railroad to Miami in 1896, and continued it on to Key West in 1912.

The line to Key West was partially destroyed in the vicious hurricane of 1935. Since then it has been converted into the scenic Overseas Highway, over a large portion of the original stone and concrete trestlework, from Florida key to key, to the doorway of Key West. Thousands of visitors annually enjoy this automobile "voyage."

Flagler's ardor in developing south Florida fired Fisher's enthusiasm and prompted him to present the striking memorial to his own new city (page 590).

The rapid growth of Miami Beach as a resort center tends to obscure its cultural aspects, but they are unmistakably present.

Twenty-four years ago, for example, the Committee of One Hundred was formed. Members were executives of large and small corporations from the North and Midwest who had built winter homes on Miami Beach and adjacent islands. They wanted to form friendships in their adopted seasonal community among men with common interests.

They acquired a clubhouse which included an auditorium. Membership today is limited to 300. Every Tuesday evening over a period of some 15 weeks in the winter season the group gathers to hear prominent speakers brought from all over the country to address them on national and international subjects.

New Hospitals in Miami Area

In postwar years Miami has taken rapid strides to enlarge its hospital facilities. Today Dade County has 21 hospitals with 2,692 beds and 326 bassinets. The healthful year-round climate and Gulf Stream-cleansed air are highly beneficial to heart cases especially, who come from far and near.

Largest in the area is the 600-bed Jackson Memorial Hospital, recently taken over by the county and well on its way to becoming a modern medical center. A new $2,500,000 building is being added to the plant, and State and Federal funds of more than $1,000,000 have been provided for installation of a 100-bed psychiatric ward. A Latin-American wing is soon to be added.

Next largest hospital is the Veterans Administration Hospital, formerly the vast Miami-Biltmore Hotel, in Coral Gables.

The South Florida Children's Hospital, for boys and girls under 16 and for polio victims of all ages, opened last March. The main building was erected at a cost of $875,000.

The new $6,000,000 Mercy Hospital, built

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Kodachrome by Justin Locke

Modern Façade Clothes a 23-year-old Steel "Skeleton" to Form U. of Miami's Merrick Building

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University of Miami's Chief of the Iron Arrows Holds Aloft the Honor Society's Symbol in Ceremonies Based on Seminole Ritual

Everglades Indians sewed together hundreds of small pieces of cloth in intricate patterns to make the colorful jackets. Dr. Bowman F. Ashe, University President, founded the Society in 1926 to recognize outstanding upperclassmen. Membership in Iron Arrow is the highest undergraduate honor attainable at the University.

Long-nosed Cyrano de Bergerac Pens a Love Letter as Young Poets Chatter—University of Miami Actors in a Scene from Rostand's Play

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Former B-24 Pilot, a Married GI Student Lives with His Family in a Modern Housekeeping Apartment on the U. of Miami Campus

Ernest Beasley is one of 4,895 veterans enrolled at the University under the GI Bill of Rights. Part of the new dormitory-apartment development is set aside for married students, part for single men, and part for coeds.

← Barry College Girls from Puerto Rico and Cuba Dress Up on Pan-American Day

About 40 percent of the 289 students in this Catholic women's college in Miami come from Caribbean countries. The girl at lower left wears the costume of a *gallega*, from the Province of Galicia in northwest Spain; her seated companions dress as gypsy dancing girls of Sevilla. The two standing, with mantillas and fans, represent the madrileñas of Madrid.

Miami colleges and civic groups join in observing Pan-American Day annually in recognition of the close relationship between the south Florida city and its Latin-American neighbors.

"Sweet Ad-da-line"— → Barbershop Harmony of Pi Kappa Alpha Pledges Resounds

Newcomers to this social fraternity at University of Miami wear Gay Nineties attire on orders of their "elders." Other fraternities direct their pledges to dress in sailor suits, wear plug hats and carry canes, or adopt barefoot tramp motifs during initiation week.

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Islands Dredged from Biscayne Bay 30 Years Ago. Miami in Background, Flagler Monument to Left, Flamingo Hotel in Foreground

Two Years of Inoculation with Cobra Venom Makes William Haast Immune to Bites from the Poisonous Reptiles

Here he holds a Cape cobra while his son, not yet wholly immune to its bite, force feeds it with a liver-and-vitamin concoction to assure a venom supply. Haast began to inject distilled raw cobra venom into his blood in September, 1948. Eleven months later a snake bit him without appreciable effect. Marks on boy's left hand resulted from a moccasin bite. At right is a deadly Indian cobra. Haast recently brought 370 cobras to Miami from India for his serpentarium.

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Brilliantly Plumed Macaws and Satiny Parakeets Live Uncaged in Miami's Parrot Jungle

Well fed, the birds never stray from their landscaped park, although they are permitted to fly free. Some roll over, open cans for pecans, or do other tricks for visitors, as well as perch on their shoulders.

on land formerly a part of Vizcaya, the James Deering Estate (pages 595-604), is soon to be dedicated. Over-all plans call for a 364-bed hospital, nurses' training school and home, and clinical buildings.

One of the late Carl G. Fisher's Miami Beach hotels, the Nautilus, which was transformed into a Veterans Hospital, now has been turned over to a nonprofit group of trustees and renamed Mt. Sinai. It has 285 beds and 50 bassinets.

Another new and well-equipped hospital is Doctors, built by a group of physicians on property adjacent to the University of Miami.

Individual private scientific research proceeds in many quarters in the area. For example, about 10 miles south of Miami, William E. Haast has conducted a serpentarium for the past two years. Last May he brought back from India 370 cobras to add to his stock of Indian, Egyptian, and spitting cobras, and many other varieties (page 591).

To maintain his serpentarium, Haast charges admission to the public, but he is more interested in the scientific aspects of snake raising, including the extraction of cobra venom for use in serum.

Immune to Cobra Bites

In September, 1948, Haast started a program of self-immunization to cobra bites. He injected distilled raw cobra venom into his blood, beginning with a mild dose and gradually increasing it. In August, 1949, a cobra bit him without appreciable effect.

When he first started his program, he took a diluted injection every few hours. Now that he is immune, he finds one every three months is sufficient to keep him in that protected state.

The Miami area also boasts a parrot jungle and a monkey jungle. Both are commercial ventures, but neither could exist anywhere except in a subtropical area.

Scores of brilliantly plumed parrots fly free in their sanctuary, some deigning to pose on spectators' shoulders and arms to have their pictures made (opposite). Parakeets and a flock of flashing flamingos also dwell within the limits of this preserve.

Many varieties of primates, including Rock of Gibraltar monkeys, baboons, chimpanzees, gibbons, and mandrills, live in the monkey jungle.

Dangerous varieties are confined. But the large group of rhesus monkeys turns the tables on spectators here. Visitors stroll through caged passageways with the rhesus monkeys on the outside, looking in at the strange humans behind the wires.

To see another private scientific venture, I called on Mr. Charles Crandon, whose manifold interests include the Miami Civic Music Association, development of the Dade County park system, expert woodworking, and avocado and mango raising, all in addition to his personal business enterprises.

I called to look into still another venture of this versatile gentleman—his earthworm-raising project!

Earthworms Boon to Avocado Trees

As I entered the ample grounds surrounding his home in Coral Gables, I was impressed by the grove of heavily laden mango and avocado trees. Beneath each was a mulch of grass, weeds, and leaves.

"I never spray my trees," Mr. Crandon said. "My earthworms down under that mulch keep them healthy. When I first planted the trees four years ago, the soil here was white sand, and I had to blast holes for the roots. Look at it now."

He pulled away the mulch to reveal the dark soil, enriched by earthworm castings. We went to the rear of the property. Here were huge compost piles, each with a sprinkler system over it to keep the compost—principally leaves, pine needles, and garbage—moist in dry weather.

"We're raising millions of earthworms here," Mr. Crandon said. "But we have to watch for their enemy, the mole cricket. It lives on them. It's larger than a cricket and burrows into the ground very fast."

Everything growing on the property is enriched with earthworm castings, including rosebushes and Chinese lichee trees.

Tests Against Florida Sunshine

For many years General Motors Corporation has maintained a Research Laboratories Division in Miami under the direction of Dr. Earl M. DeNoon, in cooperation with the widely acclaimed scientist and inventor Dr. Charles Franklin Kettering.

I visited the laboratories near the International Airport, where most of the work is done out of doors. Dr. DeNoon also operates here the South Florida Test Service, for other manufacturers. A host of materials is exposed to weathering and tested in the Florida sun.

From a weathering standpoint, few other places in the world have as interesting a climate as southern Florida. When a refrigerator manufacturer, for example, can produce an outer finish on his product that will stand tests in Miami, he can be sure that it will stand up anywhere in the United States.

National Geographic Photographer Willard R. Culver

A Banyan Tree's Descending Roots Strangle a Sidewalk in Coconut Grove

Native to India, the banyan thrives in subtropical Florida. Beginning as a seedling on the branch of another tree, it exists as an air plant until dangling roots penetrate the earth and nourish the tree. As more roots descend, the banyan becomes a columned hall ceilinged by a canopy of leaves. Its host tree, smothered, eventually vanishes. Meanwhile the banyan, if unchecked, spreads across several hundred square feet. Coconut Grove, today a charming residential area, was the pioneer settlement on Biscayne Bay.

Paint manufacturers, as well as those engaged in textiles, plastics, rubber, and allied fields, are particularly intrigued by the weathering tests conducted here. Hundreds of small wood and metal panels, each with a different coat of paint, are lined up on the sun racks, both in direct sunlight and under glass, and are subject to constant inspection.

At frequent intervals the reaction of each item set out for testing is accurately noted. Some rubber materials, for example, deteriorate in a few days. Some colors fade within a few hours. As a result of the tests, manufacturers can devise resistant products.

Miami is far from content to rest on its cultural laurels, and its two excellent newspapers, the *Miami News*, owned by James M. Cox, former Governor of Ohio, and John S. Knight's *Miami Herald*, constantly exhort its citizens to greater efforts.

Now the whole area is enthusiastic over a project of staggering proportions, a proposed multimillion-dollar Inter-American Cultural and Trade Center. Fulfillment of this dream means the transformation of Miami from a city into a huge metropolis.

Miami's Pan-American Vision

The plans, revealed last May, call for a big Inter-American Center to be built on or near Biscayne Bay.

The object is to bring North and Latin America together commercially and progressively on a common meeting ground. The proposed center would have buildings for science, art, and industry.

Will Miami's dream come true? Certainly its fantastic growth in the last decade records a past performance which augurs well for the future.

Vizcaya: An Italian Palazzo in Miami

By William H. Nicholas

With Illustrations by National Geographic Photographer Justin Locke

ON CHRISTMAS Day, 1916, when the late James Deering opened the doors of Vizcaya in Miami, Florida, he saw a dream come true. This American business genius had created in the New World an Italian palazzo, comparable only to historic fortress-palaces of the 16th century.

By use of historic example and antique furnishings, and with extraordinary veracity, he had achieved a triumph in recalling a golden age of art and architecture. His new home reflected the splendors of celebrated Roman and Venetian residences, furnished in its entirety, as they were, in the chief decorative styles of more than four centuries ago.

Mr. Deering, an International Harvester Company executive, had traveled widely abroad. For 25 years he had collected in Europe architectural backgrounds, rare period furniture, textiles, sculpture, and ceramics. To enshrine them he built Vizcaya, his home until his death in 1925. His palazzo on Biscayne Bay became a repository of Italian decorative art unexcelled in America. His art-loving heirs have kept it so to this day.

An army of 1,000 artisans composed of Italian stonecutters, cabinetmakers, plasterers, painters, and gifted landscape gardeners built Vizcaya, their labors extending over five years. Mr. Deering purchased near-by quarries whence came the rough coral, cut and carved on the spot, for the palace walls. Little steel was used in construction.

Agents bought roofs of whole Cuban villages, replacing them with modern materials, to obtain the weathered, hand-shaped old tiles for the palazzo roofs (page 598).

Treasures from Historic Palaces

The architects, F. Burrall Hoffman, Jr., and Paul Chalfin, designed the building to accommodate the remarkable collection of antique doorways, wall panels, and ceilings removed from Venetian, Roman, and Milanese palaces.

Mr. Deering leased large warehouses in which he and the architects, over and over again, experimentally laid out and furnished room after room. The height of the second floor was determined by the size of a tall entranceway, with marble frame and wrought-iron gates, connecting the palazzo tearoom and the patio. This gateway came from the palace built for Niccolò Pisani and his son, Vettor, daring Venetian admirals of the 14th century when Venice was a great sea power.

Vizcaya's formal Italian gardens were planned to rival in detail and ingenuity the landscape masterpieces of the Villa Albani in Rome or the Villa d'Este in Tivoli.

How much did Vizcaya and its furnishings cost? Many estimates of the number of millions of dollars spent on the place have been made, but all have been pure guesses. Mr. Deering, who died a bachelor, never let it be known. What he was interested in was quality and artistic perfection.

No matter what the cost, Vizcaya could not be reproduced today. No longer is it permissible to remove art treasures permanently from European countries.

Spanish in Name, Italian in Spirit

Although Vizcaya is Italian in spirit, the name is Spanish, after the same province of Biscay from which Biscayne Bay takes its name. The letters B and V are virtually interchangeable in the Spanish alphabet.

The crest above the huge entrance to the grounds on South Miami Avenue is a model of the caravel *Vizcaya*, one of many successive royal Spanish ships to bear that name.

When Justin Locke, National Geographic staff photographer, and I visited Vizcaya, the National Geographic Society had been graciously accorded permission to make, for the first time, color photographs of the palazzo.

From the entrance we drove beneath orchid-hung tropical trees for several hundred feet. Then we turned into another tree-arched driveway and came to the oval-shaped forecourt, passing huge Venetian vase forms at its entrance. On our right a superb 17th-century gateway of carved pink marble and Istrian stone, framed in coral, led to an adjacent court. This gateway came from the Palazzo Bevilacqua in Verona, built by Michele Sanmicheli, 16th-century Italian architect.

Stepping through the wrought-iron entrance to the palace, we faced a fountain group made up of a Roman bath of yellow marble, surmounted by a 17th-century Italian statue of Bacchus, god of wine, and flanked by carved infants astride sea monsters.

Presence of the ancient Roman bath is not incongruous. Pompeii and Herculaneum, Roman cities buried in lava during an eruption of Vesuvius, A.D. 79, were excavated 17 centuries later. The ancient art thus revealed

gave a compelling impetus to revival in Italy of classic Greek and Roman design, totally forgotten during the Dark Ages.

The tall, graceful doors at either end of the loggia once stood in the vestibule of the Hôtel Beauharnais in Paris. This was the palace occupied by Napoleon's stepson Eugène, son of Josephine and a Martinique planter.

Through the doorway on our left we passed into the entrance hall. Its outstanding feature is its hand-colored wood-block wallpapers made by Joseph Dufour of Paris about 1814.

Galerie Mythologique is the title of the set, printed in shades of gray, with 24 strips depicting the Vengeance of Ceres, Phaëthon and Apollo, Venus and Diana, the Judgment of Paris, Time and the Seasons, and the Muses. It is the only known Dufour set of this pattern in America.

The library, or Adam room, shows the classic design in furniture developed by the Adam brothers of England. The brothers traveled widely in Italy during the classic revival, and it made a profound effect upon them. This is reflected particularly in a fine Corinthian mantel, over which an ancient Roman mosaic has been set into the wall.

A rare set of chairs in this room once belonged to Pauline, sister of Napoleon, who wed the Roman prince Camillo Borghese in 1803 and promptly refurnished his 200-year-old palace in the classic style.

18th-century Salon

The style of Vizcaya's 18th-century salon is Louis XV, particularly as it was developed in Italy (page 601). The size of the room was determined by the plaster ceiling, which once graced the Palazzo Rossi in Venice.

French design then was making its impact on Italian style, and vice versa. These decorative styles reflect the trend from the era of dignified, courtly Louis XIV, builder of Versailles, to the lovely but artificial and rococo designs which developed under his great-grandson, Louis XV, and flourished to a lesser extent under Louis XVI and Marie Antoinette.

Rococo comes from the French word *rocaille*, or "rockwork," a style characterized by a lavish mixture of imitation rock forms, pierced shellwork, scrolls, and foliage.

We found a continuation of rococo in the music room. Ornate ceiling and paneled, painted canvas walls came out of a Milanese palace. The lavishly decorated spinet was built in 1645 by Horatius Albana; the gilded zither is a century later; the harp is carved and decorated in florid style.

Two magnificent rooms turn time back to the period of the Italian Renaissance.

One, the great Renaissance hall, we entered by a small doorway, easy to defend, for in the 16th century large houses still were built somewhat in the manner of fortresses. One end of the hall is taken up by a huge stone chimney piece, a notable example of French Renaissance sculpture (page 603).

Most notable of the wall hangings is an Italian tapestry, woven about 1550 for Duke Ercole II of Ferrara, depicting Hercules killing the Nemean lion. Was the weaver flattering the Duke? Ercole is Italian for "Hercules."

A massive 15th-century Italian sideboard in the other Renaissance room, the banquet hall, once held church vestments (page 599).

The handsome 15th-century Italian chimney piece is carved of dark sandstone from hills near Florence, in the style of sculptors in the court of Lorenzo de' Medici.

The east loggia is distinguished for its huge cedar doors, encrusted with bronze designs and installed in marble frames. Doors and frames came from an old palace in Rome which was acquired by the Torlonias, great Roman banking family.

The intricate wrought-iron chandelier of the upstairs dining room was removed from an Italian palace. The wall murals are by Claude Joseph Vernet, French painter of marine scenes for Louis XV. A mantel is decorated in lacquer in the Chinese manner (page 600).

Vizcaya's gardens, in formal Italian treatment, are unduplicated in America (pages 597, 602, and 604). With the palazzo at one end and a small casino upon a mound at the other, they are conceived as a vast room walled in with formal vegetation and forests.

The floor of this garden room is an ornamental and diversified arrangement of beds and plots, with trimmed borders and pleasant paths, flanked by statues and fountains. No tropic vegetation out of keeping with Italian gardens has been permitted to intrude.

Strolling through the gardens, we came at length to the sea wall. We looked out upon a huge stone barge breakwater, embellished with statues and pillars (page 598). All the sculpture on the barge was designed by A. Stirling Calder, eminent American sculptor.

As in the palazzo itself and as in the formal gardens, the barge carries out in conspicuous detail Mr. Deering's aim to re-create faithfully on American soil an Italian palazzo.

The citizens of Miami and all southern Florida have good reason indeed to be proud of majestic and artistic Vizcaya.

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Kodachrome by Justin Locke

Vizcaya Reflects the Grandeur of an Italian Palazzo in a Miami Setting

Erected on the shore of Biscayne Bay 34 years ago by the late James Deering, the fortresslike structure today houses a collection of European decorative art and architecture unsurpassed in America.

Statues on Vizcaya's Stone Barge Breakwater Guard the Entrances to Its Private Harbor

The figures, symbolizing the delights and terrors of the sea, and the fruits and trees of the Tropics, were designed by A. Stirling Calder, American sculptor. The tall obelisks furnish a contrast to the distinct level sea line.

Here on Biscayne Bay an army of 1,000 Italian stonecutters, cabinetmakers, painters, plasterers, gardeners, and other artisans worked for five years to build the palazzo, carve statues and ornamental stonework, complete the landscaping, and install the waterworks system for the series of fountains and a chain of small canals.

The building is chiefly of Florida coral, a rock resembling the creamy travertine marble of Italy. Stucco on the wall spaces comes from limestone quarried in Miami.

Mr. Deering's agents bought roofs of whole Cuban villages, replacing them with modern materials, to obtain the weathered, hand-shaped old tiles for the palace roof.

The long, low steps leading from the landing to the front terrace were ingeniously cut from slabs of coral to reveal the sea fan and brain coral designs in the ancient sea bottom stone.

The architects, F. Burrall Hoffman, Jr., and Paul Chalfin, designed Vizcaya in the manner of a 16th-century Italian fortress-palace.

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Kodachromes by Justin Locke

Banquet Hall Tapestries Once Hung on the Walls of Robert Browning's Villa in Asolo, Italy

The red horse in the tapestry, "with that red gaunt and colloped neck a-strain, and shut eyes underneath the rusty mane," was described in the English bard's poem, *Childe Roland to the Dark Tower Came*.

The massive sideboard is late 15th-century Italian. Religious subjects set in its inlay decorations imply that it once stored the vestments of an important church. In one panel the face of the devil was gouged out long ago by some pious devotee.

The 16th-century Italian hand-carved dining-hall chairs were made by Florentine workmen brought to England by the Count of Craven and were used in the banquet hall of his Combe Abbey. The long stretcher table resembles them in type.

The portrait is of Sir Edward Dering, first Baronet of the name, who belonged to an English family known as the Surrenden Derings. It was painted in 1650. A companion portrait of Lady Dering also hangs in this room.

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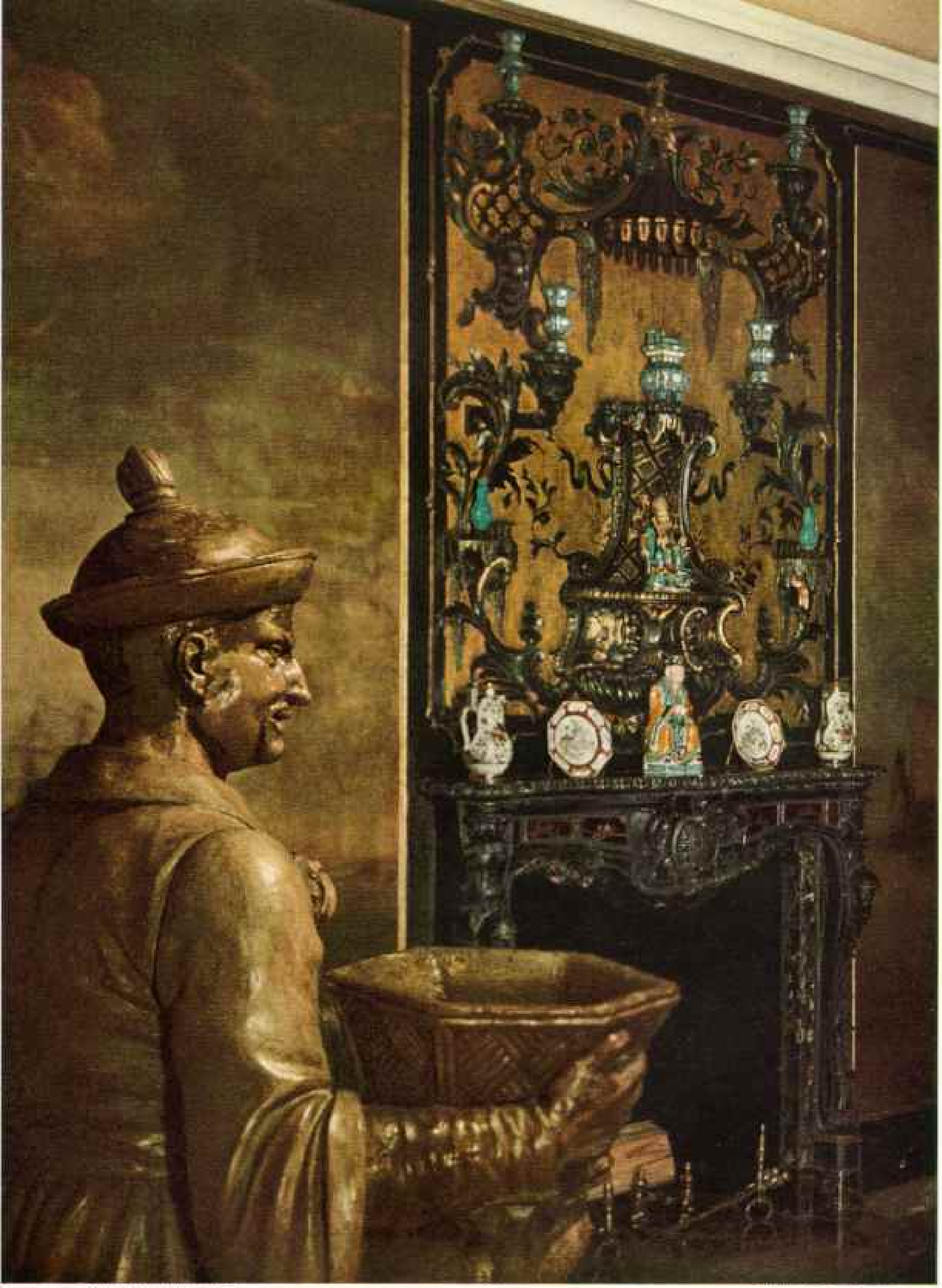
Photographs by Justin Locke



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Kodachrome by Justin Locke

European Artists Copy Oriental Style in Statue and Lacquered Wood Carving

The terra-cotta figure is early 18th-century French; the over-mantel decoration English. They are part of the furnishings of the second-floor dining room at Vizcaya. Brackets over the mantel hold Ming porcelains.

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Kodachrome by Justin Locke

Treasures from Italian Palaces Furnish Vizcaya's 18th-century Salon

Plaster ceiling of 1750 came from the Palazzo Rossi in Venice. Furniture is Louis XV, as developed in Italy. Paneling and woodwork once adorned a palace in Palermo. Limestone mantel is of Louis XV design.

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Kodachrome by Justin Locke

Clipped Hedges, Statues, Vases, Fountains, and Terraces Combine to Create a Formal Italian Garden at Vizcaya

Jasmine hedge plant takes the place of European box, which it closely resembles. The pools bring to mind the famous gardens of Italy's Villa Lante. Some of the decorative pillars and vases were carved from Florida coral by Italian sculptors brought to Miami when the palazzo was built. Others are antique marble.

From a French Château of Catherine de Médicis Came the Chimney Piece of the Renaissance Hall

Carved figures of Fame support the massive central coat of arms above the fireplace. Some of the armorial designs have been cut away.

The huge Italian tapestry was woven about 1550 for Duke Ercole II of Ferrara. It depicts Hercules killing the Nemean lion. Perhaps the weavers wanted to flatter their patron, for Ercole is Italian for "Hercules."

Carved winged unicorns, symbols of the distinguished Farnese family of Italy, one of whose members was Pope Paul III, support the long center table. The figures still bear traces of the original gilding. Lions on the table are from the same period.

The beamed ceiling is in the manner of Jacopo Sansovino, architect of magnificent buildings skirting two sides of the Piazza di San Marco in Venice. A third of the beams came from a Venetian palace; the others were copied in Miami by Italian craftsmen. Only by close inspection can the modern beams be detected.

The column at left, of *cipollino* marble, once stood in a Roman villa.

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Kodachromes by Justin Locke

▲ **Stone Walk and Venetian Bridge Jut Out from Sea Wall to a Graceful Teahouse**

More than one hurricane has been unkind to the latticed roof, a penalty the tiny building must pay for its unprotected but pleasant location. A grove of palms at right contrasts with the formal Italian gardens, from which subtropical vegetation is barred.

▼ **An Ancient Roman Sarcophagus Serves as a Garden Fountain Basin**

Huge lead frogs from which streams play were designed and executed by the late Charles Cary Rumsey, distinguished American sculptor and poloist. Italian statues of the 17th and 18th centuries flank the garden terrace walk in distance.

Baltic Cruise of the *Caribbee*

By Carleton Mitchell

WHEN a pleasant dream comes true, it is nice to dream again.

No sooner had my wife Zib and I returned to Annapolis after cruising the islands of the Caribbean * than we began to dream about the skerries (little islands) of the Baltic.

"It's cold up there," warned one friend.

"Pilotage is difficult," said another.

"There are unswept mines," contributed a third.

"The Cold War will engulf you," added a chorus.

But the idea persisted. We thought of the archipelago around Stockholm, hundreds of little islands flowering in the brief summer; of isolated Finland and its courageous capital, Helsinki; and the storied walls and battlements of Sweden's ancient Visby and Kalmar.

True, the Iron Curtain had already closed off one shore of the Baltic; newspapers carried headlines that showed hazards were not all navigational. And we could learn of no other American cruising yacht that had ventured into the Gulf of Finland since the war.

Cruise Begins at Oslo

However, on the afternoon of July 12, 1949, the United States ensign flew jauntily from the sterns of two yachts lying off the Royal Norwegian Yacht Club, Oslo. On one mooring was our *Caribbee*, on another *Argyll*, owned by William T. Moore of Oyster Bay, New York, our cruising companion for the summer. Both were ocean racing yawls, fast, able, and comfortable.

That morning the yachts had gone overboard into the waters of Oslo Harbor from the foredeck of the S. S. *Mormacwave* (page 615). Masts and rigging were in place, the stains of shipping from New York removed.

We had chosen Oslo for the start of the cruise so that we could sail down its beautiful fjord and cross Sweden by the famous Göta Canal. I had always wanted to see rural Sweden from my own deck and sail its lakes in the mountains (map, page 608).

It had been ten years since Zib and I visited Oslo. Our last memory was of Karl Johans Gate, the principal avenue, thronged with silent crowds while sirens howled the first practice blackout. Since then Norwegians have weathered war and occupation. Yet we found their lovely capital little changed. Shops were well stocked, restaurants crowded.†

Every weekday evening steamers carrying commuters to their homes on Oslo Fjord race dramatically for the harbor narrows (page 623). We dropped our lines and followed the fleet. There was not a breath of wind and the sky was cloudless, of the depthless blue found only in high latitudes. Oslo was red and white against a background of pine-covered green slopes.

About 15 miles below Oslo, where the fjord narrows, we passed the small island of Kaholm. Soldiers inspected us from lookout towers. Hidden in the rocks were bunkers, narrow eye slits barely visible.

Where Nazis Got a Surprise

These were the guns that upset the time schedule of the Nazi invasion of Norway. When the cruiser *Blücher* came abeam, the fortress opened up. Surprised Nazi generals drowned in dress uniforms donned for the grand entry into Norway's capital.

A few miles farther we saw a rusting monument to the Norwegian underground movement—the German freighter *Donau* lying at a steep angle on the shore. While this troop transport lay at Oslo, the resistance hero, Max Manus, worked for three days under the dock among rats and filth attaching homemade limpet mines to her hull.

When she was well down the fjord, the mines blew holes in her bottom, and her commander drove her on the rocks, full speed. However, all those in the afterpart of the ship, including many Nazi soldiers going home on leave, were lost.

That night we anchored behind Hankøy, a center of Norwegian yachting. The Crown Prince has a house perched on a hill overlooking the harbor. He is an ardent racing sailor.

