VOLUME CXII NUMBER FIVE

THE NATIONAL GEOGRAPHIC MAGAZINE

NOVEMBER, 1957

Special Supplement Painting of *Mayflower II*

Seventy-two Pages of Illustrations in Color

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

NONMEMBER SUBSCRIPTION $8.00 A YEAR
SINGLE COPIES $1.00 EACH

NATIONAL GEOGRAPHIC Society

16th & M Streets N.W. Washington 6, D. C.

National Geographic Magazine

ORGANIZED IN 1888 "FOR THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE

To increase knowledge, the National Geographic Society has conducted 150 research projects and exploring expeditions literally to the ends of the earth. The Society diffuses knowledge through its monthly National Geographic Magazine and its books, nine million large color maps a year, bulletins for schools, and news releases on world events for press, radio, and television.

MELVILLE BELL GROSVENOR, *President and Editor*
THOMAS W. McKNEW, *Vice-President and Secretary*
ROBERT V. FLEMING, *Treasurer*
MELVIN M. PAYNE, *Senior Assistant Secretary*
LYMAN J. BRIGGS, *Chairman, Research Committee*
ALEXANDER WETMORE, *Vice-Chairman, Research Committee*

Board of Trustees

GILBERT GROSVENOR
Chairman of the Board, formerly President, National Geographic Society, and Editor of its Magazine (1899-1954)

JOHN OLIVER LA GORCE
Vice-Chairman of the Board, formerly President and Editor, National Geographic Society (1954-1957)

LYMAN J. BRIGGS
Director Emeritus, National Bureau of Standards

LEONARD CARMICHAEL
Secretary, Smithsonian Institution

L. O. COLBERT
Rear Admiral, U. S. Coast and Geodetic Survey, Retired

HUGH L. DRYDEN
Director, National Advisory Committee for Aeronautics

ROBERT V. FLEMING
Chairman of the Board
Riggs National Bank

MELVILLE BELL GROSVENOR
Editor, National Geographic Magazine

ELISHA HANSON
Lawyer and Naturalist

CHARLES F. KETTERING
Consultant and Director
General Motors Corporation

EMORY S. LAND
Vice-Admiral, U. S. Navy, Retired, formerly President
Air Transport Association

CURTIS E. LeMAY
Vice-Chief of Staff
United States Air Force

H. RANDOLPH MADDOX
Vice-President
American Telephone and Telegraph Company

GEORGE C. MARSHALL
General of the Army, formerly Secretary of Defense

BENJAMIN M. McKELWAY
Editor, The Washington Star

THOMAS W. McKNEW
Vice-President and Secretary
National Geographic Society

ERNEST E. NORRIS
Retired President
Southern Railway System

JUAN T. TRIPPE
President, Pan American World Airways

EARL WARREN
Chief Justice of the United States

ALEXANDER WETMORE
Research Associate
Smithsonian Institution

LLOYD B. WILSON
Honorary Chairman of the Board
Chesapeake and Potomac Telephone Companies

CONRAD L. WIRTH
Director National Park Service
U. S. Department of the Interior

WILLIAM E. WRATHER
Director, U. S. Geological Survey, Retired

Trustee Emeritus:
WILLIAM V. PRATT
Admiral, U. S. Navy, Retired

Assistant Secretaries: Vernon H. Brewster, Robert E. Doyle
Assistant Treasurers: Hilleary F. Hunkinson, William H. McCauley

Herman J. A. C. Arens, Executive Assistant, and Carol Johnson, Secretary, to the President and Editor; Lenore Williams, Secretary to the Vice-President and Secretary; Sibyl Peck, Asst. to Chairman, and Leon J. Canova, Asst. to Vice-Chairman, of the Board.

Copyright © 1957 by National Geographic Society, Washington, D.C. International copyright secured. Printed in U. S. A. Second class mail privileges authorized at Washington, D. C., January 26, 1888. Cover design and title protected by international trademark. Articles and photographs are copyrighted. For material used, generous remuneration is made.

MELVILLE BELL GROSVENOR, *Editor*
THOMAS W. McKNEW, *Vice-President & Secretary*
FREDERICK G. VOSBURGH, *Associate Editor*

EDITORIAL STAFF

Assistant Editors: Robert L. Conly, George W. Long, Franc Shor, Mason Sutherland
Senior Staff: Beverley M. Bowie, Andrew H. Brown, Allan C. Fisher, Jr.
Foreign Staff: W. Robert Moore (Chief); David S. Boyer, Luis Marden, Jean Bowie Shor, Howell Walker, M. Woodbridge Williams (Naturalist)
Editorial Staff: John R. Hoppes, Jay Johnston, Stuart E. Jones, Nathaniel T. Kenney, Samuel W. Matthews, Mary C. McDade, Carolyn B. Patterson, John Scofield, Kenneth F. Weaver, Peter T. White, Rose T. Mac-Bryde (Asst.)
Special Service: Ralph Gray (Chief); Scott Hart, Edwards Park
News Service: Windsor P. Booth (Chief); Lonnelle Aikman, Frank Sartwell
Geographic Book Service: Merle Severy
Edit. Research: Inez B. Ryan (Chief); Margaret Bledsoe, Ann K. Holcomb, Werner Janney, Levenia Loder
Geographic Research: George Crossette (Chief); Louise F. Althoff, Newton V. Blakeslee
Librarians: Esther Ann Manning, Julia F. Banks

ILLUSTRATIONS STAFF

Illustrations Editor: Walter Meayers Edwards
Asst. Illus. Editors: Kip Ross, Andrew Poggenpohl, Herbert S. Wilburn, Jr.
Picture Editors: Charles Allmon, Robert L. Breeden, Wilbur E. Garrett, Leonard J. Grant, Mary S. Griswold, Gilbert M. Grosvenor, Gilford D. Hampshire, Geraldine Linder, Cary Stillwell (Librarian)
Engraving & Printing: Dee J. Audella, Joe M. Barlett
Artist & Naturalist: Walter A. Weber
Photographers: B. Anthony Stewart (Chief); Thomas J. Abercrombie, Willard R. Culver, Bates Littlehales, Kathleen Revis, Joseph Baylor Roberts, Robert F. Sisson, Volkmar Wentzel
Photo Lab.: Edwin L. Wisherd (Chief), Richard H. Stewart (Asst. Chief); John E. Fletcher, Donald McBain. *Film Editor:* Joseph M. Rideout

CARTOGRAPHIC STAFF

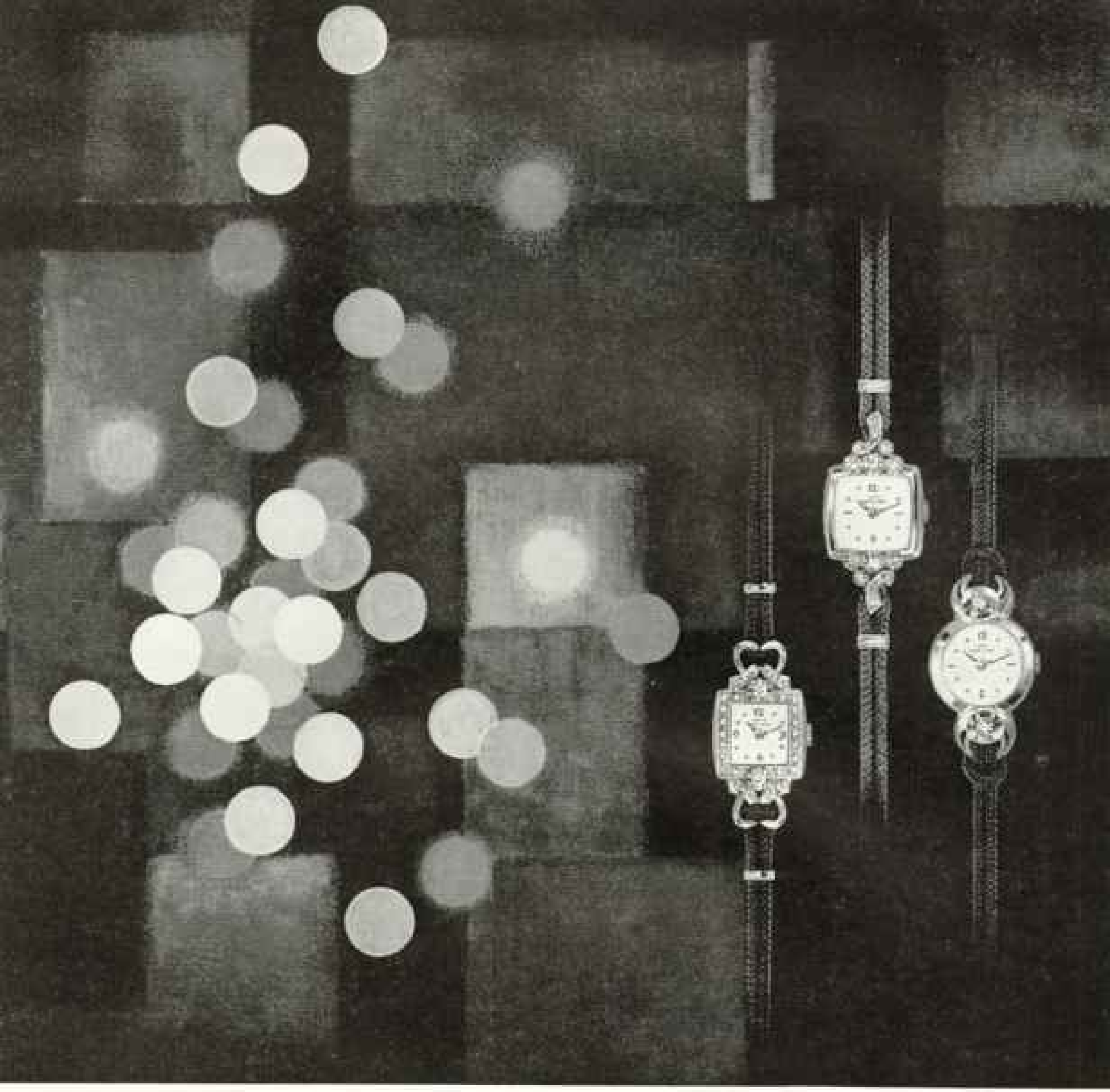
Chief Cartographer: James M. Darley
Newman Bumstead (Asst. Chief); Irvin E. Alleman, John J. Brehm, Wellman Chamberlin, Richard Darley, Athos D. Graziosi, Apphia Holdstock, Ralph E. McAlear, Walter K. Morrison. *Typographer:* C. E. Riddiford. *Cartographic Artist:* William Palmstrom

SECRETARY'S STAFF

Personnel: Herbert T. Henderson. *Membership:* Sheldon Carr. *Payroll:* Esther M. Lohner. *Accounting:* F. Charles Brown, C. Vernon Sanders. *Statistical:* Everett C. Brown. *Cashier:* Frank S. Delk. *Coast:* Sargent C. Elliott. *Purchasing:* John P. M. Johnston. *Administration:* William T. Bell, Charles F. Althoff. *Membership Fulfillment:* Roy J. Klockenbrink. *Accounts Records:* Della M. Hurt

ADVERTISING

Gilbert G. La Gorce (Director); John F. Connery (Manager); *Regional Offices—New York:* Harley L. McDevitt; *Chicago:* Leslie R. Gage, *San Francisco:* Donald F. Mikkelsen, *Los Angeles:* Jack V. Sheehan



The warmth of your love lives in a Hamilton

A timepiece without peer, each Hamilton diamond-set watch is fashioned with brilliance that has won international design honors. Naturally, there are attempts at imitation. But your Hamilton jeweler will show you the unbroken seal and registered guarantee that mark the genuine Hamilton diamond watch. The price is lower than you'd imagine. Left to right—Inspiration F, $275. Enchantment J, with 8 diamonds, $225. Splendor R, with 2 diamonds, $125. Hamilton Watch Company, Lancaster, Pennsylvania.

HAMILTON

the watch fine jewelers recommend more often than any other

The Super Magnasonic. Top and front gliding panels conceal controls and changer.

The Cosmopolitan 21-inch, High Fidelity Television with concealed top control.*

There's a new world of enjoyment for you in the realism of Magnavox High Fidelity

Let Magnavox True High Fidelity fill your home with the glow of beautiful music, superbly re-created with all the excitement, color and realism of the original performance. In television, too, Magnavox High Fidelity adds more pleasure to programs through a magnificent sound system to match the finest picture in TV.

THE SUPER MAGNASONIC gives you superior performance and greater value than any other make. Four speakers, 15" and 12" bass, 5" and 4" high frequency; 20-watt amplifier and precision Magnavox changer with *Diamond Stylus*. Functional styling, gliding panels eliminate doors, lids or drawers. In genuine hand-rubbed mahogany, oak, walnut, cherry or ebony. Model 293C, in genuine mahogany, $259.50.

THE COSMOPOLITAN with three high fidelity speakers, 10-watt amplifier, chromatic optical filter and other exclusive features. In your choice of genuine hand-rubbed mahogany, oak, walnut or cherry as shown, $399.50.

Magnavox instruments are the finest money can buy—and they cost far less than you may think. Sold only by America's finest retailers, Magnavox-selected for their integrity and ability to serve you. **diagonal measure.*

THE MAGNASONIC "310" with 12" and two 5" speakers, 10-watt amplifier, precision Magnavox changer with diamond pick-up and many of the other features you can only get in higher priced instruments. Only $169.50 in mahogany finish.

magnificent

Magnavox

high fidelity • television • radio-phonographs

The Magnavox Company, Fort Wayne, Indiana

PERSONAL LETTER from the Editor of the NATIONAL GEOGRAPHIC MAGAZINE to Captain Alan Villiers, "Windrush," Oxford, England, November 2, 1955:

"No doubt you have read in the papers over there about the building of a new *Mayflower* at Brixham, and the plan for sailing it across the Atlantic. . . .

"Would you size up the project for us and let us know if you'd be interested in covering it for the National Geographic?"

From deepwater man Alan Villiers, who had already thrilled Society members with his yarns of windjammer voyages on *Eagle* and *Joseph Conrad*, to Editor Grosvenor, November 9, 1955:

"I think the *Mayflower* project would make a good piece for The Magazine. I had better go down to Brixham and look over the setup on the spot. I hope they realize that it is a difficult thing to sail that ship across in this day and age."

From Alan Villiers, November 24, 1955:

"I went down to Brixham and looked over the *Mayflower*. They want me to be captain of the ship!"

And thus it came about that a great sailor became the captain of a great adventure. The members of the National Geographic Society can read in this issue of their Magazine Alan Villiers's exclusive firsthand account of the new *Mayflower*'s crossing, one of the most fabulous voyages of modern times.

Indians and photographers welcome world's best-known sailing skipper to Provincetown

RECOMMENDATION FOR . . . AND INQUIRY ABOUT *Membership*

Members of The Society roam the world through the pages of their official journal, the NATIONAL GEOGRAPHIC MAGAZINE. Their enthusiastic nomination of friends for membership explains The Society's phenomenal growth. Members receive The Magazine and its 10-color maps without cost beyond their annual dues, less than nonmember subscriptions.

Those who are interested in The Society's work and its Magazine but do not know a member should inquire (below) concerning membership.

TO: THE SECRETARY
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON 6, D. C.

CANDIDATE FOR MEMBERSHIP (PLEASE PRINT)

STREET

CITY, ZONE, STATE

MEMBERSHIP DUES OF **$6.50** INCLUDE SUBSCRIPTION TO THE NATIONAL GEOGRAPHIC MAGAZINE

Please fill in section that applies:

☐ I **NOMINATE** for membership the candidate above. (Use separate sheet for additional nominations.)

☐ **(GIFT MEMBERSHIP)** I nominate and enclose $_____ for dues of candidate shown at upper right. Please send gift card to recipient. ☐ Yes ☐ No

☐ I **DESIRE INFORMATION** regarding membership and the NATIONAL GEOGRAPHIC MAGAZINE. (Fill in upper form.)

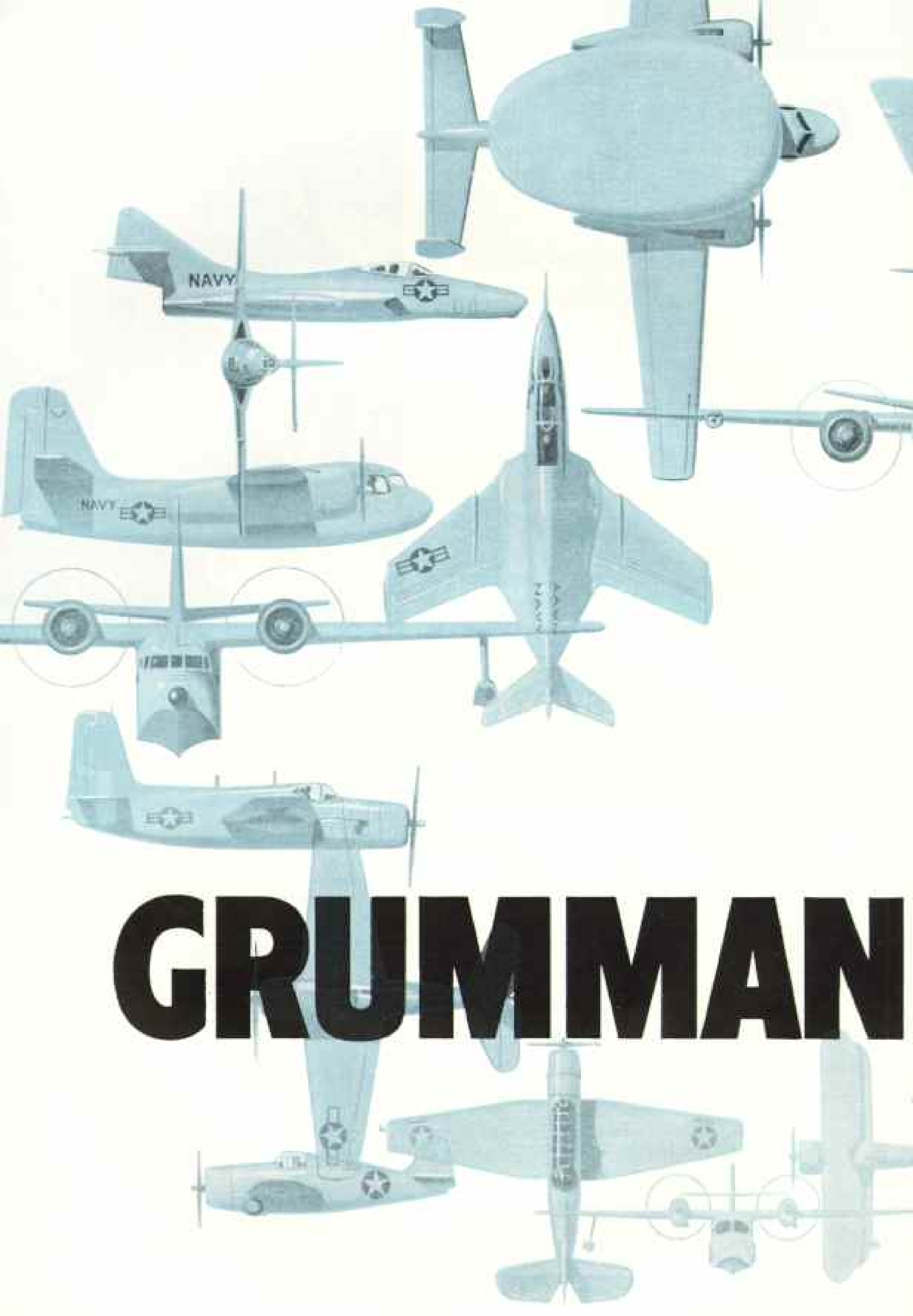
FOR CALENDAR YEAR 1958. $6.50 rate applies in United States, U.S. Poss., and Canada. Countries in the Postal Union of the Americas and Spain, $7.00. Elsewhere, $8.00. (Determined by postage differentials.) Life Membership, $150.00. U.S. funds. Make remittances payable to and send direct to National Geographic Society. 11-57

NOMINATOR (PLEASE PRINT)

STREET

CITY, ZONE, STATE

Members and others interested in The Society's work may make gifts or bequests of money, securities, or other property for "the increase and diffusion of geographic knowledge." Such gifts are deductible for tax purposes.