Beyond Hankøy—literally "Hank Island," as the termination øy means "island"—Oslo Fjord widened into a huge bay. Just after lunch, at 1:02 Saturday, July 16, I took bearings and found we had crossed a watery border and entered Sweden.

For the night we stopped at the fishing village of Havstenssund. As we sat in the cockpit talking over our navigational problems

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

† See, in the National Geographic Magazine: "Midshipmen's Cruise," by Midshipmen William J. Aston and Alexander G. B. Grosvenor, June, 1948; "Norway Cracks Her Mountain Shell," by Sydney Clark, August, 1948; "White War in Norway," by Thomas R. Henry, November, 1945; "Norway, an Active Ally," by Wilhelm Morgenstierne, March, 1943; and "Norway, A Land of Stern Reality," by Alfred Pearce Dennis, July, 1930.

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Cranes Bristle Like Oil Derricks above Göteborg, Sweden's Atlantic Gateway

Europe's imposing forests of cranes are seldom seen in United States harbors, where stevedores load cargoes with the freighters' own booms. Our shippers claim less lost motion for their system. Their vessels can unload onto piers and lighters simultaneously. Here the author started his canal tour across Sweden.

of the day, we were dramatically introduced to another. Two young ladies unconcernedly strolled down to the water, undressed, swam, sunbathed until dry, dressed, and strolled off. During the rest of the cruise many rocks and islands were draped in similar fashion.

Swedes Crave the Sun

Swedes crave the sun to compensate for the dreary winter months. "Summer is like coming out of a cave," explained a Swedish friend. "After the long, dark night we cannot get enough sunshine. All summer we try to store it up for the next winter."

I had dreaded swimming in these "cold" waters. But at Havstenssund I took my first plunge over the side. The water temperature was a comfortable 70° Fahrenheit. Afterwards I swam everywhere, even in the Gulf of Finland.

A branch of the Gulf Stream, which we had followed on the cruise of the *Carib*, swings across the Atlantic to the west coast of Norway; part of it even goes to Sweden. This "river in the ocean" brings across millions of cubic yards of tropic water. It helps to make the Norway coast temperate despite a latitude corresponding to that of Kamchatka, Siberia, and northern Labrador!

Our next run took us through home waters of the Vikings, those bold seamen who terrorized, yet colonized, much of Europe and islands of the Atlantic. What an ideal place for hit-and-run marauders, we thought, as we sailed through the narrow passages of western Sweden—rocks everywhere, blind passages, twisting channels. No stranger could pursue a local vessel here.

But the Vikings were not often pursued. They controlled the northern seas. These seamen-warriors fought with pleasure and considered death by old age shameful.

As we raised the island of Marstrand, we conjured thoughts of the Viking ships that furrowed these waters a thousand years ago. Long, lean craft they were, with towering bows.

Sails Limp, a Model Ship Stands Becalmed on a Glassy Sea in Götеborg's Marine Museum

One room depicts fishing vessels from dugouts to steam trawlers. Another shows Fijian spears, carved walrus tusks, Indian Ocean sea shells, and other souvenirs brought home by old-time mariners. Fishing boats "floating" on glass reveal below-water gear. The touring child or sailor can spend hours here just dreaming.

What a sight they must have been! Oars flashing in the sunshine, weapons glinting behind painted shields!

From far at sea, Karlsten fortress dominates bleak and rocky Marstrand (page 614). This grim castle was begun by Charles X in 1658.

The wind was light and warm. As we coasted slowly along, we passed hundreds of sunbathers basking on the rocks like bare brown seals. Swimmers were in every cove, for Marstrand is one of the most popular Swedish resorts. The last King brought his court there each year.

"Occasionally you still see old-timers," said a friend; "ladies in long gloves, choker collars, and carrying parasols; or elderly gentlemen in high collars, tight, narrow trousers, and tighter and narrower shoes. They wander around as if looking for a vanished life."

So narrow became the inland passage beyond Marstrand that we cruised single file. We could almost scratch a match on a marker, dash across the deck, and light the brush on the other side! (Page 615.)

Clear of the gorge, we set sail and glided by tiny rock basins crammed with fishing boats, nets, and racks for drying fish. This part of Sweden depends on the sea for its livelihood; the scant soil grows little.

Göteborg, Sweden's Atlantic Outlet

As we neared Göteborg, a towering black cloud formed over the hills. Just in time we picked up a mooring in the sheltered basin of the Royal Göteborg Yacht Club. A deluge of wind and rain descended upon us, our first bad weather since landing in Oslo.

Gustavus Adolphus, one of Sweden's greatest rulers, planned Göteborg as the kingdom's Atlantic outlet. Dutch engineers laid out the seaport, including its network of canals. Today Göteborg is Sweden's principal port, its second largest city. Masts pierce the sky, warehouses line the waterfront, huge shipyards turn out modern vessels (opposite page).

605 Drawn by Harry S. Otter and Irvin E. Alleman

The Iron Curtain's Shadow Falls Across the Baltic, Gateway to Northern Europe

These waters, the counterpart of North America's Great Lakes, have known many masters, from the ancient Vikings to Hitler. Today Russia controls the southern shore from Leningrad to mid-Germany. Entering the Gulf of Finland, the author passed under the muzzles of Soviet big guns. To start his Baltic cruise, he first sailed across the breadth of Sweden, using the Göta Canal (page 605 and below).

Out of Göteborg's crowded harbor we motored, bound up the Göta River, the first section of the canal. This unique waterway, a complexity of rivers, lakes, canals, and locks, links Sweden's east and west coasts. Though proposed as early as the 16th century, work really began in 1810 to forestall Napoleon. If the French dictator sealed off the narrow exit to the Baltic at Öre Sund, Swedish commerce would be trapped.

Soon *Caribbee* and *Argyll* were motoring through a placid countryside. Fat cows grazing on lush green fields looked up surprised as the trim yawls with flags waving gaily chugged past. Fine farmhouses with big barns appeared on both banks.* It reminded us of Wisconsin.

Suddenly, an imposing ruin shattered the illusion. It was Bohus Castle, a token of the centuries when the Göta marked the frontier between Norway and Sweden (page 616).

Famous men sailed between these banks in bygone days. Harald Fairhair, a mighty warrior, ascended the Göta with his Viking ships to attack settlements on Lake Vänern.

At the advanced age of 12, Harald, a lesser king of divided Norway, proposed to a maiden named Gyda. But she replied she would marry only the ruler of all Norway.

So Harald set out to conquer the other kings, vowing he would not cut his hair until

* See, in the National Geographic Magazine: "Rural Sweden Through American Eyes," by Elizabeth W. Nilson, June, 1940; "Life's Flavor on a Swedish Farm," by Willis Lindquist, September, 1939; and "Country-House Life in Sweden," by Amelie Posse-Brázdová, July, 1934.

Caribbee Mitchell

Caribbee Anchors Off Helsinki, Where the Americans Received a Rousing Welcome

Finland's sea-warmed capital lies only six degrees south of the Arctic Circle (page 626). It shares a position close to the 60th parallel with southern Greenland, northern Labrador, and its neighbor, Leningrad, Russia. The skyline's prominences are (l. to r.) Great Church, Uspenski Cathedral, and an apartment house.

he succeeded. His thick and flowing locks became a feared banner.

Finally, in 872, he won the Battle of Havs Fjord, near Stavanger, crushing all resistance and uniting Norway. He married Gyda, but they did not live happily ever after. He married and divorced several wives, ruled for 60 years, and founded a line of kings that lasted four centuries.

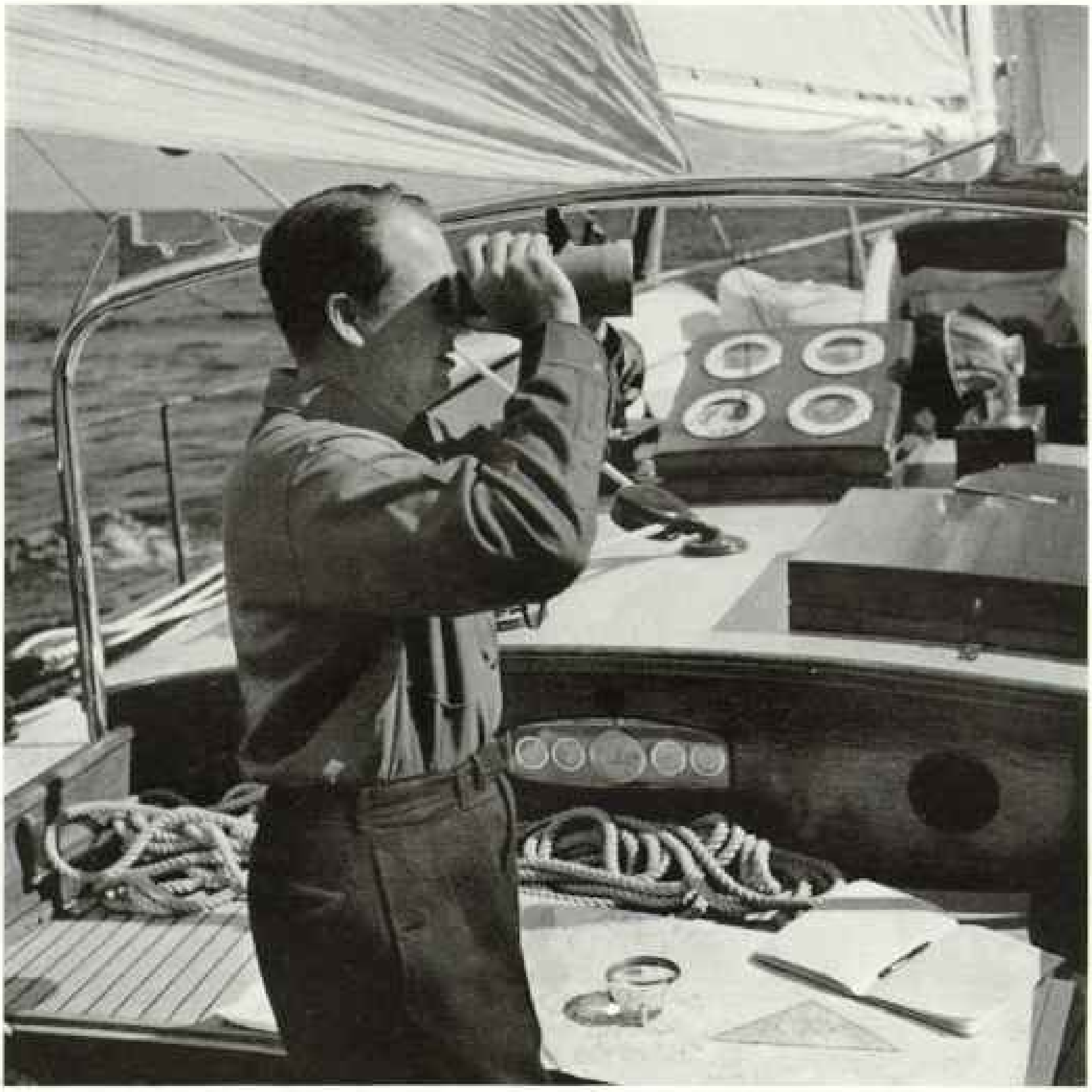
Göta's Locks, a Giant's Staircase

In late afternoon we reached the foothills and our first lock. Ahead, we stared at a giant's staircase, a series of locks stepping up the hillside. These water elevators by-pass Trollhättan's harnessed waterfalls, which provide power for much of southern Sweden.

Actually, the canal is divided into three parts: the first, a deep section for ocean-going ships, from Göteborg to Lake Vänern; the second, a series of connecting lakes; and the third, a thin waterway from Lake Roxen to the Baltic. The total distance is approximately 240 miles, of which 59 were dug by man. There are 64 locks all told.

By dusk we had climbed the water stairs and anchored in Lake Vänern. While the men swam, Zib put the final touches on a *smörgåsbord* she had spent the afternoon preparing.

She was worried whether her efforts with local dishes would win approval of Swedish friends in our crew. They did: herring with dill, herring with sour cream and chives, herring with onions; sardines, anchovies; tiny shrimp to be eaten shells and all; smoked salmon, smoked reindeer, smoked sausage; radishes, sliced tomatoes, fresh cucumbers;



Rapper Kroulan

Binoculars to Eyes, the Author Pilots *Caribbee* Through Finland's Baltic Waters

Carleton Mitchell of Annapolis, Maryland, is a rear commodore of the Cruising Club of America; he has sailed some 20,000 miles in the last five years. His 58-foot center-board yawl is named *Caribbee* for the Carib Indians discovered by Columbus in the West Indies.

stuffed eggs, caviar; cold chicken, sliced ham; a platter of cheeses; a basket of Swedish bread; and, of course, schnapps and beer.

Caribbee's table could not hold it all, so part overflowed onto the chart table. When the "main course" came along, not even sailors could face it!

By Boat Across Sweden's Heart

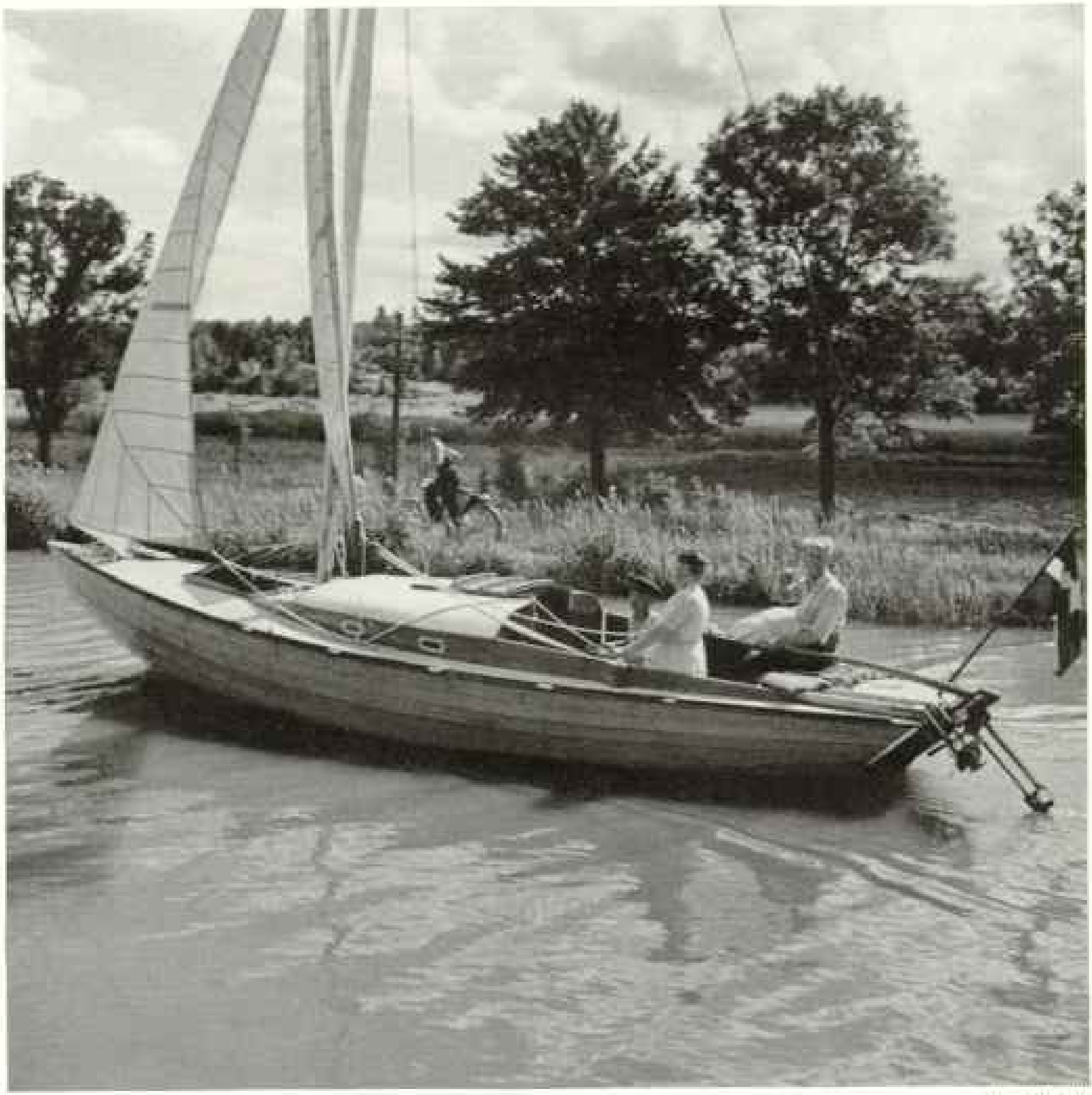
At dawn we were under way. Early it was flat calm and we powered, but as the sun rose, a light breeze struck in and we set sail.

All day wavelets chuckled under the bow as we glided pleasantly across the heart of Sweden.

When shadows lengthened, we entered the "old canal," unchanged since originally built. The locks were smaller. Gates and valves had to be opened by hand. Except for line tenders left aboard, the crews of both boats scrambled ashore to walk round and round long wooden bars, as in the days of Napoleon.

To save time and effort, we put the two boats through together. But so tiny were the locks that until both were inside and the gate closed behind, we could not be sure that they would squeeze in.

Thus began a phase of the cruise I shall always remember. At times the banks of the canal were higher than the surrounding coun-



Caristina Mitchell

A Vacationing Swedish Family Sails Through Göta Canal on a Folkboat

Northern Europe's folkboat, relatively cheap, is a sort of flivver yacht within the reach of many. These three live aboard all summer long. If the wind dies, they will start their Swedish outboard motor. If that fails, father will join the cyclist on the old towpath and pull, as crews of engineless ships used to do (page 621).

try, so that we looked down on neat farms dotted with grazing cattle. Innumerable hand-operated bridges barred our passage. In answer to our horn, the tender of a bridge would saunter from his house and swing it open. We motored down watery lanes between lines of trees, and passed thick woods, open fields, quaint villages.

Curious crowds appeared at every lock to watch us go through. People ran from houses and waved. Very few American flags had ever passed; none since World War II (pages 618, 619).

Our canal crawling was broken by other passages across sylvan lakes—Lake Viken, where we attained our greatest altitude, 278 feet above sea level; Lake Vättern, apparently one enormous spring, famous for fish from icy depths; and Lake Roxen. To reach the last we had to descend the 15 locks of Berg, the most spectacular point of the Göta trip (page 620).

Our Last Lock—Baltic Ahead!

From the highest lock the drop seemed almost vertical. Far below we saw blue water and dwarfed sails. I wondered what would happen if a gate failed, letting the waters go roaring down.

On shore stood a monument to the 60,000

Swedish soldiers who had helped build the canal. But to me their memorial was the canal itself, still of service to Sweden.

Beyond, at Mem, we passed through the final lock. Suddenly I realized that the water under us was from the Baltic. Another dream had come true.

But our proper introduction to the Baltic really came a few miles beyond. The canal had opened into the wooded bay of Slätbaken; in turn, this narrowed, and on a low point stood a gray stone tower.

Sten Schaeffer, a Swedish friend who was sitting beside me in the cockpit, told its story:

"That is Stegeborg. In 1200 it must have looked just like that, but later a whole castle was built around the original tower. Kings lived there for centuries. Then after Karl X died in 1660, it was eventually abandoned.

"When a new Royal Palace was constructed in Stockholm, Stegeborg Castle was torn down, stone by stone, and shipped to Stockholm. But the workmen found the old tower too solid to break up. So the first part of Stegeborg is also the last."

We sailed through the narrows, *Argyll* leading, and anchored for the night at Arkösund. We were in the Baltic skerries of Sweden.

Imagine thousands of islands of all shapes and sizes, scattered at random across sparkling blue water, with deep channels between and quaint harbors behind each headland. Picture pine trees coming down to the shore, smooth brown rocks, and white sails against a blue sky. Those are the skerries, spread like pebbles on a beach along Sweden's shores and Finland's south coast.

We loafed through these islets with warm, fair breezes, guided by perfect charts and a profusion of navigational aids. A friend aptly described this sailing in the skerries as "walking in the garden."

Here we had no long passages or heavy seas, no worries over savage squalls. This is to ocean cruising what roaming in a cottage garden is to climbing Mount Everest—a sailor's Garden of Eden.

However, we wanted to have a look at the open Baltic, so we laid a course for Hävringe Lightship and then the peninsula of Landsort (page 634).

Russian Patrol Craft Close By

As we sailed along rolling slightly to a small beam sea, the Swedish radio added a disconcerting note. A broadcast reported that, a few days before, Russian warships were maneuvering between Öland and Landsort, almost where we were. It also relayed a warning by the Finnish Government to stay well clear of the Russian zone of Porkkala in the Gulf of Finland. Five small sailing yachts, blundering inside the buoys, had recently disappeared.

As in the Bahamas, so far to the south and west, there was virtually no compass variation. We were almost exactly on one of those isogonic lines where the needle of the compass points toward true north, or the North Pole.

However, we were not without some uncertainty, as the chart indicated numerous circles of local magnetic disturbance. One, not far from our path, showed a possible error of plus or minus 60 degrees, probably caused by an enormous deposit of iron ore.

Argyll and *Caribbee* parted company at Landsort. Bill Moore continued outside, while we continued our walk in the garden and approached Stockholm by way of Lake Mälaren. It was worth the detour.

Old Stockholm—"City within Bridges"

Our first impression of the Swedish capital was from the lake in front of Stockholm's Town Hall, called by some "the most beautiful building since the Renaissance." From our deck it was breath-taking. The three golden crowns of Sweden soar into the sky above its soft red brick (page 631).*

Stockholm is a city worthy of its Town Hall. Much is extremely modern architecturally, yet there is an Old Town, one of the most perfect examples of medieval Europe in existence (page 630). As the original Stockholm sprawls across an island, it is called the "City within the Bridges." The old heart is surrounded by a new body.

I have never met a returned traveler who did not like Stockholm. Its location is superb, rising above a pattern of sparkling waterways. These, with parks and wide streets, give it an air of spaciousness and livability.

Its people are courteous and hospitable. Theirs is a gracious civilization. Eating is a ritual. Tables groan with the assorted delicacies of the *smörgåsbord*, the "bread and butter table." Nothing could be a greater understatement! (Page 609.)

When fresh-water crawfish, *kräftor*, come into season, the city—and all of Sweden, for that matter—goes on a crawfish spree. Every restaurant blossoms with *kräftor* tablecloths, lamps, and kindred decorations.

Stockholm is also a city of museums, castles, and churches. High above the city lies Skansen Park, where houses of every period of

* See "Granite City of the North," by Ralph A. Graves, NATIONAL GEOGRAPHIC MAGAZINE, October, 1928.

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Kodachrome by Gardiner Mitchell

Argyll, Breezing Past Swedish Skerries, Overtakes _Caribbee_, Her Baltic Cruise Companion

These American yawls spent a glorious summer touring northern waters. They inspected thousands of skerries (islands) scattered across sparkling blue water; they found protected harbors behind nearly every bold headland.

Caribbee Rides a Freighter Across the Atlantic . . . Swedish Children Toss Bread to Fish-scavenging Gulls at Marstrand

▲ Opposite page: Karlsten fortress, built by Sweden's Charles X, looks down upon Marstrand Harbor, where tall-masted *Caribbee* and *Argyll* lie moored together. From *vikş* (coves) such as this, the Vikings sailed on raids. Rocky, treeless skerries sheltered them from pursuit.

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Kodachromes by Carleton Mitchell

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Bohus Castle, a Railed-in Ruin, Once So Dominated Its Countryside that It Gave Its Name to a Province, Sweden's Bohuslän

From these heights Norwegians at arms once kept watch on Swedes across the border. Today the frontier lies farther north, and Sweden controls all this territory. Here the Nordre River flows out of the Göta, first link of the all-Swedish Göta Canal (pages 618, 619, and 620). Kungälv (right) squeezes between stream and cliff.

Toytown, a Model of Medieval Copenhagen, Rises in Göteborg as a Danish Gift to the Swedish People

Sweden's principal port, planned and built by King Gustavus Adolphus, has the feel of the sea. Nearly every house can sight masts in the harbor; warehouses line the waterfront; busy yards turn out ships. Canal builders from the Netherlands long ago gave Göteborg a Dutch look.

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Sails Furled, *Caribbee* Leads *Argyll* into a Göta Canal Lock. Touring Rural Sweden, They Brushed Past Grazing Cows

Göta system's rivers, lakes, and canals carried the yawls 240 miles. Its 64 locks lifted and lowered them 278 feet. Electricity swung newer gates (Atlantic side to Lake Vänern), but human hands turned machinery in this old section, which was built to prevent Napoleon's bottling up the Baltic.

Swedes, on Foot and on Cycle, Gathered at Every Lock to Watch the American Yachts Pass Through

Few United States flags ever traversed the Göta Canal and, so far as the author could learn, none since World War II. Welcoming the Americans, citizens ran from their houses and waved. Cyclists pedaled towpaths from lock to lock, keeping pace with the yawls. One young fellow from Motala came on the rumble seat (left). Others gathered at Berg, where a Stockholm-to-Göteborg canal steamer (hull down behind the lock gate) climbed the water stairway.

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Gunwale to Gunwale, Fender to Fender, the Yawls Drop Down Berg Locks into Lake Roxen

To save time threading Göta's short, narrow locks, the yachts developed a squeeze play. *Argyll's* bow to *Caribbee's* quarter, they crept along, using sawdust bags as bumpers. Tenders laboriously turn the antique gate (right).

Swedish history have been brought, rebuilt, and refurnished. Visitors literally walk back through the centuries.

Some churches recapture the past, too, especially Riddarholm, the Westminster Abbey of Sweden. Here the kings and the great lie under banners and in magnificent tombs.

Unfortunately, our luck with the weather ran out on our arrival. The rains came down in limitless quantities, so we moored *Caribbee* and moved to a hotel. A local paper cartooned a sports event in the stadium—gymnasts performing in deep-sea diving suits!

Then came a change for the better. All the way from Oslo we had had sunshine but little wind. Now our luck became even better: we still enjoyed the sun, and strong, fair breezes as well. No sooner had *Caribbee* cleared the mooring basin than the overcast melted away; so we hoisted working sails and tore through the passages at maximum speed.

Swedish people take advantage of Nature's blessing. Nowhere are there more little boats. As we came through the narrows at Sandhamn, we saw hundreds of boats lying in front of the Royal Swedish Sailing Club. We had arrived for Sandhamn Regatta Week, one of the biggest yachting events of Europe. It was the one date that Bill Moore and I had planned our summer cruise around (page 632).

Thus began a memorable few days. Our welcome was swift and complete. We had hardly anchored before a representative of Commodore Jacob Wallenberg brought out an invitation to dinner. Each night there was another dinner, and formal dances inside the clubhouses or folk dances on the lawn.

Swedish Families Summer Afloat

To the Swedes any boat is a cruiser; whole families spend the warm months on craft the size of our smaller racing classes. Sailors pick a likely spot and tie up to shore, build a cooking fire on the rocks, eat picnic style, and sleep in the cockpit under a canvas tent. At Sandhamn several hundred were doing just this and racing each day besides (pages 611, 633, and 634).

To join in the racing, Bill chartered a sloop of the international 6-meter class. Zib and I took a sailor's holiday and crewed in races against boats from Sweden, Norway, Finland, and Great Britain.

On the final day *Caribbee* hoisted sail for the resort of Saltsjöbaden, another yachting center. From the walks around a large hotel people watched our approach. It was a moment for stylish seamanship.

A mooring off a large waterfront building lay empty. I carefully planned my approach: douse forestaysail and mizzen, a quick turn into the wind, then mainsail down, mooring picked up. Simple! Except, when I spun the wheel, I happened to look up. It was the ladies' bathhouse, one of those hazards to navigation. *Caribbee* missed the mooring by a boat length.

Here began the finest sailing I have ever known. Both *Argyll* and *Caribbee* got under way with the first glow in the sky. It was calm. Soon a breeze came in fresh and true from the southwest. We set every light sail that would draw. We boomed through the skerries, sunlight dancing on the water, the islands like green jewels in a silver setting.

Even one who loves the Tropics must concede there is nothing so fine as a spell of good weather in high latitudes. The air is crisp, and warm in the sun, cool in the shade. By day the sky is deep blue, by night the stars are dazzling. Thus we sailed the skerries of Sweden and Finland.

Baltic Water Nearly Fresh; No Tides

The Baltic has a special charm. It is called a sea, but is more like a lake, as indeed it was during one geologic period. Connected with the Atlantic only by sounds between Sweden and Denmark, yet fed by the heavy rain and snowfalls of the northern forests, the water is virtually fresh. There is almost no tidal rise and fall, so few strong currents.

During the summer the sea is usually placid, but winter gales make it one of the most dangerous bodies of water on the globe.

At Söderarm Light we suddenly popped out of the skerries into the Aland Sea, a small segment of the Baltic. We set a compass course. The spinnaker pulled hard. The coast of Sweden began to dim, that of Finland to rise.

It was a crossroads old in history. Here sailed the Goths, that restless and aggressive people who overran much of Europe and helped to destroy the Roman Empire. Here crossed the boats of the eastern Vikings. Here cruised the fleets of Peter the Great.

Rapidly we raised the shores of Åland Island. As we neared its principal port, Mariehamn, the spars of a square-rigged ship towered above the trees. I should have been disappointed had it not been so, for this tiny and remote spot was the last home of the big sailing ships.*

* See, in the National Geographic Magazine: "Last of the Cape Horners," May, 1948; "Where the Sailing Ship Survives (Åland Islands)," January, 1935; "Cape Horn Grain-Ship Race," January, 1933; "Rounding the Horn in a Windjammer," February, 1931, all by Alan J. Villiers.

Copenhagen Harbor Swarms with Freighters, Passenger Ships, Fishing Craft, and Old Square-rigger (Right)

Ferries, Freighters, and Warship Crowd Oslo's Waterfront

Oslo lies at the head of a magnificent fjord, an arm of the Skagerrak reaching 60 miles into a green and rolling countryside.

Here *Caribbee*, freighted across the Atlantic, began her first European cruise. The author, venturing into unfamiliar waters, cautiously followed a fleet of these commuters' boats (page 605).

"I studied the charts as we powered along," Mr. Mitchell writes; "I looked at the buoys. Everything seemed strange, nothing right. I felt apprehensive.

"Suddenly we were beyond the narrows and in the wide expanse of Oslo Fjord. Just as suddenly my uncertainty vanished, not to return all summer.

"Although I grasped the symbols on the charts, I could not learn to pronounce Scandinavian place names. They baffled me the entire cruise.

"As *Argyll* and *Caribbee* checked with each other by radiotelephone while skirting Soviet waters, we unintentionally used an American code. No intelligence officer hearing our pronunciation of place names could possibly have guessed what we meant!"