GRUMMAN

Sum total: 27 years. With many firsts along the way. The first military plane with retractable landing gear. The first carrier-based aircraft with folding wings. First swept-wing jets on operational service with carrier squadrons. First in the air with area-rule (coke bottle) fuselage for fighters. The first aircraft capable of performing the complete search-attack mission against subs. First in amphibians with the production of more such craft than the rest of the world combined. First with two-place transonic jet fighter-trainers.

Sum total: more than 24,000 planes. Ready in quantity when needed. At minimum cost to our government. And backed by unexcelled operational and maintenance field support throughout the world. Small wonder Grumman products have been in uninterrupted service every day of every year since 1930.

EXPERIENCE

Grumman

GRUMMAN AIRCRAFT ENGINEERING CORPORATION
Bethpage • Long Island • New York

Air Superiority Fighters • Anti-submarine Aircraft • Jet Trainers
Air Transports • Nuclear Research • Aerolift Truck Bodies
Hydrofoil Research • Grumman Boats

For a copy of this illustration, suitable for framing, and containing a brief history of the Grumman aircraft shown, write Grumman, Dept. A-16, at the above address.

Nightwork goes easier with the Dictaphone Time-Master

The dictating machine with the Dictabelt record

Whether it's night work or not, a Dictaphone TIME-MASTER dictating machine cuts through paperwork more efficiently than any method of dictation known.

Dictaphone's exclusive DICTABELT Record gets every word crystal clear.

Recording is visible so you can't lose your place . . . permanent, so dictation can't be erased or changed. DICTABELTS can be mailed or filed like a letter.

You'll save time and money the Dictaphone way. Ask for a free trial. Call your local Dictaphone office or write Dictaphone, Dept. H, 420 Lexington Ave., New York 17, N. Y.

The Dictabelt record—main reason why the Dictaphone Time-Master far outsells all other dictating machines.

DICTAPHONE CORPORATION

Service you can depend on the world around

In Canada, write Dictaphone Corporation, Ltd., 204 Eglinton Ave. East, Toronto . . . in England, Dictaphone Company Ltd., 17-19 Stratford Place, London W. 1. Dictaphone, Time-Master and Dictabelt are registered trade-marks of Dictaphone Corporation.

THE ORIENT

supreme travel experience of a lifetime!

THE ORIENT is your scrapbook of unforgettable memories.

Here are lands of color and contrast. Where ancient temples and towering skyscrapers stand side-by-side. Where exquisite landscapes are splashed with the vivid red of pagodas. Where you may step from the exciting bustle of Tokyo's Ginza into cloistered paths the ancients traveled.

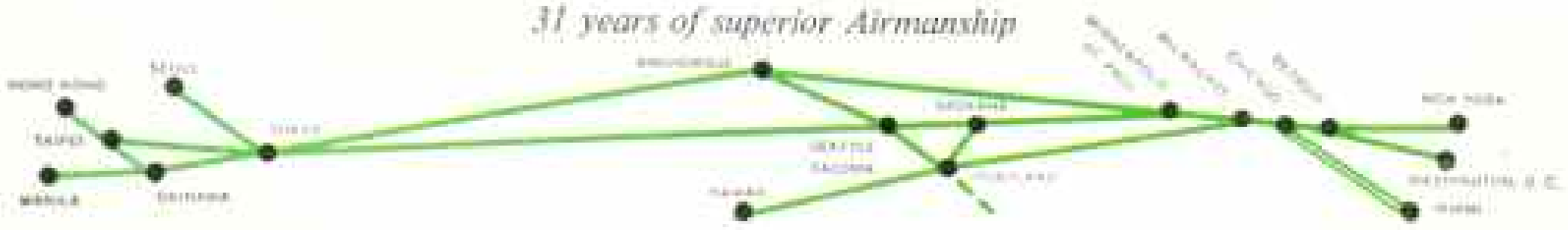
Above all, these are lands where there are no strangers. Your welcome is warm. Your pleasure and comfort is everyone's concern. And every day is an event to color your conversation for years to come.

See the Orient now. You're only a day away on Northwest—shortest, fastest to all the Orient. And you've a choice of luxurious DC-7C IMPERIAL SERVICE or thrifty tourist flights . . . (radar equipped, *of course*). For a colorful Orient vacation folder, see your travel agent or write to Northwest Orient Airlines, St. Paul 1, Minnesota.

Coast-to-Coast • Canada • Alaska
Hawaii • The Orient

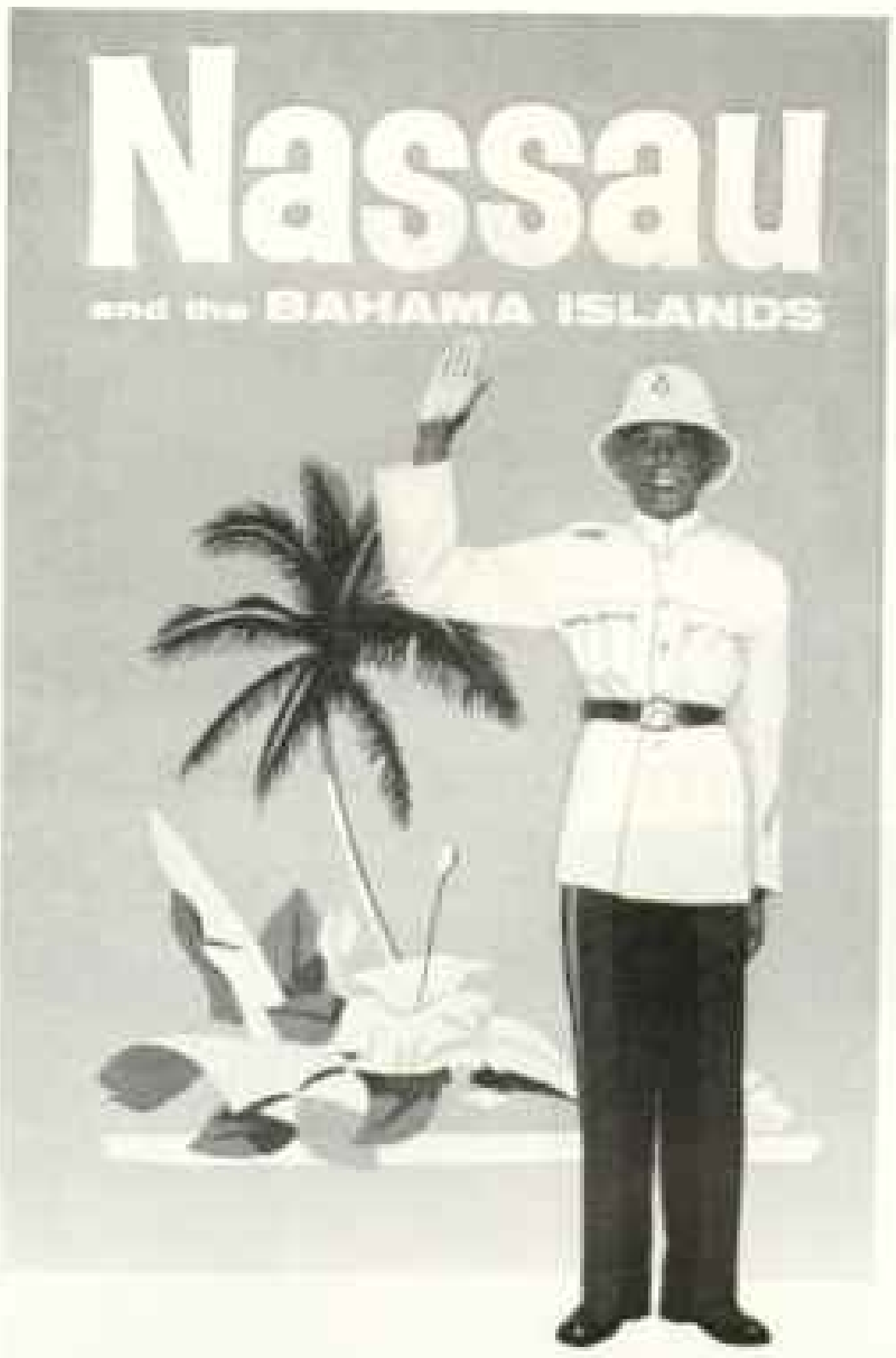
NORTHWEST *Orient* AIRLINES

31 years of superior Airmanship



Nassau

and the BAHAMA ISLANDS



Nassau is only 4 hours from New York, less than an hour from Florida. Direct air services from Miami, Fort Lauderdale, Tampa—St. Petersburg, West Palm Beach, Montreal, Toronto.

More than 100 flights a week
to the Bahamas including daily, non-stop service from New York City.

from NEW YORK every FRIDAY
the 24,400-ton, fully air-conditioned
S. S. NASSAU
7 and 10 day cruises, $170 up
2 days in Nassau—ship your hotel
(No extra charge for stopover)
INCRES NASSAU LINE, Home Lines
42 Broadway, New York 4, N. Y.

•

from MIAMI every FRIDAY
S. S. FLORIDA
arriving Miami Monday morning from Nassau
Round trip, $36 up
3-day, all-expense cruises, $51 up
(two days in Nassau)
P. & O. STEAMSHIP CO.
MIAMI 8, FLORIDA

NASSAU, BAHAMAS, DEVELOPMENT BOARD
1633-34 duPont Bldg., Miami 32, Fla. NG-11-57
Please send free literature to:
Name.....
Address.....
City.....**Zone**....**State**.....

To Island Adventure...
on BOAC flights galore

BOAC's great air fleet to island adventure now* includes the fast, intercontinental **DC-7C** aircraft to **Nassau**...or **Jamaica.** Fly first class, non-stop. Enjoy the gracious manner of British service...without paying a farthing more.

Additional daily service now scheduled on smooth, jet-prop **Viscount** to Nassau and Jamaica. Fly tourist class from New York*...first class from Miami.

For more adventure to enchanting Outer Islands of the Bahamas, make connections from Nassau on Bahamas Airways. Or to tropical Caribbean Islands by British West Indian Airways from Jamaica. **Commencing December*

World Leader in Air Travel

B·O·A·C

takes good care of you

Consult your travel agent or nearest BOAC office. Ask about budget plan: 10% down, balance in 20 months. BOAC direct service cities: New York, Boston, Chicago, Detroit, Miami, San Francisco. Other offices: Los Angeles, Philadelphia, Pittsburgh, Washington, Dallas.

BRITISH OVERSEAS AIRWAYS CORPORATION
Dept. C-45, 530 Fifth Ave., New York 36, N.Y. MU 7-8900

a startling difference your ear can hear

GRUNDIG Majestic

ULTRA-HIGH FIDELITY MUSIC INSTRUMENTS

"Debutante" 7015, AM-FM-SHORT WAVE
with Automatic Phonograph . . . $299.95*
Other Consoles . . . from $269.95

MAGNIFICENT "PORTRAITS IN SOUND" IMPORTED FROM WEST GERMANY

Now . . . with your Continental GRUNDIG MAJESTIC, all the wondrous complexity of colorful sounds that whirled through the composer's mind are yours to command instantly, at the mere press of a button on this magnificent instrument. Here too is cabinetry that refuses comparison; superb Walnut, Mahogany or Ash, hand rubbed and buffed by Black Forest craftsmen to a glowing, breathtaking finish. Yes, you'll recognize the startling difference in a GRUNDIG MAJESTIC the moment you see and hear it. Do it—today!

Table Models with
AM-FM-SHORT WAVE . . . from $109.95

Consoles with TV,
Tape Recorder, AM-FM-SHORT
WAVE and Automatic Phono, from $599.95

Write Chicago Office for: **FREE FULL-COLOR BROCHURE**
Illustrating over 35 models, and Name of Nearest Dealer

*prices slightly higher West and Southwest

Majestic INTERNATIONAL SALES division of WILCOX-GAY CORPORATION

743-G N. LaSalle Street, Chicago 10, Ill. • 79 Washington Street, Brooklyn 1, N. Y. • 25 W. 57th Street, New York 19, N. Y.

Mention the National Geographic—It identifies you

It's fun when you fly French to...

AFRICA

AIR FRANCE

Safari Tours

Three exciting itineraries cover the Dark Continent —both the primeval jungle areas and modern cities. Fly Air France non-stop New York to Paris—and then on to Africa. You'll enjoy French luxury and cuisine all the way!

U·A·T

Fast, comfortable flights—Paris to Johannesburg

Straight to the heart of the rich, beautiful Transvaal aboard a modern Super D.C. 6. Stopover privileges in Nice, Tripoli, Brazzaville, Livingstone and Salisbury. French service, comfort and cuisine all the way!

AIR FRANCE (General Agents for U.A.T.) Dept. N-11-7
683 Fifth Avenue
New York 22, N. Y.

Please send me the folders I have checked below:

( ) AFRICAN SAFARI TOURS
( ) WINTER HOLIDAY TOURS

Name_____

Street_____

City_____ State_____

Aboard the Santa Fe Super Chief.

Push-Button Focusing must be easy to use!

Of course the Graphic* 35 with exclusive Push Button Focusing is easy to use! You just squeeze the push-buttons and look through the coupled rangefinder window at the back of the camera to focus a brilliant full-color 35mm transparency or a sparkling black and white negative. The Graphic 35 camera has exclusive Spectramatic flash settings, too; they'll help get good indoor flash pictures almost automatically. Yes, the modern Graphic 35 camera has many, many features, features that make it the ideal camera for both beginners *and* advanced amateurs. *Complete outfit—camera, case and flash—as little as $8.95 down.*

As a companion for the Graphic 35 select the Constellation Slide Projector. It is the only 500 watt fully automatic projector priced under $100! Pay as little as $8.98 down. See the Graphic 35 and its teammate, the Constellation projector, at your Graflex dealer, listed in the "yellow pages."

For free folder write Dept. NG-117, Graflex, Inc., Rochester 3, N. Y. Prices include federal tax where applicable and are subject to change without notice. *Trade Mark

75th Anniversary—1887-1957

GRAFLEX®

Prize-Winning Cameras and Equipment

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

Lima has 400-year-old charm, big bargains in silver, deep sea fishing

Santiago's hotels are famous for fine food, modern comfort, friendly service, Latin fun

Today's man-about-the-world heads for gay South America

Buenos Aires race tracks draw smart crowds. Alligator bags cost very little in Argentina. Filet mignon costs 50¢

Panama, exciting crossroad by land, sea, and air, greets travelers from everywhere. Enjoy the Canal, and late night life

A new day has dawned in travel. People who've been everywhere now talk of South America's cities, scenery and lavish hotels—where dollars go a long, long way.

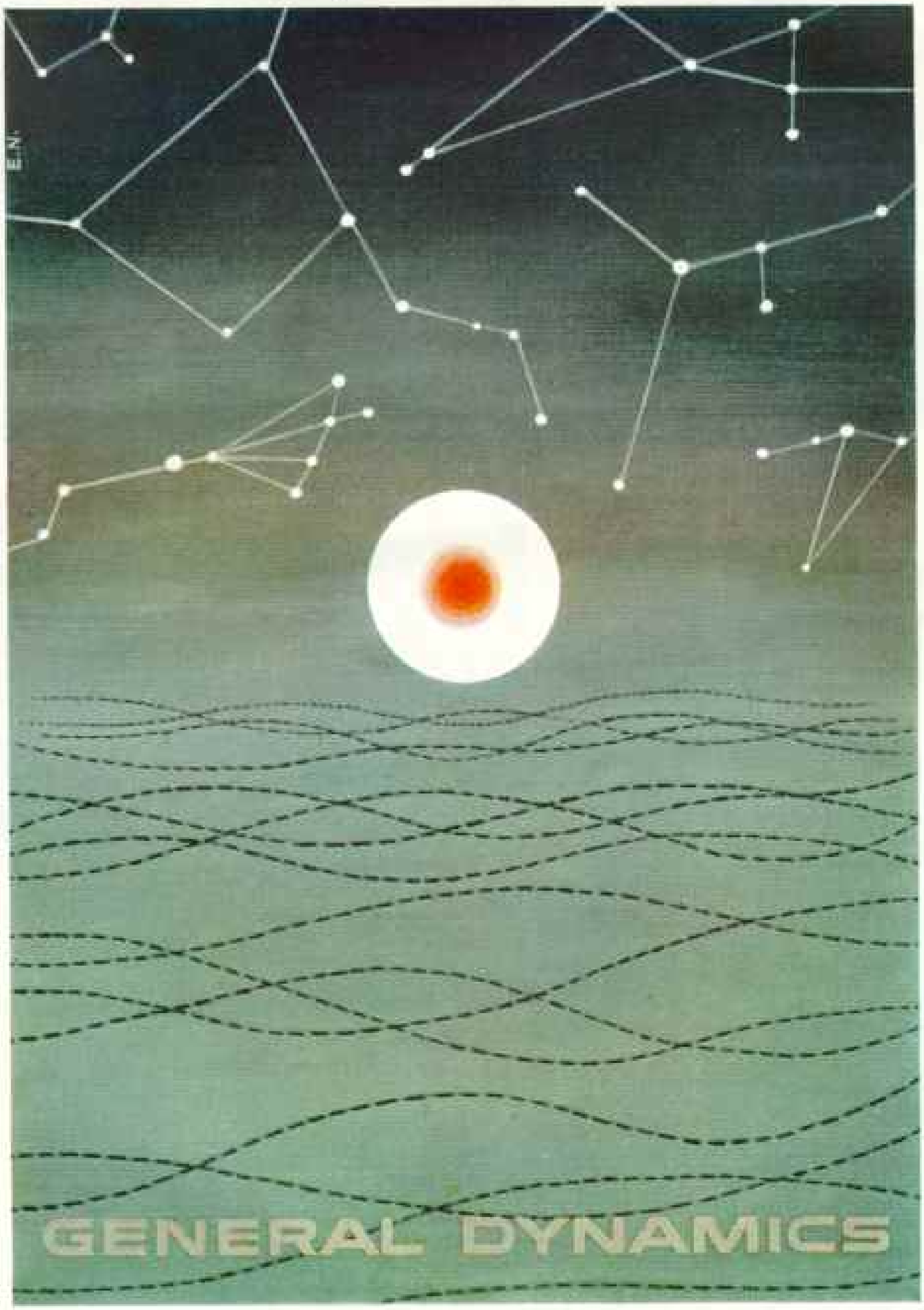
Lowest fares yet! For 30% off regular fares, you can go 'round South America on 28-day *Pan Am Holiday #703.* $989 from New York, includes hotel rooms, local sightseeing, and you fly *El Pacifico* DC-6Bs. For slightly more, you can fly *El InterAmericano* DC-7Bs. Both have radar, fly daily over the routes of National, Pan Am and Panagra. Call your Travel Agent or Pan American, U. S. Sales Agent for—

La Paz, Bolivia, lofty capital, smiles in sunshine below snowy peaks

PANAGRA

PAN AMERICAN-GRACE AIRWAYS

Exploring the Universe: Basic Forces . . . General Dynamics today is the product not only of its own particular history but of the scientific and industrial history of the Western world. As such, Dynamics declares its corporate purpose to be: *The comprehensive exploration of the basic forces of the universe and their translation into useful work under the sea, on the sea, on land, in the air, and in space beyond the earth's atmosphere.*



GD
C-L
EB
GA
ED
C-V
S-C

"Happy Marriage" blanket, with Dual Comfort-Selectors, lets each sleeper choose a different degree of warmth. $44.95*

You're never cold, never too warm...all you feel is comfort

General Electric Blankets
New low prices from $24.95*

The General Electric Blanket does what no ordinary blanket can do . . . *automatically* keeps you comfortable, in any weather.

If your bedroom temperature changes, the General Electric Blanket changes, too . . . so that *you're* never cold, yet never too warm. And you never have to get up for extra blankets!

This constant comfort makes a delightful difference in your next-day point of view.

Approved by Good Housekeeping

Comfort-Selector lets you choose the degree of warmth you like best. The G-E *Sleep-Guard*® system assures dependability.

Miracle fabric by Chatham, blended of cotton and rayon. Durable nylon bindings. Blanket *is completely washable!*

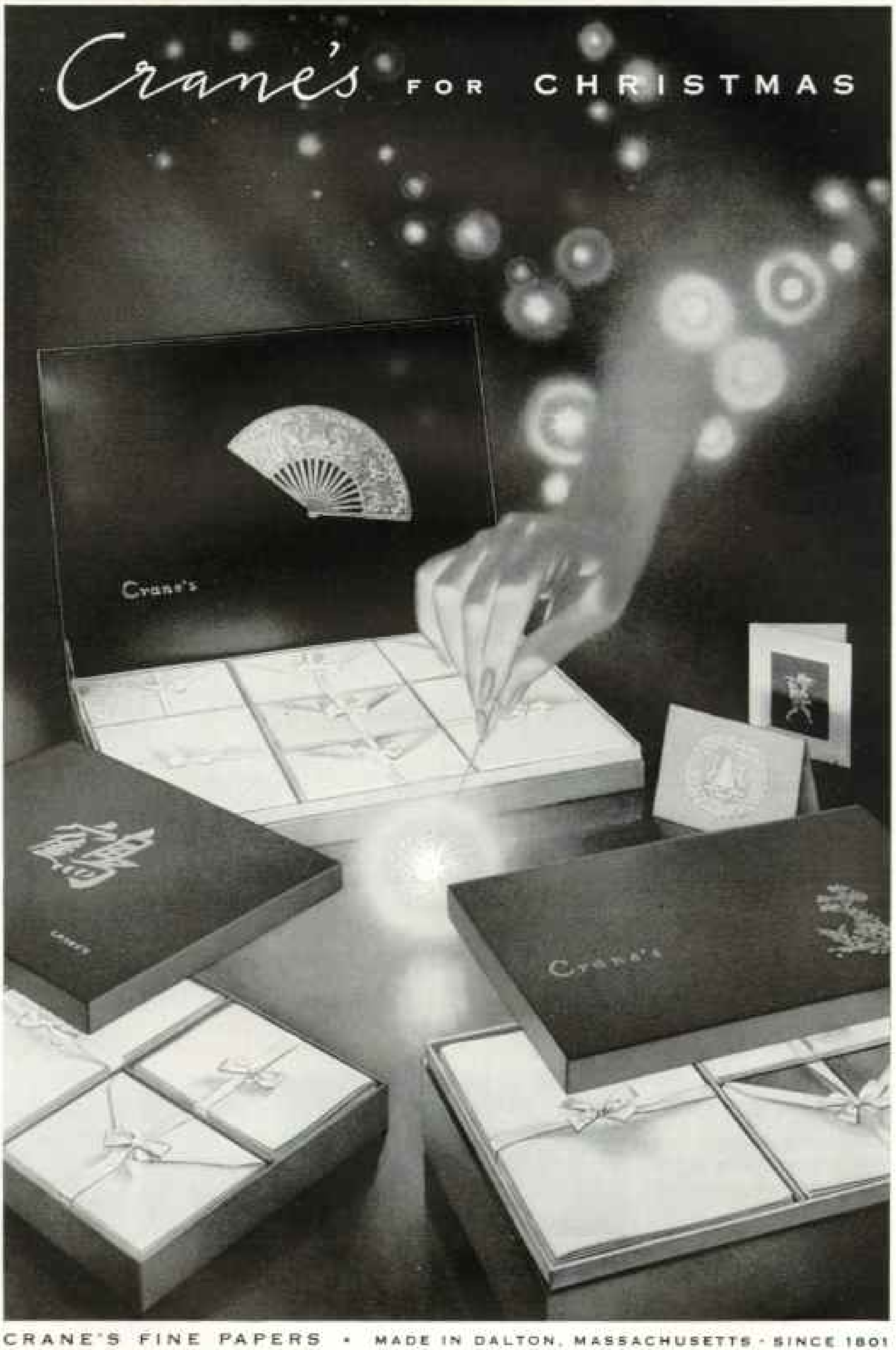
Six smart new colors. Custom-tailored corners. Approved by Underwriters' Laboratories.

*Manufacturer's recommended retail or Fair Trade Price: $24.95 to $44.95. General Electric Company, Automatic Blanket and Fan Department, Bridgeport 2, Connecticut.

15,000,000 people enjoy the comfort of automatic blankets... pioneered by General Electric.

Progress Is Our Most Important Product

GENERAL ELECTRIC



CRANE'S FINE PAPERS • MADE IN DALTON, MASSACHUSETTS · SINCE 1801

100% RAG PAPERS FOR SOCIAL AND BUSINESS CORRESPONDENCE · CURRENCY · SECURITIES · CARBON · TRACING

You can relax...
on the "City of Los Angeles" Domeliner

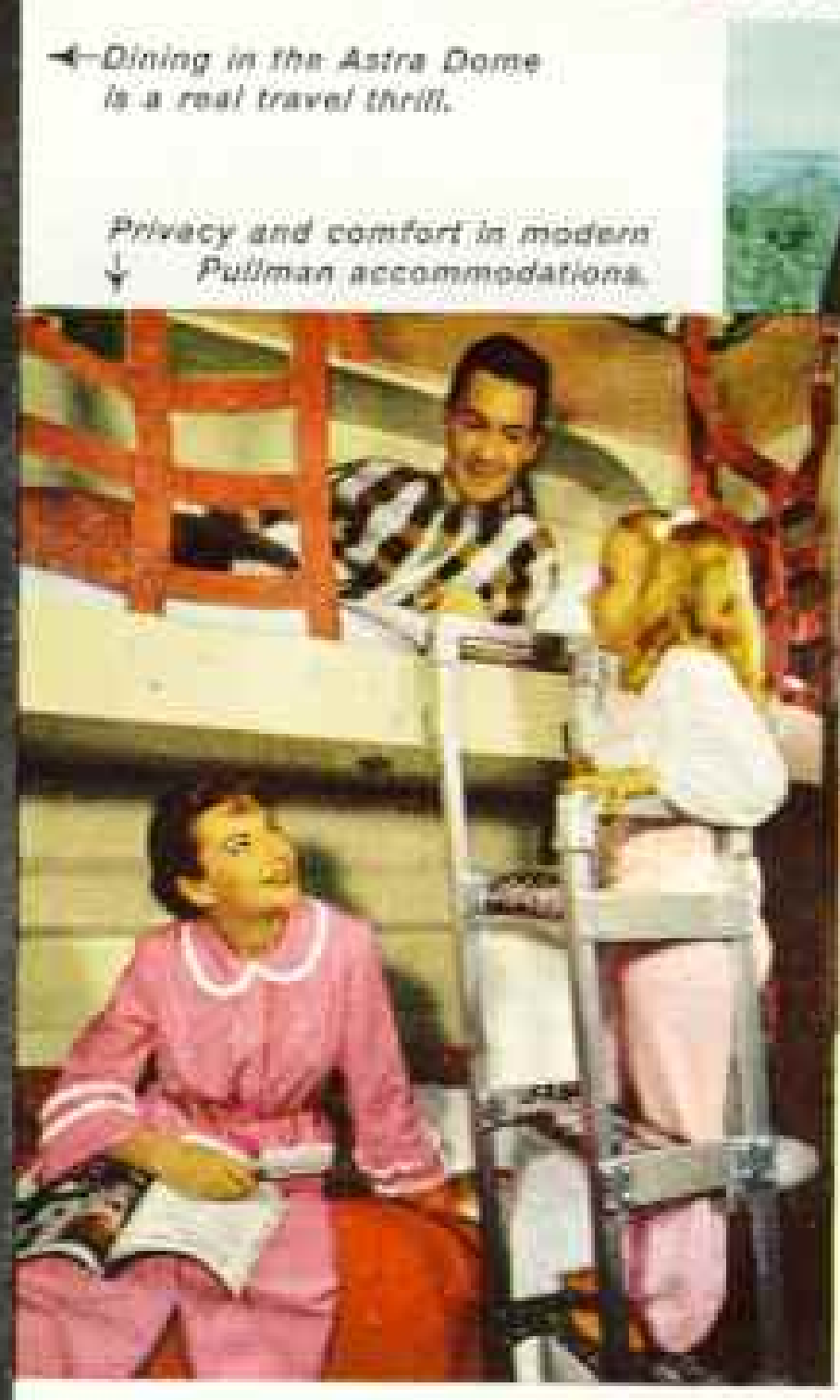
between **CHICAGO** and

Los Angeles

Too often we think of a vacation only in terms of *where* to go. The *how* of going also is of importance. It will add a great deal to your enjoyment if you board a Union Pacific Domeliner for a relaxing, scenic trip.

Dining in the Astra Dome is a real travel thrill.

Privacy and comfort in modern Pullman accommodations.



No extra charge for riding in the Astra Dome lounge car.

The Domeliner "CITY OF LOS ANGELES" represents the finest in modern rail travel. The photos tell the story. Dining-car service, too, is unsurpassed. You have a wide selection of freshly prepared foods, graciously served.

• • •

On your way to or from Los Angeles—by Union Pacific—you can stop over at exciting, glamorous Las Vegas at no extra rail fare. Ask your ticket or travel agent.

FAMILY FARE PLAN

You'll be surprised at what you can save on Family Plan rail fares. Generous baggage allowance. Ask any rail travel representative for details.

UNION PACIFIC RAILROAD

MAIL COUPON FOR BOOKLET

UNION PACIFIC RAILROAD

Room 777, Omaha 2, Nebr.

I am interested in a rail trip to California. Please send booklet.

Name_____

Address_____

City_____ Zone____ State_____

Phone_____

Also send Family Fare Plan Leaflet ☐

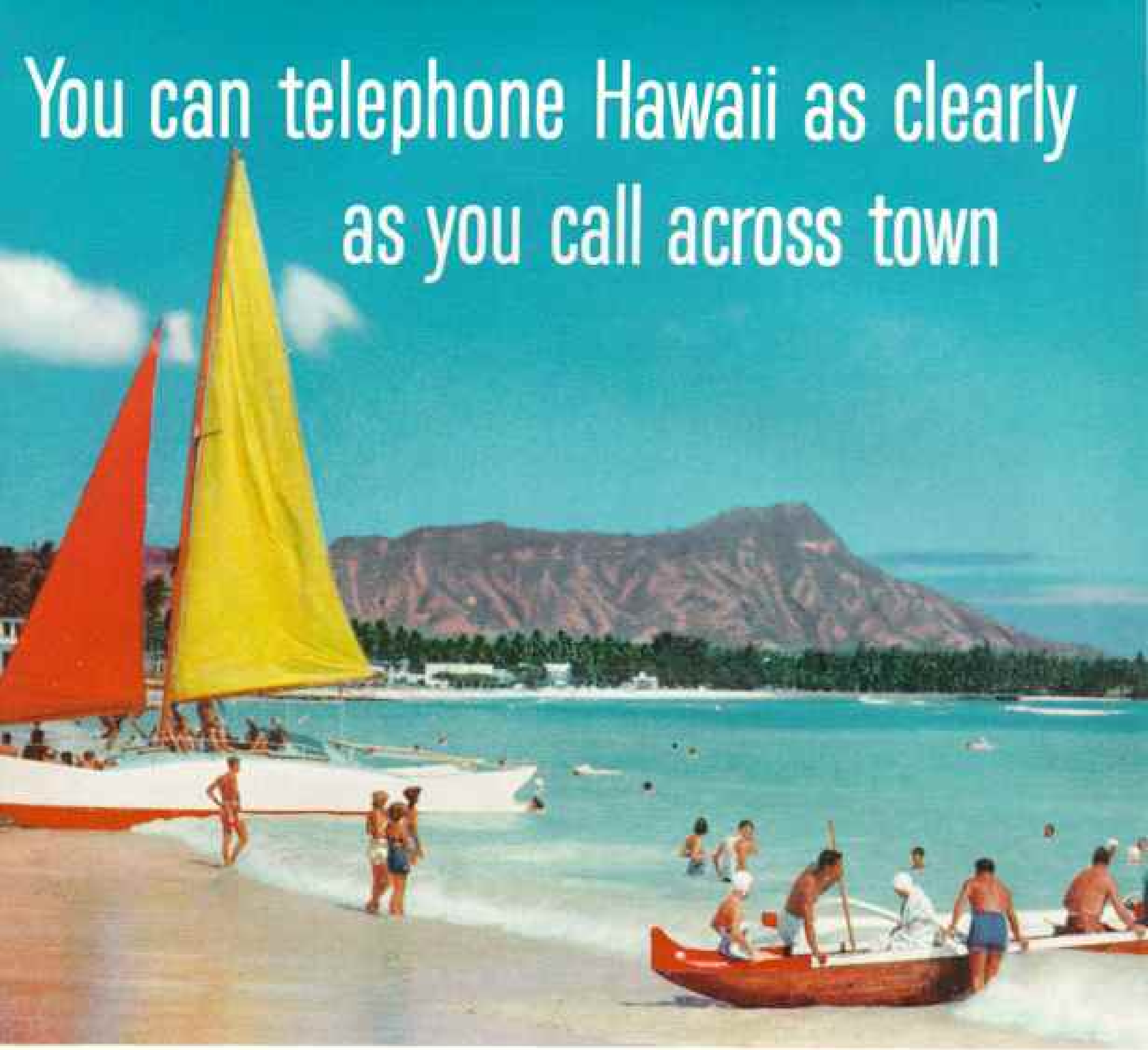
We're squeezing flight into smaller packages

The mighty MIG. Honeywell's new Miniature Integrating Gyro weighs less than 8 ounces, measures only 1.75 inches in diameter. In inertial guidance applications it is the equal, performance-wise, of floated gyros 3 times larger and contains 300 fewer parts than its predecessor. It is a typical example of Honeywell's success in "squeezing flight into smaller packages."

HERE at Honeywell Aero it isn't enough that our control and instrumentation systems are the last word in precision and dependability. They must also be engineered into the smallest, lightest and most compact form possible. Helping us meet this and other engineering challenges is a history of engineering achievement which includes: over one quarter million of the world's most accurate gyroscopes; more flight control systems than any other company has produced; fuel gages for every type of plane; control systems and components for missiles, rockets and jets. Honeywell Aeronautical Division, 2600 Ridgway Road, Minneapolis, 13, Minn.

Honeywell

H Aeronautical Division



Waikiki Beach in Honolulu

New underseas telephone cables now link United States mainland and Hawaii

Another historic advance in communication service has just been completed.

For years you have been able to call Hawaii by *radio*-telephone. Now new telephone *cables* have been added, stretching for 2,400 miles under the Pacific Ocean, connecting the United States mainland and Hawaii.

Added to the present radiotelephone circuits, the new cable system provides more and faster and better service. It makes it possible for you to telephone to and from Hawaii as clearly as you call across your own home town. Just give the operator your call.

KNITTING THE WORLD TOGETHER

The original certificate of incorporation, American Telephone and Telegraph Co., February 28, 1885, includes these prophetic words: "*. . . and each and every of said cities, towns and places is to be connected with each and every other city, town or place in said states and countries, and also by cable and other appropriate means with the rest of the known world as may hereafter become necessary or desirable . . .*"

BELL TELEPHONE SYSTEM

"The old gray miles ain't what they used to be!"