Carleton Mitchell

Thrifty Ålanders Helped Themselves to Free Wind. It Drove Their Ships and Gristmills

Once 900 windmills ground the grain of this Baltic archipelago. Now they, like the square-rigged ships, fall into disuse (page 621). This old Mariehamn mill showed signs of recent use. When the miller, pushing the long lever, turned the creaky housing into the wind, how the wooden sails used to clatter!

In its harbor the late Gustaf Erikson refitted the sailing ships that ranged the waters of the world, participating yearly in the famed grain race from Australia to the British Isles. They will sail no more. Edgar Erikson, present head of the shipping company, can no longer maintain the picturesque but inefficient windjammers.

"Nowadays it is hard to get cargoes, harder to get crews," he told me. "We cannot afford modern wages for a ship that might be delayed for weeks by calms or head winds. Young men no longer desire to ship as apprentices."

The bark *Pommern*, whose tall masts greeted us, will be maintained as a museum in memory of Gustaf Erikson and his vanished fleet (page 637).

As we tied up to a dock in the shadow of *Pommern's* yards, our friend Ethel Krogius called, "*Tervetuloa Suomeen*" (Welcome to Finland).

On Aland we hired an automobile and drove through the countryside. Neat farms patterned the rocky, rugged land. We shivered at the thought of the hardships of the winter months. I remembered a comment of the military attaché of a neighbor country: "The Finns do not recoil from human sweat. They work."

Despite a series of wars that devastated many of their towns and took an enormous toll of manpower, despite the loss of territory and huge reparations imposed by the Russians, the Finns are cheerful, and move forward as a free and independent nation.*

Skerries Like Spilled Pepper on Chart

Beyond Mariehamn our way led to the eastward through islands of incredible variety and profusion. The chart showed them ahead like a handful of pepper spilled across a tablecloth. It was fortunate that we had been in-

* See, in the National Geographic Magazine: "Scenes of Postwar Finland," by La Verne Bradley, August, 1947; "Flashes from Finland," 19 ills., February, 1940; "Farthest-North Republic," by Alma Luise Olson, October, 1938.

troduced gradually to skerry pilotage. We could take advantage of ideal sailing conditions.

The water was smooth in the archipelago, and both boats carried every sail that could be hung from their masts. At one narrow spot a small boy called in Swedish from the shore, "Do you go with a motor?" Our tall masts were catching breezes not apparent below, and the boy could not understand our speed.

Finnish skerries differ from those of eastern Sweden; they are of reddish-brown rock, worn smooth by ice and winter gales. Small ones look like whales sunning on the surface. Those nearest the Gulf of Finland are barren, but along the inner fairways most are heavily wooded.

We anchored each night. One stop was at Kejsar Hamnen, Tsar Harbor, a snug cove between two islands. It had been a favorite of Alexander II, Tsar of Russia and Grand Duke of Finland.

Once he asked an old woman named Stina if she had fish to sell; she handed him the rope to her fish float while she dipped inside. The attendants were horrified: tsars weren't given lines to tend! But this Tsar was amused. The old lady became famous as Kejsar Stina, and the royal yacht bought fish from no one else.

Hangö, Western Outpost of Asia

At the southwestern tip of the Finnish mainland lies the port of Hangö. It was held by the Russians during 1940 and 1941, following the first "Winter War," when Finland defended herself with such surprising success. Hangö might be called the western outpost of Asia; beyond it the huge mass of Russia stretches off to the Pacific.

Buildings were paintless and pocked by shrapnel and bullet. Reconstruction was going on. A new town hall was rising on the foundations of the old, destroyed by fighting.

On the waterfront we were shown a monument to German soldiers who landed there in 1918 to help the Finns drive Red troops from Helsinki. After the Russians got Hangö in 1940, they removed the monument; when the Finns returned in 1941, they restored it. But in the Moscow agreement of 1944, when Porkkala was leased to Russia for 50 years, the monument was removed again.

Heavy drift ice closes the Gulf of Finland to steamers. Traffic bound for Helsinki formerly used the skerry channels, kept clear by icebreakers. But the Russians closed these protected fairways. So now steamers must use the inferior port and facilities of Hangö during the winter.

On the third afternoon beyond Hangö, a Finnish friend piloted us to a lovely island where his family has a summer home. After we had safely moored *Caribbee* and *Argyll*, he introduced us to a Finnish bath.

Stones had been heated in a closed room and water poured on to create steam. We lay on raised wooden benches. Within minutes perspiration gushed from every pore. We slapped each other with birch boughs dipped in water and momentarily laid on the stones.

Afterwards we lathered with soap, then swam.

During the winter Finns end up by rolling in snow or taking a plunge through holes chopped in the ice, but it was cold enough for me right then!

That night we ate huge platters of *kräftor* and sang the Swedish songs we had learned. But none of us could quite forget being in the shadow of the Kremlin. Just six miles to the east lay the forbidden zone of Porkkala, 150 square miles in area and extending well offshore. No one knows what is happening inside.

Skirting Finland Through a Fold in the Iron Curtain

Here, as elsewhere, the Iron Curtain is impenetrable. Finnish trains pass through with their shades tightly closed, drawn by a Russian engine. Boats are not allowed to go through the island passages. Frequently Finns living near by hear sounds of blasting, indicating that the area has been heavily fortified.

On the other side of the Gulf of Finland, little more than 20 miles away, the Estonian island of Naissar has also been fortified. Thus Russian guns command all ships moving in or out of the Gulf of Finland. Peter the Great is supposed to have conceived this plan to "put a cork in the bottle."

So when we left the next morning for the final run to Helsinki, we sailed through this fold in the Iron Curtain. We felt unfriendly eyes following our boats with binoculars and radar screens.

To prevent craft straying within the Porkkala zone, the Finns maintain a wide semicircle of floating buoys. When we picked up the first, we could make out details of the shore beyond and see high towers. Simultaneously, we made out a vessel coming toward us. At first she was just a speck, but as we watched through binoculars she grew rapidly. It was a moment of apprehension.

Caribbee happened to be in the lead. We

hoisted our American ensign. We could see no flag on the stranger, but she was obviously a naval patrol craft.

When about 200 yards away she made a sudden turn to parallel our course. At her stern snapped the Finnish colors. They looked very good to us.

We dipped our ensign and she returned the salute, her crew standing rigidly at attention despite a heavy roll.

If any Russians watched, we gave them a good show, for both yachts were carrying balloon jibs and mizzen staysails while the wind piped fresh (page 629). Our two-boat ocean race carried us well out into the Gulf, within sight of Naissar. For a while, as the log put it, "only Russia was in sight."

Then the Helsinki Lightship appeared over the horizon. We had run the Soviet gantlet. When we picked up a mooring off the yacht club, we were six degrees from the Arctic Circle and less than 200 miles from Leningrad.

Helsinki Recovering from War

We lay in the center of Helsinki. From our decks we could see the market place and the Government buildings and passing traffic (pages 609, 636).

Helsinki struck us as typical of the nation.* Many buildings, even the President's Mansion, lacked paint; this was not a sign of neglect but of honor. Finns are paying off their debts, reconstructing necessary buildings. Fresh "make-up" can come later. Some travelers find drab Helsinki depressing. To me it was just the opposite.

Bill Moore had visited Helsinki two years before. Store shelves were bare and restaurant fare limited. Now stores had a good stock and food was plentiful. Possibly no other war-torn country in Europe has shown a more remarkable recovery, and without substantial outside aid.

Everywhere on the cruise we were well received. People in Norway and Sweden seemed genuinely pleased to see the American flag floating from the sterns of two yachts. Crowds gathered whenever we docked. Passing boats would wave and salute. But in Helsinki our welcome was complete. Finnish hospitality was boundless.

Finns Hope for Olympics in 1952

Finland is scheduled to be host to the Olympic Games in 1952. Preparations were going forward for the reception of athletes and visitors. The stadium and hotel under construction symbolized to us Finnish courage and determination.

Once before, in 1940, the Finns had prepared for the Olympics. Then the games were canceled because of the attack by Russia in November, 1939.

My only complaint about Finland stemmed from my usual difficulty with language. Here I had to struggle with not one tongue but two, as every sign, every map, every street name, appeared in both Finnish and Swedish. Even *Helsinki, Suomi*, becomes *Helsingfors, Finland*, in the Swedish tongue. This is a heritage from the long Swedish rule and the hundreds of Swedish families who remain as part of the nation.

There was another rainy spell while we were in Helsinki. With the wind seemingly fixed in the southwest, "on the nose" going back, we expected a hard thrash out of the Gulf of Finland and down the Baltic. But the day before we left, skies cleared and the wind shifted.

"A dry easterly!" exclaimed Finnish friends. "You have luck!" Fair winds from Sweden to Finland; now the wind was to be "on our tail" homeward bound.

Markers of Porkkala fell astern, again without incident, and we ticked off the lighthouses on the Finnish coast: Jusarö, Russarö, Utö.

Baltic Sailing—Woollies by Night, Shorts by Day

It was cold after the sun went down. As we angled out into the Baltic, a short steep sea kept the decks wet. During the afternoon the wind had backed into the north, and it blew hard during the night.

"If this is August, I wouldn't want to be here in January," said Walter, our professional seaman, as a polar wind knifed through layers of woolly clothes.

Next morning the wind lightened. By 4 in the afternoon I was stripped down to shorts from Bermuda and a Nassau straw hat!

The fabled island of Gotland lay abeam. We had covered 270 miles in 35 hours, a rousing sail across open water, very satisfying after peacefully "walking in the garden." The course had been circuitous to keep us well clear of the Soviet-controlled Estonian and Latvian coasts.

Again we sailed in the wake of ghostly ships.

Once these waters had been furrowed by the keels of eastern Vikings, the Rus. These hardy Northmen are not so well known as those who ravaged the Atlantic shores, but

* See "Helsingfors—A Contrast in Light and Shade," by Frank P. S. Glassey, National Geographic Magazine, May, 1925.

Three Lions

Time Stands Still in the Alands. Spinning Wheel and Ships' Bunks Are Home Fixtures

Self-sufficient Alanders fish a living from the sea. Some farmers, tilling several rocky islands, go from field to field by boat; their wives row to market. Many a tall Aland tree has gone to sea as a mast clothed in sails of Aland flax. No wonder the 6,534 rocky islands developed a race of mariners (pages 621, 624, 637).

they were equally bold in their exploits. While Atlantic Vikings were Norwegians, Danes, and occasional Swedes, those who followed the "eastern way" were mainly Swedes.

From their homes in the skerries they sailed across the Baltic in light boats, then rowed up the rivers that flow into the sea. From the headwaters they portaged their boats across the divides, then followed other streams south to the Black and Caspian Seas.

These mariners fought and traded their way around Christian Europe, on the coasts of Asia Minor, and in 860 even attacked Constantinople. The name "Russia" is a heritage of those Rus Vikings. They founded kingdoms in that country, with capitals at Novgorod and Kiev.

Our goal, Gotland, has drawn ships through the centuries. The island once was the center of a vast trade stemming from that "eastern way." Its principal town, Visby, rivaled medieval London in size and importance (pages 638, 639).

Earlier warriors sailed from its shores to battle against the Roman legions. Thousands of Greek and Arabic coins have been unearthed here, and Iron Age graves have yielded Chinese pottery and shells from the Indian Ocean. Merchants of Visby wrote one of the earliest-known maritime codes.

Visby Still a Medieval City

As we beat slowly along the shore, the late afternoon sun gilded Gotland's limestone cliffs. I thought of other sailors who had seen it the same way—Stone Age men riding rafts and hollowed logs; Vikings from the hidden fjords of the far north; merchants returning from trading voyages to every known part of Europe and the Middle East. Then I remembered the armada that appeared off the island one July day in 1361. King Valdemar of Denmark landed, crushed all resistance, and forced tribute from the town. It was the beginning of Visby's decline.

We found Visby a fascinating place. There are no jarring notes; shops and other new buildings harmonize with the old. Most

striking is the number of magnificent churches in various states of preservation.

In the narrow streets we relived bygone days: men-at-arms moving by torchlight, the town quiet behind its wall and moat, all approaches closed except the "Lovers' Gate" through which young couples were permitted to stroll into the country.

Our next destination was the island of Öland, close to the mainland—not to be confused with the Finnish Åland Islands. We left Gotland just as a fiery sun disappeared below lavender clouds. With the dark came a fresher wind, and soon the lights of the coast appeared. It was dawn when we dropped sails in Borgholm Harbor.

Above loomed a castle, a huge and forbidding pile, one of the most impressive ruins in all northern Europe. Certainly its magnificent courtyard, large enough for a game of polo, is on the grand scale and conveys a sense of regal pageantry.

As I wandered around, I was annoyed by names scrawled over every wall. Then I spotted a glass plate protecting a name scratched by a previous tourist: "Nils J——, Anno 1699."

Kalmar Controlled Sweden in Early Days

The Baltic is ringed by castles. But none seem as beautiful as Kalmar Nyckel, or Kalmar Key, a few miles beyond Borgholm, across the strait. For centuries it was known as "The Lock and Key of the Swedish Kingdom." He who held Kalmar controlled Sweden (page 640).

As we walked its corridors, I thought of the great drama it witnessed in 1397. Gifted Queen Margaret of Denmark brought Norway, Denmark, and Sweden together in the Kalmar Union, a federation successful only during her lifetime. And I pictured mad King Erik XIV working as a carpenter on the inlaid paneling of a second-floor room while he awaited the reply of Queen Elizabeth of England to his marriage proposal.

Bill Moore and I planned a course directly for the Danish island of Bornholm. But our eye caught tiny dots of land on the way, a group called Christiansø. Two parallel islands formed a harbor. We decided to explore it.

A little past midnight we picked up close ahead Christiansø light. It was utterly dark. A big sea was running. To enter we had to stay exactly in the white sector of the light; there were rocks on both sides of the channel. Cautiously we went ahead. A flashlight showed a stone breakwater close abeam.

We were not disappointed in Christiansø. The harbor was not much wider than the boats were long. Only 160 people live on the island. Theirs is a rugged existence (p. 642).

During heavy northerly gales the seas surge through the harbor. Two years before, waves broke three feet deep along the quay. The whole village tended the fishing boats day and night.

Once strongly fortified, Christiansø is administered by the Danish Navy, which rents 18th-century houses and barracks to fishing families. Nothing except a lighthouse has been built here for 100 years (page 643).

Old fortifications bristle everywhere, rusted guns point to sea. Strangely, such islands with a military past are often the most peaceful and forgotten.

Bornholm—"Cork" in the Baltic

Bornholm lay 11 miles to the southwest. As we approached, we saw a rolling countryside of green and brown fields broken by the red roofs of twin towns, Sandvig and Allinge. As we rounded the northern point, the scene changed abruptly. The west shore rose steeply in wooded cliffs, surmounted by the imposing ruin of Hammershus fortress.

Flat farm land, haystacks, and sleek cattle reminded us of Holland. There were many windmills. Everything was neat and clean (page 646).

Rønne, the principal town, seemed new. Our taxi driver told us the grim reason. After the Nazi collapse the commander of the German occupation forces refused to surrender to any but British or American troops. The Russians wanted to take over, so mercilessly they bombed the town until the Nazi general capitulated. Immediately the Russians moved in. They remained until the spring of 1946, leaving reluctantly.*

Bornholm could be the "cork" in the Baltic, just as Porkkala is in the Gulf of Finland (page 625). Its strategic position is important.

Mines Still Lay in Wait for Unwary

Beyond Bornholm we encountered another reminder of war. The official British Admiralty-U. S. Hydrographic Office publication NEMEDRI contained doleful comments: "Mariners are warned to keep a sharp lookout for drifting mines . . . the temptation to cut corners must be resisted . . ."

Although we felt wooden sailboats were safe, we stayed within buoyed swept channels, especially since a steamer had been lost not long before taking a short cut.

Trälleborg on the Swedish mainland was a

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

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Caribbee, Hoisting Her Reaching Canvas, Scoots Across Calm Blue Waters

Dangerous in winter gales, the Baltic in summer is as placid as a lake. Its waters are almost fresh; tides barely rise. _Caribbee's_ sails (bow to stern) are balloon jib, mainsail, mizzen staysail, and mizzen.

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Artwork by Göran Algård

Stockholm's Old Town, Heart of a Modern City, Wears a Medieval Look. Pedestrians and Trolleys Throng Its Bridges

Caribbee, on Lake Mälaren, Glides Past Stockholm's Town Hall, Aglow with Soft Red Brick

Finished in 1923, Town Hall has been called the "most beautiful building since the Renaissance." "I cannot quarrel with the description," says the author. "From our deck the sight was breath-taking. Here was one famous view not overrated."

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Day's Last Race Is Ended. Sandhamn's Fleet Is Beached Bows to Shore, Anchors Out Astern. Drying Sails Hang Slack

Swedes love boats as Americans love cars. Stockholm, laced with waterways, is a yachtsman's paradise. Here in Sandhamn the author counted hundreds of boats gathered for the Royal Swedish Sailing Club's regatta, one of Europe's biggest and brightest water shows.

A Swedish Yawl, Varnished Sides Gleaming, Moors in Sandhamn Basin. Others (Right) Fly Out Through the Narrows

Many Swedish yachtsmen live aboard in summer. Cruising past the skerries by day, they tie up to the rocky islands by night, build fires, and cook picnic meals. They rock to sleep beneath tents pitched in cockpits. Hundreds racing off Sandhamn live such a vagabond existence.

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What a Treat Is Sandhamn Regatta to Children of Racing Parents!

Here for a week everyone lives for play in the blessed northern sun. Dad toys with boats like a youngster; Mom neglects her sermonizing. Kids, school and chores forgotten, meet new friends, go on new adventures. These "pirates" walk an iron plank.

Every Hand on Hävringe Lightship Stops to Watch the Americans Pass

Sweden's floating lighthouse, its blinker revolving by night, its siren tooting in fog, safeguards Baltic traffic south of Stockholm. The author found Scandinavian waters well marked with navigation aids, but he had momentary difficulty understanding them.

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Açfomlor by Göran Ahlard

Resplendent Medieval Costumes Honor the Ancestral Way in Dalecarlia

On work days Dalecarlian farm folk yield to sober modern dress, but on Sundays they shine with colors. Lake Siljan (background) is the heart of this Swedish province, where certain patterns go back to Viking times.

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Kodachrome by Carleton Mitchell

Helsinki Market Place, Throbbing with Life, Ignores the Iron Curtain's Shadow. Farm and City Folk Bargain over Produce

Cart horses stand stolidly; pigeons steal their grain. One would never guess that Finns daily hear the roar of Russian fort-building and that shipping runs a gantlet of Soviet gun muzzles. Hard-working Finns neglect paint to restore war damage and pay reparations.

Four-masted *Pommern*, Sail's Old Workhorse, Stores Her Canvas and Retires in Mariehamn

Unable to compete with steam's economy, the sailing ships which once hauled the world's commerce have quietly closed their careers.

As late as 1949 two windjammers found employment. Today, one by one, the survivors go to sleep in such snug harbors as Mariehamn, Åland Islands.

This Finnish archipelago became working sail's last home in the Western World. Between two world wars canny Ålanders, buying bargain-counter ships, scraped up profitable cargoes in out-of-the-way ports.

Of 20 sailing ships in the 1932 Grain Race, many were owned by Mariehamn's Capt. Gustaf Erikson. His *Pommern*, rounding South America, raced from southern Australia to London in 129 days. (See "The Cape Horn Grain-Ship Race," by A. J. Villiers, NATIONAL GEOGRAPHIC MAGAZINE, January, 1933).

When Captain Erikson died in 1947, his square-rigged fleet had dwindled to three ships. *Pommern* has been dedicated as a museum ship to his memory.

Here perspective plays a trick. The masts of *Caribbee* and *Argyll*, which seem to loom so high, actually do not reach the bark's lowest yards.

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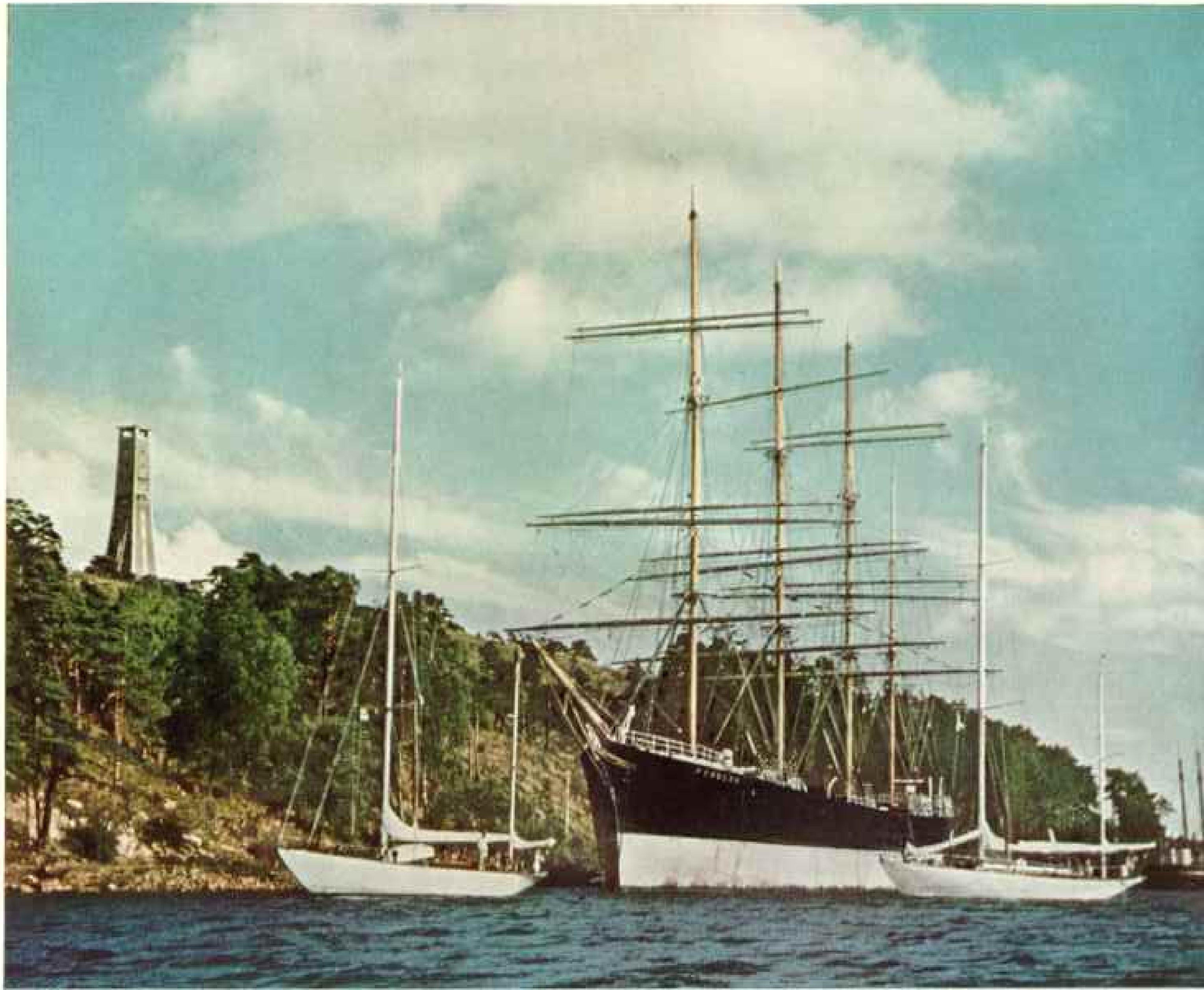

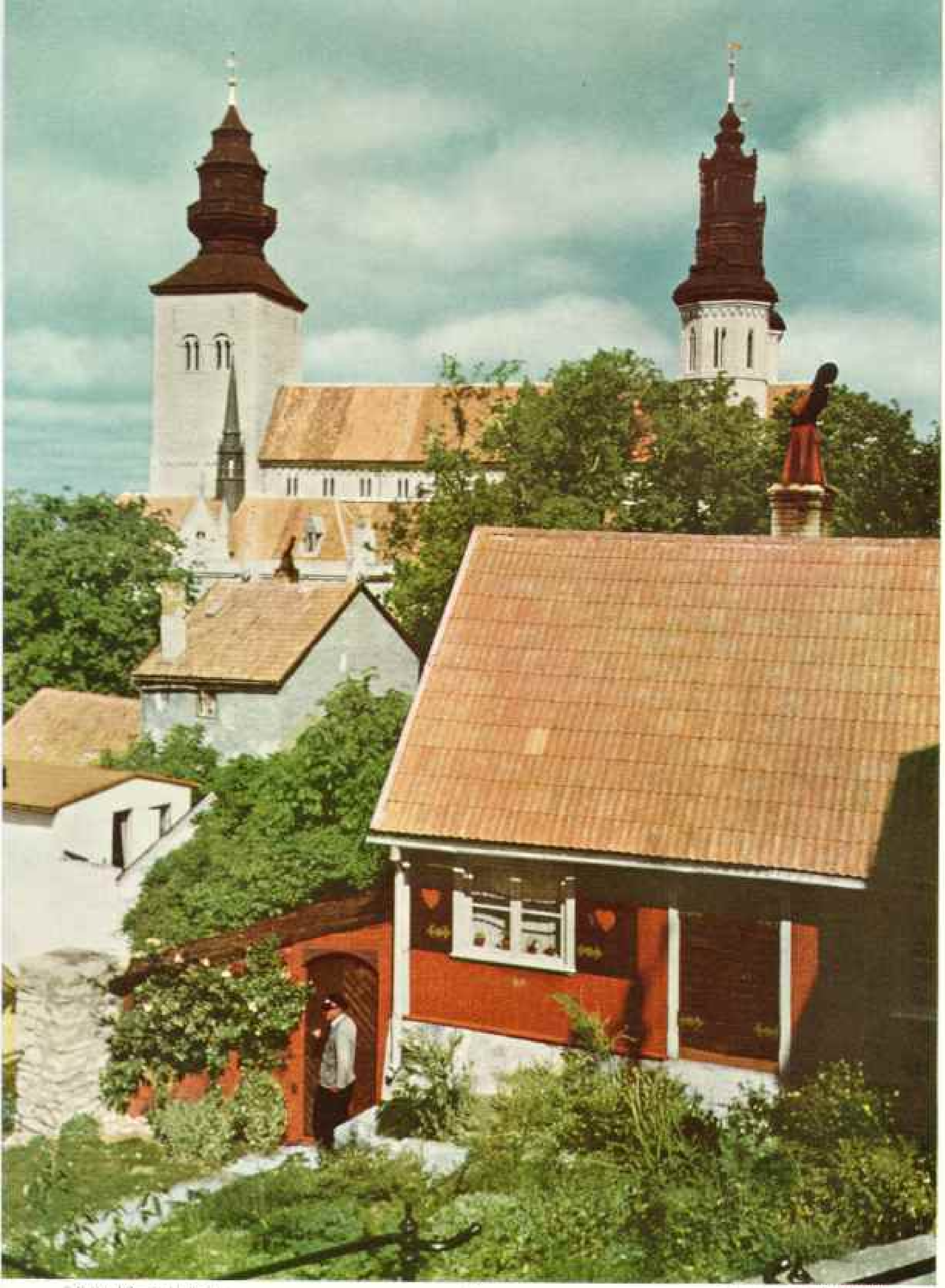

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Time Stands Still in Visby, Sweden's Museum City. Poverty Is Its Fortune

Visby people, too poor to build, continued to live in medieval dwellings. Now the world beats a path to their doors. Gotland Island's German traders built towered St. Mary's Cathedral in the 13th century.

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Kodachromes by Carleton Mitchell

Visby's City Walls Extend Two Miles; Once That Green Valley Was a Moat

From Gotland's waters Vikings roved across Russia. Their descendants lost the island to Danish conquerors in 1361. Legend says a girl betrayed them, and, in punishment, they walled her in Maiden's Tower, one of the citadels overlooking the ramparts.

Trolley Car and Cycles Serve Visby, Once the Baltic's Richest City

When Gotland Island rivaled London, it was so wealthy, says an old ballad, that women spun with golden distaffs and pigs ate out of silver troughs. Now it looks to travelers such as these for a living. They face one of the medieval battlements.

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Graceful Kalmar Castle Conveys No Hint of the 24 Sieges Which It Withstood in Three Centuries

Started in the 13th century, Kalmar became known as the "Key to Sweden." In 1397 it witnessed the short-lived merger of Sweden, Norway, and Denmark into a single kingdom. Swedes, sailing in the ship *Kalmar Nyckel*, established Delaware's New Sweden in 1638. The castle was restored in modern times.

Small Boats Throng Torekov's Bathtub-sized Harbor. Small Fry Delight in the Figureheads at Its Marine Museum

At this Swedish fishing village *Caribbee* bought fish right out of a trawler's nets; she turned around with difficulty; and she departed in the only fog of the cruise. Her crew inspected relics of sail's glorious days in the old schooner (right). Sight-seeing launch and cyclist (on the pier) reflect Torekov's popularity as a summer resort.

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Areas colors by Göran Algård

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Kodachrome by Carleton Mitchell

Skipper Berthed at Christiansø on a Dark, Rough Night. When Day Revealed the Narrows, He Was Awed by His Own Temerity

Christiansø (background) and Frederiksø, Denmark's last Baltic outposts, squeeze the harbor between them. When seas rush through, lashing quays, fishermen swing aside the bridge (left) and tend boat lines. An artist, not the sailor, left the canvas. *Caribbee* rides in the center.

As Round as a Dollar Is Christiansø's Old Stone Fort

This Baltic dot, where gulls screech, foghorns mourn, and breakers roar, used to be a Viking pirates' lair.

Long before 16-inch guns, Denmark made Christiansø a naval base, erecting the circular citadel in 1684 and the naval barrack (opposite page) in 1789. Almost nothing has been added within the last century save the lighthouse perched above the fort.

Today a museum quiet pervades the old fortress. Antique, rusting cannons still point to sea. Musket slits "command" the harbor. Wave-beaten rocks hold rings for mooring frigates that never appear.

Denmark's Navy retains control, but Christiansø's strategic importance is no more. Airfields on Bornholm, 11 miles away, dominate the island.

Save for its fishermen and lighthouse keeper, the island would appear deserted. Its 100 people, marooned on a half-mile-long crag in the Baltic, lead a lonely existence.

Stray mines, still not swept after more than five years of peace, imperil fishing boats. Tons of German poison gas dumped into the sea not far away create an extra hazard. Occasionally a net snags a gas container and, if there has been a leak, it cannot be used again for months.