Now, Travel in First-Class Luxury!

Just take a look at yesterday's model to see how far bus travel has advanced!

Modern Trailways buses ride as smooth and quiet as a cloud. The contour design of the seats gives you solid, built-in comfort — from the leg-stretching room at your feet . . . to the new adjustable headrest. The scenery may change from sun-drenched plains to snow-covered mountains, but inside the air is always fresh and temperature controlled.

Many coaches have restrooms aboard and operate on fast, express schedules. There are several non-stop services, with hostesses to bring your pillows, magazines, and refreshments from the snack bar.

Trailways offers you a choice of several scenic routes — go one way and return another. Choose an arrival or departure time that is the most convenient . . . then travel straight thru on the same bus without a change. Enjoy the luxury of first-class travel by making your next trip on Trailways.

TRAILWAYS, Dept. NG 117
1012 14th St., N.W., Washington, D.C.
Please send me FREE information on a trip.

To_____

From_____

Approximate Leaving Date_____

I am interested in ☐ expense paid tour, ☐ vacation trip (check one).

Name_____

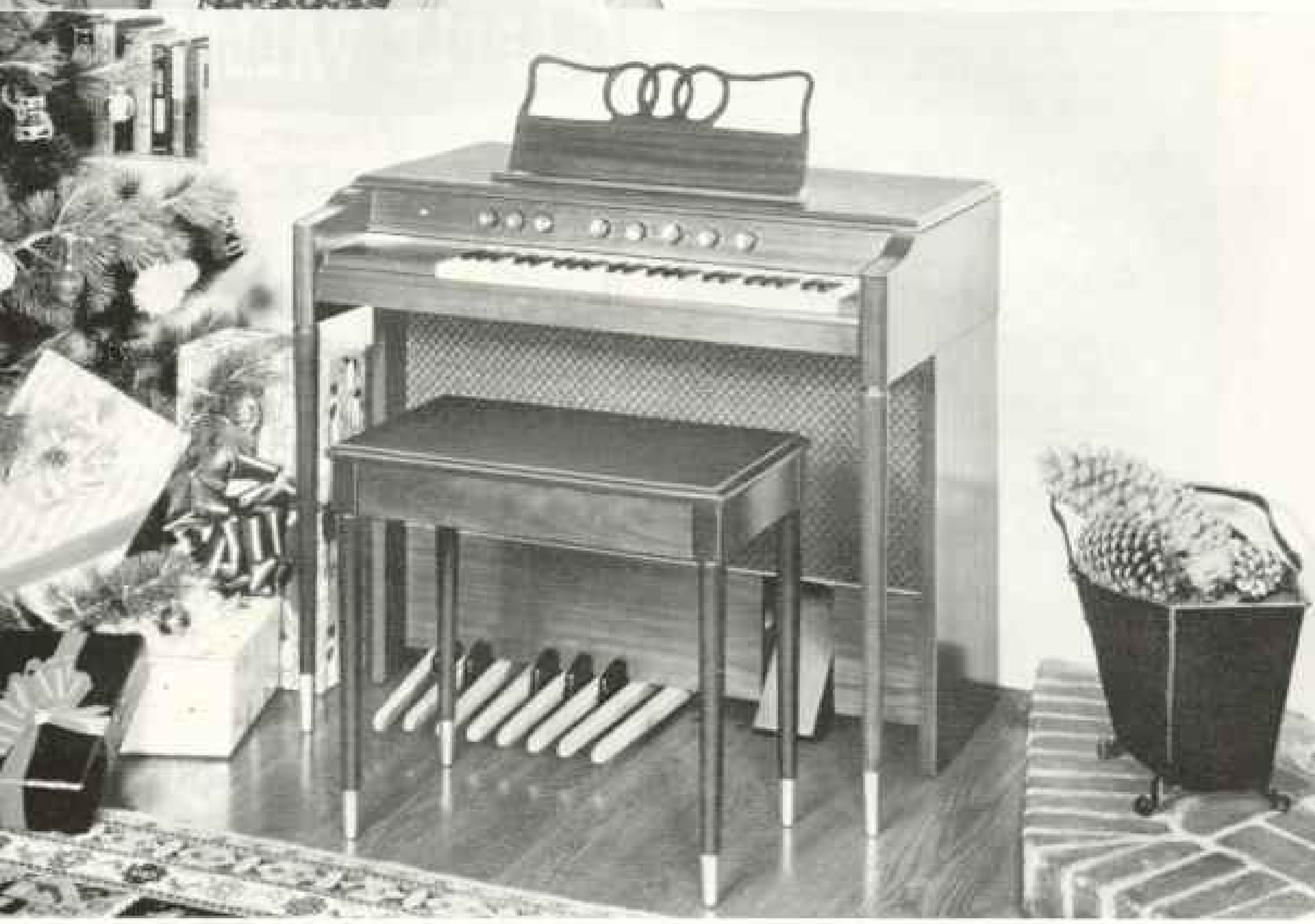
Street Address_____

City_____ State_____

TRAILWAYS

"It's fun to watch and hear the children make progress on our Thomas Organ"

Says Mr. William Rogers
of 741 Brummel, Evanston, Illinois.



...and this fine home organ is only $695!

WOULDN'T IT BE WONDERFUL this Christmas to include a fine Thomas Organ in your family fun? Imagine the thrill of giving a Thomas on Christmas Eve . . . and playing carols on Christmas Day!

IT'S THAT EASY. Many people . . . without any previous musical training . . . play melodies the first evening. Because the Thomas *invites* you to play. A simple keyboard smiles at you. Voices are controlled by dials. Sound like a string ensemble, create a lilting woodwind air or turn to the organ's own inspiring voice and play carols with all the *warmth* of Christmas.

FOR ADDED COLOR, the exclusive Solo Control accentuates a melody high or low. Make it "sing" with continuous Variable Vibrato. And listen to that *true organ tone*—sweet, clear highs—deep, rich bass.

SO MUCH FOR ONLY $695! Because of Thomas Organ inventions plus long electronics experience—almost every family can afford this fine home organ. A variety of styles to choose from. As low as $70 down delivers a Thomas. Bench extra. PRICES SLIGHTLY HIGHER IN CANADA. FOR YOUR THOMAS DEALER CALL WESTERN UNION BY NUMBER AND ASK FOR OPERATOR 25.

Thomas
ELECTRONIC
ORGANS

Guaranteed by Good Housekeeping

COMMENDED PARENTS

In Canada—EATON'S OF CANADA

FREE . . . DEMONSTRATION RECORD!

THOMAS ORGAN COMPANY
A Division of Pacific Mercury Corp.
8361 Haysenhurst Avenue, Sepulveda, California

I'd like your Free Record of organ music.

NAME _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

This year, hear a new panorama of tone at Florida's famed

SINGING TOWER

To bell tones of traditional majesty, the Singing Tower at Lake Wales now adds the enchanting voices of the plucked harp and silvery celesta! The instrument that makes possible this glorious music is the

SCHULMERICH "CARILLON AMERICANA"*

. . . the most recent development of the world's leading maker of carillons, bells and chimes. When you listen to the "Carillon Americana" remember that a Schulmerich carillon makes an ideal memorial gift for church, chapel, school or college. Many sizes are available. A 25-bell Schulmerich carillon can now be installed for as little as $2500. For an interesting folder on the history of bell music, write to Schulmerich Carillons, CU Carillon Hill, Sellersville, Pa.

*Trademark

SCHULMERICH CARILLONS

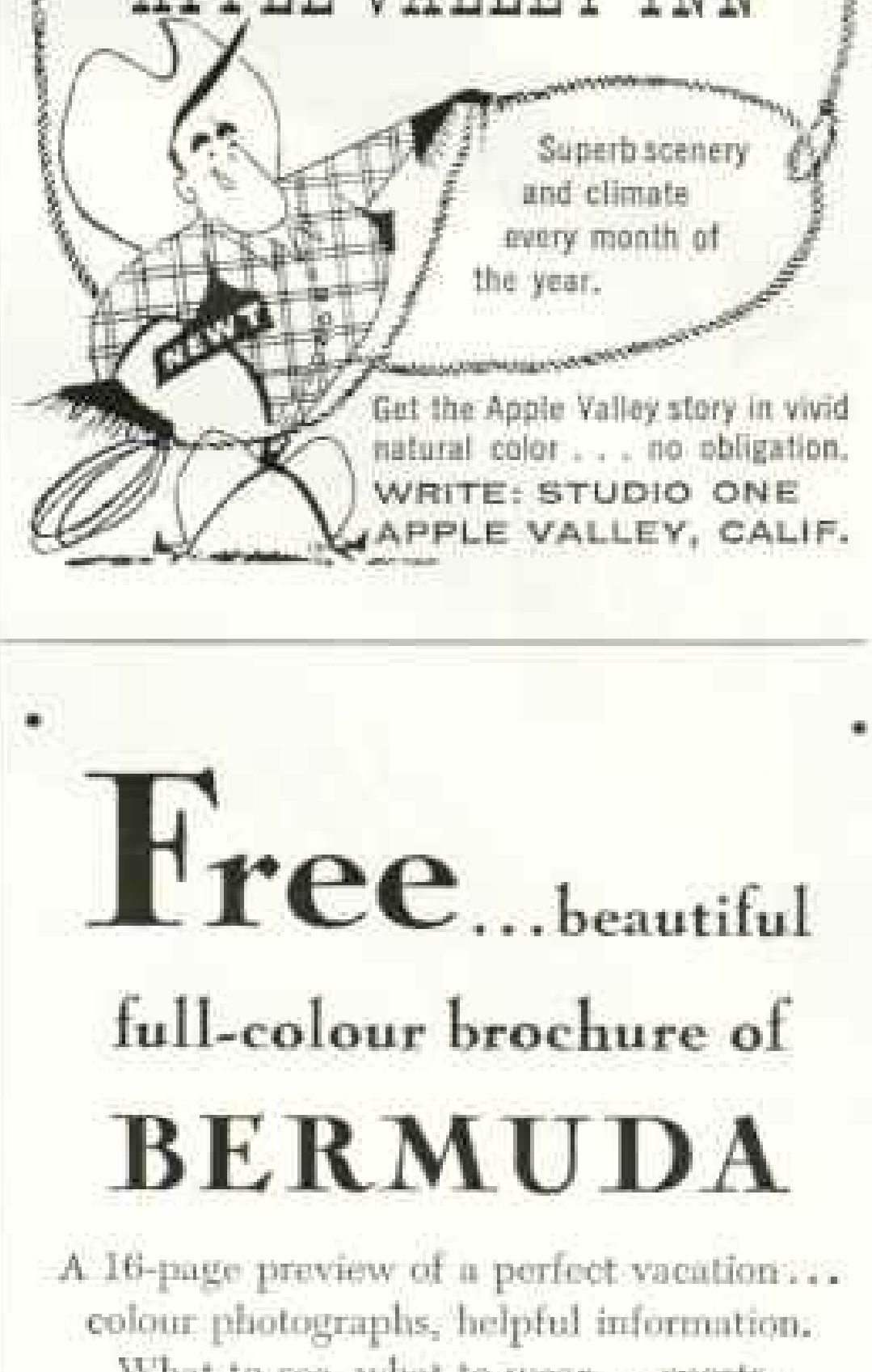
CALIFORNIA'S INCOMPARABLE DESERT

THE *Golden Land* OF

APPLE VALLEY

Home of Renowned

APPLE VALLEY INN



Get the Apple Valley story in vivid natural color . . . no obligation.
WRITE: STUDIO ONE
APPLE VALLEY, CALIF.

Free...beautiful full-colour brochure of BERMUDA

A 16-page preview of a perfect vacation . . . colour photographs, helpful information. What to see, what to wear . . . sports, beaches, shopping, transportation, hotels and guest houses.

SEND COUPON TODAY!

The Bermuda Trade Development Board,
Dept. N711, 620 Fifth Ave., New York 20, N. Y.

Please send Illustrated Bermuda Brochure.

Name _____

Street Address _____

City _____ Zone ____ State _____

FIRE INSURANCE

THEFT INSURANCE

LIABILITY INSURANCE

ALL IN ONE POLICY!

See how Hartford's one-policy "Package" gives you 3-in-one protection!

Why buy *three* policies—and pay *three* premiums?

You get *Fire Insurance* in the Hartford "Package." *Plus* windstorm, hail, lightning, smoke damage, glass breakage, vandalism and explosion insurance for your home and just about everything in it . . .

You get *Theft Insurance* that pays you for losses of clothing, appliances, silverware and other items of personal property stolen from your home . . .

And *Liability Insurance* for accidents at your home or resulting from many activities away from home.

For all 3 coverages . . . just one policy . . . with one renewal date . . . one premium. Modern . . . convenient . . . *and may save you up to 20% of what separate policies cost!*

Begin enjoying the advantages of a "Package" Policy this week. Your Hartford Fire Group Agent will arrange to give credit for present policies, and set up budget payments for the new one, if you like. See him. Or mail coupon for folder.

Year in and year out you'll do well with the

HARTFORD
FIRE INSURANCE
COMPANY **GROUP**

Hartford Fire Insurance Company
Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey
Hartford 15, Connecticut
New York Underwriters Insurance Company
New York 38, New York
Northwestern Fire and Marine Insurance Company
Twin City Fire Insurance Company
Minneapolis 2, Minnesota

• • • • • • Mail today for FREE folder • • • • • •

Hartford Fire Insurance Company Group
Hartford 15, Connecticut Dept. FG-11

I'd like full details on the "Package" Policy. Please send me your free folder.

Name_____

Address_____

City_____ Zone_____ State_____

delicious coffee... automatically

BUFFETS
PARTIES • DINNERS
"REC" ROOM EVENTS
CHURCHES • CLUBS • OFFICES
EMPLOYEE LUNCH ROOMS

3 sizes...

48 to 72 Cup

30 to 50 Cup

12 to 24 Cup

WEST BEND

party percolators

Just pour in cold water — plug into AC outlet — add coffee — and forget it. Delicious coffee is as easy as that — and the coffee stays serving hot automatically, too. These new, large perks operate as easily as your 8 cup percolator. Signal light flashes when coffee is ready to serve. Durable aluminum. West Bend manufacturers automatic percolators from 2 to 72 cup capacity.

12 to 24 cup...$29.95 30 to 50 cup...$39.95 48 to 72 cup...$42.95

AUTOMATIC SKILLET
with polished aluminum cover $22.95

FLAVO-MATIC COFFEE MAKERS
2 to 5 cup $11.95
6 to 8 cup $13.50

At Housewares, Hardware, Gift and Appliance Stores; Prices Slightly Higher in Canada and Hawaii.

WEST BEND ALUMINUM CO.
Dept. 82b, WEST BEND, WISCONSIN

Enjoy

A New World of Carefree Living...
in a NEW MOON Mobile Home

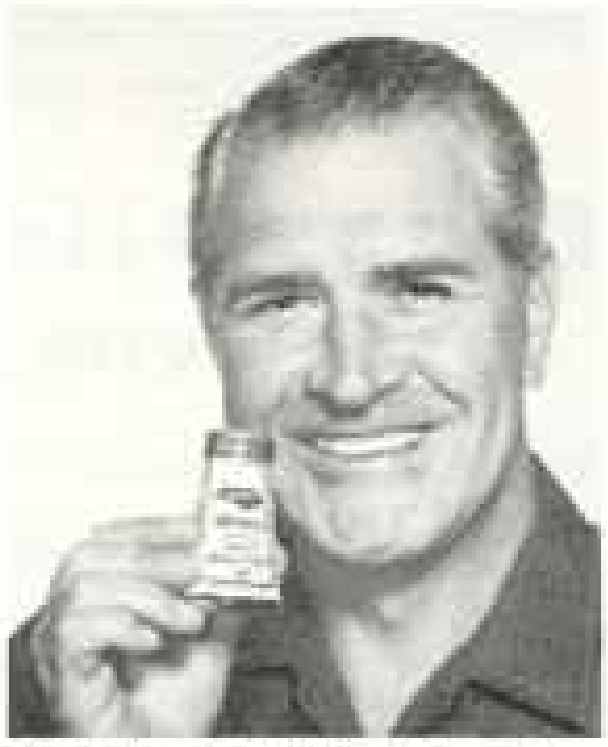
Carefree... comfortable... economical. That's life in a spacious, completely furnished NEW MOON, where easy upkeep means more time for casual entertainment or the luxury of complete relaxation.

Write today for a free copy of New Moon's colorful 1957 folder

NEW MOON Homes, Inc.
Alma 2, Michigan

Preferred by More Families... in More States... than any other Mobile Home

On a SALT-FREE Diet?



Start enjoying meals again by seasoning your food with Adolph's, the best-tasting salt substitute made. Adolph's looks and sprinkles like salt—retains its flavor in all cooking, baking and canning. Adolph's contains Mono-Potassium Glutamate, which accents the true flavor of all foods—makes them taste their natural best. Ask for Adolph's Salt Substitute at your grocer's.

ADOLPH'S LOW-SODIUM MEAT TENDERIZERS are the only meat tenderizers available for salt-free diets. Ask your grocer or write Adolph's Ltd., Burbank, California.

Adolph's
SALT SUBSTITUTE

Now—the greatest minds and ideas of thirty centuries—yours for more successful living today

ENCYCLOPAEDIA BRITANNICA in collaboration with the UNIVERSITY OF CHICAGO present . . .

THE REVOLUTIONARY NEW

SYNTOPICON

THE **MASTER KEY** TO THE

GREAT BOOKS OF THE WESTERN WORLD

Ingenious, new literary invention magically opens for you the wisdom and knowledge contained in the Great Books!

Yes, through the development of an ingenious new literary tool—called the SYNTOPICON—the GREAT BOOKS, those great masterpieces of literature you've always wanted to read—now can be read easily.

No longer is it necessary to deprive yourself of the benefits and enjoyment the GREAT BOOKS bring, on the grounds that you "don't have the time." The masterful writings included in these volumes—spanning thirty centuries and the whole record of Western Culture—have been carefully selected by a group of the world's most eminent scholars. They are now magically opened for you by the unique SYNTOPICON.

Plato

Shakespeare

Goethe

The GREAT BOOKS contain 443 works by 74 authors—Homer, Plato, Aristotle, Hippocrates, Thomas Aquinas, Machiavelli, Shakespeare, Augustine, Bacon, Swift, Dostoevsky . . . to name just a few. Chances are, however, that no private library or collection can boast them all. Twelve of them are not available at all in English.