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▲ *Caribbee*, Nearing Bornholm, Hoists the Danish Flag as a Courtesy

American yachts cruising foreign waters carry flags of the nations they expect to visit. When at anchor or under power, they unfurl the U. S. ensign from the stern; sailing, they suspend it from the after leech.

▼ Christiansø Nets and Glass Floats (Right) Dip into Boiling Tar

All but a few of the rocky island's souls are fishing folk. Herring in summer, salmon in winter occupy their days. Each man has a table-sized, wall-enclosed garden whose precious soil was shipped from Bornholm.

dead city. Before the war it was an entry port for Polish coal, a terminus for ferries commuting to points on the south Baltic. The Russians stopped such traffic. Coal chutes stood gaunt and rusty along deserted quays; ferry slips lay empty.

American Bombers Flew in Baltic Door

During the war vast fleets of American planes roared over Trälleborg on their way to German targets. By coming in over the Baltic they avoided much German fire.

"Bombers would go by for an hour," said a Swede. "One time the commander of our antiaircraft batteries here in Trälleborg talked by radio to the commander of the American squadron. 'You are over Swedish territory,' said the Swedish officer. 'We know it,' replied the American. 'I must fire,' said the Swede. Our guns fired furiously. 'You are shooting too low,' radioed the American commander. 'We know it,' answered the Swede."

Before the war all shipping bound in or out of the Baltic had to round Falsterbo peninsula, the southwest tip of Sweden. Outlying shoals forced steamers close to the German-held Danish shore.

To prevent being bottled in the Baltic, the Swedes frantically cut a canal through the peninsula. It is not imposing as canals go, merely a wide ditch a mile long, but during the war it was of tremendous importance.

Today large ships again round Falsterbo, but we chose the new canal. As *Caribbee* and *Argyll* passed through, I was struck with the parallel that forced the building of two Swedish waterways a century apart: the threat of Napoleon resulted in the Göta Canal (page 608), that of Hitler in the Falsterbo.

On leaving the canal, we found ourselves in narrow waters. There are three exits from the Baltic to the Atlantic, two lying between the Danish islands, and the third, the Sound (Öre Sund), between the principal Danish island and the peninsula of Sweden. From Copenhagen (København) the Swedish coast is plainly visible.

Markers showed safe lanes to follow. For once buoys did not indicate hazards created by Nature, but by man. The aviators of every belligerent nation used the Sound as a dumping ground.

Again we sailed in the wake of history as the towers and buildings of Copenhagen lifted ahead (page 622). In these very waters occurred one of the most dramatic incidents in the career of that great British naval hero, Horatio Nelson.

A British fleet commanded by Admiral Sir Hyde Parker descended upon Copenhagen in 1801 and demanded that the Danes cease convoying merchant ships, thus aiding Napoleon. The Danes refused. Their fleet, not fully in commission after the winter, lay anchored under the protection of powerful forts. A frontal assault appeared futile.

But Nelson was undaunted. He secured his senior's permission to approach the Danes from the rear with half the British fleet. By night small boats sounded an unguarded channel the Danes thought safe. When morning came, the British ships sailed in. Some ships grounded, but Nelson did not hesitate.

The Danes fought furiously. Admiral Parker, thinking the contest hopeless, signaled to withdraw. When Nelson was told of the order, he raised a telescope to his blind eye. "I see no signal," he cried. "Continue fighting!" Most of the Danish ships were captured or sunk, dooming Napoleon's Baltic alliance.

Copenhagen—a Danish Paris

Copenhagen might be called a Paris of the northern countries.* Streets are wide and shaded by trees. Life is leisurely, based on sidewalk cafes and fine restaurants. Nowhere did we enjoy better food; yet, curiously, it was the only country where we were issued ration tickets. Denmark was not short of food, but the Danes had voluntarily tightened their belts to export meat and dairy products to other nations.

Everywhere in Copenhagen we saw the mark of one of her most energetic rulers, King Christian IV, that same gentleman who refounded Oslo. Although he died in 1648, much remains of his city: a Stock Exchange, many churches, barracks now used as apartments, and even a round tower designed for astronomical observations. Peter the Great of Russia on a wager drove a team of horses up its spiral stairway.

As we cleared the narrow passage from the Sound, bound for Göteborg, a huge fortress towered over our decks. It was Kronborg at Helsingör, better known as "Hamlet's Castle." From its walls we had previously looked across the two-mile gap to Sweden. Now we were staring up at its stern battlements, but not as woefully as earlier sailors when its guns forced them to stop and pay toll.

Shakespeare chose an appropriate setting for his tragedy. The castle still broods, a somber mass full of threat.

* See, in the National Geographic Magazine: "2,000 Miles Through Europe's Oldest Kingdom," by Isobel Wylie Hutchison, February, 1949; "On Danish By-lanes," by Willis Lindquist, January, 1940; "Royal Copenhagen," by J. R. Hildebrand, February, 1932; and "Denmark and the Danes," by Maurice Francis Egan, August, 1922.

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Bornholm's Fishing Fleet Sleeps, but Wait Until the Herring Catch Comes In!

Then graybeards, wives, and all the cotton-topped children assemble to meet the boats and clean the fish. These, when smoked a delicious brown, are called Bornholmers. Denmark's rocky Baltic island builds houses, churches, roads, and piers of granite and exports building stones (left) all over Europe. If a farmer cannot till his thin soil, he quarries its granite base (page 628).

That night we crept behind the breakwater at the tiny fishing village of Torekov. Again we were in Sweden. Friendly hands took our lines to help us turn (page 641).

Our last morning's sail began in one of the thickest fogs I had ever seen, and the first we had encountered on our cruise. As soon as the sky turned silver, both boats were under way, and we cautiously felt our way from buoy to buoy to the open Kattegat, where we could steer by compass.

Within an hour the fog lifted and the wind gradually strengthened, again providing perfect sailing conditions on that last leg.

The sea grew rough as we neared the lighthouse of Nidingen. But our luck held. Nidingen marks the beginning of the west-coast skerries. We cut into their shelter; the sea smoothed. Again we "walked in the garden."

Ahead, that September afternoon, we saw Göteborg, peaceful in the fall sunshine. When we picked up our old mooring, our cruise was over except for shipment home.

As I write this, Russia is requesting a salvage base on Bornholm, Swedish fishing boats have been pursued, and a United States Navy plane has vanished into the sea we sailed so recently.

These are waters that have witnessed much history and known many masters. The Baltic will not remain the "lake" of any nation.

Men, even those now silenced, will dream again.

Here Come the Marines

By Frederick Simpich

AT TUN TAVERN, Philadelphia, on November 10, 1775, our idolized Marine Corps was born. Seagoing soldiers, able to fight on land or water—that's what the Continental Congress wanted. So recruiting officers, beating drums Salvation Army street style, "drummed up" the first of what are now America's fighting Marines.

That valiant little Tun Tavern band, with its flintlocks and funny clothes, was expanded to about 485,000 men in World War II, and suffered 85,000 casualties.

In its colorful career of 175 years, our Marine Corps has shot its way ashore in some 250 places and seen more odd nooks and crannies of the world than any other Yankee fighting force.

In that time it has ridden everything from camels and shaggy Mongolian ponies to rubber boats, dog sleds, and submarines. For sheer audacity, reckless courage, and hairbreadth escapes, its exploits read as might some imaginative Plutarch's *Lives* of all the sea rovers, buccaneers, and hand-to-hand fighters since the wild days of Genghis Khan.

Soon after Communist North Koreans invaded across the 38th parallel, ground and air units of the Fleet Marine Force, based at Camp Pendleton and El Toro, California, sailed from San Diego to join Gen. Douglas MacArthur's forces. Within a few days after landing, the Leathernecks were in action against a numerically superior enemy.

Message Worth Framing

Jealous of its hard-earned "first to fight" reputation, the Corps was ready and rarin' to go when the word flashed from Tokyo that MacArthur wanted all the Leathernecks that could be sent him.

"Hey, Mac, we're back!" sang out one Marine as the vanguard elements of the famed First Division hit the shore in Korea.

"Compliments of the Corps!" So read legends on the bombs loaded under the wings of Marine ground-support planes.

The Marines are pretty proud that MacArthur called for them in Korea—so proud, in fact, that this official document probably is due for framing and preservation. The Corps knows a historic exhibit when it sees one, and will undoubtedly take good care of the MacArthur message.

Loving a frolic as well as a fight, the singing, skylarking Marine endears himself to American hearts.

Proof of Marine popularity is the eager way grandstand crowds whistle, clap, and shout "Here come the Marines!" when, on any Fourth of July or other parade day, the Leathernecks march by.

In all their exciting annals, from China to the Caribbean, the Marines are to us what the Foreign Legion is to the French, or what the Grenadier Guards and the Gordon Highlanders are to the British.

Patriotic Americans sense this, even in the crashing chords and triumphant words of the *Marines' Hymn:*

From the Halls of Montezuma
To the shores of Tripoli,
We fight our country's battles
In the air, on land and sea.
First to fight for right and freedom
And to keep our honor clean;
We are proud to claim the title of
United States Marine.

All around the world, on troop transports bound for adventures overseas, under tropic palms, amid northern snow and ice, and in rest billets behind the fighting lines, the words of their song have inspired legions of Marines to a high resolve and renewed faith in their oath of loyalty to the flag.

"From the Halls of Montezuma to the shores of Tripoli" is not just a poetic line. Marines went with Gen. Winfield Scott on that almost incredible march to Mexico City in 1847, from which there was no turning back.

When Scott drew his sword and threw away the scabbard, it was conquer or die. He pushed on with Marines and soldiers to the dramatic Battle of Churubusco; despite heroic Mexican defense, he scaled the walls of Chapultepec and took the National Palace—the "Halls of Montezuma."

Barbary State pirates, on the north coast of Africa, used to abuse our merchantmen. After an arrogant pasha cut down the flag from over our consulate in 1801 and declared war on the United States, our Navy and Marines struck the "shores of Tripoli."

Here the Leathernecks, under Lt. Stephen Decatur, performed feats of daring still fresh in wardroom yarns.

In one astounding move, Marines marched from Alexandria, Egypt, with a group of native troops and mercenaries across the Libyan Desert, along the shores of the Mediterranean, to attack and take the walled city of Derna in Tripoli. Over it, for the first time in that part of the world, they raised the Stars and Stripes. This was in 1805.

At Derna a friendly pasha gave Lt. Presley Neville O'Bannon, USMC, a peculiar type of

648 U. S. Marine Corps, Official

Iwo Jima's Heroic Flag-raisers Symbolize Marine Valor at Its Finest

In a studio in Washington, D. C., sculptor Felix de Weldon (left) and his assistant, Idilio Santini, work on 32-foot plaster figures of five Marines and a Navy pharmacist's mate who braved Japanese fire to plant Old Glory atop Mount Suribachi, Iwo Jima, February 23, 1945.

Cast in 100 tons of bronze, the statue will be erected in the Washington area. A cloth flag will fly from the 110-foot staff. The monument will honor all Marines who gave their lives in the Corps' 175 years.

De Weldon's inspiration was the famous photograph by Joe Rosenthal, of the Associated Press. From combat movies made at the same time, the sculptor chose a more dynamic grouping, with the flag nearer the center of the composition. Three surviving flag-raisers were De Weldon's models; the others were killed later.

Seasoned in World War II's Jungle Battles, Marines Head for a New Campaign in Korea

Men of the First Marine Division, from Camp Pendleton, California, boarded the Navy's assault transport *Pickaway* at San Diego. With them went air units. After a 21-day, 6,000-mile voyage, the Leathernecks landed in South Korea. They went into battle with 45-ton Pershing tanks, 3.5-inch rocket launchers to destroy enemy armor (page 669), and flame throwers for use against pillboxes and caves.

sword he had used while with the Mamelukes in Egypt. A pattern of this Mameluke sword is still carried by officers of the Leathernecks.

How Leathernecks Got Their Nickname

That nickname, "Leathernecks," came from a black leather stock, part of early Marine uniforms, worn to keep a man from getting his throat slit by the whistling sweep of a "snickersnee."

Though Leatherneck is thus explained, no one seems to know the origin of another nickname, "gyrene." Webster defines it as Army slang—*G.I.* plus *Marine*—and adds that it is used "derogatorily." Marines themselves, however, do not mind being called gyrenes.

Just prior to the outbreak of the Korean War, the Corps numbered about 7,000 officers and 65,000 men. Our National Security Act of 1947 says the Marines shall provide forces "of combined arms," with supporting aviation, "for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign."

The law further says Marines shall work with the Army and Air Force to develop tactics, technique, and equipment used by landing forces; that they shall provide detachments for service on armed vessels of the Navy or for guarding naval bases and naval property—"and such other duties as the President may direct."

Those last words mean that Marines may still be ordered to land overseas to protect American lives and property, as in the past, or to guard our mails, aid in floods or other disasters, or protect the Treasury and the Mints, in case of riots or earthquakes.

From days of "boot camp," where recruits are trained, it is pounded into a Marine's head that he must think and act quickly—use his head to save his hide.

650 National Geographic Photographer John E. Fletcher

Marine Boots at Parris Island, South Carolina, Proudly Put on New Uniforms

Already these recruits have donned forest-green trousers and jackets. Some try on cap frames, to be worn with summer or winter covers. Laid out before each man are shirts, underwear, shoes, gloves, and dungarees. A haircut "close to the bone" comes in a fledgling Leatherneck's first hours at boot camp.

Such a Marine was young Lt. (now Brig. Gen.) Clayton C. Jerome. Once, flying over San Diego, he thought fast and saved his own neck, and those of people in the crowded city below.

While practicing acrobatics high in the sky, the stick of his plane broke off at the socket. Rather than jump and let his runaway plane crash in the heart of San Diego, he chose to try to land. So he got out his handkerchief, jerked off his belt and necktie, with them lashed the stick back in its socket, and made a safe landing.

He's the same Jerome who later, while naval attaché in Latin America, risked his life in an amphibian to fly over treacherous jungles and down into the narrow Cuyuni River in Venezuela to rescue victims of a crash.

At Cherry Point Air Station, in North Carolina, I talked with Brig. Gen. L. H. M. Sanderson, another weather-beaten, tough old pilot. He told me how, as a youngster, he initiated dive bombing in Haiti.

"That was years ago," he said. "We had few instruments. I rigged up a kind of sight on the nose of my open plane. Underneath I hung a 100-pound bomb, in an old mail sack with a puckering string. The outlaws were camped on steep hillsides. Flying level, it was hard to hit 'em; so we'd dive, right down the mountainside. At the right second I'd signal with my left hand, and the boy in the back seat would jerk our puckering string and drop the bomb out of the mail sack. It worked fine!

A Stove Lid Serves as Armor

"We had no armor then. They kept hitting our plane, so I got me an old stove lid and sat on it.

"That very day, ping! ping! ping! three Mauser balls hit that lid like bullets hitting rabbits in a shooting gallery. They stung the seat of my pants, but the old stove lid saved me."

The first Marines I ever saw were guarding the American Legation at Peiping, soon after the Boxer Rebellion.*

Many then were mounted on long-haired Mongolian ponies. For winter sport the men skated on frozen moats outside the old city walls or pushed themselves about on the Manchu ice sleds.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Causes That Led Up to the Siege of Peking," by W. A. P. Martin, February, 1901; and "Chinese 'Boxers,'" by Llewellyn James Davies, July, 1900.

551 National Geographic Photographer John E. Fletcher

Grinning "Skinheads" Get the Word on How to Make Up a Bunk

"You fold it like this and tuck it under here," the sergeant tells a platoon of Marine recruits at Parris Island. Sheets and blankets, neatly mitered at the corners, must be as taut as a drumhead. To test tightness, the instructor drops a penny on the bed. If it doesn't bounce—rip everything apart and try again!

After long observation of life in all branches of our armed services, from the China coast to the Rhine, I think the Marine officer is usually closest to his men. They are a tight Three Musketeer-like outfit, "all for one and one for all." And so many enlisted men have become good officers.

Take Herman H. Hanneken, a St. Louis boy who served five years in the ranks and wound up a brigadier general. As a sergeant in Haiti in 1919 (serving as a captain in the Marine-organized native gendarmerie), his was an exploit rarely topped in the annals of Marine adventure.

Haiti was in revolution. Marines were there to help the lawful government put it down. The *caco*, or rebel, leader was slick and wily Charlemagne Peralte. Once he was disposed of, all good Haitians felt, peace would be in sight.*

So, aided by Cpl. William R. Button, a brother Marine, Hanneken planned a clever trick. Blacking their faces and donning ragged old civilian garb to look like *cacos*, and carefully memorizing the secret countersign, these two Marines actually passed all the rebel sentries, got right into headquarters, and shot Peralte himself. Not only that, they dragged his body down the mountainside and had him duly identified at Marine headquarters.

Hanneken and Button got the Congressional Medal of Honor for "extraordinary heroism and conspicuous gallantry and intrepidity in actual conflict with the enemy."

This was only the start of Hanneken's amazing career. He went on later, advancing through officer grades, to capture other outlaws when helping Nicaragua on the road to peace, and finally fought in the Pacific war.

Awarded the Navy Cross, the Gold Star in lieu of a second Navy Cross, the Legion of Merit, and a string of other medals which, if he wore them, would hang across his chest like a hammock, Hanneken was retired as a brigadier general after a thrilling 34-year career.

Officers May Go on Delicate Missions

I know one Marine officer, with the gift of tongues and the sixth sense of a Sherlock Holmes, who every now and then fades from sight. Nobody at headquarters asks, "Where's So-and-So?" They suspect that, somewhere

* See "Haitian Vignettes," by Capt. John Houston Craige, NATIONAL GEOGRAPHIC MAGAZINE, October, 1934.

National Geographic Photographer Joseph H. Roberts

Helicopters and Seagoing Tanks Help Marines Fight Afloat, Ashore, and Aloft

From a Sikorsky Flying Windmill a cable unreeled from a hydraulic winch lowers a Leatherneck to a waiting armored amphibian, or LVT (Landing Vehicle, Tracked). Alongside hover two twin-rotor Piasecki, popularly called Flying Bananas or Sagging Sausages. Camouflaged Marines watch from another LVT. In maneuvers like these in the Potomac, the Corps tests helicopters for observation and artillery spotting, air-sea rescue, troop and equipment transport, and liaison work during a ship-to-shore assault. Special helicopter crews have been trained for carrier take-offs and landings (page 663).

653 U. S. Marine Corps, Official

Marine Riflemen Surprise the Defense with a Helicopter Landing

Such aircraft already have gone into action with the First Marine Division on the Korean front. Among their many jobs are reconnaissance and evacuation of wounded. Here, in a demonstration at Quantico, Virginia, a Leatherneck squad shows how a twin-rotor ship can drop men behind enemy lines (page 665).

behind the scenes, he's busy with cloak and dagger.

Marine officers often serve as naval attachés; some aid the State Department on missions to such remote capitals as Addis Ababa, or in trying to negotiate a peace between warring factions in turbulent lands.

When in 1846 war with Mexico was imminent, and we believed that Great Britain and France coveted California, President James K. Polk wanted to send orders to the American consul at Monterey, to our Navy on the west coast, and to Capt. John C. Frémont, who was out there on an exploring trip.

Polk chose Marine Lt. Archibald H. Gillespie as his agent. Gillespie made his way across Mexico in disguise, talked to the commander of our Pacific Squadron, Commodore John D. Sloat, then sailed to Monterey. There he gave Consul Thomas O. Larkin the White House message.

But Frémont was away, up near the Oregon line. After a trek of 600 miles through savage Indian lands, Gillespie met up with him.

It's history now that our western boundary was extended to the Pacific; and Gillespie, by courage and tenacity, played his part in gaining California for Uncle Sam.

California and the Marines have always been good friends. When the *Cyane* sailed to take San Diego, Lt. Stephen Clegg Rowan, its executive officer, went ashore on July 30, 1846, with a Marine guard commanded by Lt. William P. C. Maddox. It was this Marine officer, local historians say, who doubtless raised the Stars and Stripes over that part of San Diego known as Old Town. It was the first time our flag flew hereabouts.

Maddox served with distinction in the California campaign.

Today, Marines and former members of the Corps are active in San Diego life.* The dramatic editor of the morning newspaper is a former Marine. So is the owner of the largest sporting goods store, the window trimmer at a big department store, the undersheriff of the county, an assistant cashier at a large bank, and a former mayor of Coronado.

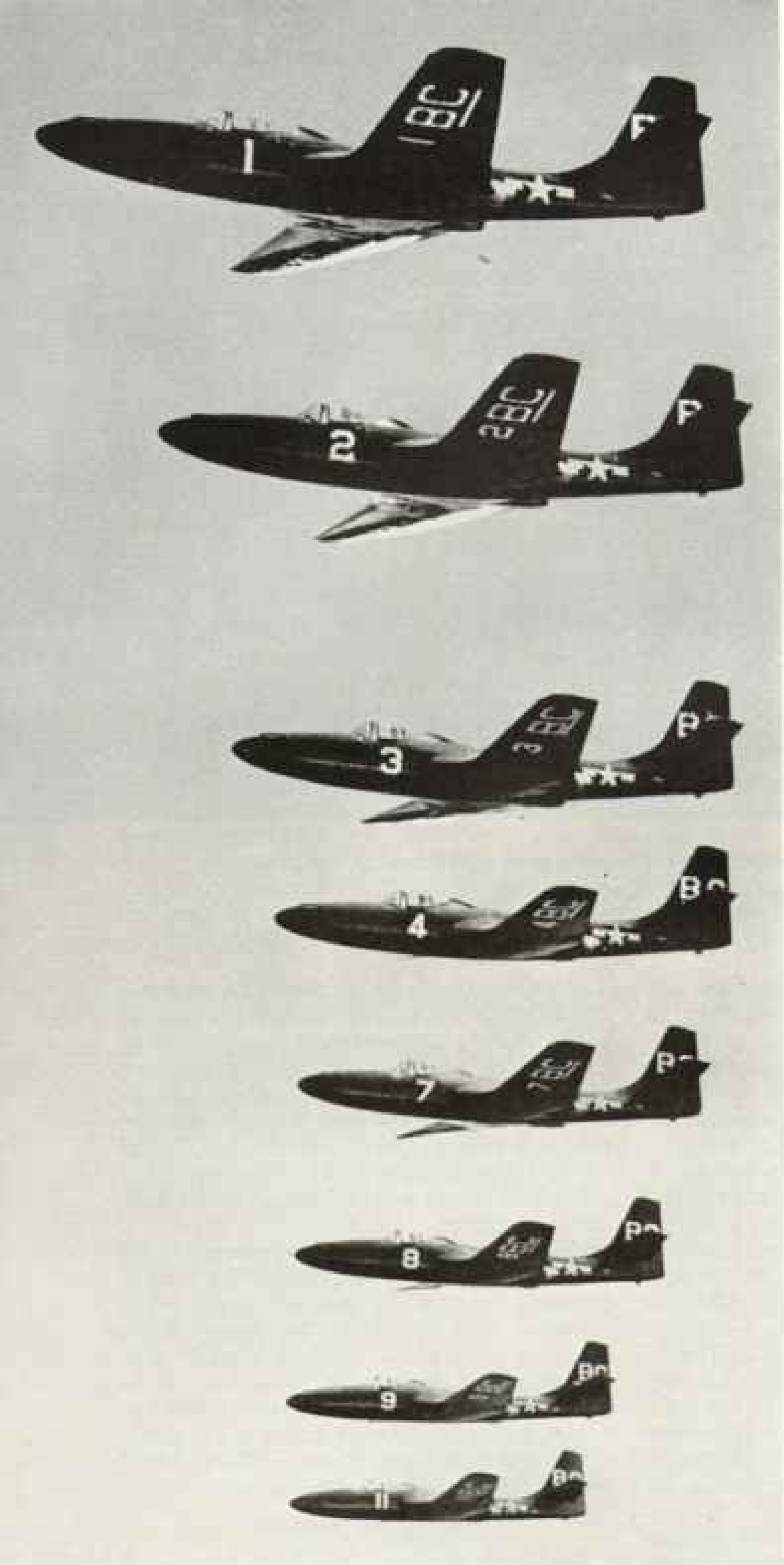
When they call San Diego a "Navy town," that, of course, takes in the Marines.

Hush-hush Training

Hush-hush training—in radar and espionage work—goes on secretly behind barbed wire at Camp Del Mar, in southern California.

There I visited Capt. Kenneth J. Houghton, USMC, who a year ago took a group of men

*See "San Diego Can't Believe It," by Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, January, 1942.



654 U. S. Marine Corps, Official

Marine Fly Boys Train in Sleek Jet Phantoms

In precise formation, two divisions of a Leatherneck fighter squadron roar over the Marine Corps Air Station at Cherry Point, North Carolina. Twin turbines drive McDonnell FH-1 Phantoms, the Navy's first carrier-based "blowtorches," at better than 500 miles an hour. Today they are used to train pilots in transition from piston to jet aircraft (page 665).

on the submarine *Perch* to share in the Army-Navy-Marine maneuvers, known as "Operation Miki," on Oahu Island in the Hawaiian group. The *Perch* was so crowded, what with its own crew and the load of Marines, that men had to eat in their bunks and got only one bath in 17 days. They were under water several days.

From the submarines, advance patrols of observers or spies stripped to shorts, put on rubber frog-feet, and swam ashore. There they spent 28 hours spying out the "aggressor's" strength, gun positions, roads, defense arrangements, etc.

Of those Marines who landed, a few got "captured." But the majority got back to the subs, with valuable information, captured documents, and one prisoner, a soldier of the aggressor force. He couldn't swim, so Marines towed him 2,000 yards out to sea in a rubber raft.

Keen Power of Observation Needed

That "enemy" soldier had plenty of excitement! In a life raft he was moved from one submarine to another, then to a destroyer, then by breeches buoy to the task force command ship, where Maj. Gen. Harry J. Collins got a look at him.

Men with amazing powers of observation and memory are specially chosen to sneak ashore, on this reconnaissance work, and study the "enemy" (pages 659, 663).

Captain Houghton let me test one such observer, Pfc. Verlin L. Oleson. We brought him into an office with which he was unfamiliar. I asked him to look about for 40 seconds, then shut his eyes and name as many items as he could which he had seen in the room in those 40 seconds. He named 38! In another test in a different room he named 50 in one minute.

In one phase of this Oahu espionage work the submarine, surfaced, towed ten rubber boats loaded with Marines. Only experts, capable of swimming for hours and in rough seas, can do these hard, hazardous coastal reconnoitering jobs.

Often the State Department has asked the Marines to help it restore order in certain small countries where Uncle Sam has had to clean up the customs service, install a sound currency system, and perhaps reorganize the local gendarmerie. But such duties seem to be diminishing.

Primarily, Marines are front-line troops. As a small force, the Corps has seen much independent service as guards on shipboard, at our consulates, legations, and embassies, and, as said, in protecting American citizens and their property overseas.

But most Marine major operations—since the Seminole War of 1835-42 in Florida and our war with Mexico—have been carried out jointly with the Army and, of course, with the Navy, its sister service of the Navy Department.

Usually in a Spearhead Role

Because the Army and Navy are so much larger, the Marine Corps has usually played a spearheading, supporting, or auxiliary role.

In almost every World War II landing in the Central Pacific, Marines hit the beach first, seizing airfields from which Army and Navy planes later flew long-range strategic missions. The Marianas and Iwo Jima campaigns are famous examples.

The Corps well knows how dangerous to Uncle Sam's aims in war it would be for the Marines to be ignorant of or to disregard the fighting powers of the other armed services. It never forgets that the Army, like the Navy, has its special powers and functions. Like them, too, it never fights to enhance the reputation of any particular commander, or just to gain prestige for itself.

Since their early days of comic-opera white or blue knee pants, scarlet sashes, and trick hats, Marines have been famed for intensive training. That's why in their first action at sea, in March, 1776, when British ships harassed our coastal trade, Marines could take Nassau, in the Bahamas, and capture much-needed cannon, mortars, and powder. This was the first successful naval operation of the Revolution.

It wasn't just by accident that, firing their muskets from the foretop of the

653 U. S. Marine Corps, Official

Feet First, Marines Leave a "Sinking Ship"

In the swimming pool at Parris Island Recruit Depot, these youngsters learn how to save themselves at the order "Abandon ship!" After climbing a debarkation net up an 18-foot wall, they jump with hands held to protect faces and bodies from floating debris. Wet dungaree trouser legs, knotted at the cuffs and inflated, form life preservers.

Potent Marine Weapons Pass in Review at Camp Lejeune

Twin-engine Grumman Tigercats from the Marine Corps Air Station at near-by Cherry Point, North Carolina, "peel up" over dust-stirring columns of Sherman tanks, each mounting a 75-mm. cannon.

Armed with bombs, rockets, and machine guns, the planes command as much authority as the thick-skinned ground dreadnoughts. Tigercats also serve as night fighters and photographic ships.

Shermans, tested in World War II battles, went into action alongside newer and heavier Pershings with the Marines in Korea in the summer of 1950.

Warfare in the Far East and threats of trouble elsewhere have stepped up the pace of training in tanks, planes, and other weapons at Camp Lejeune, permanent home of the Second Marine Division. The post, sprawling over almost 200 square miles, was named for the late Lt. Gen. John Archer Lejeune, former commandant of the Corps and former commanding general of the Second Army Division in World War I.

U. S. Marine Corps, 0810141

TNT Blasts a Pillbox; Marines Move In for the Kill

This platoon advances cautiously through high grass toward "enemy-held" woods in a training maneuver at Camp Lejeune. Such exercises train Leathernecks for duty in Korea and other trouble spots.

At combat strength a Marine rifle platoon numbers about 43 men, broken down into squads and fire teams armed with Garands and rapid-firing BAR's (Browning automatic rifles).

Greenish-gray twill dungarees uniform fighting Marines. Sun, rain, and dirt quickly turn this chameleonlike garb the color of the terrain. Camouflage cloth covers helmets.

Besides rifle and bayonet, the Marine infantryman's battle kit includes ammunition belt, entrenching tool, canteen, and first-aid packet.

National Geographic Photographer
John E. Fletcher

658 U. S. Coast Guard, Official

Bound for Japanese-held Tinian, a Buffalo Churns Through the Sea with Leathernecks Spoiling for a Fight

In this World War II invasion scene, Marines ride to battle in an amphibian tractor. Extensive knowledge of enemy defenses helped the Marines take Tinian with light casualties. Capture of the island, twin of Saipan in the Marianas, gave the Air Force a base for B-29 Superfortresses.

Airborne Marine Scouts, Faces Daubed, Spy on the Enemy

Put down offshore by a big Navy flying boat, these reconnaissance specialists head for the beach in a rubber boat to check on opposition faced by later landing parties.

On their faces they wear camouflage paint for concealment in undergrowth. Camouflage helmet covers are tied pirate fashion; cumbersome "tin hats" are left behind.

Success or failure of an amphibious assault may depend on information brought back by such parties. Men with unusual powers of observation and the ability to remember what they have seen are chosen for the work (page 654).

These Leathernecks from Camp Pendleton practice in San Diego Bay.

U. S. Marine Corps, Official

660 National Geographic Photographer Willard R. Culver

"The World's Deadliest Weapon . . . a Marine and His Rifle"

So said the late General of the Armies John J. Pershing. The AEF commander's remark was inspired by Marine exploits in such World War I battles as Belleau Wood, Soissons, Château Thierry, St. Mihiel, and Meuse-Argonne. For 175 years Leathernecks have seen action in more of the world's odd corners than any other American fighting force. These men train at Quantico (pages 647 and 663).

Bonhomme Richard, Marines beat down the British crew of the *Serapis* and boarded that prize on the day John Paul Jones said, "I have not yet begun to fight!"

In this kind of fighting originated a distinctive feature of Marine uniform—the cruciform braid knot on officers' caps. Tradition says Marines first sewed bits of line on their headgear so that comrades firing from the rigging could distinguish friend from foe.

Wars End, but Training Doesn't

For 175 years Marines have never ceased training. That training carried them from Guadalcanal and Tarawa to Iwo Jima and Okinawa in the last war—and now to Korea (pages 648, 649, 658, 669, 672).*

Now they're training harder than ever, but with new weapons and new tactics. I know. I've just flown to their principal bases—Quantico in Virginia, Cherry Point and Camp Lejeune in North Carolina, Parris Island in South Carolina, and San Diego, Camps Del Mar and Pendleton and El Toro, in southern California.

I spent a week with Maj. Gen. A. Houston Noble, at that time commander of Parris Island boot camp. He and his gracious wife, fondly known to the whole camp as "Miss Addie," are heart-warming examples of that respect and affection which the best type of enlisted Marines feel for their officers and families. You see here with what regard and protective understanding officers treat their men.

Marine Corps history is full of heroic cases in which officers lost their lives trying to save their men.

Marines are made, not born. You see how they're made, here on Parris Island (pages 650, 651, 655, 670) and at the other boot camp in San Diego. Traditionally, in peacetime or in wartime, they're all hand-picked volunteers. In the standard ten weeks of tough, trying, back-breaking training they suffer, die, and are resurrected. Only the fit survive!

"Sure, we first shingle their heads close as a mule's tail," said General Noble. "That's a mighty social leveler; that and the rough dungarees make 'em all look and feel alike. Then you can't tell a millionaire socialite from a Brooklyn paper-hanger's son."

And here the DI, or drill instructor, a hard-boiled old sergeant with a voice like a mad bull, drives them incessantly down the hard path to physical and disciplinary perfection.

* For additional articles on the Marine Corps, see "National Geographic Magazine Cumulative Index, 1899–1949."

"Give us two weeks on a fat boy," they say, "and we'll cut him down to fit his pants. . . . Skinny ones? We fatten them up!"

Close order and extended, they drill, drill, drill, old "hay-foot, straw-foot" style. They wash clothes, scrub floors, make beds, polish rifles—and always on the double. Run, run, run, even to the "head" and *back*.

By night they're so tired all they want is sleep.

Once a week, maybe, they can see a post movie. Even then they march to and from it in formation. No dances, no women. Games, sure, and lots of swimming, to train them for any future use as frogmen in reconnaissance squads.

They box, and practice with knives; they parry and thrust with bayonets, and learn how to crack a man's jaw or skull with a rifle butt when necessary to survive. At judo they learn to hit an enemy in the back of the neck with the edge of a hand and knock him cold.

"We pound it into them, over and over," said General Noble, "till they come to believe, themselves, that a Marine is the toughest, most fearless, and invincible fighting man on earth."

661 U. S. Marine Corps, Official

"Outa the Sack, Men—Feet Flying!"

In the gray dawn aboard the aircraft carrier *Midway*, these Marines hit the deck at a noncom's command. Every large Navy vessel carries a detachment of seagoing Leathernecks. They serve in gun crews, act as orderlies to high-ranking officers, and stand guard at sea or in port.

At the rifle range I watched recruits practice firing.

"Don't pull that trigger! Squeeze it like you would the teat of that milk goat back in the Ozarks," bawled the DI.

"And you there, firing prone. Keep your rump down! Don't stick it up like a camel's hump, or some sniper will shoot it off . . . Keep flat—dig your belly into the sand! Make snake tracks with your nose!"

Women Marines, there to look on, smothered a giggle. But to them, in that whole exhausting ten weeks, no "chicken"—as they call the recruits—dares even so much as speak.

Men behind the earth butts pointed with sticks to where each marksman's bullet hit the target; then they'd pull down the target, paste white paper over the bullet holes, and raise it up for the next shooter.

When one unhappy lad missed the whole target, they waved a red flag—the badge of shame! At sight of it the whole line yelled "Maggie's drawers!"—the accepted nickname for that humiliating signal.

All through their Marine careers every enlisted man and officer must put in hours of target practice at regular intervals, to keep qualified.

From Boot Camp to Stations

When these ten weeks of purgatory are over, boot camp graduates are assigned to divisions, to ships, or other duty wherever needed.

652 U. S. Marine Corps, Official

Natty in "Undress" Blues, Marines Stand at Parade Rest on *Midway's* Flight Deck

Inspection finds brass polished, shoes gleaming, rifles spotless, and cap covers, belts, and bayonet scabbards snowy white. A special school trains Leathernecks for shipboard duty.

Marines pray as well as fight. At El Toro, for example, they have in their chapel a three-sided altar—a side for Jews, one for Protestants, and one for Catholics. They're liberal, and tolerant always of the other fellow's faith. If a wounded buddy is dying, they bare their heads or kneel while a chaplain says a simple prayer. Or in New York, or New Orleans, they may all flock to the big cathedral, say on Christmas Eve, to attend a pontifical solemn High Mass.

Quantico Is a Tough School

Buzzing helicopters, like giant "snake doctor" insects, hover over the fields and forests of Quantico, 35 miles down the Potomac from Washington, D. C. This is the big Marine school, with especially tough, skull-busting advanced courses for majors and colonels.

Think of the clumsy sailboats used by early explorers hereabouts, with maybe one small muzzle-loading cannon good only for scaring Indians. Compare them with a modern Marine "Water Buffalo," or seagoing tank, with machine guns and a rapid-fire cannon that shoots several miles (page 658).

We flew in one twin-rotor "Sausage." From it we watched a sister helicopter from which dangled a cable with a big hook on the free end of it. Hovering low over a field howitzer, the copter picked up the cannon with that hook, lifted it up into the sky, carried it a mile, and set it down ready for firing, all in two minutes!

"We train gun crews to do that at maximum speed. That's so that any time, especially in a fog or on a dark night," explained an officer, "we could move guns quickly by air, drop them down behind enemy lines or in some other unexpected place, and suddenly commence shooting."

This whole Potomac bank at Quantico fairly crawls with amphibian vehicles, engaged in beachhead training problems (page 652). We rode out into the river, with a squad of Marines in spotted camouflage suits, in an amtrack LVT (Landing Vehicle, Tracked).*

Over a near-by Water Buffalo hovered a helicopter. It lowered a harnesslike affair on a cable and "rescued" a wounded man from the Buffalo (page 653).

This school, commanded by Maj. Gen. Franklin A. Hart, emphasizes amphibious war. Besides classroom work with movies, maps, textbooks, and lectures, it sends students into the field and out on the river or up in the air, to work out problems using men, weapons, and vehicles.

Often one outfit of officers and men will pretend to be the "enemy," who are trying to seize, or trying to defend, a beachhead. This enemy is opposed, of course, by Marines, simulating another "army."

Each year the Quantico course ends with an Amphibious Command Post Exercise, which includes the theoretical landing of an enemy force of corps size at Onslow Beach, North Carolina. Then students from this school act as landing force commanders and staffs, and Marines from the Second Division, Camp Lejeune, seek to "repel" the attack. In this training, officers and men of the Navy and some of their ships and transports take part. Sometimes other Marine amphibious exercises are held with West Point cadets and Annapolis midshipmen participating.

Training in communications is heavily stressed.

Take this situation: a landing party is shooting its way ashore, but strikes a pillbox, a fort, or other enemy obstacle that's slowing it down. It wants gunfire from the ships lying out at sea behind it; or it wants its Marine airplanes to come over and bomb those enemy positions that are impeding its advance.

How to get that word back to the ships or up to the planes, most quickly, and tell them just where to drop their shells and bombs?

To perfect radio and other communications training, Marine airmen take duty with the ground troops; sometimes a Marine infantry or artillery liaison officer may ride with the bomber planes to speed up effective cooperation.

Finally, advanced classes at Quantico tackle theoretical problems involving new enemies, new weapons, and new ways of fighting a war. They apply these to this or that part of the world map. Who will attack us, where, and how? Where would we go to fight back? Students get free rein; many novel approaches and fresh ideas come to light.

The Fleet Marine Force

The term "Fleet Marine Force" is well understood in the Navy, but it's new in law, so Marine officers are glad Congress used it in the 1947 act. Such a force, in brief, is a balanced force of Marine land, air, and service elements integrated with our Atlantic or Pacific Fleets. It is trained and equipped to seize or defend advanced naval bases, and to fight as far inland as the Navy wishes.

For years, before Pearl Harbor, Marines rehearsed on just how to make such landings.

Early as 1921, in war plans for use in the Pacific, Navy and Marine strategists began

* See "Landing Craft for Invasion," by Melville Bell Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, July, 1944.

654 U. S. Marine Corps, Official

The "Old Man" Gives His Opinion of Marine Performance in "Operation Portrex"

Standing before a battle map, Maj. Gen. Franklin A. Hart, then commanding the Second Marine Division, addresses his officers at a critique held after amphibious maneuvers at Vieques Island, Puerto Rico, in 1949. The exercises were the largest since World War II. Before a landing force assaulted Vieques, the island was softened up with live aerial bombs, rockets, and shells from the guns of Navy vessels.

figuring out how such an island-hopping war would have to be fought. And, remarkably, almost step by step, that is exactly how it was fought, using Marines to spearhead the beach landings and to seize advanced naval bases. The Marine landing force was helped out by Marine and naval planes from both carriers and adjacent land bases, and by bombardment from naval vessels shooting over the heads of the Marine landing parties.

An Intelligence Officer Vanishes

Attached to these 1921 war plans I saw a fascinating study of "Advanced Base Operations in Micronesia" prepared by Lt. Col. Earl Hancock Ellis, USMC. About 1923, while doing further intelligence work in connection with the Japanese-mandated Pacific islands, Ellis mysteriously disappeared on Koror Island, in the Palau group. Perhaps the Japs killed him.

War plans for tomorrow are of course "top-top-top secret." Frankly, however, say the planners, "We've stopped fighting the Japs, island to island fashion." Vaster and different problems of transport and logistics arise when, for example, we study Eurasia as a possible stage of future fighting.

"You hear a lot of cocktail party strategists talking about airborne armies," said one officer.

"Sure, airborne troops have their place. Russians and Germans first proved that. But in any great war of tomorrow, the bulk of men, supplies, heavy weapons, and ammunition will still have to cross the sea in ships. That means Marines will still have to make their beach landings."

In order to fight the single battle of Okinawa,* points out Gen. Alexander A. Vandegrift, USMC (retired), second wartime Com-

* See "Okinawa, Threshold to Japan," by Lt. David D. Duncan, USMC, National Geographic Magazine, October, 1945.

665 U. S. Marine Corps, Official

Marine Infantrymen, Acting as Eyes for a "Blind" Tank, Guide It by Telephone

One member of a Second Division rifle squad talks to the commander (in turret) over a phone unreeled from an armored box on the Sherman's rear. In actual combat the turret would be buttoned down and visibility sharply limited. This tank, on training maneuvers at Camp Lejeune, bears breather equipment enabling it to ford streams or land on beaches without drowning the engine.

mandant of the Corps, almost 1,000,000 measurement tons of ammunition and supplies had to be moved overseas from the Western Hemisphere, as well as 277,000 U. S. troops.

"Cargo-carrying aircraft will no more replace vehicles of the same type on the seas than they will those on land," says Fleet Admiral Chester W. Nimitz, who bossed the naval war in the Pacific.* "For example, the 100,000 long tons of cargo which 44 ships can transport from San Francisco to Australia monthly would require for the same purpose 100,000 four-engined C-87 airplanes manned by 120,000 highly trained personnel, plus 89 seagoing tankers to provide gas along the route and at the far end of the run."

Marine Fly Boys Are Ready

For any quick emergency or advance movement of relatively small Marine forces, the fly boys at Cherry Point in North Carolina and at El Toro are ready night or day to take the air in their big transport planes (pages 654, 656).

They've got their weapons at hand, their food, clothes, tents, medicines, and ammunition all conveniently packed, marked, and stacked close to the runways. They can load and start, literally, in a few minutes. Though mass movements must still be made by sea, don't discount the fly boys.

Training planes are thicker over Cherry Point than flies over a custard pie in a Chinese cafe. Most sensational sight here is the giant workshop, where expert mechanics can make a new plane out of the pieces of old ones. Brig. Gen. Ivan W. Miller, fondly known as "Ivan the Terrible," showed us through.

We saw jet engines being taken apart and put together. Men pulled damaged wings off

* See "Your Navy as Peace Insurance," by Fleet Admiral Chester W. Nimitz, NATIONAL GEOGRAPHIC MAGAZINE, June, 1946.

666 National Geographic Photographer Willard R. Culver

An Ingenious New Gadget Lays a Steel Carpet to Speed Marines Across a Beach

Yards of wire mesh are stowed in accordion folds on the stern of the DUKW, or amphibian truck. Waddling ashore from a landing craft, the vehicle paves the way for others following it. Mat-laying equipment, developed since World War II, here undergoes tests on the Potomac near Quantico.

planes as a farmer's wife might dismember a chicken.

Simulating high-altitude conditions, airplane engines roared and popped in great iceboxes kept at subzero temperatures. Through little glass peepholes we could look in at them.

Then what a warehouse! It made you think of Sears Roebuck, or the storerooms of some great airplane factory, such as Douglas or Consolidated Vultee. I tested a storekeeper to see if he knew where all his 200,000-odd items were stacked and labeled. He did. He had anything from a plane's door handle to a 1,200-horsepower engine.

Pilots Fly with Odd Pets

"It was lonesome on those long Pacific hops," said Maj. W. T. Warren, who flew us about Parris Island, Camp Lejeune, Cherry Point Air Station, and over the Carolina swamps and abandoned rice fields.

"For company we carried monkeys, parrots, bears, even snakes. My monkey wore a yellow sweater with our Marine emblem on it. He'd grab the wheel and pretend to fly!

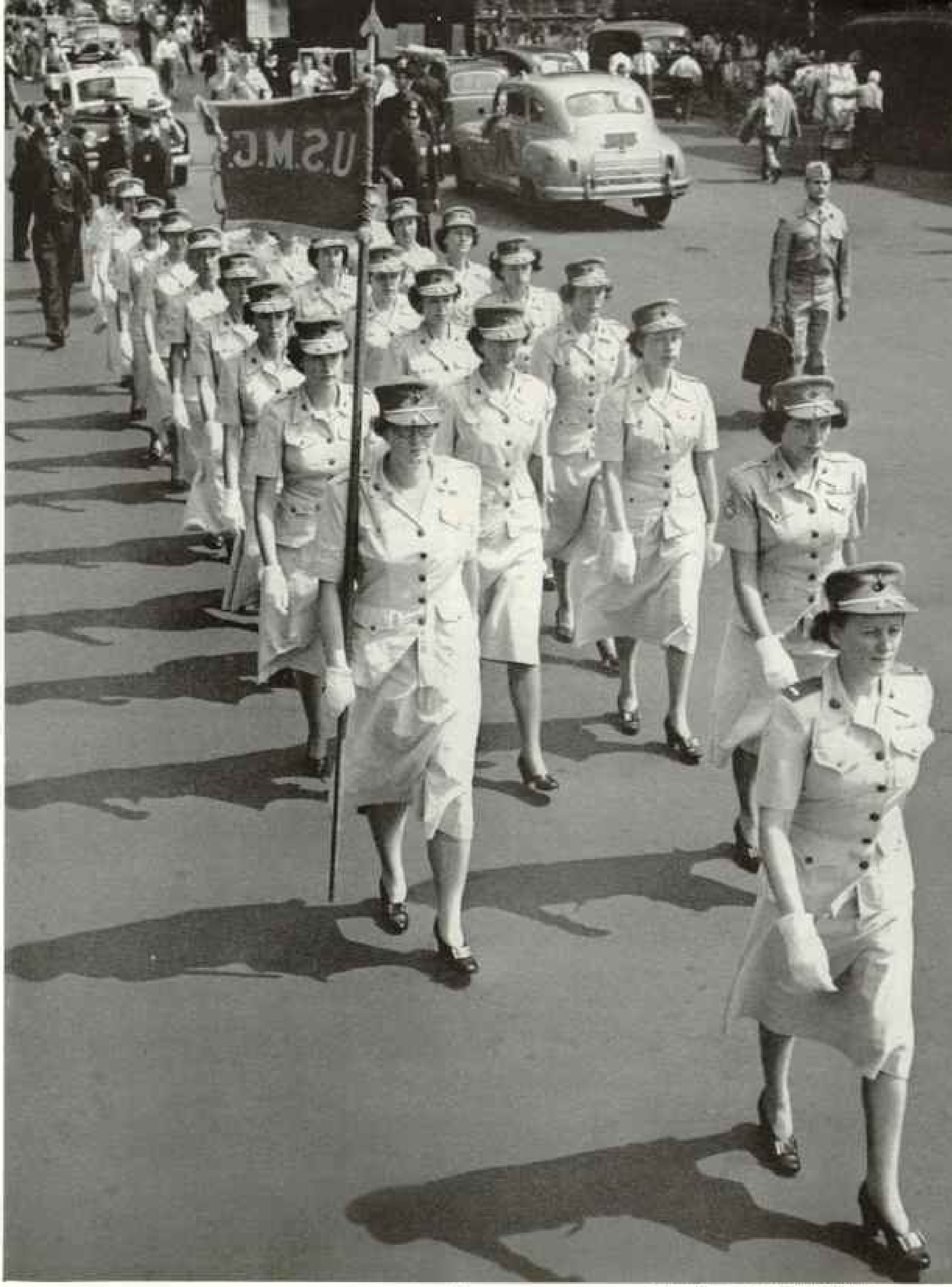
"I guess another monk got homesick. Anyway, one day, high over his jungle home, he looked down at the familiar green trees and jumped out an open window!

"Oddest yarn was about a pet bear; he rode with the captain and copilot in a big freight transport. One day, when the copilot had dysentery and was lying down, the captain just for fun put the bear in a pilot seat and fastened his safety belt. Then he set the plane on the automatic pilot and went back to comfort his sick buddy.

"Just then," continued Warren, "a youngster in a single-seat fighter pulled alongside, as they often did, to wave a friendly greeting to us. Then he saw that bear! It was scratching on the window with one paw, probably trying to get out. But the kid thought it was waving to him.

"He turned tail, whizzed back to the airport, landed, and ran to the doctor. 'Listen, doc,' he said. 'They got bears flying them big planes now—I'm through!' "

Of course, in the Marines' 175 years of Count of Monte Cristo exploits and adventures, a lot of Munchausen tales can grow. General Jerome told me how, as a young pilot in North China, he and Maj. Gen. W. J. Wallace used to shoot bustards from an open-cockpit biplane.



667 Morris Warman—N. Y. Herald Tribune

Lady Leathernecks Return to Duty; Their Motto: "Free a Man to Fight"

Bound for Camp Lejeune, this platoon of women Marine reserves marches down a New York street. Called up with them were 1,000 officers and enlisted men of the First Infantry Battalion. In World War II, 18,000 women Marines, performing a variety of home-front jobs, released men enough to form a new division (page 668).

There's even one (unconfirmed) story that while hunting wild geese around the Taku marshes Lt. Gen. James T. ("Nuts") Moore (retired) ran out of shells. With traditional Marine ingenuity and quick thinking, he flew low over the swamps in his open plane; this scared up the geese. Then he flew back, under them, reached up and grabbed a fat gander by the feet!

When I asked General Jerome if I might quote him on this story, he said, "Well, strange things can happen when Marines get ashore in China!"

But never mind China. Look at Camp Joseph H. Pendleton, that 126,000-acre base at historic Santa Margarita Ranch, on the coast of southern California. It's headquarters for the First Marine Division.

In peacetime it leases some of the land—5,627 acres this year, for rentals totaling $243,562. Tenants grow grain, peppers, tomatoes, and vast fields of flaming red poinsettias. On its hills it runs some 27,000 sheep, goats, horses, and cattle.

Pendleton is a self-contained municipal unit, with movies, playgrounds, stores, chapels, laundries, clubs, libraries—every facility a city of 25,000 needs—besides myriad barracks, offices, machine shops, and acres of canvas-covered weapons.

Colossal field maneuvers, with bulldozers and tanks in motion, plow terrifying scars over its grassy and brush-grown hills; heavy cannon fire echoes like thunder from distant mountains. And, every now and then, the whole division takes to planes, ships, and amphibian craft and roars away to San Nicolas or San Clemente Island, off the California coast, for that everlasting amphibious training which keeps Marines on their toes.

Rancho Now a General Headquarters

One night I sat with the commanding general, Maj. Gen. Graves B. Erskine (recently sent to the Far East), and his talented wife, in their historic ranch-house headquarters. This Spanish rancho—now a Marine camp—was once owned by Andrés Pico and his brother Pío Pico, last Mexican Governor of California. Their vaqueros and others, armed with lances, fought the American soldiers and Marines under Gen. Stephen W. Kearny at San Pasqual in our war with Mexico.

I've been in many a Marine headquarters, from Haiti to the Philippines, but I never saw a setup like Camp Pendleton.

An enthusiastic naturalist and hunter, General Erskine had built fish ponds, cover for quail, and "guzzlers" where birds can drink water and hide safely from such predators as hawks, foxes, and bobcats. In his jeep he sent me on a bone-breaking, above-the-clouds mountain ride with his aide, Lt. William F. Doehler, who carried a carbine in case deer tried to kick us, coyotes tried to chew off our tires, or bobcats should jump into the jeep.

Wild animal signs and tracks were everywhere. Once we saw crows and coyotes devouring a sheep. Doehler is a born Nimrod. So is the General. Why ask, then, why Doehler was the General's aide?

Reserves, Too, Are Trained and Ready

Maj. Gen. M. H. Silverthorn, former director of the Marine Corps Reserve (he became Assistant Commandant of the Corps last July), told me how ready to fight his men are too. In 1950 the Reserve launched the greatest training program in its postwar history.

Until interrupted by the Korean War, a high light of this 1950 program was the airlift. Last year transport squadrons of the regular Marine air arm lifted more than 8,000 ground reservists to and from training locations without a single accident. That operation was expanded to transport about 12,000 by air.

When World War II broke, there ceased to be any difference between reservists and regulars. Both fought heroically. By V-J Day, reserves made up more than 70 percent of all Leathernecks in action, including more than 18,000 women reserves.

Before Korea, 125 separately administered units of the Organized Reserve were training in 119 cities of the United States and Hawaii. Of these, 100 units made up the ground component, manned by more than 33,000 officers and men. They trained at least one night a week and two weeks each summer. About 32 more such units were to be set up this year.

Today, all the Organized Reserve battalions are on active duty.

Our Marine Air Reserve now consists of 30 fighter and 11 ground-control intercept squadrons, based at 25 naval air stations throughout the country. I lately watched a squadron of Corsairs training at Anacostia Naval Air Station, in the District of Columbia. These fly boys, civilians, use their vacations to practice with their planes.

"Our yearly training is held at nine regular Marine bases on both coasts," said General Silverthorn. "All these men are ready to fight at the drop of the hat."

In the late war some 18,000 women joined the Marines, mostly as clerks. Many worked as weather observers, control tower operators, parachute riggers, Link trainer instructors,

660 Marine Corps Photo

Marines Cover a Korean Road with Bazooka and Machine Gun

These Leathernecks, well dug in, wait for Communist armor or transport to present a target. One man slips a 3.5-inch rocket into the launcher's breech while a companion, only his hands visible, helps aim.

and radio operators. Some served as cooks and mechanics; literally, these latter worked from "soup to nuts." None fought.

Tireless, capable, efficient, these women released enough men to form a whole new division of fighting Marines. Their motto—: "Free a man to fight" (page 667).*

Director of Women Marines is Col. Katherine A. Towle; she holds degrees from the University of California, where she was formerly assistant dean of women. Like her subordinate officers, she is a regular Marine, enjoying all the privileges, allowances, pensions, etc., that male officers enjoy.

"But marriage is a problem," said one. "We can marry, sure; we can even carry a husband as a 'dependent,' if he can't support himself. But neither we officers, nor the enlisted women, may have children born while we're in service. The only children we're allowed to have, and hold our commissions, are children over 18. And you can't give birth to an 18-year-old baby!" she said laughingly.

You think of Brady's famous Civil War pictures when you run through the Marine Corps' astounding Pacific war photographs, made by its own combat cameramen fighting the Japs. It's a veritable pictorial history.†

Dogs Used to Carry Messages

Dogs added much to the pictorial history of Pacific operations. Doberman pinschers, gifted at detecting an enemy's presence, served as "alert" dogs with patrol and outpost units. German shepherds were used to carry messages.‡

Dropping their cameras, Marine photog-

* See "Women in Uniform," by La Verne Bradley, NATIONAL GEOGRAPHIC MAGAZINE, October, 1943.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "How We Fight with Photographs," by F. Barrows Colton, September, 1944; and "Aerial Color Photography Becomes a War Weapon," by General of the Air Force H. H. Arnold, June, 1940.

‡ See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Animals Were Allies, Too," 16 illustrations, January, 1946; and "Your Dog Joins Up," by Frederick Simpich, January, 1943.

620 National Geographic Photographer John E. Fletcher

"If It Wasn't Rugged, It Wouldn't Be the Marine Corps!"

Truth of the saying dawns early on recruits like these at Parris Island. Wearing gas masks and holding bayoneted rifles, they charge through a smoke screen against an imaginary foe. After ten rigorous weeks at boot camp, young Leathernecks are ready for assignment to ship or shore stations (page 660).

raphers many times helped their buddies beat back the foe. There was Cpl. Cyrus P. Collings, with a raider battalion spearheading our offensive in New Georgia islands. He took a picture of an incoming Jap, then set down his camera, grabbed his rifle, and shot the Jap.

Recruited mostly from the ranks of newspaper photographers, these men knew all about making pictures of ball players sliding into second base, chorus cuties showing their knees and waving divorce decrees, burning buildings, or politicians making speeches. Others had run commercial studios or made newsreel shorts.

In the Pacific they had to snap their models first, then kill 'em. They dug foxholes for darkrooms, used empty beer bottles to hold chemicals, and sausage cans as developing tanks.

Two photographers were killed when Capt. Louis Hayward, a movie star, led men of the Second Division's photo unit in the assault on Tarawa.* They worked from Higgins boats, foxholes, treetops, and from behind machine-gun crews—but they got 900 useful pictures and 5,000 feet of revealing movies.

In this fight T/Sgt. Norman Hatch rode in on the engine hatch of a landing craft. Some 400 yards offshore the boat rammed a coral reef, and everybody had to jump overboard and wade ashore. Five were killed. His 35-mm. camera clutched in one hand, held high above water, and his rifle in the other, it took Hatch 15 minutes to make the "longest walk of his life."

Jap bullets zipped about him; ashore, he helped with the shooting, then began grinding more pictures from behind a sea wall. Sand, water, and flying debris jammed his camera. Heat melted the emulsion on his film, so he buried the rest of it to keep it cool for future use.

Forward with the Flame Throwers

With Hatch was Sgt. Obie E. Newcomb, Jr. (now a warrant officer). Together they pushed ahead with the flame throwers. From behind a log they kept picturing the attack. Two slain Marines fell on them, temporarily putting their cameras out of order. Again they fired their rifles till they got hot.

* See, in the National Geographic Magazine: "Gilbert Islands in the Wake of Battle," by W. Robert Moore, February, 1945; "War Finds Its Way to Gilbert Islands," by Sir Arthur Grimble, January, 1943; and "American Pathfinders in the Pacific," by William H. Nicholas, May, 1946.

671 U. S. Marine Corps, Official

Marines Draw a Deadly Bead with a 3.5-inch Bazooka, America's New Tank Killer

First used in combat in Korea, this 15-pound "stovepipe" hurls an 8½-pound finned rocket capable of ripping 11 inches of armor. A reflecting sight allows marksmen to aim at fast targets. The launcher, recoilless because it is an open tube, can be fired from shoulder or bipod.

Besides all the use newspapers and magazines made of these pictures during wartime—all so interesting to people back home—others of strictly military subjects were of infinite value to Marine intelligence officers. Today, in training camps, study of photography is still a must.

Navy Keeps Transports Ready

Astonishment gripped the whole world when the Berlin Airlift was performed by British and American flyers.*

Less publicized were certain hazardous but successful air hauls of mountainous cargo by Marines, as in the Saipan and Iwo Jima campaigns.† Not known, or even suspected by most people, is the Marine Corps' intensive training today in the use of air transport, and in quick loading and rapid movement of large bodies of men, munitions, heavy guns, and other equipment by ocean vessels.

In a big post like Camp Pendleton, for example, certain groups of Marines are left behind to care for the place. But all the others, when they received orders to Korea, had tents, emergency supplies, ammunition, etc., all packed; their big guns, bulldozers, tanks, landing craft, and other vehicles were ready to start on short notice for the docks at San Diego.

The Navy, too, which owns the transport ships, has them ready, each earmarked for assignment to a certain seaport.

"Plans are only as effective as the means we have for putting them into action," said General Hart, who commanded at Camp Lejeune at the time of my visit. (He is now at Quantico—page 663.)

"Well, with the means you have, how long would it take you to get going?" I asked him.

"In two days I could have a lot of 'em on the ships," he said, "and in about five days we'd all be out at sea, on our way."

This is how the plans are carried out:

Each amphibious assault ship has an embarkation officer, as has each principal Marine Corps unit. Working together, they utilize the amphibious troop commanding officer's list of all vehicles, supplies, etc., that are to be loaded—named *in the order* in which they have to be landed. To be sure that first things may be landed first, everything is put on the

* See "Airlift to Berlin," 26 illustrations, National Geographic Magazine, May, 1949.