These works are indispensable to the liberal education of a free man in the Twentieth Century. To every man they are a challenge to raise himself above the level of the commonplace. They bring you and your family the wisdom and culture that have ripened and mellowed with the passing centuries . . . enabling you to speak with ease and authority on the widest variety of subjects. You can have at your instant command the thoughts of the world's finest intellects to aid you in gaining greater material success in the business world and greater spiritual and mental attainment.

And now with the help of the amazing SYNTOPICON, the GREAT BOOKS can be yours, and your family's—not just to own—but to live with, profit from, and enjoy for a lifetime. Yes, the greatest minds and ideas of thirty centuries can now be yours—for a more satisfying life today.

Handsome brochure offered FREE!

A costly full-color brochure that tells the complete story of the GREAT BOOKS and the SYNTOPICON can be yours, free and without obligation, if you act now. To obtain your copy of this handsome booklet, just fill in and mail the coupon today. The supply of this costly brochure is necessarily limited—so avoid the chance of disappointment, mail the coupon now!

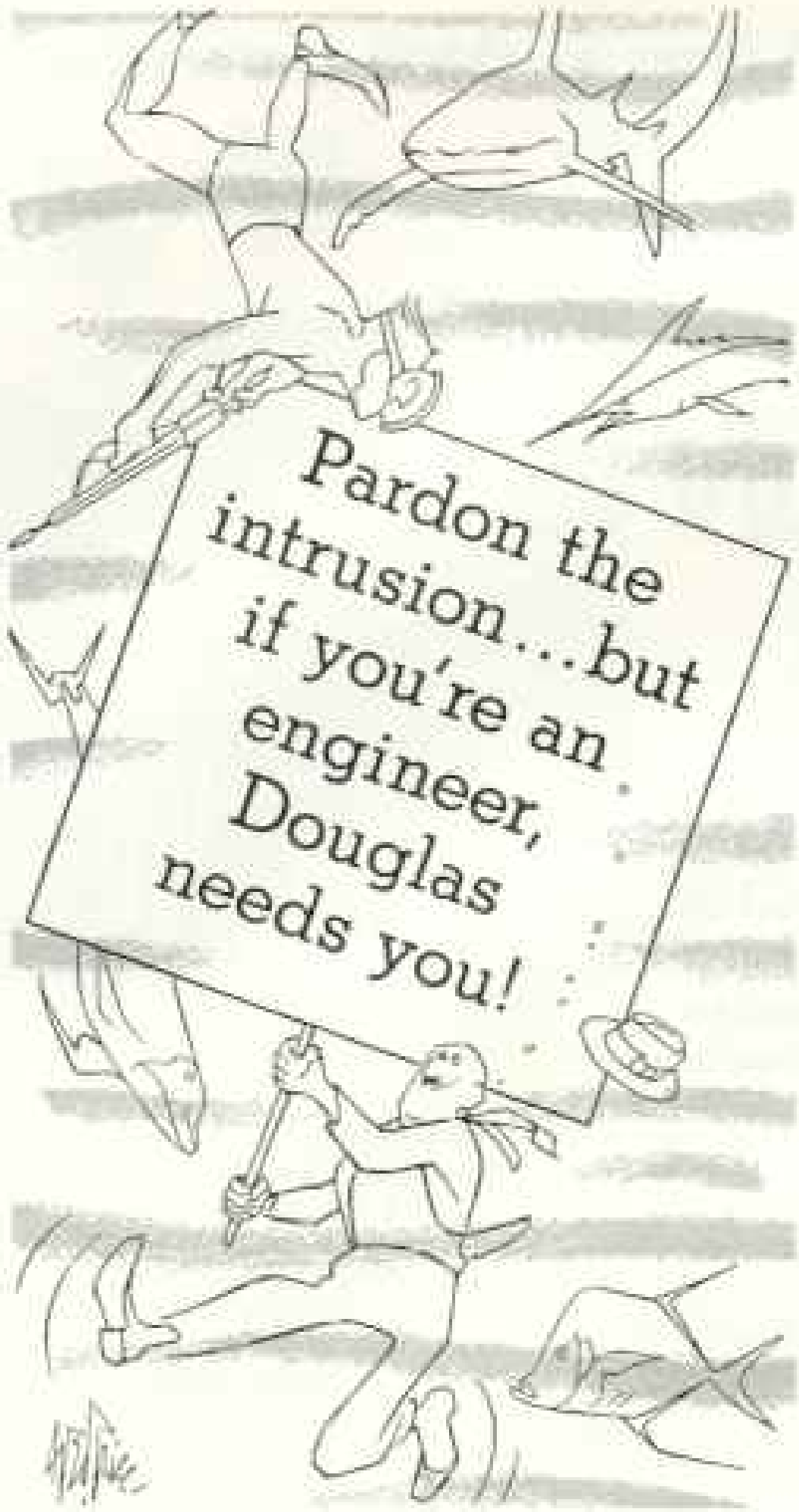
GREAT BOOKS OF THE WESTERN WORLD, Dept. 147-B
425 N. Michigan Avenue, Chicago 11, Illinois

Please send me, *free and without obligation* your handsome brochure which pictures and describes the GREAT BOOKS and the revolutionary SYNTOPICON in exciting full detail. Also include complete information on how I may obtain this magnificent set, *direct from the publishers*, on your special budget plan.

Name _____
(please print)

Address _____

City _____ *Zone* ____ *State* ____



Do you know what *your depth* really is? A lot of engineers never get the chance to find out. But at Douglas, we give you the ocean to test your talents. We think you'll find the kind of challenge you're looking for among the many exciting — and still classified — projects at Douglas. Tell us "your dreams" and we'll try to help you make 'em come true. We're located on both coasts and a good many places in between.

Please write for complete information to:

C. C. LaVENE
DOUGLAS AIRCRAFT COMPANY
BOX 620-E
SANTA MONICA, CALIFORNIA

Go further with **DOUGLAS**

WHEN YOU OWN THE FAMOUS EXAKTA . . . YOU OWN THE BEST!

The New Automatic

EXAKTA IIa

35-MM SINGLE LENS REFLEX CAMERA

The Exakta IIa is acclaimed to be the most versatile camera in the world. With the Exakta you can photograph not only such subjects as children, pets, wildlife, flowers, landscapes and industrial scenes, but also microbes under a microscope—or even the moon if you wish. You can use it in your work for making slides and to copy documents, pages from books, stamps, etc. The Exakta always gives you the perfect assurance of positive accuracy, because the same lens that is used for viewing also takes the picture! The picture you see on the ground glass is precisely the picture your Exakta IIa records on film! The Exakta IIa is a remarkable instrument that liberates you from every picture-taking limitation. You can take all types of pictures with this very same viewing system . . . from microscope to telescope and everything which is in between, including close-ups! Your dealer will be glad to demonstrate the new Automatic Exakta IIa Camera to you.

free!

Write today Dept. 420 for FREE illustrated and descriptive brochure on New Automatic Exakta IIa camera.

EXAKTA CAMERA COMPANY
205-A Bruns Street, Brooklyn, New York

Print your own
FASTER . . . AT LOWER COST
on the Heyer ELECTRIC DUPLICATOR

Model 76 A
$299.50 plus tax

Print Bulletins, Sales Letters, Forms . . . sharp, clean copies of anything typed, written or drawn. **Conqueror Mark II Automatic Electric Spirit Duplicators** deliver 110 copies per minute; post card to legal size, in 1 to 5 colors . . . at the touch of a button. There's no effort on the operator's part for these Conquerors run without watching and even *turn off automatically*. They conquer every duplicating job with speed, ease and neatness . . . and they're *priced much below comparable machines*.

FREE 16 Page Booklet gives full information. Send for it today!

THE HEYER CORPORATION
1859 S. Kostner Ave., Chicago 23, Ill.

Kenton listens to Brown on Zenith High Fidelity

No one is fussier about tone than a musician. That's why music men, like Stan Kenton and Les Brown, take such pleasure in Zenith Extended Range High Fidelity. On a Zenith you hear the original performance . . . exactly as recorded . . . *all* the delicate highs, the vibrant lows, and rich middle tones. Here is High Fidelity of truest quality . . . Zenith Quality! And too, only Zenith gives you the Studio Sound Control Panel so you can adjust the tone to the make of your record and the acoustics of your room.

SHOWN: Zenith's Rhapsody FM-AM Radio High Fidelity Combination. Model HF1284. Choice of Blond Oak, Walnut, Sable Gray, or Ebony color. All with woven cane grille. From $425.*

QUALITY BY

Zenith

The Royalty of High Fidelity

and Les Brown has one, too!

*Zenith High Fidelity Instruments priced as low as $99.95**

- Exclusive Zenith Studin Sound Controls—"Presence" control (to project the soloist out in front of the orchestra), loudness control, bass and treble controls—for unmatched mastery of tone.
- 4 Zenith Quality Speakers: two Alnico 5 "woofers" and two extra sensitive electrostatic "tweeters" cover the full range of human hearing.
- Record Compensator—adjusts so that present-day LP records (*whatever the brand*) play with highest fidelity.
- Zenith Custom Cobra-Matic® Record Changer plays all speeds—10 to 85 rpm. Built-in stroboscope tells when record is playing at precise recorded speed. Feather-light Cobra® Tone Arm makes records last longer, sound better.

Backed by 38 years of leadership in radionics exclusively. Also makers of Radio, Television and fine Hearing Aids.

*Manufacturer's suggested retail price, slightly higher in far West and South. Prices and specifications subject to change without notice.

Zenith Radio Corporation, Chicago 39, Illinois

This quality goes in before the Zenith name goes on.

ZENITH

Featured, two of Capitol Records' latest: "Les Brown's in Town" and Kenton's "Cuban Fire."

FREE FACTS about 29 careers for your child !

Booklets by world's leading authorities help you help him plan his future!

Here's valuable help from New York Life for parents who want solid facts to better guide their children in the selection of a career. Each of the 29 booklets was written by a top authority in his field and contains detailed information about background and preparation for each career, as well as opportunities and rewards that can be anticipated.

For any or all of these booklets, simply check the list below and mail the coupon. They're offered as a public service by New York Life and come to you without obligation.

Check the booklets you want—MAIL TODAY

New York Life
Insurance Company

Career Dept. NG-13
51 Madison Avenue
New York 10, N. Y.

☐ Doctor
☐ Lawyer
☐ Chemist
☐ Printer
☐ Retailing
☐ Dentist
☐ Architect
☐ Nurse
☐ Teacher
☐ Farmer
☐ Banker
☐ Accountant
☐ Engineer
☐ Aeronautical Engineer
☐ Salesman
☐ Pharmacist
☐ Electronic Engineer
☐ Librarian
☐ Newspaperman
☐ Public Servant
☐ Home Economist
☐ Personnel Work
☐ Atomic Scientist
☐ Owner of His Own Business
☐ Mineral Engineer
☐ Armed Forces
☐ Food Retailing
☐ Medical Technologist
☐ Traffic Manager
☐ We will also send you a booklet on "The Cost of Four Years of College"

Name_____

Address_____

City_____ Zone_____ State_____

Add-a-Coin Bracelet

Rush reply today! Exciting, generous NEW offer of beautiful, hard-to-get stamps — some not even catalogued yet. These NEW Elizabeth II stamps have never been given before, now yours FREE. From world's newest country, Ghana, Pitcairn Islands, Kenya, Cook Islands, Ascension, many others. All genuine, all different, mint and used — so new, you'll add them all to your collection. Other offers for inspection plus free "Stamp Collector's Guide". *Offer Limited.* RUSH name, 10c for postage, handling to GARCELON STAMP CO., Dept. NG11Q, Calais, Maine.

Perhaps you didn't see us offer this book FREE. So here it is once more: opportunity at your door!

THIS IS THE HOUR: *A Novel about Goya* by Lion Feuchtwanger is *free* to the new members of The Heritage Club who enroll for a six-months' sampling of beautiful books. This richly pictorial edition has nearly two hundred reproductions of Goya's work: forty-four are full page, either in color or gravure. Mail coupon *promptly* and a Prospectus will be sent at once.

TO: THE HERITAGE CLUB
595 Madison Avenue, New York 22

NAME_____

ADDRESS_____

_____

226-N

Treasured beyond all other gifts

All *your* yesterdays. . . . A gift of diamonds is a bridge for time. . . . Beyond all other gifts it stars the cherished moments of a shared lifetime. . . . It gives, as nothing else, enduring meaning to all your yesterdays by making them a part of your tomorrows. . . . "A diamond is forever."

This year, let a diamond make memorable that special anniversary, or important birthday, a debut, the birth of a child, or any significant event.

½ carat, $235 to $500

1 carat, $625 to $1230

2 carats, $1365 to $3410

3 carats, $2500 to $5910

Color, cutting and clarity, as well as carat weight, contribute to a diamond's value. A trusted jeweler is your best adviser. Prices shown cover range of quotations in July, 1957, by representative jewelers for their top-quality unmounted diamonds. (Federal tax extra.) Prices vary with top qualities offered. Exceptionally fine stones are higher.

De Beers Consolidated Mines, Ltd.

Crowning achievement of 166 years of fine watchmaking – the new Girard Perregaux self-winder has 39 *functional* jewels. The extra jewels mean less friction and wear – greater precision and longer life – smoother winding at the slightest motion of your wrist. The model illustrated indicates the date automatically. It is shockproof and water-resistant. In gold, gold armor, or steel. – Ask for a "39 Jewels" folder explaining this latest achievement in Swiss watchmaking.

GIRARD PERREGAUX
Fine Watches since 1791

Prices somewhat higher in the U.S.A.

S. A. GIRARD PERREGAUX & Co.
La Chaux-de-Fonds, Switzerland – 610 Fifth Avenue, New York

Compare the AIRES with all other 35mm cameras and you'll see why it is acclaimed the world's best value! *Features include:* "Trimming" type combined viewfinder-rangefinder that makes it a cinch to shoot fast-moving objects, even if you wear eye-glasses . . . LVS 1/500 sec. shutter . . . Automatic rangefinder focusing to less than 2 feet . . . Fast 6-element f:1.9 45mm lens. At dealers everywhere, only $99.50. Case $12.50.

For literature, write Dept. GA712

Kalimar Inc.
1109 S. Kingshighway – St. Louis 10, Missouri

Astronomy is FUN

FREE BOOKLET
TELLS YOU HOW TO CHOOSE THE RIGHT TELESCOPE

Accurate facts on how telescopes differ in performance. Describes types used by professionals. Tells features to look for. Tips on how to select wisely. Many illustrations. Postcard brings you copy FREE.

Criterion Manufacturing Co.
Dept. NLC2, 331 Church St.
Hartford, Conn.

8mm MOVIES
"ON APPROVAL"
See BEFORE You Buy!

Send for 50 FT. COLOR film on approval. Check your preference. If you keep it send only $5.00.

- ☐ Yellowstone
- ☐ Boulder Dam
- ☐ Grand Canyon
- ☐ Yosemite
- ☐ Niagara Falls
- ☐ Crater Lake
- ☐ Bryce Canyon
- ☐ Sequoia

Free Catalog—8mm & 16mm movies in color and B&W—Comedy, Variety, Spectacular, etc.

VARIETY MOVIES Dept. G-11
Box 7589, Hollywood 28, California

How many of these famous places have you visited?

You can visit the far-off, exciting places you've always dreamed about—even on a short vacation—if you travel by air. You'll have more time to enjoy yourself at your destination, thanks to today's fast flights and frequent schedules. Modern air travel is convenient, clean, and comfortable. The cost may be less than you think, with family travel plans or air coach rates.

Any airline representative or travel agent will be glad to offer suggestions about flying to new places this year to help you get the most out of your precious vacation.

The air is yours—use it!

UNITED AIRCRAFT CORPORATION *East Hartford, Conn. • In Canada: Canadian Pratt & Whitney Aircraft Co., Ltd. Designers and builders of:* PRATT & WHITNEY AIRCRAFT *engines,* HAMILTON STANDARD *propellers and turbine aircraft equipment, and* SIKORSKY AIRCRAFT *helicopters—for our armed forces and the finest airlines in the world.*

Faced with

HIGH COLLEGE EXPENSES within the Next Few Years ?

Plan Ahead to Budget and Insure the Complete Cost of your Child's Education*

The Insured Tuition Payment Plan relieves you of the hardship of meeting high college bills each semester by spreading the cost over pre-college as well as college years. It also ends your worry about the effect of your death or disability on your child's education because the amount of the insurance is always equal to the balance of the cost of your entire educational program. You plan your child's complete educational program and pay at minimum cost over 12 months each year out of earnings. When your son or daughter is admitted to college the Insured Tuition Payment Plan pays the college each year the amount you have selected for the number of years you have provided. This unique plan is now operating in many of America's leading schools and colleges. The earlier you start a plan, the smaller your monthly payments and the longer the term of the low-cost insurance protection.

Write Today for Full Details

Richard C. Knight
INSURED TUITION PAYMENT PLAN
112 Water Street, Boston 9, Mass.

Please send me full details on the following educational program:

1. Number of years Plan is to pay educational expenses: _____
2. Annual amount of educational expense*: $ _____
3. First payment to college is to be made in the fall of: 19 _____
4. Date of birth of the parent to be insured: _____

PARENT'S NAME AND ADDRESS (Please Print)

_____

_____

_____

* Tuition, Board, Room, Fees and Other Expenses (or any part thereof) for as many years as you plan.

Trustee of the Funds: Second Bank-State Street Trust Co., Boston, Mass.

G-11

Christmas gift for SLIDE FANS

Bi-Lens® 35

Slide Viewer with BUILT-IN LIGHT for NATURAL viewing with BOTH eyes!

ONLY $6.95

(batteries and transformer extra)

Say Merry Christmas and Happy VIEWING to every slide fan on your list, with Bi-Lens/35! It offers crisp, distortion-free viewing, exciting new depth, a built-in light that uses batteries or AC current with transformer. And—it accepts all 2x2 slides: 135, 828, Rollei Super slides and new 127 Ektachrome Super slides! See it today.