† See "South from Saipan," by W. Robert Moore, National Geographic Magazine, April, 1945.

672 U. S. Marine Corps, Official

Where Tough Training Pays Off: Marines Dash Across Tarawa's Deadly Beach

Storming the airport, these World War II Leathernecks carry shovels to dig foxholes or throw up hasty barricades. A hurricane of Japanese crossfire sweeps the palms. Tarawa's 76-hour battle cost the lives of almost 1,000 Marines. More than 4,000 of Japan's crack Imperial Marines were wiped out.

ship in reverse order. This is known as "combat loading."

This means each commanding officer will have his unit landed in the sequence which will most easily let him carry out his orders. Ships are loaded by the same troops who will unload them. Each vehicle, crate, box, gun, and tank is marked with a sign or number in accordance with which it is placed on the ship.

Every Man Knows His Job

To keep in form, Marines practice at seaports in the loading and unloading of ships. Even at boot camp school, in San Diego, they have a transparent plastic model of a Navy transport. Hence the greenest recruit learns early how a ship he may soon have to help load is laid out—with all its decks, holds, engine room, cold-storage plant, antiaircraft guns, etc.

In this training for getting to sea, every single man in the outfit knows just what his job is to be, and how to do it. In these plans for quick embarkation the Marine Corps also keeps close track of the ships it is to use; it has plans and drawings of all of them, and if the Navy makes any change in any amphibious assault ship, no matter how minor, Marines are kept informed.

This all means that orders for embarkation can be issued, and the force started on its way to the docks, even though the ships themselves may still be en route to that port or getting fueled and provisioned.

That's what the Marines' Commandant, Gen. Clifton B. Cates, means when he says the Corps is "ready, day or night"!

General Cates insists that the men of his Corps be ready.

In common with most of his officers, he feels very close to his men. Every one of them, from shavetail to general, knows that "Lucky" Cates understands his problems and backs him to the hilt.

For this Commandant from Tennessee has a record of command that is unique among even the Corps' most senior officers. He has led troops under fire at every echelon from platoon to division. His commands include a platoon, then a company, in some of World War I's hottest battles; a battalion on the fringes of the Sino-Japanese fights around Shanghai's International Settlement in the 1930's; the First Marine Regiment at Guadalcanal; and the Fourth Marine Division at Tinian and Iwo Jima.

Under such leaders the men of the Marine Corps go forth again, ready to fight their country's battles.

We Took the Highroad in Afghanistan

By Jean and Franc Shor

With Illustrations from Photographs by the Authors

REMOTE Wakhan! Some 700 years ago this Afghan district on the Russian border linked Orient and Occident. Great caravans of Marco Polo's time inched their way across its craggy peaks and crevasses. Today, by-passed by modern transport, it stands virtually "out of this world."

But should the Communist drive for world power push south, Wakhan, a thin strip of no man's land separating Russia from Pakistan, lies like a gigantic tank trap across the most direct route to the riches of the Indian subcontinent (map, page 676).

A year ago the idea struck us: why not explore the ancient highroad on the rooftop of the world? We set our plans in motion, but met discouragement from all sides. It was barely possible that our proposed journey across prohibited military zones of Turkey and Iran might be arranged, we were told, but Wakhan was strictly taboo.

A number of scientists and explorers in recent years had requested permission to traverse the Wakhan corridor, but the Afghanistan Government had refused everyone. Even if permission were granted, the trip would be too dangerous, we were told. The tribesmen of the Pamirs were fierce and inhospitable.

We decided to go ahead with our plans anyway. We were well received in Ankara and Tehran and crossed Turkey and Iran without difficulty.

Then we went on to the capital of Afghanistan, Kabul, an up-to-date, progressive city with a population of about 250,000 (page 675).* Here we expected our romantic journey to come to an abrupt end. We were advised to present our request to the director of the press, His Excellency Syed Kasim Khan Rishtya (page 701).

"What magazines do you write for?" Rishtya asked. When I mentioned that Jean and I had recently done an article for the National Geographic Magazine, Rishtya smiled broadly.

"I am a reader of The Geographic," he said, "and so is His Majesty the King. You couldn't have a better recommendation."

Indeed, we couldn't. Two days later Rishtya summoned us.

"His Majesty," he said, "has ordered an exception in your case. You will be the first foreigners in more than 100 years to make the full journey. The Minister of War will furnish a military escort, and I will send a journalist from my office as an interpreter."

We later discovered that one man had preceded us in the Wakhan traverse. H. W. Tilman, English mountain climber, in 1947 tried to cross the northeast tip, but the Kirghiz arrested him and took him down the corridor to Faizabad. Being under arrest, he had little freedom of observation. We were the first Westerners since the time of Marco Polo to explore fully the entire length of the corridor.

A Visit with the King

We tried to express our gratitude, but Rishtya waved our thanks aside. "His Majesty will also receive you for an interview at his palace at Paghman. There you may photograph him and his son, Prince Nadir Shah."

Mr. Rishtya drove us to the palace, where we had a friendly chat with His Majesty Mohammed Zahir Shah. The King is well above medium height, slender and handsome, with a lean face and piercing eyes (pages 674, 682). He pointed to the current copy of the National Geographic Magazine on his desk and said, in perfect French, "I look forward to its arrival every month. I know of no better way to learn about the other peoples of the world."

The next two days were a whirl of last-minute preparations. Finally we struck out in a rented station wagon for Faizabad, capital of Badakhshan, with Ghulam Hazrat Koshan, the young journalist from Rishtya's office (page 685).

After a two-day trip over poor roads, we reached Faizabad, where we met the governor of Badakhshan, Mohammed Sawar Khan. He explained we should have no difficulty traversing the Wakhan because the snows would not come for another month. He said he would provide us with riding horses and pack animals, as well as military escort.

It all seemed too good to be true—and, as it turned out, it wasn't true. But that night we went to bed in high spirits, believing for the first time that we were going to succeed where so many had failed.

We spent the following two days preparing

* See, in the National Geographic Magazine: "Back to Afghanistan," October, 1946, and "Afghanistan Makes Haste Slowly," December, 1933, both by Maynard Owen Williams.

Afghanistan's King Authorizes the Americans' Trip Through Forbidden Wakhan Corridor

His Majesty, Mohammed Zahir Shah, a subscriber to the NATIONAL GEOGRAPHIC MAGAZINE, keeps a copy on his desk in Kabul (page 682). His War Minister, Gen. Mohammed Omar Khan (standing), lent the Shors an altimeter from one of his precious military planes. The friendly intervention of these two enabled the authors to retrace Marco Polo's steps across an ancient mountain gate between Occident and Orient (page 673).

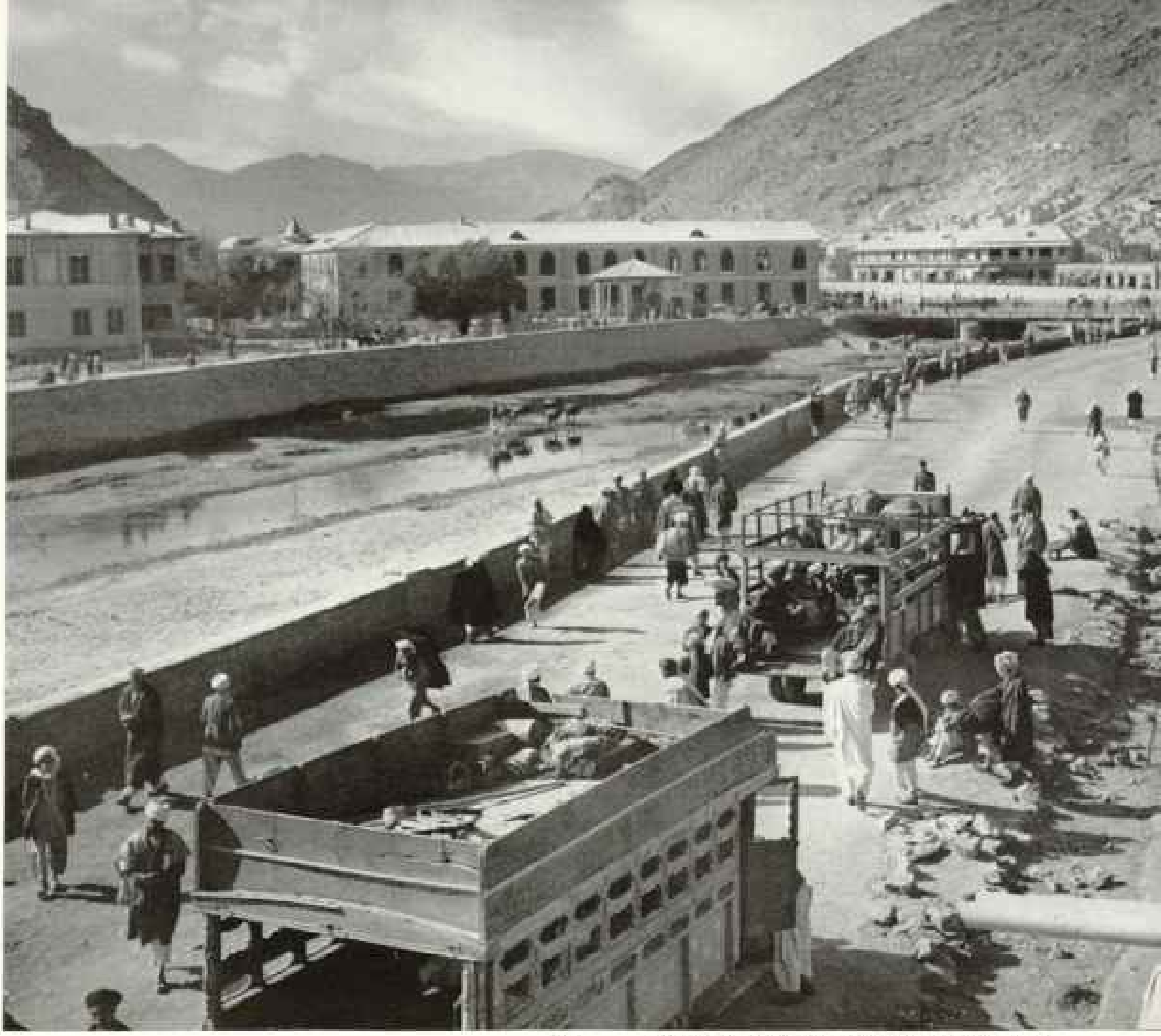
for the next lap of our journey. The governor insisted we should wear Badakhshan costumes, since much of our trip would be along the south bank of the Oxus River, in plain view of the Russians on the other side. So we shopped in bazaars for long-sleeved, ankle-length white woolen *chapons*, the standard outer garment in that region, and for hand-knit stockings, scarves, hats, and gloves.

To the governor's assistant, Mohammed Wajid, we suggested that it might be advisable for us to purchase our own horses in Faizabad and sell them at the end of our journey. He was indignant. After all, he informed us, we were the guests of the Government, and horses and pack yaks would be furnished by the Army. The only money we would need, he insisted, would be perhaps 100 *afghanis*, about $7.50, for tips. I kept 1,000 afghanis and mailed the rest of our currency to a friend in Kabul.

The next day we met Cadet Syed Rashid, who, with two young soldiers, was to provide our escort. Cadet Rashid was a slender-waisted young man with a haughty look, a tired handshake, and heavily padded shoulders. We all climbed into the now-crowded station wagon and started on our adventure.

For 20 miles the road climbed steadily through a narrow valley following the foaming Kokcha River. The road is new—only two cars had preceded us over it, the King's and the governor's—and frighteningly steep and narrow. Our progress wasn't helped by the fact that the telephone line is laid, in places, right down the middle of the highway.

A solid wall of rock, 45 miles from Faizabad, marked the end of our travel by motor.



675 National Geographic Photographer Maynard Owen Williams

Kabul Buses, Home from Peshawar and Khyber Pass, Unload Tall, Turbaned Passengers

Old Kabul has dusty streets, high prices, and few Western goods. The authors recall "one blessed shipment of Swiss cheese and chocolate which we all but bought out." A new city has been laid out in the suburbs, but construction lags for want of funds. Kabul River appears at low ebb; a herder drives his stock beside the trickle. Buses carry enormous luggage platforms; overflow passengers frequently ride on top.

Men were waiting with horses, and our luggage was quickly transferred to horseback.

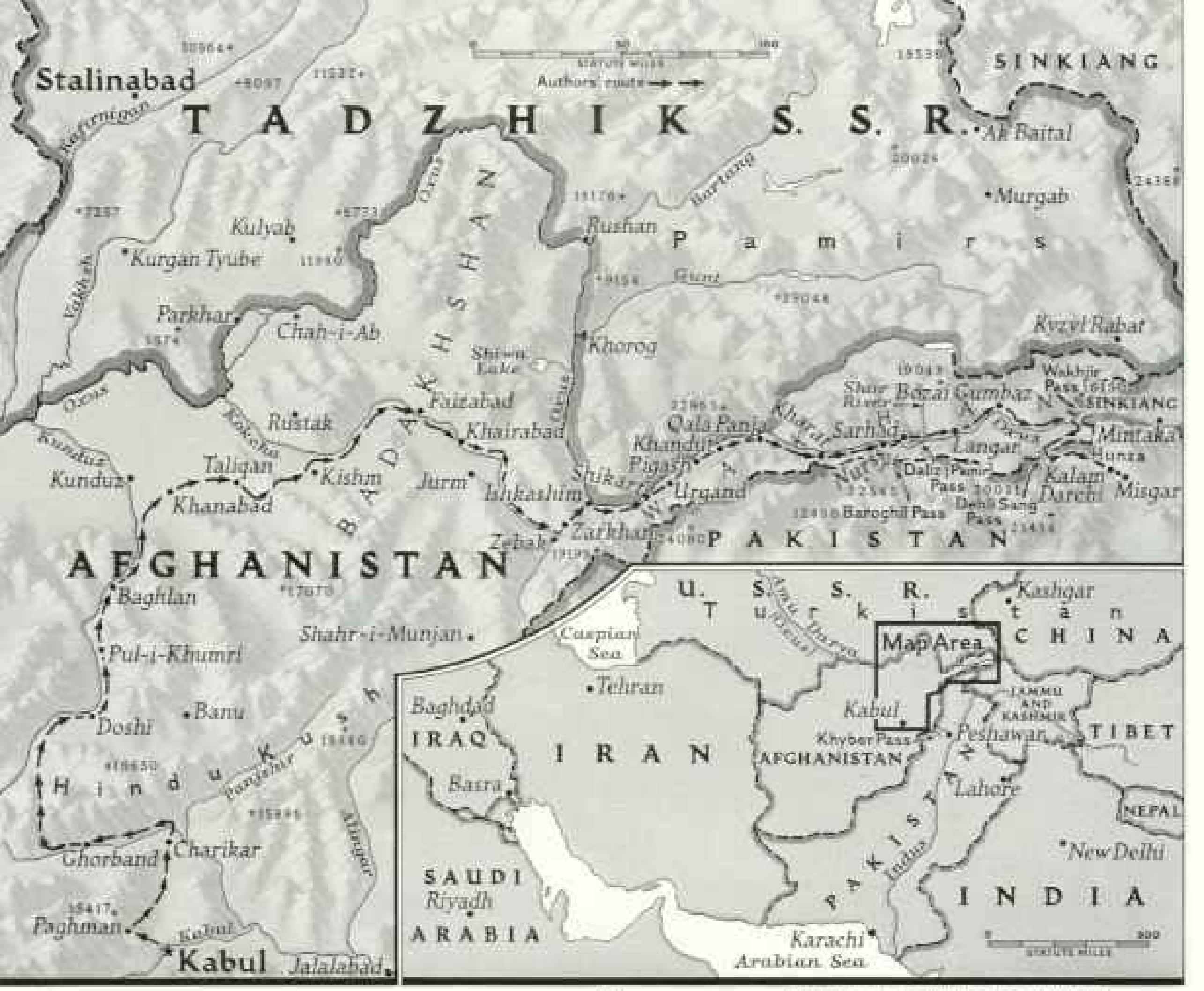
An hour after dark we reached a road engineers' camp and had an excellent dinner of mutton, chicken, and rice (page 699). In Kabul and Faizabad our hosts had provided utensils for us. But here the engineers ate Afghan style—picking up the meat in their fingers, dropping it into the rice bowl in the center, rolling it into a ball, and popping it into their mouths. We used our own spoons.

I awoke at dawn, thinking how wonderful it was to be in the real wilderness of the whole world, beyond the reach of mechanized civilization. A little brook rippled by our tent, the horses moved softly on the hillside above, and bright-plumed birds sang.

Suddenly I was brought bolt upright by the jangling, ear-splitting ring of a telephone. A second ring, not four feet from my head, permanently shattered my illusions of primeval peace. It was the field telephone strung along the new road. The governor was calling to see if we were all right.

We were in our Mongol-style saddles for 13 hours that day. Several times we had to lead our ponies across swaying bridges made of flat rocks laid across thin poles. The natives we met along the way were friendly, but tragically poor. Their homes are low huts of stone plastered with mud, their flocks small, and the grain in their tiny fields scant. Yet in every village we were invited to stop for tea and bread. The villagers all stared at Jean, the first Western woman to visit that nook of the world.

The afternoon ride was sheer torture. We had not been on horseback for months, and



576 Drawn by H. B. Eastwood and Irvin E. Alleman

Afghanistan's Wakhan Corridor, Touching China, Insulates Pakistan from Russia

Alexander the Great campaigned along the Oxus, where Afghan and Russian today keep suspicious watch. Marco Polo saw its 20,000-foot peaks when he trod the Wakhan going to Kublai Khan's court in Cathay. Latest Westerners to penetrate the corridor were Americans, Franc and Jean Shor. Map traces their route.

our aching muscles complained at every step. Two hours after dark we reached Zebak, cold and hungry, to find that no food was available. We brewed a pot of tea and slept in a half-ruined mosque.

The next morning Koshan announced that the rental of the horses which had carried us the previous day was 150 afghanis—about $11. I told him of Wajid's insistence that the Government would provide our transportation. Koshan knew of no such plan. I was most embarrassed, for, having listened to Wajid's advice, I now had less than 1,000 afghanis. Obviously, we would run short on a 12- to 15-day journey at 150 afghanis a day.

As we waited for fresh horses, Jean busied herself with a little mending, and I tried to multiply 150 by 15 and get an answer less than 1,000. We were interrupted by the arrival of three ragged teen-age girls with matted hair, who kissed Jean's hand and invited us to their home for tea.

We found two families of about 15 people living in a tiny smoke-filled hut, with no furniture. An ancient iron kettle steamed merrily over a fire in the center of the floor. We had tea, presented the elders with some sugar, and gave the children fruit drops wrapped in cellophane. They popped them into their mouths immediately, and, before Koshan could translate our warning that the wrapping should be removed, most of the youngsters had swallowed them.

Place Where the Salt Ends

Ultimately fresh horses were procured, and we started out for Ishkashim. The trail winds along a pleasant valley at an altitude of about 8,500 feet, with barren mountains rising to 15,000 feet on either side. Numerous springs provide ample irrigation, and the thin soil produces wheat, barley, and a few vegetables.

Zarkhan, where we stopped for lunch, is known as the "Place Where the Salt Ends." No salt is found in the area, and inaccessibility and poverty have discouraged imports; so

for centuries the people of the Wakhan have lived without salt. Their diet consists chiefly of goat milk, dried peas, and a flat, crisp bread baked from pounded whole wheat.

Few villages in the world are more beautifully situated than Ishkashim. It sits atop a cliff overlooking the silvery ribbon of the Oxus, surrounded by green fields and by the great snow-capped peaks of Russia, half a mile north, and Pakistan, a few miles to the south.

The telephone line from Faizabad ends at Ishkashim, and I asked Koshan to have the governor approve a $100 check by telephone. The governor gladly authorized the village treasurer to give me the legal rate of exchange, and we went to bed convinced the problem was solved.

The next morning, however, the village treasurer refused to accept the check, even with the approval of the governor. Koshan had a brilliant idea.

"Let me have the picture of you and the Shah of Persia," he said.

An Elderly Musician Plays a Sad Solo on His Bulky Fiddle

Kabul, honoring the authors, arranged a concert of Afghan music. Its haunting tunes suggested wild Gypsy airs. Some of the instruments had sound boxes fashioned from huge gourds. This *qaraugi* had some 20 strings. Gholam Hassan, though 75 years old, was the virtuoso of all the performers. After one practice session he joined Jean Shor in playing "The Eyes of Texas."

In Tehran Jean had photographed me chatting with Mohammed Reza Shah Pahlevi. We handed over the photograph, and in five minutes had the money.

Said Koshan: "The treasurer rules that if you are a friend of the Shah of Persia you must be good for $100."

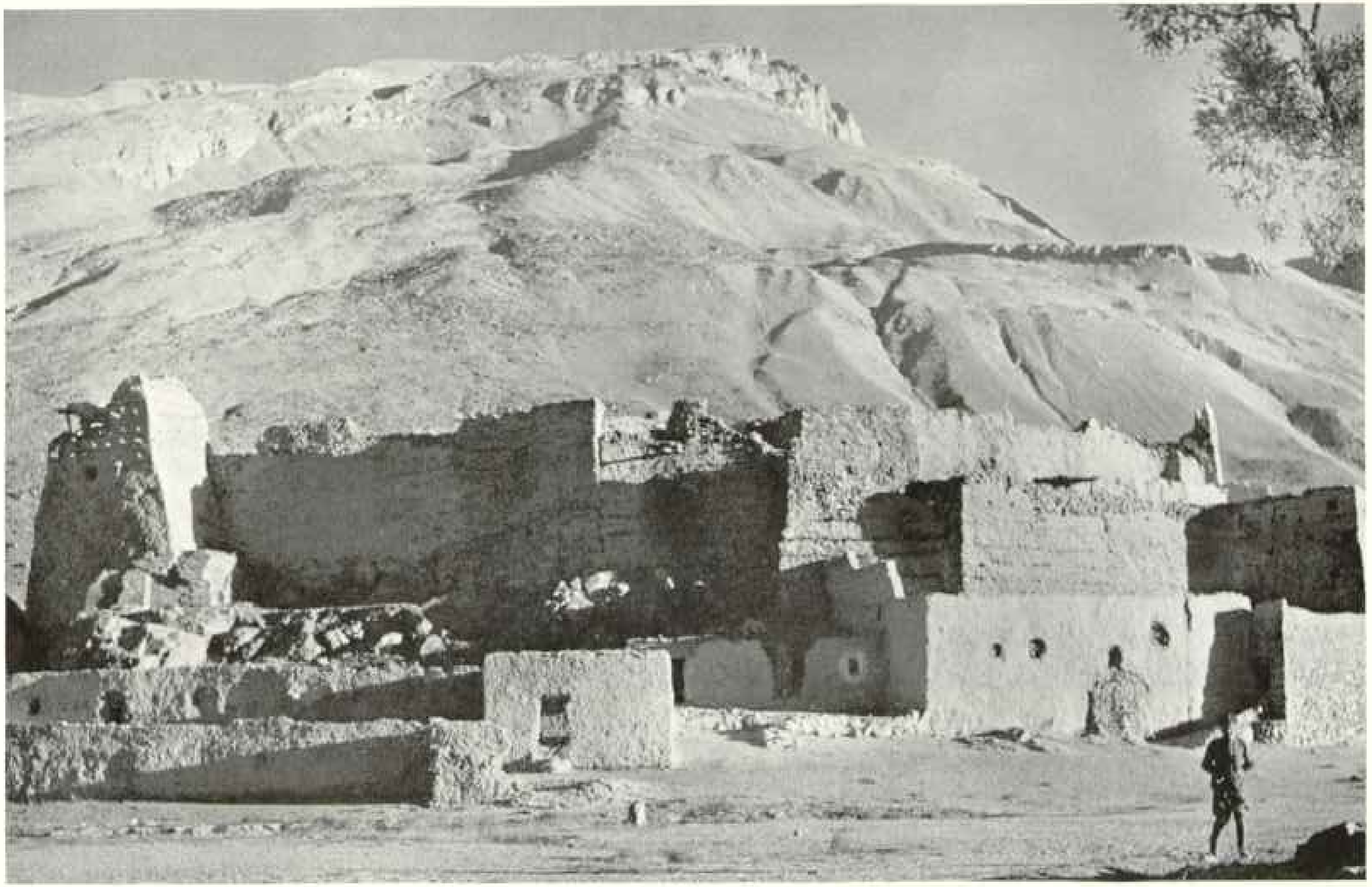
U. S. S. R. 200 Yards Away

From Ishkashim our path lay directly along the Russian border, so we changed into our Afghan costumes. The valley of the Oxus is less than a mile wide. The river narrows to a mere 200 yards, and the people of Russia's Tadzhik Soviet Socialist Republic are plainly visible on the north bank. An auto road skirts the Russian bank, and frequent trucks pass in plain sight of the Afghan side, where not even a wheeled cart exists.

Ordinarily, in such a remote area boundaries have little meaning, but here there is apparently no intercourse between the two banks.

Our hosts were obviously concerned for our safety. Our escort was increased to four soldiers, and when we stopped at Shikarf armed guards walked post all night around our little hut. Jean asked Koshan why such precautions were necessary.

"There is a Russian military post only 200



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In Ancient Times This Crumbling Fort Commanded All Movement Along the Oxus and Through the Wakhan

Within Qala Panja's thick walls the authors found cisterns and stables (page 680). Antique as it seemed, the fort was the most modern of three built on the site. One heap of ruins appeared to date from pre-Christian times. Hills lie on Russia's side of the Oxus (not shown).

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Toiling Yaks and Horses Stumble Up a 15-degree Grade in Pamir Pass. The Oxus Twists Through Its Gorge Far Below

yards from here," he whispered. "We are afraid the Russians might cross the river at night and *catnip* you."

The Russians didn't "catnip" us, but the bedbugs did. They ignored our DDT powder and swarmed in by the thousand.

The next day we lunched at Urgand, a little village at about 9,000 feet altitude. Finding a heavy crop of wheat that high up amazed us. This grain takes only 40 days from planting to harvest. It produces a heavy yield, and is apparently quite impervious to cold. We brought samples of the seed back to Washington, where the Department of Agriculture is experimenting to determine whether it can be grown here (page 687).

The Blessing of the Prophet

By noon the next day we reached Khandut, the administrative headquarters of the Wakhan district. There we met the judge of the Wakhan, a 70-year-old gentleman with a magnificent white beard.

He greeted us warmly. The Koran, he explained, urged all Moslems to travel widely, to know more of the other peoples of the earth, and ours was thus a mission which undoubtedly had the blessing of the Prophet.

We reached Qala Panja, the Fort of the Oxus, at dusk (page 678). The garrison consisted of about 50 soldiers quartered near by, captained by an officer who wore a United States Army blouse and Afghan trousers tucked in Russian boots.

The garrison commander had disturbing news of an incident at the Afghan-Chinese border. The Afghan Kirghiz, he reported, had been fighting with tribes on the Chinese Turkistan side of the border during the past few days, and the border might be closed. Koshan and Cadet Rashid made tentative suggestions about turning back, but we announced we would go as far as possible.

In four days of travel from Zebak to Qala Panja we had climbed only about 500 feet, from 8,500 to 9,000, but after leaving the fort we turned sharply upward. For hours we toiled up a rocky cliff, our horses picking their way carefully along a narrow ledge.

We rode hard all afternoon, crossing one ridge of mountains and dropping down once more to the rocky river valley. As dusk fell, Rashid began to look worried. There was no trail, only a broad valley full of great boulders, crisscrossed by foaming mountain streams. We plodded on for two hours after dark, our horses stumbling and slipping on the stones. Rashid would not admit he was lost. But he was, so we called a halt for the night.

Our bedrolls were with our baggage animals and the soldiers, who had gone on ahead of us, so we prepared to sleep in our chapons. Rashid informed us that the country was full of wolves, so we took turns standing guard.

At 3 I awoke, to find Rashid sound asleep and the horses stirring restlessly. Jean awoke and insisted on guarding for a couple of hours too, so I dozed off.

Half an hour later I was awakened by a blinding flash and the howling of an animal obviously scared to death. I ran to Jean's side and found her holding our flash gun. A wolf had attempted to attack our horses, and Jean, having no more lethal weapon, had fired a flash in his direction. It did the trick.

One of our soldiers found us shortly after dawn. The whole group had spent the night searching for us. They had been worried because of the wolves. I smiled at Jean and explained that American girls were trained to take care of themselves around wolves.

Private Bath in Public

An hour's ride brought us to Kharat, where we slept for a few hours. When we awoke, the villagers brought us tea and saltless bread, and Jean went off with the women of the village for a bath in privacy.

"Privacy, indeed!" Jean said later. The women brought her a pot of warm water, but the room unfortunately had no door. So off they went, looking into every hut, until they found one that did have a door. The girls evicted a protesting gentleman, brought in the water, and departed. Jean undressed and started to bathe. A moment later, one of the older women returned, squatted on the floor, and stared at Jean. Before long, half the female population of the village was watching.

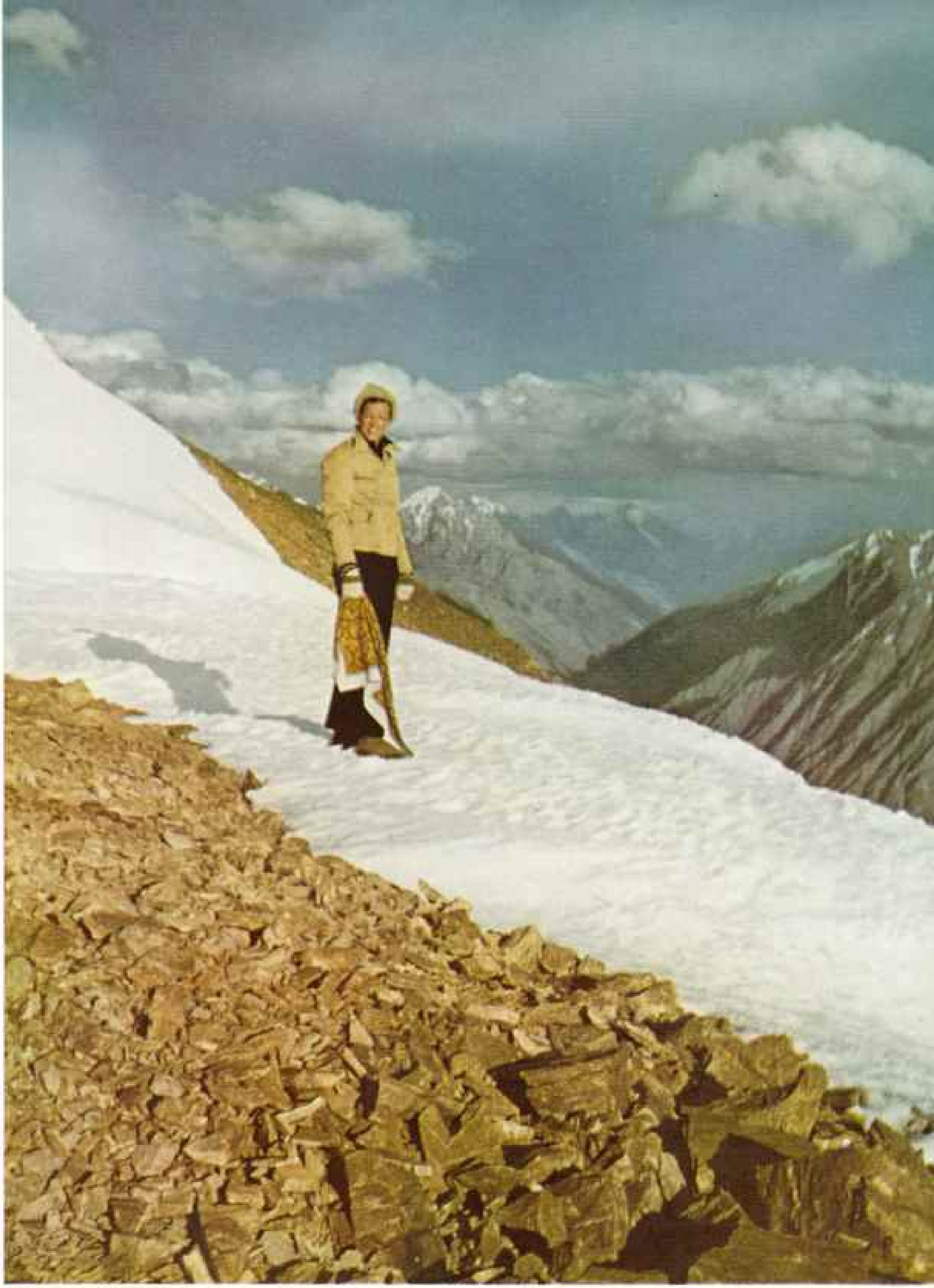
They insisted on helping Jean dress. They had never seen laced boots before and kept wrapping the laces around Jean's legs, Afghan fashion. The zipper on her jacket fascinated them, and they took turns zipping it.

"My soap delighted them. One asked for a piece of it, and I smiled a 'Yes.' She cut off a chunk, and so did all the others. I ended up soapless; even had to borrow a piece back to wash my dirty clothes. I finally finished dressing and returned to find Franc writing in our log that I'd gone off to 'bathe in privacy.' Men!"

I asked Koshan to find out if we were the first Americans these people had seen.

"They have never even heard of America," he said. "They never see foreigners."

We left the friendly village at noon and worked our way over rugged trails until dusk. Jagged mountains shaded the trail, those in Pakistan towering over 20,000 feet. Here we



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Kodachrome by Peter Shor

Jean Shor, Crossing the 20,000-foot Dehli Sang, Stands in the Pamirs, Roof of Asia

This American girl and her husband were among the very few Westerners ever to traverse the Wakhan corridor, the ancient East-West trail followed by Marco Polo. Here Afghanistan looks into Pakistan.

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Kodachromes by Jean Shor

↑ Afghan Prince Gets a Camera Lesson from Franc Shor

The King of Afghanistan (below) likes to see other peoples pictured in the NATIONAL GEOGRAPHIC MAGAZINE. He considered it only fair that they see the Afghan royal family. So, for the camera's sake, he dressed Prince Nadir Shah in native raiment. They received the authors in Paghman Palace, near Kabul.

↓ Mohammed Zahir Shah, Tailored King, Wears Karakul Cap and Parisian Tie

Afghanistan's urbane monarch, breaking with tradition, issued the order allowing the Americans to cross forbidden territory. His golden lambskin cap must have cost $250 or more, reports Mr. Shor, who paid $10 for his own black outfit (above). Both wore ties bearing the same French label, Mr. Shor noted.

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Badakhshan Drum Dancers Celebrate Afghanistan's Independence Day

In Fairabad, capital of Badakhshan, the provincial governor gave a concert in honor of the Shors. Here the master of ceremonies wears his own creation, a checkered pajamalike outfit with a chef's-style cap. Mr. Shor (right) inspects competitors about to start a dance marathon (below).

Dizzy Drummers, Dancing to Reed Pipes, Spin and Drum until They Drop

Four men, beating drums with sticks, revolved at constantly increasing speeds, meanwhile shifting their awkward burdens from neck to waist to knees. One by one they succumbed to vertigo and collapsed. Finally only the one on the right remained. After 15 minutes he too fell. Musicians played a monotonous melody.

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Kodachrome by Franz Shor

Kirghiz Maids Milk Shaggy Yaks. Snow-clad Peaks Overhang the Herd's 15,000-foot Pastures on the Pamir Plateau

The bisonlike yak, as mount, milker, and wool- and hide-bearer, serves Central Asia's highlanders as the reindeer serves Scandinavia's Lapps. Its hair makes tough ropes; its tail becomes Hindustan's fly switch; its milk is scant but creamy. Here at Rahman Qul's camp near Bozai Gumbaz, calves are tied to a picket line. Unmilked cows grunt rather than moo their impatience. Grazing bull (left), sheep (center), and horseman (right) dot the vast plain.

← Mr. Koshan Reclines on the Stones of a Ruined Fort

This young Kabul journalist was attached to the Shor party as interpreter. Strictly a city man, he had little relish for the outdoor life.

The crumbling fort, standing at Pigash, yielded no clue to its antiquity save the fact that it was locally known as "Kaffar-Ha," or pre-Moslem.

Kodachrome by *Jean Shor*

Welcome, Stranger! →

This elderly trader, traveling alone from Kashgar to Faizabad, used the Wakhan corridor, even as Marco Polo did nearly seven centuries ago. Having sold four of his Badakhshan ponies, he was returning home with two others laden with the silks and cottons of Chinese Turkistan.

"We met him on the Pamir Plateau," Mr. Shor writes. "We dismounted. Everyone shook hands and wished the blessings of God and Allah on our respective journeys."

Were he to shave his beard and don creased trousers, the kindly trader would excite scarcely a glance on any American street. Like most Afghans, he is an Aryan, and he speaks Persian, an Indo-European language. He thinks nothing of riding 50 to 60 miles a day.

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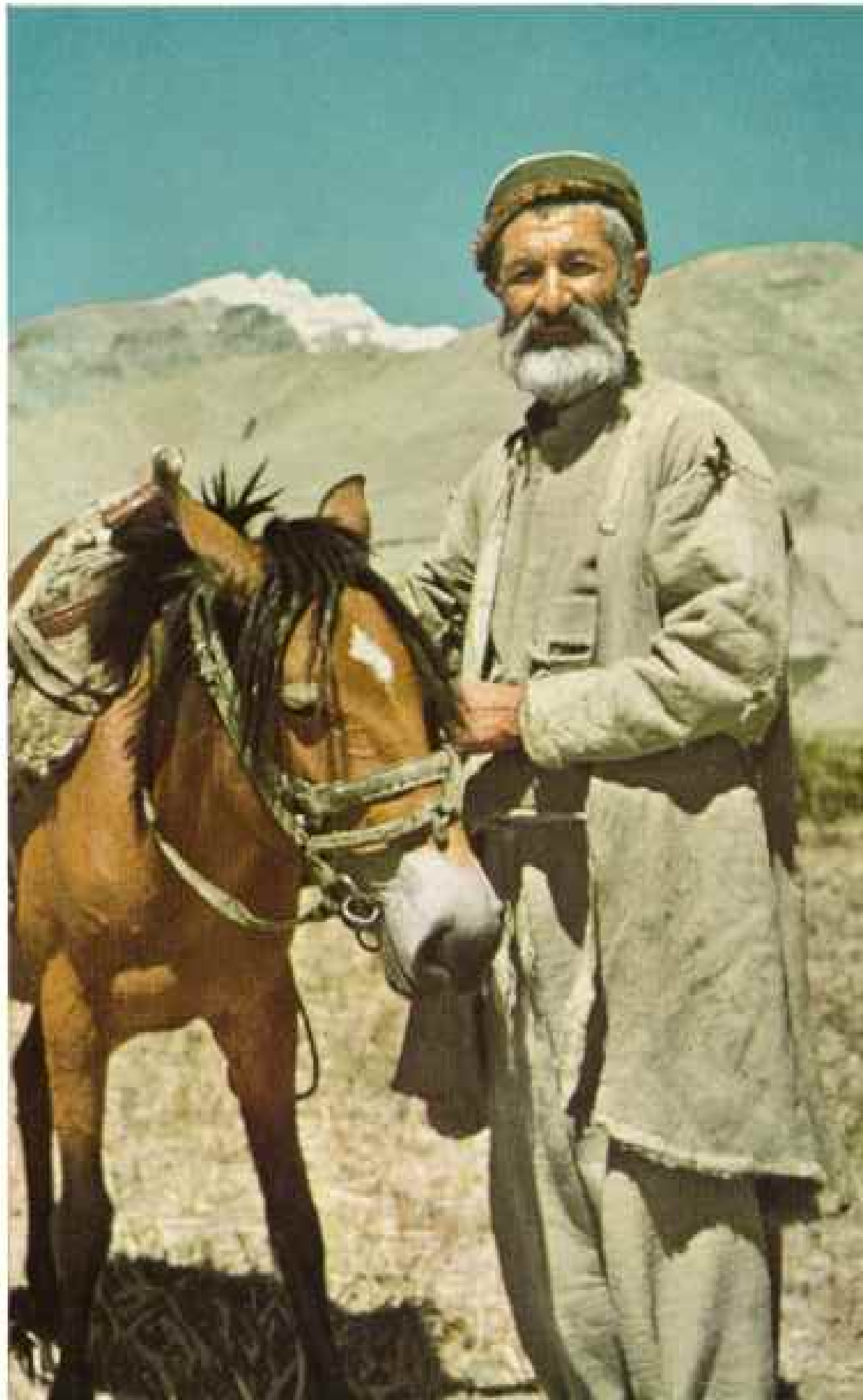
Kodachrome by Frans Shor



A 5-foot Wakhanese Shoulders a 200-pound Burden Which the 6-foot Photographer Couldn't Budge

Twenty centuries have not changed farming methods in the Wakhan corridor. This field at Urgand was plowed with a wooden stick. Its cold-resistant wheat, grown at 9,000 feet, matured in 40 days. Mr. Shor brought back seed to be tested in the United States.

Opposite page: Mrs. Shor examines a hot spring bubbling out of Nurse valley (page 694). She bathed in the 100° stream, but did not dare drink its mineral waters. White Afghan robe and skin boots were adopted to escape recognition by suspicious Russian lookouts across the Oxus River frontier.

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Kodachromes by Franc Shor

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Log Bridge, Paved with Twigs and Stones, Sways Like a Tightrope, Creaks Like an Oxcart

Here Mr. Shor, scrambling down for a drink, slipped into the icy water. While drying out, he map-identified the scene of his misfortune. His reward for traveling 11,000 miles into the Pamirs was a dip in the Shor River!

© National Geographic Society

Kodachrome by Frank Shor

No Bottles, No Formulas—Kirghiz Mothers Lead the Simple Life

At seven years the girls, costumed like their mother, help milk the yaks and keep house. Brother, bundled to his ears, will be a daring horseman by the time he's eleven. All are healthy and playful.

Shor and Friends Compare Nomad Boots with Paratrooper Leather

These fur-hatted Kirghiz admired the way the author packed a yak with diamond hitch, but disliked his boots (too cold, they said). Quolan Larh (right), who never heard of the U. S., learned to sing *Oh! Susanna*.

Kodachrome by Jean Shor

Cool in Summer, Warm in Winter, the Yurt Makes a Snug Home

The Kirghiz, a Turkic-speaking tribe akin to the Kazaks, roam Russian Turkistan, northern Afghanistan, and Chinese Sinkiang. Tireless horsemen, they brave raging fords and icy passes. Scorning to grub the soil, they live off the produce of their herds.

Their herds' seasonal needs mold most Kirghiz into a migratory routine, but these people settle down at Bozai Gumbaz (pages 684 and 693) to enjoy the Pamir Plateau's year-round pastures. Their domed tent is fashioned of felts lashed to a circular willow trellis. The flapping reed door admits light and breeze; a vent in the roof exhausts smoke from yak-dung fires.

In one of these tents, carpeted richly and lined with bright tin trunks, the Americans were welcomed to the encampment. They drank hot yak-butter tea, ate roast sheep, and slept in a smaller yurt.

Weather-beaten father, mother, and two children, attended by a servant, occupy this yurt. Necklaces, the family treasures, contain Iranian, Indian, and Russian coins.

"We gave them a handful of French, British, and United States coins," the authors report. "Some future traveler is going to have a time figuring where they came from."

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Kodachrome by Jean Shor

Women, Weaving Straps for the Yurt and Milking the Herds, Do the Tribe's Hard Work While the Men Play

Kirghiz wives, all covered with their tribe's white bonnets, keep the fires, mind the babies, and pitch the tents. Though they are orthodox Moslems, they do not go into veiled seclusion. The little milkmaid (right) covers her face only against sun and rain. Her pails came from Russia.

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Kodachrome by Franz Shor
Kodachrome by Jean Shor

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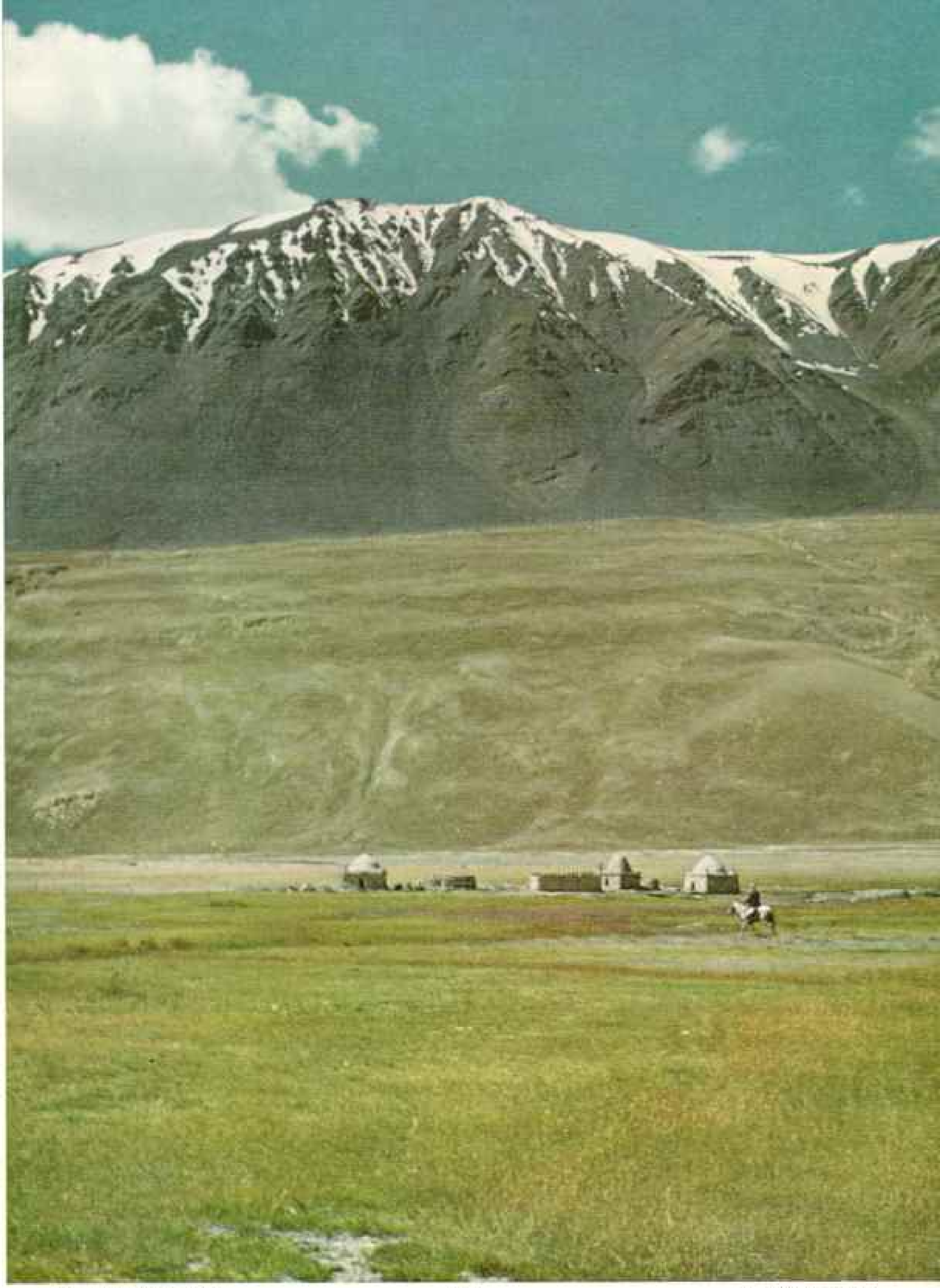
Kodachromes by Jean Shor

↑ Altitude-loving Yaks Carry Afghans Across 14,000-foot Pamir Pass

Easy-gaited and sure-footed, the yak is too broad-backed to be comfortable. Grazing wherever it can, it weaves in and out of the trail, defying the pressure of a rope through the nostrils. These hardy soldiers formed the Shors' military escort.

↓ Up and Up the Panting Ponies Labor; Riders Dismount to Spare Them

Where the Sarhad-Langar trail narrowed to two feet, Jean Shor's mount started bucking. Another horse dropped dead. Men grew so weary on the dawn-to-midnight journey that they wanted to lie down on the rocks. Loose stones plunged thousands of feet.



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Kodachrome by Jean Shor

Tombs of Forgotten Warriors Break the Plateau's Grassy Monotony at Bozai Gumbaz

Kirghiz herders camp a mile away (page 684). Though they can no longer name the dead, they keep up the graves. Ibex and long-horned *Ovis poli* roam the 20,000-foot peaks; men find no reason to tread the snowy heights.

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Kodachrome by Frans Lanting

In a Silent, Empty No Man's Land the Expedition Rides Past Towering, Nameless Peaks

In the loneliness around Nuros, civilization's comforts seemed but a dream (page 686). So deceptive was the clear air that peaks 40 miles away appeared within an hour's ride. The jutting mountain ahead lies in Pakistan. Though it soars more than 22,000 feet, maps give it no name.

Amu Darya, the Ancients' Oxus River, Gathers the Pamirs' Snow Waters and Carries Them 1,560 Miles to Russia's Aral Sea

Alexander the Great crossed the lower Oxus some 23 centuries ago, and people here still remember him by his Persian name, Iskander. Franc Shor here prepares to ford an upper branch. In it he found fighting 4-pound trout. For 680 miles the Oxus forms the Afghan-Russian border.

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Shor and His Kirghiz Guides Near Dehli Sang's Icy Summit

For four hours they fought their way across the snow field's "frozen mile of torture . . . The last few hundred yards . . . we crawled on hands and knees, dazed by exhaustion . . . On we went, five yards at a time, (until) we stood on the top of the world" (page 681).

Shor Repacks a Yak for a Rough 4-hour Crossing of the Oxus

Yaks regularly carried 160-pound burdens. On steeper climbs their drivers ofttimes jumped aboard. The two skullcapped gentlemen from Nurss owned the beasts. Having leased them for the day's journey to Sarhad, they went along to take them back.

met our first yaks, great ponderous animals with shaggy coats, sure-footed as goats on narrow mountain paths. We spent the night at Nurss, a tiny village at 10,500 feet, sleeping near a hot bubbling mineral spring (p. 686).

Pack yaks replaced our baggage horses the next morning. For four hours we forded the Oxus, crossing eight separate streams in the mile-wide river bed. The water was swift and ice-cold, and the animals staggered and struggled to keep their feet in the raging current. The water frequently came far above our stirrups, and we balanced our feet on our horses' necks.

An hour beyond the ford we came to Sarhad, the last military post in the Wakhan. The commissar greeted us warmly and led us to a pleasant grove on a mountainside.

Eating Fresh Peas Shocks Natives

While Jean napped, I took a stroll through the village. To my amazement, I found a garden full of green peas. It had been days since we had seen green vegetables. I bought peas, yak butter, milk, and a chicken, borrowed a pan, and returned to our grove. I built a fire and went to work.

When Jean awoke an hour later, our lunch was ready—fried chicken, fresh peas, toasted Afghan bread and butter, and a cup of cold milk. The children were horrified to see us eating green peas, and warned us, in sign language, that they would make us ill. Koshan later revealed that these people never eat fresh peas. They dry them, pound them to flour, and mix them with wheat for bread.

The commissar and Mr. Koshan returned with bad news. The earlier reports of border warfare were true. From Sarhad to Mintaka, the Chinese border post, the trail leads across the Pamir Plateau, at an average elevation of more than 15,000 feet. There are no villages on the way, only a few settlements of wild Kirghiz tribesmen, contemptuous of any authority. Even the commissar, in two years at Sarhad, had never ventured onto the great plateau. He warned us the journey would be difficult and dangerous.

If we wished to risk the trip, he would help us. But he stressed the danger and suggested that we cross Baroghil Pass southward into Pakistan. I left the decision to Jean. She knew the dangers and knew her own strength. Did she want to try the journey over the Pamir (Daliz) Pass?

"With that fried chicken under my belt I can go anywhere," she laughed. "Why are all you men sitting around talking when we should be packing?"

The commissar smiled and shook her hand. "The commissar says he is proud to know you," Koshan translated. "He will come with us himself."

We started out at dawn the next day. The trail from Sarhad rises straight up, over paths of shifting shale and around rock chimneys. In some places the path is literally stuck against the cliff—rocks wedged into cracks in the stony wall, more rocks piled on top of them, and a thin covering of brush. Few sights are more disconcerting than to see daylight *through* the trail you are traveling.

The Pamir Pass is a series of 14,000-foot crests, interspersed with 10,000-foot valleys. Up and down we labored, leading our horses and prodding our gasping yaks. The commissar kept pushing us forward. We had a dangerous bridge to cross, he remarked, and must make it before dark (page 692).

We reached the bridge at 5 o'clock. It was about 60 feet long, with a drop of 50 feet to the raging river. We crossed one at a time, leading our animals, while the structure swayed and creaked. One yak lost his footing, and the bridge lurched frighteningly. But we made it (page 688).

Fairyland by Moonlight

We were soon on our way down the trail. The mountainsides were masses of wild flowers: pink wild roses, showy daisies, dandelions, buttercups, blooming thistles, and great patches of edelweiss. The sun went down and a full moon rose, bathing the whole scene in an unreal, golden light. It was fairyland.

As we plodded on, hour after hour, men and animals reached the point of exhaustion. By 9 o'clock we were ready to sleep on the rocks. Mr. Koshan asked the commissar when we would stop.

"He says there is a Kirghiz camp a few miles ahead," he translated. "We may reach it by midnight."

I looked at Jean. She bit her lip.

"Jeepers!" she breathed. "Why did I make that foolish speech back at Sarhad? Now I've *got* to keep up."

We reached the camp an hour later. As we halted in front of the two yurts (circular tents) which appear on the map as Langar, the commissar's horse dropped dead.

We slept that night in a felt-walled Kirghiz yurt, with a dozen-odd members of two Kirghiz families. A fire of yak dung burned on the dirt floor. Despite the 12,000-foot altitude, we were warm and comfortable. In the morning we checked our pulses to see how we were reacting to the extreme height, and found both our hearts beating at 110 a minute; otherwise, we noticed no ill effects.

Knife in Mouth, a Kirghiz Skins a Sheep for Roasting in the Authors' Honor

This fierce fellow, camping at Bozai Gumbaz, slit the animal's throat at dusk and fed the blood to a pack of savage dogs. He yanked off the skin as one might pull off a sweater. Liver and kidneys he saved for a before-dinner snack. The main feast was served catch-as-catch-can and eaten with the hands. One tribesman, gnawing at the skull, grazed an eyebrow with his long sharp carving knife each time he took a bite.

Our friendly, broad-chested Kirghiz hosts all stood six feet tall. Their attractive women kept the yurt spotlessly clean. About a third of the large structure was partitioned off with a woven mat of wool and reed. Behind it the women store yak milk in big open vessels.

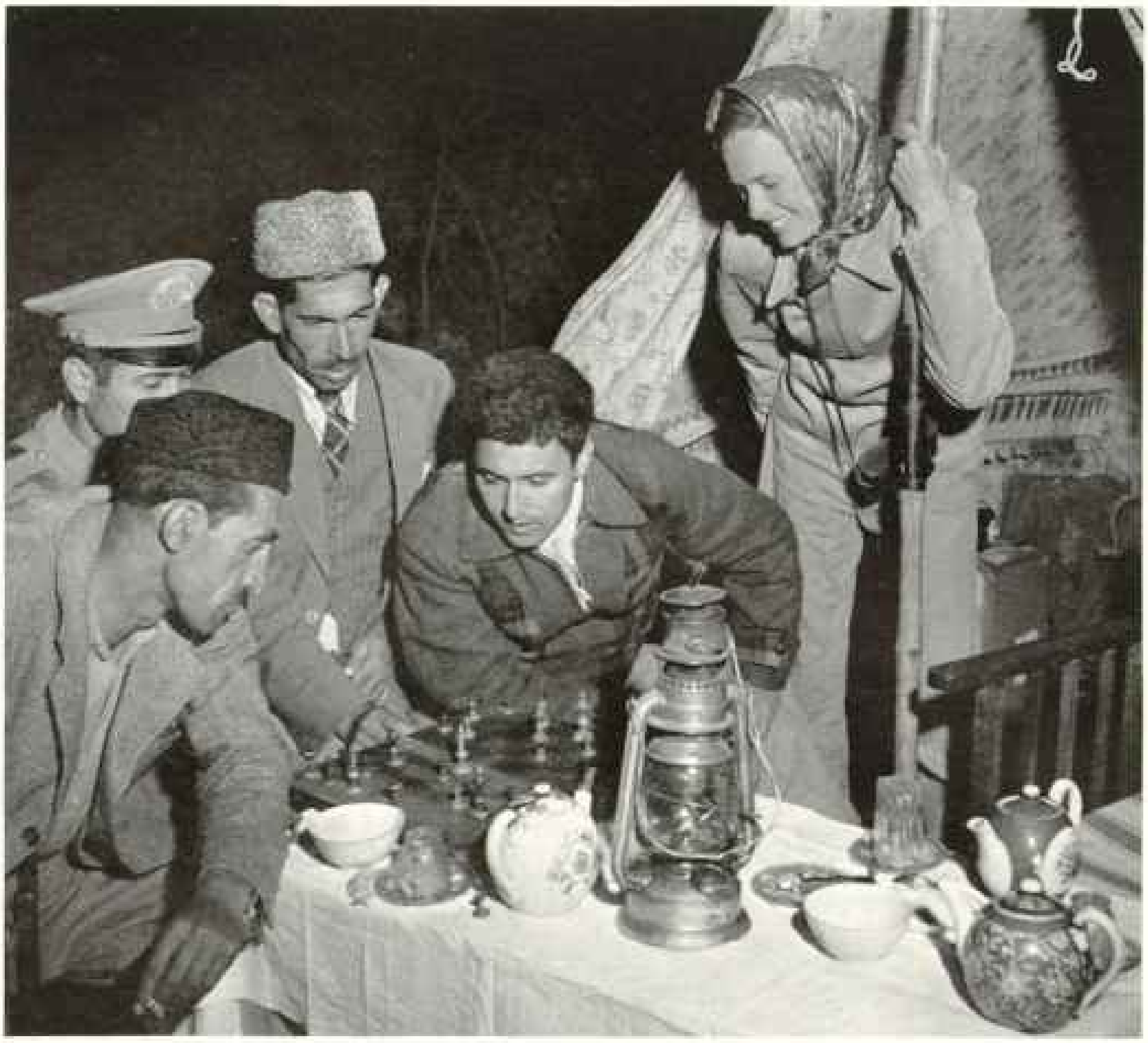
Getting Acquainted with Pamir Kirghiz

The Kirghiz of the Pamirs live almost entirely on yak- and goat-milk products. They wash down yoghurt, their principal fare, with a concoction of tea, salt, yak butter, and milk, served boiling hot. They eat bread only during two winter months, meat only at feasts. They are among the finest physical specimens in the world and are capable of great endurance, even at the high altitude in which they live (page 705).

The Kirghiz are a nomadic people. They live in the Russian Pamirs, Chinese Turkistan, and Afghanistan, having practically no regard for national borders. On the Pamir Plateau, however, many families have abandoned their migratory ways. They find the rich grass of the great plain adequate for their flocks the year round (pages 684, 689-692).

The next day our ride took us straight across the Pamir Plateau. It stretches for miles in every direction, covered with lush grass and watered by the upper Oxus and by the melting snows from the 20,000-foot mountains which surround it.

Our host at lunch, a magnificent young Kirghiz well over six feet tall, wore a great fur hat, Russian-style blouse, corduroy breeches, and high boots of fine black leather. Quolan



Tea and Chess by Lantern Light Enliven an Evening on the Faizabad-Zebak Road

Ghulam Hazrat Koshan (right) matches wits with a highway engineer. Cadet Syed Rashid (military cap), the mayor of Zebak, and Jean Shor watch. In this tent, pitched in a stony wilderness, the authors were startled by a telephone's ear-splitting ring at dawn; Badakhshan's governor was calling to see if they were safe. They talked over a line strung, in places, down the middle of the new road (page 673).

Larh was reluctant to have us take pictures, but an hour of friendly conversation thawed him out. He not only permitted us to photograph the women of his family but insisted on trying our cameras himself. He decided to ride with us to our evening stop.

Our horses did well on the flat plain, and Quolan Larh and I spent the afternoon teaching each other songs. He mastered *Oh! Susanna*, and I finally managed a few bars of his Kirghiz war song (page 689).

We reached Bozai Gumbaz, the largest Kirghiz settlement in the Pamirs, an hour before sunset. A score of yurts stood beside a swift stream, and women were milking their yaks. We were bowed into an enormous yurt (pages 690, 691, 693).