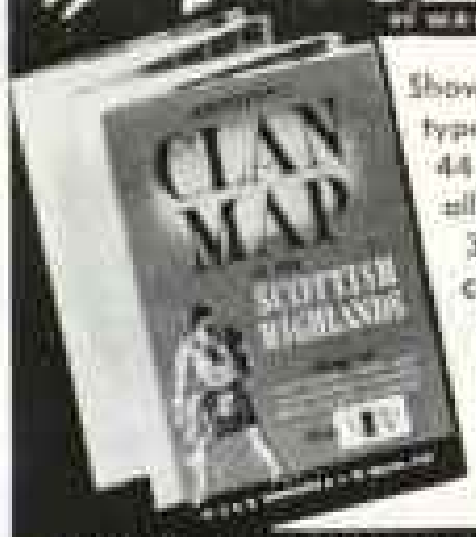
TRANSFORMER. Converts household AC current for use with the illuminated Bi-Lens/35 Viewer. Complete with cord..... $3.50

Made by SAWYER'S manufacturers of quality photographic products

® Sawyer's Inc., Portland 7, Ore. Prices slightly higher in Canada

AT CAMERA COUNTERS EVERYWHERE

new! Scottish CLAN MAP



Shows where each Clan lived - 18 different types of Highland dress - Tartan Plaids of 44 Clans. Coats of Arms of the Chiefs, all beautifully shown in full color. Size 38" x 28".

Cloth Backed Folded 1.50 Postpaid

Mounted on Rollers Ready to Hang 4.00 Postpaid

Interesting and Decorative. Send for Free Booklet or Folder of Gifts from Scotland.

SCOTTISH IMPORTS LTD.
352 SUTTER ST., RM. G • SAN FRANCISCO 8, CALIFORNIA

convenient! fast! low cost!

COLOR PRINTS

and film processing by mail

Color films deserve the best—depend on the world's largest direct mail color processors. Send for free mailer and price list.

COLOR FILM PROCESSING	COLOR PRINTS AND DUPLICATES
Anscochrome, Ektachrome, or Super Anscochrome—	2½ x 2½ ..... $ .25
35mm 20 exp, 2¼, 127, or	3½ x 5 ..... .45
Superslides, mounted $1.25	5 x 7 ..... 1.00
Unmounted 1.00	8 x 10 ..... 2.00
Kodachrome-20 exp .. 1.50	35mm duplicates .. .25
	Sorry we do not ship COD

"satisfaction or your money back"

COLORFAX LABORATORIES • INC
Authorized Kodak Color Laboratory
1160-G Bonifant Street • Silver Spring, Maryland

See "High Adventure with Lowell Thomas" (CBS-TV). Watch your newspaper for time and dates

because Hertz has a more efficient reservation service . . .

MR. LOWELL THOMAS HAS THE HERTZ IDEA!

Posed picture? Sure. But Mr. Thomas is no stranger to us. And here's why he prefers to rent Hertz cars: "When I ask you to have a car waiting for me in another city, it's *there!*"

As you know, Mr. Thomas travels far and *fast*. Making films. On-the-spot radio and television interviews. Hunting high adventure. To save time he takes a plane or train—has a new Powerglide Chevrolet Bel Air or other fine Hertz car waiting *there*. That's The Hertz Idea!

Hertz has more offices *by far* where you can rent a more dependable car. Cost? National average rate's only $38.50 a week plus 8 cents a mile—including *all* gasoline, oil and proper insurance. Try The Hertz Idea, too. Call your local Hertz office to reserve a car—*anywhere*. We're listed under "Hertz" in *alphabetical* phone books everywhere.

You'll prefer Hertz service . . . because there's more of it! Hertz Rent A Car, 218 South Wabash Avenue, Chicago 4, Illinois.

More people by far . . . use

HERTZ

Rent a car

"RENT IT HERE . . . LEAVE IT THERE" NOW, NATION-WIDE AT NO EXTRA CHARGE!
(Between Hertz cities on rentals of $25.00 or more. For Chevrolet sedans and comparable models only.)

even Santa's broken-up* giving the fabulous 2½ oz.

minox
camera

World's tiniest precision camera is the GIFT SUPREME. Takes wonderful pictures (standard 2" x 4" size or larger) with incredible ease. Ask your dealer for a demonstration.

Minox III-S with Case and Chain . 139.50

Write for literature EE

Kling Photo Corp., 257 Fourth Ave. New York 10, N. Y.

*Smart Santas give themselves a Minox camera TOO! (hint!)

New 2 lb.-11 oz. voice recorder works anywhere!

The name is Dictet. The maker: Dictaphone. Description: a battery-powered voice recorder that lets you *trap* your out-of-office thoughts—anywhere. So simple—just lift the mike and talk. Mike has start-stop switch, acts as speaker for instant playbacks. Magazine takes one full hour of perfect recording. With simple accessories, Dictet doubles as a transcriber. Or, you can buy the matching Dictet Typer for transcription. Find out more. Send the coupon.

DICTET®
BY DICTAPHONE®

Dictaphone Corporation, Dept. H
420 Lexington Avenue, New York 17, N. Y.
Please send full color booklet on new Dictet.

Name _____
Company _____
Address _____

"But, Doctor...he's not himself any more"

"Doctor, I don't know what's come over Tom. He has always been happy . . . considerate of me and everybody else. But for months now, he has been changing. He broods a lot, his temper's quick and he is always complaining about his health. I can not get him to see you or any other doctor. Claims his trouble will wear off."

Doctors hear of many situations like this, and they know that medical advice in such cases is often essential. Of course, we all have emotional upsets at times.

However, when disturbing feelings persist . . . when a person is so worried, anxious or depressed that he does not seem like himself any more . . . the source of the trouble must be sought, and corrective steps taken to restore mental poise and physical well-being.

Doctors have become increasingly aware of the effect of the emotions on physical health. There is no longer any doubt that illness of emotional origin is just as real as appendicitis or pneumonia or any other physical ailment. No matter what the physical symptom is . . . for example —nagging headache, digestive upsets, irregular heart beat or backache . . . something can usually be done about it.

In fact, studies made by the National Association for Mental Health show that almost 50 percent of all people seeking medical attention today suffer from conditions brought about or made worse by emotional factors.

A visit or two with the doctor may reveal the underlying cause of the physical disturbance. This is frequently something that the patient does not even suspect.

Once the source of the trouble is found . . . and the patient understands how his emotional reactions are playing havoc with his health . . . a successful recovery can usually be anticipated.

So, if you find yourself . . . or any member of your family . . . becoming persistently over-wrought, irritable, exhausted or unduly nervous, seek your doctor's help . . . and the sooner the better.

For an emotional disorder, like a physical illness, can be treated with greater hope of success when therapy is started promptly.

A simple discussion of how our emotions cause headaches, digestive upsets, and affect our outlook on life is presented in Metropolitan's new booklet called "Emotions and Physical Health." Use the coupon below for your free copy . . . without any obligation.

Metropolitan Life Insurance Company
1 Madison Avenue, New York 10, N. Y.

Please send me a copy of your booklet 1157N, "*Emotions and Physical Health.*"

Name _____

Street _____

City _____ **State** _____

Metropolitan Life

Insurance *(A MUTUAL)* **Company** *(COMPANY)*

1 MADISON AVENUE, NEW YORK 10, N. Y.

Tourists view the Gateway to the West, Cumberland Gap National Historical Park

Cumberland Gap—where you can walk in the footsteps of Daniel Boone

Beyond the mountain wall was danger, hardship, perhaps death, but Daniel Boone was a man who had to go there. And so, in 1775, he led a party of pioneers through Cumberland Gap into the Kentucky wilderness. The Wilderness Road that he hacked out was to become one of the major arteries in the settlement of the West.

Today Cumberland Gap has been set aside for you as a National Historical Park—a gift to the people of the United States from Kentucky, Tennessee and Virginia. Here, where these three states meet, you can find traces of the original Wilderness Road, Civil War fortifications, limestone caves and other interesting geologic formations.

From the Pinnacle, a rocky cliff that towers above the Gap, you can see some of the East's most spectacular mountain scenery, little changed since the days of the Shawnee war parties.

It has been nearly two centuries since Boone went through the Gap and opened up the Wilderness, but Americans are still pushing back frontiers exploring the unknown. The microscope and the slide rule have replaced the long rifle, but the pioneering spirit remains unchanged. It is the story of America's past—it is the hope of America's future. You feel it strongly at Cumberland Gap.

FREE Tour Information

If you would like to drive to Cumberland Gap, or anywhere in the U.S.A., let us help plan your trip. Write: Tour Bureau, Sinclair Oil Corporation, 600 Fifth Avenue, New York 20, N. Y.—also ask for our colorful National Parks Map.

SINCLAIR AGAIN SALUTES "MISSION 66"... the 10-year conservation program for the Nation's scenic and historic heritage—your National Park System. Cumberland Gap National Historical Park and scores of other units of the System are being soundly developed and more adequately staffed, thanks to Mission 66. Its purpose is to enable more and more Americans to enjoy their priceless properties wisely, while safeguarding them fully for future generations.

SINCLAIR

A Great Name in Oil

Another in Sinclair's American Conservation Series

VOL. CXII, No. 5 WASHINGTON NOVEMBER, 1957

THE NATIONAL GEOGRAPHIC MAGAZINE

COPYRIGHT © 1957 BY NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON, D. C. INTERNATIONAL COPYRIGHT SECURED

H. R. H. The Prince Philip, Duke of Edinburgh, Introduces to Members the Narrative of His Round-the-World Tour

BUCKINGHAM PALACE

THE 1956 Olympic Games at Melbourne in Australia gave me the opportunity to visit a number of places which I had not seen before, both on the way there and on the way back.

Australia is halfway round the world from England, so it seems only natural to go out one way and back the other.

On the outward journey, the Seychelles Islands, Malaya, and New Guinea were new to me and full of interest. Malaya was preparing for independence, which she has now achieved, while eastern New Guinea is administered by Australia, and therefore I found it most interesting in comparison with British-administered territories.

Ceylon and Australia I had visited before, but in both countries I managed to see different places and activities. Ceylon is busy bringing back into operation an irrigation system which may be a thousand years old, while Australia is building an irrigation system which will bring new life to vast desert areas.

I saw many other things besides, but it was the return journey across the South Pacific into the Antarctic and to the remote Atlantic islands which was the most unusual part of the journey.

I visited the Chatham Islands, 500 miles east

PHOTO BY BARON

of New Zealand, population 600; Graham Land, population 60 temporary inhabitants and several million penguins; the Falkland Islands, population 2,000; Tristan da Cunha, population 250; and St. Helena, population 5,000. All these places are off the shipping routes, without airfields, and contain human communities which may not have all the modern conveniences but certainly have many advantages over the great centres of population. You may not have a TV set on Tristan, but you won't get ulcers either.

But there was something more to this journey than merely a pleasant sight-seeing tour. All the places that I visited belong in some way to the British Commonwealth of Nations, of which The Queen is head. It is a peculiarity of the Commonwealth that each member feels a personal connection with The Queen. The Crown is not just an impersonal symbol, it is a living institution, continuing from generation to generation. It is little wonder therefore that the people were interested to see and meet The Queen's husband and to show, through him, their affection and loyalty to their Sovereign.

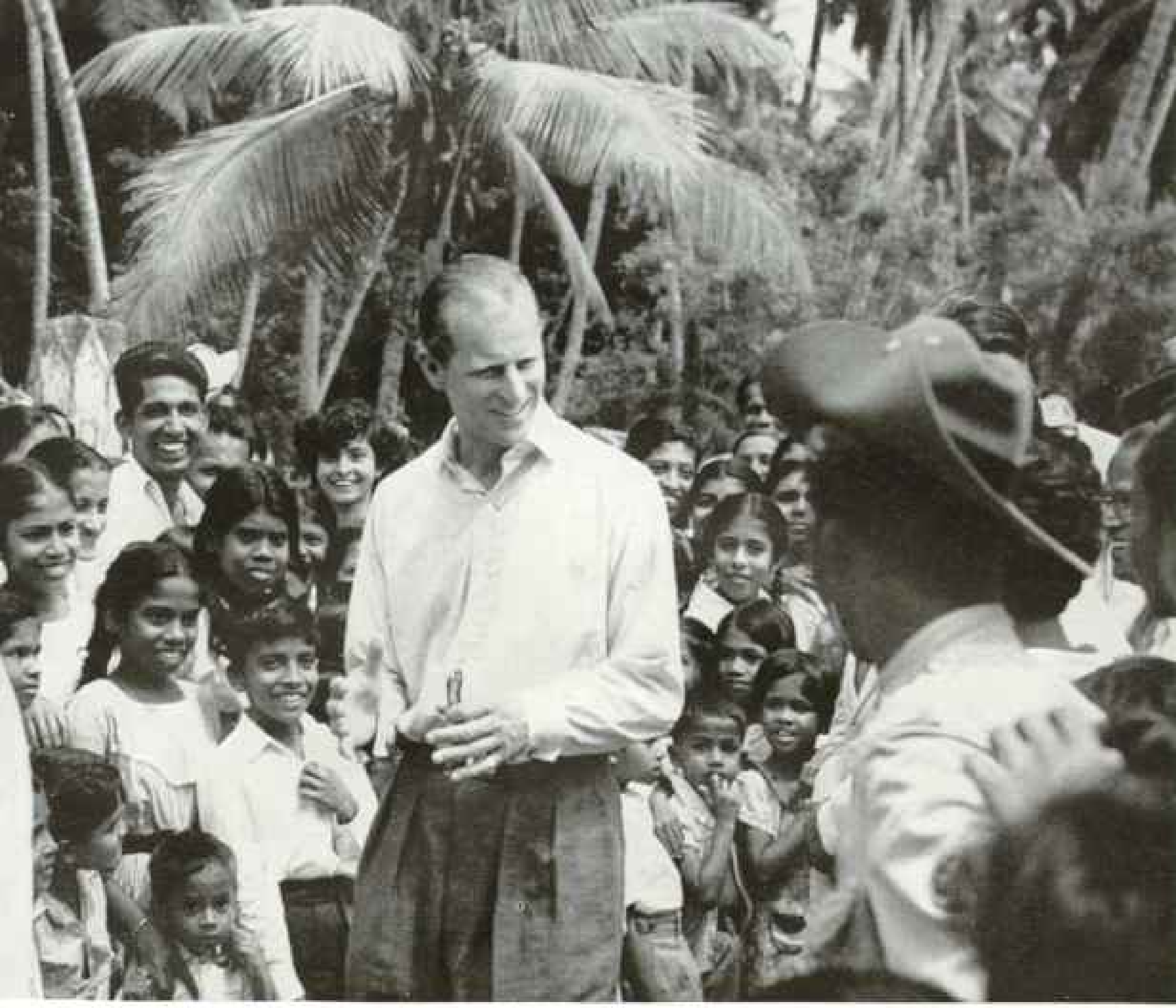
The places and people may have been interesting to look at, the long sea voyages may have had their fascination, but nothing can compare with the memory of the welcomes and the obvious and heartfelt expressions of devotion which I found whenever I went ashore. I make no apology for discussing this in an American journal because without it the journey would have been nothing but a grand tour of the lesser-known parts of the world.

Off the

IT WAS 6:59 on Christmas morning. A cold, sullen sea was running; snow clouds muffled the reluctant sun. Within the warm shell of Her Majesty's Yacht a slender man of 35 in a blue reefer jacket sat quietly in an empty study before a wireless transmitter. As the second hand climbed to 60, he cleared his throat and began.

"This is *Britannia*," he said. "I am speaking to you from the middle of the South Pacific, 55° south and 123° west—roughly halfway between New Zealand and Cape Horn. You will have to turn the globe upside down to find the place."

But even then, locating the spot would not have been easy. *Britannia* lay 1,300 miles from the nearest land and 10,000 miles from



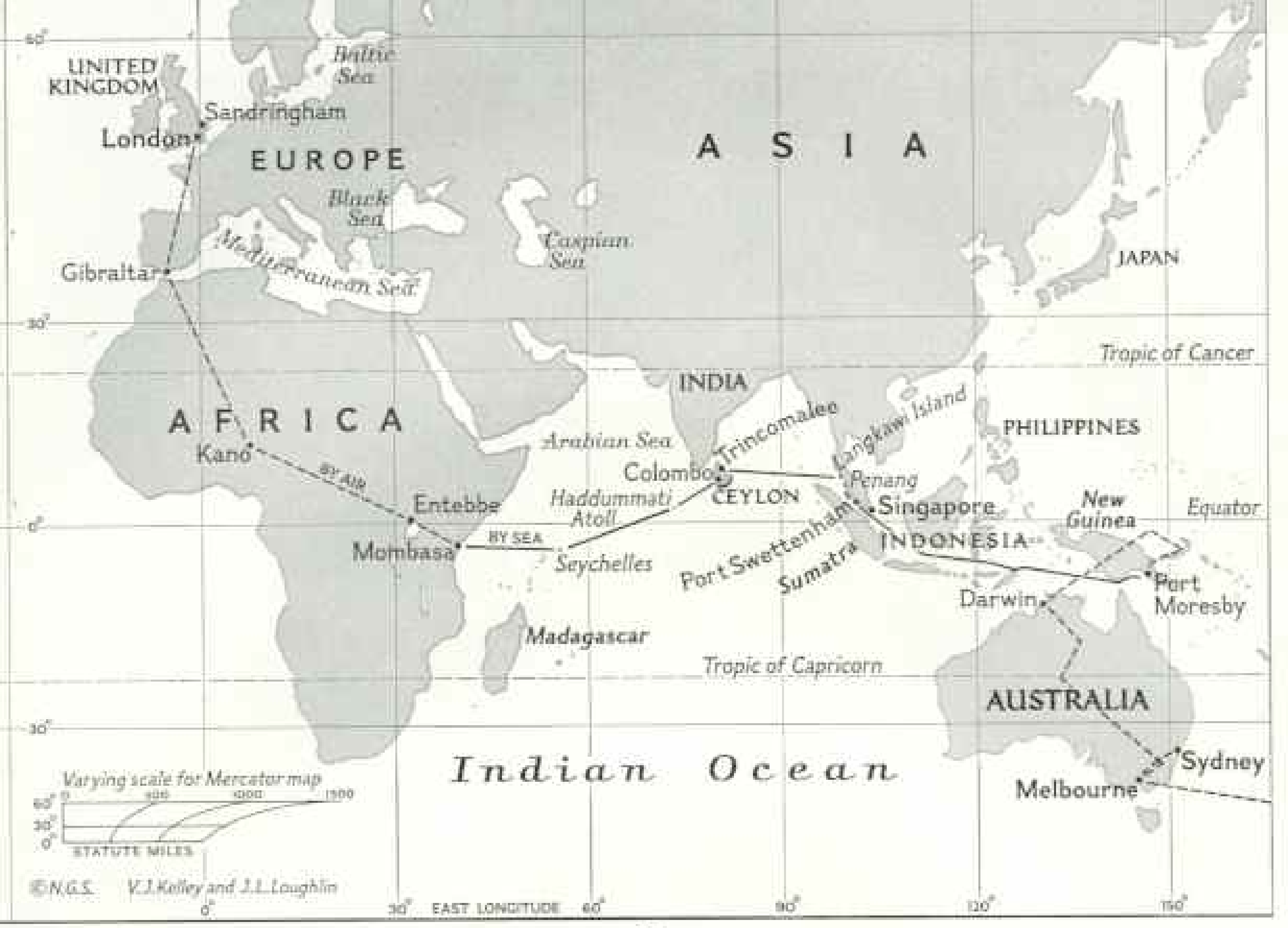
Beaten Track of Empire

her home port in England; she was an infinitesimal dot slowly inching her way across a wasteland of water.

She was, however, an important dot, a dot on which was focused the attention of a great fellowship—the British Commonwealth of Nations. For the young naval officer was Prince Philip, Duke of Edinburgh, and his message was being beamed not only to the royal family at Sandringham but to every corner of the English-speaking world (page 596).

He spoke for those exiled from home on the multifold duties of the Commonwealth, "whether Africans studying in England, Indians in Africa, Asians learning in Australia, administrators, scientists, planters, or construction workers. . . . We are the solid facts beneath the words and phrases; we are the solid flesh-and-blood links which draw the Commonwealth together under the Crown."

Prince Philip, because of his deep personal interest in geography and because of the educational and scientific nature of the National Geographic Magazine, graciously granted special facilities to Beverley M. Bowie, of the Magazine's Senior Editorial Staff, in preparing this article. The author was permitted to draw upon the personal diaries and reminiscences of His Royal Highness, as well as those of Viscount Cilcennin, Sir Raymond Priestley, Lt. Comdr. Michael Parker, and the officers of Her Majesty's Yacht *Britannia*. The photographs illustrating the Prince's globe-girdling 40,000-mile tour were taken by Commander Parker. Shown above: Prince Philip in Ceylon.



586

Crossing the Equator Four Times, Philip Circumnavigated the Globe by Plane and Yacht

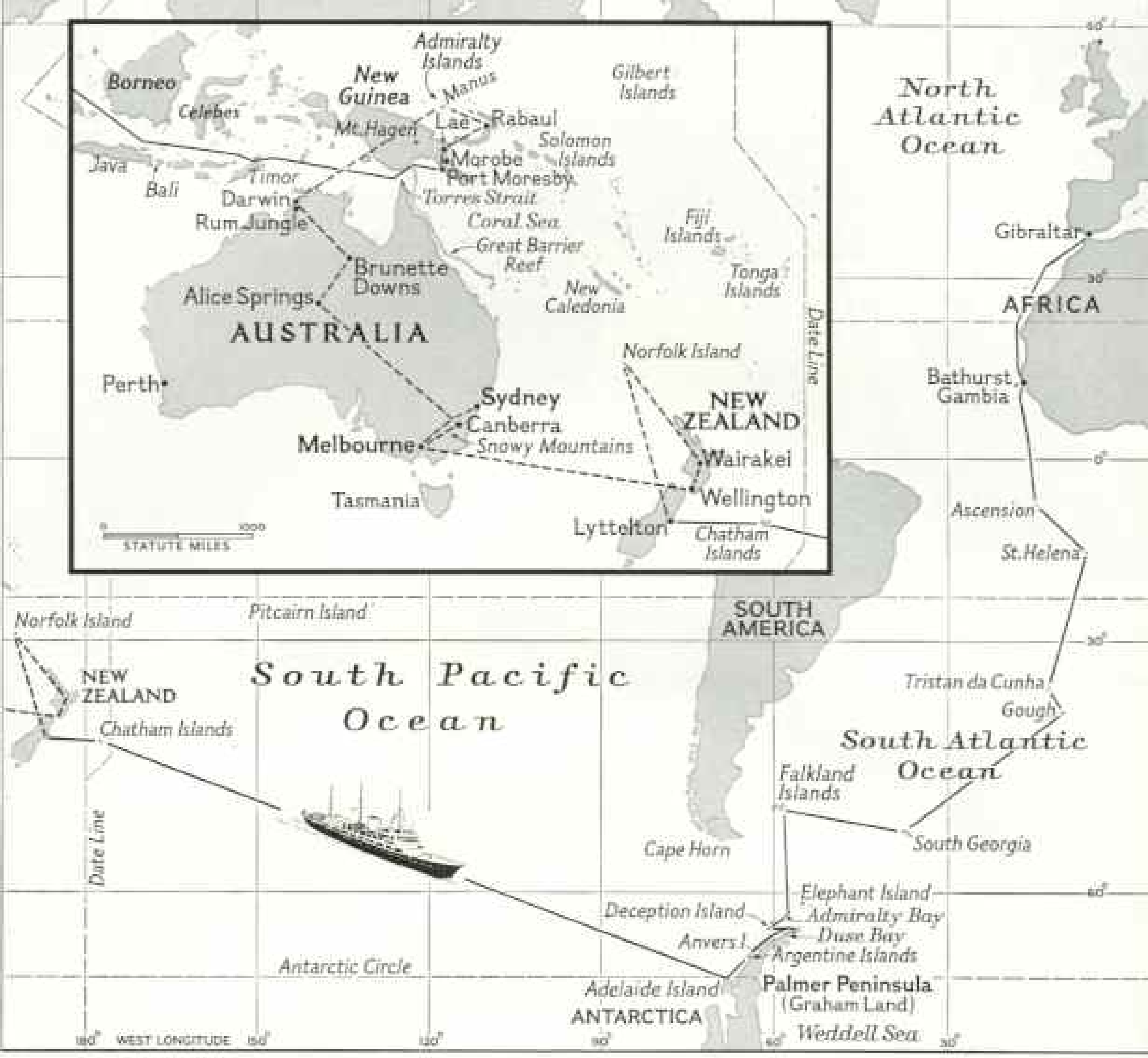
✦ In his 40,000-mile tour, His Royal Highness may have discovered no new lands, but the people of many old lands discovered him. Among them were these leonine New Guinea chieftains, flown from remote highlands to Lae. Visibly impressed by the royal visitor, they never took their eyes off the Prince.

In their name Prince Philip sent his own "very simple message to all the wives and children and relations who have remembered us today. We pray—in words used thousands of years ago—that 'The Lord watch between me and thee, when we are absent one from another.'"

How did this scene come about? What was Prince Philip doing on the somber fringes of Antarctica?

For a year and a half he had planned this global trip, starting with the kernel of an invitation to open the Olympic Games in Melbourne and expanding upon it—rather like the wayfarer who knocked upon a farmhouse door and said, "Lady, will you be so kind as to sew a shirt on this button?"

The shirt grew from the button for one important reason: The royal family has always felt the need to refresh its knowledge of the Commonwealth; the people of the Commonwealth, in their turn, have always been eager to show the royal family how they are getting on. But, naturally enough, most state visits have been paid to the great capitals, the cen-



Britannia, Weaving Among Mile-long Icebergs, Touched British Bases in the Antarctic

ters of political power. Wouldn't it be a sound idea, Prince Philip asked himself, to plot a course this time which would take him to the remote fringes of the Empire, to the lonely island outposts where men serve in faithful obscurity?

As an ultimate objective, the Antarctic sprang easily to his thoughts. A member of the Royal Society and a past president of the British Association for the Advancement of Science, Prince Philip was well briefed on the research being launched at the bottom of the world by British scientists preparing for the International Geophysical Year. By dropping in on them for potluck, as it were, he could satisfy his own considerable curiosity and give royal recognition to their work as well.

For his purposes *Britannia* was peculiarly well fitted. Her Majesty's home afloat, the 4,715-ton yacht was commodious enough for Prince Philip to entertain the people he would meet en route, yet stout enough to carry him to the ice-studded lanes of the far south. The yacht's range—2,000 miles—would make him virtually independent of conventional routes, and her cruising speed—20 knots—would make feasible even his 40,000-mile itinerary.

"Able Seaman" Guides *Britannia*

At *Britannia*'s helm the Duke found an old friend, Vice Adm. Sir Conolly Abel Smith, known affectionately to many of his shipmates as "Able Seaman Smith." One of Great Britain's few air admirals, Smith commanded a carrier in World War II.

The Duke and his party first came aboard

Spears at Ready, New Guinea Warriors Challenge "Man Belong Missus Queen"

Prince Philip, visiting Gabensis, a village near Lae, walks amid writhing brown bodies, flashing feathers, menacing spears, and a swirl of dust that rises to the treetops.

Forebears of the tribesmen might have taken their guest's head, but this reception party only plays at ferocity. The dancers work on the land or in the lumber industry.

Orange plumes of the Augusta Victoria bird of paradise, a species found in the Markham River Valley, wave from the headdress at left. White cockatoo feathers, flanked by bird of paradise plumes, decorate coconut-husk helmet at right.

Prince Philip, with hands on hips, consults with Morobe District Commissioner H. L. R. Niall. Wing Commander Leonard H. Williamson, Australian equerry of the Prince, accompanies them.

Opposite, lower: Under the royal visitor's eye, a magnificent pine moves from the slopes of New Guinea's Bulolo Valley to a plywood factory. The industry, developed after World War II, promises to be permanent; in a large measure it has replaced the gold-mining boom of the 1920's and 1930's. The Australian Government requires that seedlings be planted as mature trees are felled here.

↓Stone Age Chiefs Parade Their Riches

Bearded and turbaned like oriental potentates, these fierce-visaged men were flown down from the interior highlands to greet their Prince. Bird of paradise, cassowary, and cockatoo feathers soar from caps made of beaten and kneaded bark. Gold-lipped and baller shells form forehead shields, chin ornaments, and breastplates. Three chieftains wear chest panels of bamboo sticks. Each stick signifies the wearer owns a "thing"—a shell, wife, pig, or ax.

© National Geographic Society. All Kodachromes by Michael Parker

Britannia on the coast of East Africa, after a long flight from London to Gibraltar and over the Dark Continent to Mombasa, Kenya. On October 16, 1956, while bands played and cars followed her enthusiastically along the headlands, the yacht pulled away on the initial leg of the long voyage (map, page 586).

First stop—the Garden of Eden, or so one discredited theory describes the Seychelles. At the capital, Victoria, most of the 40,000 inhabitants, led by Governor Sir William Addis, gathered to cheer His Royal Highness, and a rousing speech of welcome was read in the teeth of a near gale.

Shark Spurs Indian Ocean Swim Record

Chinese firecrackers popped cheerfully along the route to a cinnamon factory (where the working hours appeared to be a civilized four per day), and in an idyllic cove a most successful picnic lunch was consumed: lobsters, small crabs, raspberries, and massive sea coconuts—the "forbidden fruit" of the Seychelles garden. Said the Duke after a bite of the tasteless pulp, "I don't wonder it's forbidden."

Again at sea, the ship's company celebrated Trafalgar Day. As the flag officer was reading the traditional "Nelson's Prayer," a crab plover fluttered down to the deck, was promptly christened "Horatio," and flew away again—definitely a bird of good omen.

Whatever luck he brought *Britannia* was drawn upon in full two days later when one of the officers, swimming off Haddummati Atoll, in the Maldive Islands, was shadowed by a shark. Irked, he turned and shot it with his speargun. The barbed shaft bounced harmlessly off its belly, and the shark rolled over and tore down on him like a train.

The following seconds are still something of a blur in the swimmer's memory. All that remains clear is that a new Indian Ocean record for the 10-meter free style was set in his journey to the beach.

At Colombo in Ceylon a harborful of merchant ships shattered the air with their sirens, and the governor general, the prime minister, and cabinet members came aboard to escort the Duke ashore. What interested Prince Philip perhaps more than any of the official doings was an impromptu visit to some small family shops of furniture makers and a performance at Ceylon's large and lively zoo. Over some of the island's pink bread and butter at the prime minister's estate, the Duke discussed the efforts of the Government to rehabilitate Ceylon's centuries-old irrigation system.

At dinner Lord Cilcennin, assuming that he had surmounted the language barrier, commented at some length on witch dances he had seen in Bali. Quite excited, the minister nearest him turned to his colleagues and introduced Cilcennin as a man who had studied dancing at Balliol College, Oxford!

Skirting the coast, *Britannia* steamed around to Trincomalee harbor on Ceylon's eastern flank and took on stores. To Prince Philip, who had served here during the war when it was chockablock with Allied shipping, the port seemed singularly empty. But ashore he found, as everywhere, great and cordial throngs, especially at the temple where Lord Buddha's discourses were first written down after 500 years of oral transmission. That the Duke paid homage at this shrine sent a tremor of excitement across Buddhist Ceylon.*

Riots in Singapore diverted *Britannia* to Langkawi Island. Here, amid heat like that in a Finnish steam bath, the entourage manfully marched a mile and a half, over a road lined by moon-faced children, to tea at Kuah. While the jam and plum cake circulated, native dancers engaged in mock combat until a tropical downpour routed both performers and audience. His Royal Highness left under a paper parasol redolent of fish glue, soaked but appreciative to the dripping end.

"Queen of Tonga! Very Wet!"

Penang, next day, produced a spirited assembly of Volunteer Force units and a mass "drill" by young female dentists. Then, at Kuala Lumpur, the Prince dined with nine sultans. One of these gentlemen, who had ridden through the rain in the same carriage with the Queen of the Tonga Islands at the Coronation, offered as his sole but repeated contribution to the conversation: "Queen of Tonga! Very wet!"

Slipping through the Indonesian archipelago, *Britannia* ran another long leg of the journey, 3,072 sea miles, from Port Swettenham, Malaya, to Port Moresby, Papua, refueling at sea from the tanker *Wave Chief* (page 598). The long humid voyage was broken by a pleasant "banyan," or beach picnic, on the Portuguese half of Timor, and another

(*Continued on page 596*)

* See "Ceylon, Island of the 'Lion People,'" by Helen Trybulowski Gilles, National Geographic Magazine, July, 1948.

© National Geographic Society

Admiralty Islands Raiders Swing In to "Attack" from an Outrigger's Battle Deck

Some of these tribesmen canoed 100 miles in a high wind to parade before the Prince at Los Negros Island. The official diary recorded that the "series of manoeuvres . . . would have done credit to any battle-fleet."

↑ Huge Canoes Maneuver in Los Negros Harbor

Sturdy, seaworthy outriggers serve Admiralty Islanders for travel, trade, and fishing.

This flotilla paddled before the Prince in a so-called attack formation (page 5991. In truth, Admiralty warriors never went into battle in such an open manner; they preferred ambush and the sneak attack. Inter-tribal warfare ended about 1912.

Here part of the 24 outriggers jockey for position. Men from some 25 villages take part in the review.

← Canoemen Crowd About the Royal Visitor

The organizer of a welcoming dance greets the Prince. He and his men fashioned their costumes after those of more primitive peoples to make a colorful show. Fiber skirts hide workaday shorts and wrap-arounds (opposite).

The Duke had not seen the Admiralty Islands since World War II days. At that time Allied warships crowded the harbor.

†Four Square Sails Drive a 16-man Outrigger. On Turning About, Prow Becomes Stern


CHATHAM ISLANDS
CENTENNIAL
WAR MEMORIAL HALL

Chatham Islanders Turn Out to Meet Their First Royal Guest

Any visitor to the Pacific's wind-swept Chathams, halfway between the Equator and the South Pole, makes news. Discovered in 1791 and attached to New Zealand 51 years later, the islands sit amid strong inshore currents that made them a graveyard for sailing ships. Through the years many vessels regularly plying the Chathams route have been wrecked or lost in these waters.

With winds in their favor, Prince Philip's party slipped through the sea's treacherous blockade for a daylong visit to Waitangi, the chief settlement.

←Beneath the Union Jack, the Prince greets a crowd of about 500—the total population—mostly descendants of Maori invaders from New Zealand. They journeyed from outlying sheep farms by launch, truck, or horseback.

→The Prince and his equerry, Squadron Leader Henry M. Chinnery, draw a schoolgirl into conversation at a *hangi*, or underground roast, given by the Maoris. Describing the feast, Viscount Cilcennin wrote in the tour's diary: "I have never seen such meat-eaters. Even the small child opposite me ate a piece almost as big as itself."

↓The New Zealand flag flutters above a grandstand where the Prince and his hosts watch horse races. A Maori jockey who refused to stop eating delayed the first race 15 minutes.

© National Geographic Society

"This Is *Britannia*...." Prince Philip Greets the Commonwealth on Christmas Day

one at Treacherous Bay in the Torres Strait.

Early in the morning of November 10 the royal yacht, with Prince Philip conning it shoreward, was met off Port Moresby by an informal flotilla of dugout canoes, spruced up with palm fronds. With a sweeping 180° turn, the Duke brought *Britannia* neatly alongside the dock and then went aft to welcome aboard Field Marshal Sir William Slim, Governor General of Australia.

Tattooed Papuans Stage a Jam Session

It was a richly diverse assemblage that cheered the Duke's progress through the city streets—everyone from Brownies to plumed and tattooed Papuan chiefs whose faces were painted so stiffly in clay that they resembled Greek masks. They put on a "jam session" that lasted two days.

But this was nothing compared to the barbaric splendor that awaited the Duke next day as he flew on to Lae (while *Britannia* sailed to Sydney for overhaul). Here were gathered representatives of nearly every tribe in Australian New Guinea (pages 586, 589).*

Those near enough had walked; others had been flown down from their green fastnesses for the occasion. The imposing Mount Hagen highlanders in their towering bird of paradise headdresses and the Kukukuku bowmen seemed to be still somewhat intoxicated by their trip. They pressed eagerly around the Duke, however, and never took their eyes from him. The bush telegraph had already spread the word in pidgin English: here was "Man belong Missus Queen."

It was Armistice Day, and Lae was an appropriate place for Prince Philip to observe it. In the beautiful war cemetery where he stood that morning were buried soldiers not only from New Guinea but also from Australia and India. American war dead from this area had been taken home or to Manila.

"They fought as one brotherhood," declared Prince Philip, "and they died for the freedom of the whole world. But do not

* See, in the National Geographic Magazine: "To the Land of the Head-hunters," October, 1955; and "New Guinea's Rare Birds and Stone Age Men," April, 1953, both by E. Thomas Gilliard.

forget that this act of remembrance is utterly wasted unless every one of us constantly strives to build a better and a nobler world for those who will come after us."