Brightly painted tin trunks lined the walls, and in one corner stood a dozen teapots of Russian design. An iron tripod topped the inevitable fire, and we were soon warming ourselves with cups of yak-butter tea. A group of tall Kirghiz joined us, smiled, and bowed a welcome. After half an hour of noisy tea sipping, we were escorted to a small yurt of our own.

Koshan, Rashid, and the commissar soon engaged in intent conversation with Quolan Larh and some Bozai men. They shook their heads, frowned, and frequently glanced at us. At dusk a tall, fine-looking Kirghiz, obviously the leader of the group, left the circle and spoke to two young men sitting near by. They mounted horses and rode off.

Since the villagers had roasted a sheep in our honor, the conference adjourned for din-

Cross-legged in a Kirghiz Tent, Franc Shor Puts His Life in Rahman Qul's Care

When feuding tribes blocked the Americans' road and their military escort balked, the Kirghiz leader agreed to see them through. "I will be responsible for your lives," he said. Rahman Qul proved to be a man of his word. But when the Shors arrived in Misgar, they learned their protector bore an international reputation as a highwayman (below and page 706).

ner. We asked Koshan what was being discussed, but he insisted it was only a friendly chat.

After dinner the two messengers returned, bringing some fierce-looking men in huge fox-fur hats. They joined the whispering parley. Jean and I dozed off, full of worries.

We awoke to find our worst fears realized. Over morning tea Koshan dropped the bombshell. The Kirghiz, he reported, had been fighting for two weeks with tribes on the Chinese side of the border. The area beyond our encampment was a no man's land, he said, and several men had been killed there in the last few days. The Kirghiz would not guarantee our safety beyond Bozai Gumbaz. He insisted we turn back.

Jean and I held a conference of our own. We had set out determined to reach the Sinkiang border. We were only two days from our goal. It was obviously dangerous to go on, but we had known we might face danger. We would go on.

I told Koshan of our decision. He was miserable.

"There is great danger," he said. "These tribesmen have no respect for life, not even that of soldiers or government officials. Even if you and Mrs. Shor are willing to take the chance, you must think of others. Remember that we have an escort of Afghan soldiers. Certainly it would never do to expose an Afghan soldier to an area where there might be shooting. It might cause an incident."

Rahman Qul Accepts a Trust

I had not, I admit, considered it in just that way. After much persuasion he agreed to interpret for me while I talked to Rahman Qul, the Kirghiz leader.

Rahman Qul speaks Persian, Russian, Pashto, Urdu, and Turki in addition to the Kirghiz dialect, and he can read and write in Persian and Russian. He can even spell out a few words of English. He has a frank, smiling face, and we instinctively felt he could be trusted.

"We have traveled more than 11,000 miles to reach your village," I said, "and here, only two days' ride from our goal, we face disaster. Our escort will go no farther. We wish to leave the escort behind. We put our lives entirely in your hands. If you will help us

A Finger on the Globe Traces an Age-old Trail Through Wakhan Corridor

Mr. Shor, in Kabul, confers with Syed Kasim Khan Rishtya, Afghanistan's press director (page 673).

reach the Chinese border, we will pay whatever you ask."

The tall Kirghiz smiled and put both his hands on mine.

"I accept your trust," he declared. "I will be responsible for your lives. I can accept no pay. You are our guests."

Receipt for Two Shors

Koshan was not happy about the arrangement, since he felt personally responsible for our safety. We agreed to give him a letter absolving him of all responsibility. But first he wrote a half page of Persian script and presented it to Rahman Qul. The Kirghiz chieftain read it carefully, then signed it. Koshan tucked it into his wallet.

"What was that?" I asked.

"A receipt for the two of you," Koshan said. "You are now out of our hands."

We asked Rahman Qul again to let us pay him. He refused. Then Jean had an idea. From her luggage she took a lapel watch and pressed it into the Kirghiz's big hand.

"Tell him," she said to Koshan, "that it is for his wife."

With a smile and a bow of thanks the chief accepted the gift.

We had a pleasant farewell dinner with Koshan, Rashid, and the commissar. We had covered some rough ground together, and the next morning, when we said good-bye at dawn, it was with genuine regret.

Our new guide, Tiluh Walduh, looked like a real desperado—tall and slender, with drooping handlebar mustache and brilliant black eyes. With him came two yak pullers.

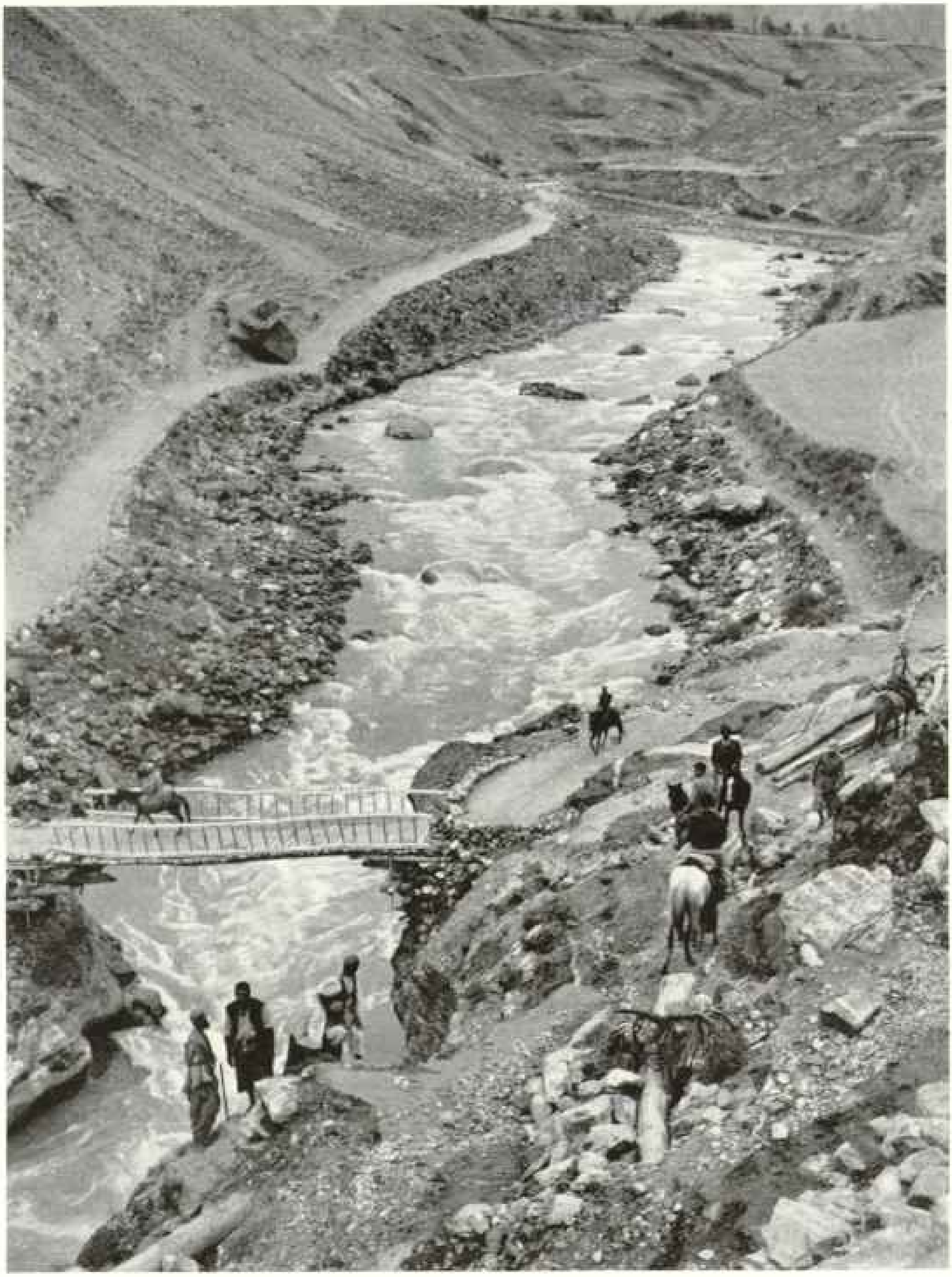
Rahman Qul came to see us off, and he and Tiluh Walduh huddled for a brief whispered conference. Then we were off across the grassy plain. The yak pullers prodded their lumbering animals into a rapid gait, and we were soon out of sight of the Kirghiz camp.

An hour from the camp Tiluh Walduh pointed out our path in sign language, and indicated he would ride the flank to watch for danger. He loped off across the plain, climbed a low ridge, and disappeared.

Specks in Infinity

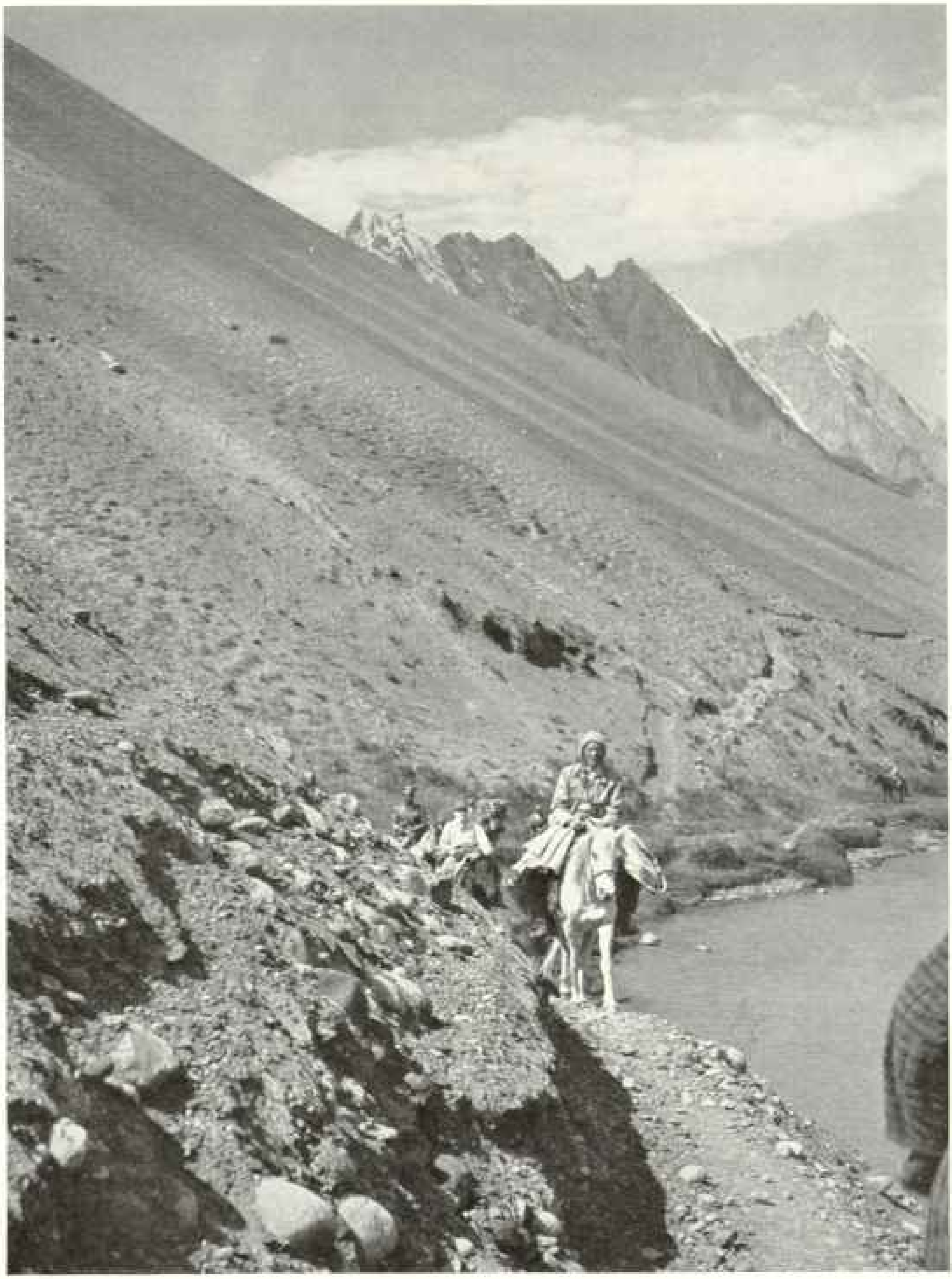
We had an uncanny feeling of being remarkably little and alone. The great emptiness of the Pamirs spread around us, punctuated by jutting peaks. There was no sound except for the steady pace of our horses and the measured breathing of the yaks. Jean and I drew closer together, riding boot to boot. The miles fell away as we rode on into that incredible silence (page 679).

Carefully we scanned the crest of the flank-



One by One, Horsemen Cautiously Cross a Teetery Bridge Spanning the Raging Kokcha

Badakhshan's new automobile road here meets an old trail. It is wide enough for just one car, but that's width enough for the province's only automobile, the Governor's. The authors came this way on horse (page 674). Villagers (on foot) have been conscripted for road work.



Paved with Loose Stones, the Narrow Trail Threatened to Slip into the Oxus

Journalist Koshan, who follows Jean Shor, bundles face with handkerchief against the sun. "We should have done the same," say the authors. "Jean's nose was burned, her lips swollen and split." Sometimes the trail rose 2,000 feet above the river. At this dip the caravan rode near Nurss.

ing hills, but not once did our outrider appear. The yak pullers plodded silently behind us; the empty distance stretched ahead. Somehow the feeling grew on me that we were the only people left in the world, that the civilization of skyscrapers and automobiles was all a dream. There was nobody else—nothing else in the world, just the two of us.

As if in answer to my thoughts, Jean reached over and took my hand. Until dusk we rode boot to boot and hand in hand, two tiny specks in an infinite space.

Tiluh Walduh rejoined us at dusk. We camped near a little stream, brewed tea, and shared a flat wheel of Kirghiz bread. Our Kirghiz friends stood watch while we slept.

The next day passed in the same fashion. Hours of silent progress through a silent land. Then, a few hours before sundown, one of our yak pullers pointed to a notch in the mountain wall some two miles ahead of us. "Wakhjir," he said. We clapped each other on the back with joy. The Wakhjir Pass—end of the Wakhan. We had made it, first foreigners in modern times to reach China by this ancient route. We kicked our tired horses into a trot.

Suddenly, less than a mile from the pass, a low, clear whistle sounded through the evening air. We stopped, puzzled. Our yak pullers signaled us to dismount. Still mystified, we complied, and the Kirghiz dragged all the animals into a little gully and motioned to us to join them.

In a few minutes Tiluh Walduh joined us. At his signal we crept around a turn of the gully, and he pointed upward to the crest of the pass. Silhouetted against the darkening sky were three Chinese Turkistan soldiers. We looked questioningly at our guide. We tried to explain to Tiluh Walduh that the soldiers would be friendly. He shook his head. He pointed to them, then toward himself and us, and drew his forefinger across his throat. There was no mistaking his meaning.

We sat quietly beneath the bank until dark. Then we mounted, and for 10 hours we rode across the Pamirs, halting only to let our dead-tired horses rest and graze. At dawn we stopped for a few hours' sleep.

When I awoke, I tried to figure where we might be—possibly some 15 miles east and a little south of our starting point.

By now we were scared to death. I tried to tell Tiluh Walduh we wanted to return to Rahman Qul's camp. Whether he understood I shall never know. He simply shook his head and pointed south to a wall of mountains.

Before noon we again reached the Oxus, here confined in a valley so narrow that we had to ford the torrent half a dozen times (page 695). We ate the last of our Kirghiz bread and toiled endlessly up the mountainside, leading our horses over shifting masses of shale which constantly gave way beneath their feet.

Toward evening we emerged in a lush, green mountain valley. A single yurt stood in the grassy vale. A fierce-looking Kirghiz, an ancient rifle cradled in his arms and a long knife hanging bare at his side, stood beside the low door. Tiluh Walduh spoke to him, and we heard the name "Rahman Qul" half a dozen times. Finally the Kirghiz signaled us to dismount and led the way inside.

All the Witch Wanted Was Everything

The interior was dirty and barren. A baby sat on the ground near the fire, and as we entered, a little girl came from behind the reed partition. Behind her came the most unpleasant-looking woman we have ever seen, a wrinkled hag with the face of a witch. She greeted our reluctant host with a blast of invective. Even the magic name "Rahman Qul" had no effect. There was no question about our being welcome—we weren't! But there was no place else to go, so we sat down with stiff smiles and warmed ourselves.

I offered everyone cigarettes, and the lady demanded the rest of the pack. I lit her cigarette, and she demanded the box of matches. We washed, and she snatched our soap. Jean put a soothing cream on her face, cracked and swollen from exposure, and our hostess demanded the rest of the jar. We opened tins of meat and cheese from our vanishing emergency rations and shared them. Grandmother insisted on the balance of our stock. She didn't get it.

Avarice sometimes brings its own reward. I took a flash picture of the children and ejected the still-hot bulb on the floor. Our acquisitive friend ignored my warning and snatched up the red-hot bulb, acquiring a slight burn. When I treated her hand, she demanded the remaining ointment!

After our meager supper, Jean and I crawled into our sleeping bags and lay talking softly. Things looked bad. We didn't know where we were, or where we were going. Our present hosts were obviously unfriendly, and the next ones might be worse. Our experience at the Sinkiang border had shaken us badly. Since we were traveling with the Kirghiz, anything that happened to them would undoubtedly happen also to us.

That night, sleeping at 17,000 feet, Jean was bothered by the altitude. Her heart pounded so that she could not sleep lying

Jean Shor Learns About Yurt Life from a Kirghiz Family in Langar

Tribesmen's tents, she reports, are snug and scrupulously clean, but smoky and low-ceilinged ("Life is a little stooped-over"). Babies, thriving on hardships and altitude, are as happy as puppies and as fat as butterballs. Mrs. Shor sits beside a cut of roast lamb. Cups contain yak-butter tea. Iron pot holds yoghurt, the Kirghiz clabber (page 698).

down. She found relief in sitting up, so she slept propped against the wall.

At dawn we broke an inch of ice from a little spring, washed, and made tea. Then came the final blow: Tiluh Walduh took both our hands in his, said a polite "Salaam," and explained, in sign language, that our host for the night would take us on across the towering mountains. Then he waved farewell—our last link with people we knew about.

Off we went with our new guide. For an hour we climbed steadily across grassy meadows. The next hour took us around a great mountain shoulder, still climbing, but now over walls of shale, slippery and dangerous. After two more hours of climbing, we halted for a rest on a tiny grass-covered plateau.

Above us stretched a mile-long snow field, ending its steep ascent in a wall of white nearly 200 yards high. It looked almost impossible to cross, but our guide informed us, with gestures, that it could be done later in the afternoon. At midday, he indicated, the melting snow and ice made it dangerous. So we rested, sharing another tin of cheese and our last bar of chocolate.

For four hours we fought our way across that slippery, frozen field. Beneath the snow was solid ice, and from somewhere far below came the gurgle of running water.

Four times we were halted by crevasses—jagged, bottomless cracks, one nearly five feet wide—which we and the animals had to jump. The sight of our heavily laden yaks leaping gracefully across those yawning openings was one we shall never forget.

Standing on Top of the World

The last few hundred yards were torture. We crawled on hands and knees, dazed by exhaustion, driven only by the knowledge that we must cross the ridge and reach a lower altitude before dark. A night on that glacial ridge could end only in death.

Somewhere we found strength, not only to move our own tired limbs but to drag the floundering animals behind us. Even the Kirghiz, born and bred on their high plateau, were gasping for breath. On we went, five yards at a time, lying in the snow and gasping between those brief advances. A few final steps, and we stood on top of the world!

We were on the crest of a great mountain range. All around us, as far as the eye could see, lay other mountain chains, their magnificent peaks punctuating the endless distance. Exhausted and gasping, we still could not take our eyes from the panorama of beauty.

For half an hour we rested and stared in awe. We were too tired to go on, but we had to go on. There was no trail ahead of us, only snow. Holding our horses by the bridles, we slid across the edge, floundering and slipping downward through the snow.

Two thousand feet below we reached an incline of shale, and worked our way crabwise down and across it. Long after dark we gouged a shelf out of the shale and slept through a flash blizzard.

Pakistan at Last!

Another day of sliding down shifting shale, still not knowing where we were bound. On we went, always down. Suddenly we rounded a narrow wall of rock and saw in a narrow valley far below us a square stone fortress, with the flag of Pakistan flying in the breeze.

Our guide pointed to the fort. "Kalam Darchi," he said. I checked our maps and finally found it, formerly a tiny British outpost in the princely State of Hunza.

The tall Pakistani soldiers of the post spoke a little English and told us that the village of Misgar, five miles down the valley, had a guest bungalow. We hurried onward, and two hours later were warmly greeted by an English-speaking telegraph operator and the mayor. They were not pleased, however, to see our Kirghiz guides. We paid them generously, bade them a grateful farewell, and they started back for their Pamir homeland.

After a warm meal and a long night's sleep we got out our maps, plotted the course we had come, and assayed the results of our journey. We were still only a day's ride from the Chinese Turkistan frontier. It would not be difficult to organize a new caravan in Hunza and continue our journey. We had succeeded in our prime goal of traveling the Wakhan corridor from end to end—the first foreigners in modern times to make the journey from west to east.

Two discoveries were left for us. The first came when, plotting our route on our maps, we discovered that the final pass we had crossed was the towering Dehli Sang, more than 20,000 feet high! We had reached that great height without knowing where we were and without oxygen equipment of any kind (pages 681, 696).

The Legend of Rahman Qul

The second discovery left us a little surprised. It came the day after our arrival in Misgar. The mayor called on us.

"These Kirghiz men you come with," he said, "belong tribe of Rahman Qul?"

"Yes," we nodded. "Rahman Qul is a very good friend of ours, a wonderful man."

The mayor shook his head. "Rahman Qul very bad man," he said firmly. "He rob caravans, kill many people. Very bad!"

We stared in disbelief. And then he told us a few tales about our benefactor. Two years before, the mayor began, Rahman Qul and his tribe had crossed the Russian Pamirs. There they had robbed a caravan and murdered every man in it. Pursued by the Russians, they had fled into Chinese Turkistan and taken up residence near the border post of Mintaka.

Rahman Qul had become a close friend of the commander of the little Chinese border garrison. Less than a month before we met him he had invited the commander and his garrison of eight men to a lunch on a Mohammedan festival day. While the Chinese were eating, Qul's tribesmen had stolen into the tent behind them and murdered every man in cold blood, the mayor reported. They had looted the garrison of guns, ammunition, horses, and supplies, and fled across the Afghan border to resume residence on the Pamir Plateau.

"For many years this Rahman Qul murder and rob people," the mayor insisted. "Very bad man. Why he no murder you?"

I remembered the night we talked with Rahman Qul in his smoky yurt, high up on the great Pamirs.

"We put our lives entirely in your hands," I had said. And his answer: "I accept your trust."

"Why he no murder you?"

I looked at the mayor and shook my head. "I don't know." I looked at Jean. I could see she agreed with me. We didn't know. Probably we never would know. But to us, Rahman Qul would always be the man who saved our lives.*

* For additional articles on Afghanistan, Chinese Turkistan, Soviet Central Asia, and Hunza, see "National Geographic Magazine Cumulative Index, 1899–1949."

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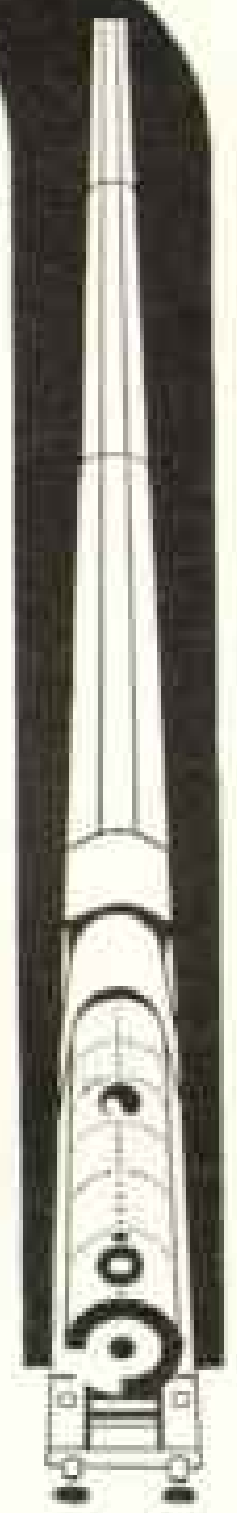

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No. & So. Hemispheres*			
Pacific & Bay of Bengal*			
Pacific Ocean* (With 79 Island Insets.)		x	
Philippines*			
South America*			
Southeast Asia*			
Top of the World* (Arctic)			
The World*		x	
U.S.S.R. (Russia)*			
Pocket Map of Central & Suburban Wash., D. C.			Index printed on Map
United States—1946*			
North Central U. S.*			
Northeast United States*			
Northwest United States*			
South Central U. S.*			
Southeast United States*			
Southwest United States*			

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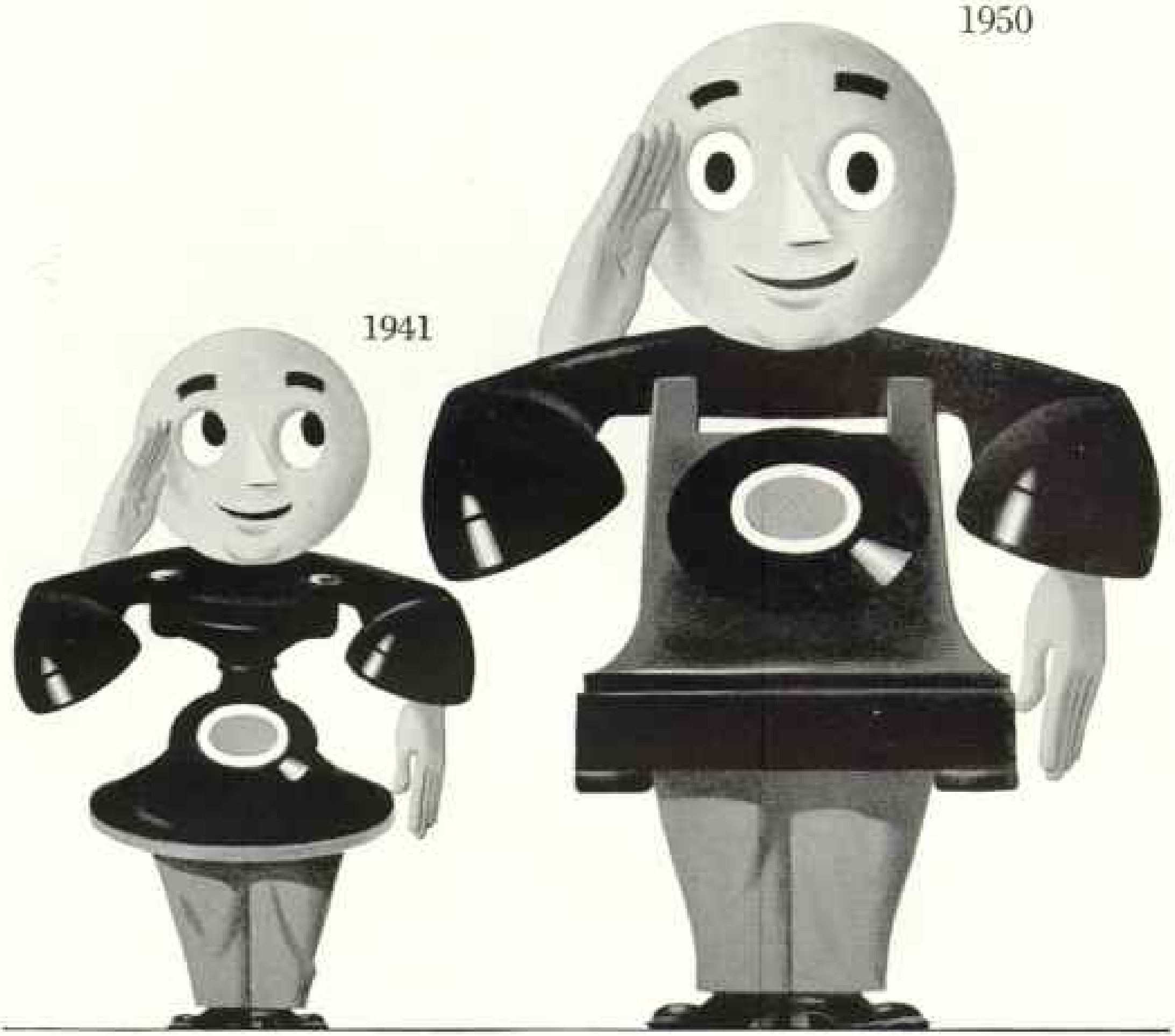

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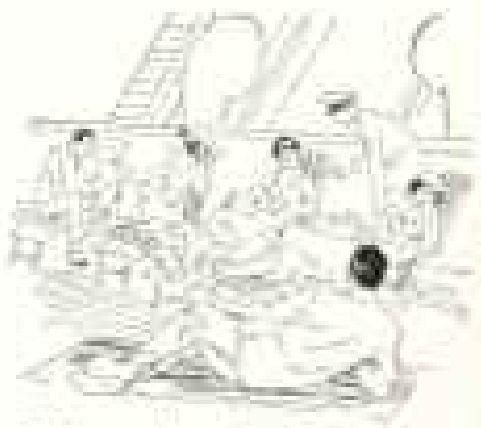

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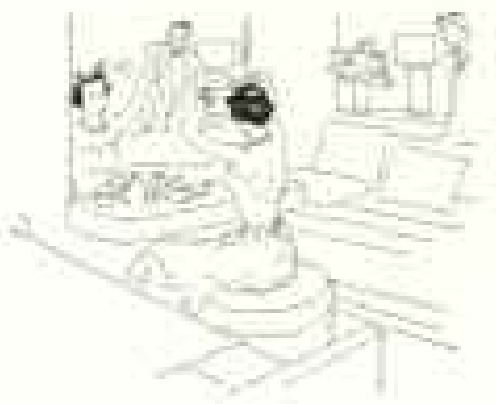

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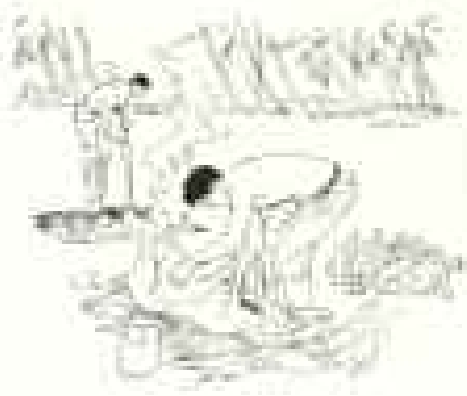

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