From Lae the Duke flew up into the hills, seeing at firsthand the chief sources of New Guinea's wealth: gold dredges, cattle, forests, and coffee and cacao groves. At the village of Gabensis two columns of fully armed natives met him. With everyone beating drums and howling madly, he was escorted into the stockade. There half the village immediately

Yachtsmen Celebrate the Holidays with Carols and Clowning

As *Britannia* churned into the roaring forties of the South Atlantic, far from the social obligations of port life, Prince Philip launched a shipwide beard-growing competition. Christmas found the Prince, Admiral Abel Smith, and 115 officers and yachtsmen in the contest's earliest and least attractive stages (below).

➔ For days ahead, in an atmosphere of rigid security, rival mess decks decorated their quarters. One seaman addressed an inflated Christmas card to "Dukie."

➔ The Lost Souls Choral Society reviewed at length the story of "Good King Wenceslas." Ione Eadie and Anne Stevenson, secretaries to the royal household, formed the soprano section.

British Admiralty (Hulton)

Sir Raymond Priestley, Distinguished Antarctic Explorer, Reads in *Britannia*'s Lounge

In this oil painting by Edward Seago, the tour's official artist, Sir Raymond sits beneath the eye of a penguin—a fanciful touch added by the painter. The scientist, a veteran of both the Scott and Shackleton polar expeditions, served as antarctic adviser to the Prince.

This painting and some 60 others by Mr. Seago were shown at a St. James's Palace exhibition after the journey.

← The artist records a refueling at sea. Tanker *Wave Chief* (right) supplied *Britannia* with oil in the trackless reaches of the South Pacific.

→ "The Critics": Chinnery, Priestley, and Prince Philip contribute commentary as Seago works. Sir Raymond insisted with mock intensity that no landscape detail be omitted for the sake of composition.

© National Geographic Society

plunged into a wild dance that sent the dust swirling up over the guests and into the topmost fronds of the palms (page 588).

After driving back to Lae, Prince Philip flew northeast to Rabaul, New Britain, circling the volcanoes that brood over the famous port. A day of official jubilation, and then on to the island base of Manus, in the Admiralties, where the Duke had served in World War II.

The unexpected is the spice of travel. At neighboring Los Negros Island the visitors were treated to a naval review which they ranked as one of the most adroit and impressive they had ever witnessed (pages 591-3).

No sooner had His Royal Highness arrived on the jetty than he was surrounded by a swarm of outrigger canoes, broadly decked, on which Admiralty Islanders danced and sang. Out in the harbor paddlers held some 24 more canoes in perfect line abreast.

Suddenly the music and the dancing stopped, like a match going out. The massed canoes swung about in line astern, passed in review, then formed in battle array and finished with a mad, foaming rush at the jetty itself.

Rather a chilling sight. But the attack had scarcely ceased when, on some hidden cue, a fleet of sailing canoes rounded a river bend, graceful as moths. Slim and stepped with as many as four masts, these delicate craft can carry as much as five tons of copra.

As the last one cleared the jetty, a new procession of canoes paddled in from the left and stopped at the Prince's pier. These displayed on their decks the products the islanders trade with the mainland—crocodile skins, shellfish, mother-of-pearl, conchs, giant clams, smoked fish, coconuts, and copra. One canoe even boasted a family pottery in full operation, the oven glowing merrily.

Crocodile Shoot Climaxes Busy Day

An R.A.A.F. Convair whisked Prince Philip and his friends over the thickly matted mountains of New Guinea and down in time for dinner at Darwin. Next morning the Prince drove 65 miles through the bush to Rum Jungle, the uranium center; was briefed on the possibilities of mining in Australia's Northern Territory; and capped his visit by chugging 18 miles up an estuary in the dark and shooting a six-foot crocodile straight between its cigarette-butt eyes. It was 4 a.m. before the royal party jounced back to Darwin and bed.

© National Geographic Society

Like Icebergs on a Polar Sea, Whale Skeletons Litter Deception Island's Beach

Fifty years ago whales swarmed antarctic waters in abundance. Men slaughtered them for the blubber alone, leaving the carcasses to drift ashore and rot. Today the whaling industry utilizes every part of the beasts.

601

Canso Amphibians Photo-survey Lonely Falkland Islands Dependencies

On black volcanic ash, mist-hung from thermal springs, men of the survey live in an abandoned whaling station. Their companions: noisome, weeping elephant seals, dive-bombing skua gulls, and penguins.

602

↑ Prince Offers a Tidbit
to Adélie Penguin Mothers
in a Futile Bid for Friendship

←Top: At Base W, a scientific outpost of the Falkland Islands Dependencies Survey, leader T. L. Murphy demonstrates the loading of a dog sledge as the Duke watches. Later, he introduced Prince Philip to a friendly litter of husky pups.

Research ship *John Biscoe*, His Royal Highness's mobile headquarters for a tour of five antarctic stations, lies offshore. Tireless Edward Seago, almost lost to sight in the distant left, sketches a scene along the icy beach of Lallemand Fjord. Low-hanging clouds shroud all but the feet of Base W's bleak surrounding mountains.

Middle: With admirable follow-through, Prince Philip returns the ball in an impromptu game of antarctic tennis. A bearded member of Base W acts as ball boy. Players considered lines unnecessary and a net needless obstruction.

Lower: An elephant seal hiccoughs rudely at passing royalty.

British Admiralty

After only five hours of sleep, the Duke took to the air again, circled over the Territory's vast new £30,000,000 rice-growing project, and landed at Brunette Downs for a glimpse of one of Australia's largest outback stations, a 5,000-square-mile ranch grazing some 43,000 head of cattle. While the heat reached 106° in the shade, aboriginal cowboys rounded up, cut out, and branded steers for His Royal Highness in exemplary Texan style.

Shortest Speech Opens Olympics

At the School of the Air in Alice Springs, Prince Philip was able to see—and hear—how the children of the outback receive their education over the air waves. He saw how the youngsters deftly tuned their radios to drown out static, and spoke to them himself over their far-flung network with evident admiration.

Here a base of the Royal Flying Doctor Service gave the Duke another opportunity to see how modern communications deal with the continent's great distances. While he was inspecting the installation, an emergency call came in: a man at a ranch 80 miles away was ill. A doctor rattled off a series of questions, made a quick diagnosis, and in a matter of minutes a plane was on its way.

The pivotal day of the whole voyage came soon after—the opening of the Olympic Games. At 3 p.m. on November 22 Prince Philip drove into the stadium, circled the arena before 104,000 fervently applauding spectators and some 3,200 athletes, and then made his shortest speech on record:

"I declare open the Olympic Games of Melbourne, celebrating the XVIth Olympiad of the modern era."

In the days to come the Duke was to visit the games often and quite informally, driving his own Lagonda sports car, chatting with truck drivers at stop lights, and mingling with athletes at the stadium.* A keen sportsman himself, he found that the games were meat and drink to him, but he never lost sight of his primary mission, to see and learn all he

*See "Sports-minded Melbourne, Host to the Olympics," National Geographic Magazine, November, 1956.

could about the British Commonwealth.

He inspected the monumental Snowy Mountains hydroelectric and irrigation project, a daring scheme to divert the seaward-flowing Snowy River toward the arid plains of New South Wales, Victoria, and South Australia.* At Sydney he went aloft for hours in a helicopter with the lord mayor, a young engineer, to view from a broad perspective the complex growing pains of a dynamic city. And at Wairakei in New Zealand he was intrigued to see men drilling not for oil but for steam—uncorking thermal jets to be harnessed for industrial power.

A short hop took the Prince to green and parklike Norfolk Island, settled first by convicts and then by descendants of *Bounty* mutineers from Pitcairn Island a century before. The Duke talked with Fletcher Christian's great-great-grandson. Mist shrouded the Norfolk pines, the glades and gentle gardens, but left no one in doubt that here was a singularly lovely part of the world.

Back in New Zealand the Duke acquired what turned out to be a most pertinent gift. From the mayor of Lyttelton, a stocky teetotaler barman, he received a Maori greenstone charm, virtually guaranteed to bless its possessor with good fortune. Of its benign effect on the weather, more later.

Docked near *Britannia* lay the *Endeavour*, New Zealand's ship of the Commonwealth Trans-Antarctic Expedition, soon to sail for the circle. With Sir Edmund Hillary, leader of the team, Prince Philip tramped the ship's decks, explored its innards, quizzed its men. It was apparent that, if he had not had his own expedition to pursue, he would gladly have changed places with Hillary.

"Rock 'n' Roll" Tackles the Forties

As *Britannia* weighed anchor, the question of her seaworthiness in antarctic waters became a topic of some interest to those on board. Before she had left England, she had been christened "Rock 'n' Roll" by the armchair admirals of Fleet Street, unacquainted with her equipment. To some Australians familiar with the tantrums of Antarctica, *Britannia* was a "toy" that really shouldn't be allowed alone on the southern ocean.

*See "The Making of a New Australia," by Howell Walker, NATIONAL GEOGRAPHIC MAGAZINE, February, 1956.

Mayhem at Sea: Hockey Fanatics Gave No Quarter, Received Many a Cracked Shin

Wolf Breidbach

Sir Raymond Priestley, veteran antarctic explorer who joined the ship at Melbourne, was impressed by *Britannia*'s gyroscopic stabilizers, capable of cutting a 20° roll down to a tolerable 6°. But even he drew sardonic amusement from the tune the band chose to play when the yacht pulled away from the wharf. It was "Cockleshell Heroes."

Said Sir Raymond cheerfully, "If we turn turtle between here and the Antarctic, there will be plenty who can say 'I told you so!'"

Though confident, Admiral Abel Smith was braced to meet the worst. Weather reports warned him he would meet a heavy swell with troughs 200 to 300 feet wide and nearly 40 feet high. As it turned out, the sea remained quite peaceful all the way to the Chatham Islands—"royal weather," the yachtsmen called it.

The islands' wind-swept port of Waitangi consists of a few red-roofed buildings huddled on a bluff. On the neighboring uplands lie close-cropped pastures, with an occasional tree hunchbacked against the gale. The better meadows can support five sheep to the acre and enable islanders to export some 20,000 sheep a year, plus 3,000 bales of wool.

Of the 600 inhabitants, most are of Maori blood, and it seemed that every able-bodied citizen had turned out to welcome Prince Philip at an underground roast, or *hangi*. On a bed of hot stones was laid a covering of damp grasses, followed by wire trays of meat (a bullock and five sheep) wrapped in cabbage leaves. Then came a tarpaulin, sacking, and earth. For four hours the imprisoned steam caressed the beef and mutton until the meat could be cut with a spoon.

The race meeting after lunch was delayed 10 to 15 minutes while the officials tried to persuade one of the Maori jockeys to stop eating and saddle up. He finally appeared on the course, a field roughly staked out near Waitangi. The home stretch ran past the grandstand, a corrugated iron structure holding some 90 men, women, and assorted youngsters.

Overweight Jockeys Shed Their Shoes

The horses, many of thoroughbred origin, carried riders of all sizes and a fine variety of costume. One gentleman jockey wore a black riding cap and pink coat along with striped blue trousers. Others went in for sports trousers tucked into their socks. An especially formidable entrant was capped with an army Glengarry and sported a full ginger beard. Any jockey declared overweight solved the problem by removing his shoes. The whole organization came under the direction of the Chatham Islands Jockey Club—second oldest in New Zealand.

What the races lacked in formality they more than made up for in enthusiasm. The Duke, talking to everyone within reach and snapping pictures with his little Minox, acted as starter for one race. This was just a matter of waiting till six riders had managed to get in a fairly straight line and then dropping a white flag and yelling "Go!"

At sea once more, *Britannia* crossed the date line and confronted Comdr. J. H. Adams with a crisis. Since there were two Wednesdays in succession, he had two birthdays to observe—and two occasions on which to stand treat for the whole wardroom. He accepted the penalty gracefully, in exchange for the curious distinction.

By this time life aboard ship had settled down to an amiable routine. As *Britannia* entered the roaring forties in earnest, Prince Philip passed the word that beards could properly be grown, and began one himself. The admiral and 115 other officers and seamen followed his example.

"The interest we took in each other's increasingly disreputable appearances," noted one officer in the ship's log, "was intense, to say nothing of the inordinate vanity with which we secretly studied our growths several times a day to see how we were getting on."

One of Prince Philip's guests was the noted English painter Edward B. Seago (pages 598-9), and his influence was soon felt in the rapid burgeoning of amateur artists on the veranda deck.

Around 4:30 or 5 p.m. a game of deck hockey would usually erupt (page 604). This rather violent pastime, played with hickory sticks and a rope grommet, was approached in much the same spirit as lacrosse among the Iroquois.

At least it was a democratic form of mayhem; Sir Raymond's orderly played a very vigorous forward on the Duke's team.

Party Prepares for Christmas at Sea

At meals it was the pleasant custom to draw lots for seats, so that no one would be doomed to the same brace of partners throughout the voyage. Conversation was unshackled.

On the mess decks feverish preparations were under way for a traditional Navy Christmas at sea. Each mess, in determined secrecy, strove to cop the prize for the best decorations. To cheer them on, a group known as the "Lost Souls Choral Society," drawn from all ranks and some of the Duke's guests, toured the ship with a portable organ powered by a vacuum cleaner (page 597).

Shortly after breakfast on Christmas Day itself, when all hands had heard the Duke's broadcast, followed by the Queen's address, a new and surprisingly fresh-faced vice admiral appeared topside and began to make the rounds. His authority, on this one day of the year, went unchallenged, even though his features suggested those of the youngest seaman aboard, a teen-age rating from the stewards' branch.

Though by afternoon *Britannia* was doing something of a jig in a choppy sea, the deck hockey fanatics went to it with festive fury. Surgeon Comdr. Patrick O'Brien had noted amiably at lunch, before he went up to play, that he had never spent a Christmas aboard ship without having to operate on someone. Sir Raymond remarked drily later on, "When I saw him knock Mike Parker head over heels, it struck me there might be a quite simple explanation."

The evening culminated in a conga line which wound through the ship and finally burst into the royal apartment itself. The officer of the deck was horror-struck until he chanced to spot the last man on the line: the Duke of Edinburgh.

Sheepskin Saddle Offers Philip an Upholstered Jaunt Around the Falkland Islands

607

Governor of Falkland Islands Drops In: Sir Raynor Arthur Winches Aboard *Britannia*

The day after Christmas—Boxing Day—brought *Britannia* its first iceberg, a castellated beauty about 2½ miles long and 100 feet high. In the next few days the yacht refueled again from *Wave Chief*, and on the 31st she made rendezvous with the British whale factory ship *Southern Harvester* and two catchers.

Dead Whale Doubles as Fender

One of *Harvester*'s catchers sidled up alongside with a fender unique in *Britannia*'s experience—a 50-foot week-dead whale, waiting to be processed for its oil (page 610). The carcass worked quite well as a buffer, though each time the yacht squeezed it, a stench arose that made strong men quail. The helicopter pilots aboard *Harvester* had their own reason to complain: at night the whale would be drawn aboard and parked just beneath their sleeping quarters.

To bring Prince Philip and his shipmates across to the factory ship, a wicker basket rather like a balloon's gondola was sent twirling over by a boom (page 615). Once they had been dumped unceremoniously onto the deck, the Duke's party began an inspection of the floating slaughterhouse, escorted by the captain and most of his crew of 430.

Harvester is mother to 12 catchers. The previous season she took aboard 2,000 baleen whales in 58 days. From time to time a tanker visits her, exchanging fuel oil for whale oil.

The fact that *Britannia* was now getting pretty far south received some underscoring that New Year's Eve when, after the haggis and the "Auld Lang Syne," a photograph of the group was taken by "available midnight

light." It may not be a great work of art, but surely there are few other pictures of gentlemen in black tie so close to the Antarctic Circle.

A further taste of the polar regions came next day when, having transferred by jolly boat to the *John Biscoe*, a ship of the Falkland Islands Dependencies Survey, Prince Philip encountered his first pack ice, just north of Adelaide Island. *Biscoe*, a sturdy research ship, plowed nonchalantly ahead to Base W, one of the United Kingdom's Graham Land IGY camps.*

Visiting Prince Viewed Dimly by Birds

Eight young men maintained this tiny outpost, all volunteers, and the majority of them scientists of one kind or another, busy with observations for the International Geophysical Year. When the weather permitted, they ranged abroad on skis and dog sledges for long distances.

The Duke tried out their sledges, made friends with their latest litter of pups, paid a visit to a penguin rookery (where incubating mothers took a very dim view of his intrusion) and then with a U. S. State Department observer, Crawford Brooks, played perhaps the first and only game of tennis yet recorded within the Antarctic Circle (page 602). It was, Prince Philip acknowledged, "rather inexpert."

Trending north, *Biscoe* called at Base F in the Argentine Islands and then negotiated the spectacular Lemaire Channel, its 2,000-foot dark cliffs perfectly mirrored in a sea that lay uncannily calm. Two avalanches tumbled into the water, and with the ship's siren the crew tried vainly to trigger a third.

Parker Dive-bombed by Angry Birds

On Anvers Island Prince Philip landed at Base N, or Skua Lodge. Elephant seals drawn up like tanks on the beach belched their annoyance; penguins in their rookery were curious and indifferent by turns; but the skua gulls, single-minded, went over to the attack, dive-bombing furiously. The Duke took great pleasure in photographing Mike Parker as he tried simultaneously to rig the antenna of his radiotelephone and to duck as the next wave of skuas rocketed in.

Base A at Port Lockroy, once an old whaling station, is now a center for the study of the ionosphere. It used to send out meteorological reports industriously, but listeners soon found that the weather at Port Lockroy, while undoubtedly interesting in itself, bore little relation to weather anywhere else. The mountains that virtually enclose the harbor may bear the blame.

Threading the high-walled Neumayer Channel, *Biscoe* pushed on to Base O at Duse Bay. Here only four men tumbled out to greet the royal deputation; the team's other four members had left to establish a refuge camp 30 miles away. But the remaining quartet did the honors nobly, presenting with pride their pet penguin, brooding over two eggs within four feet of the door, and their new television set—a dummy, unfortunately, but something to contemplate of an evening.

From *Biscoe* the party reboarded *Britannia* and cruised to Deception Island. Mist so mantled the entrance to the harbor that the admiral decided against bringing the yacht in and dispatched the launch instead. Guided by directions radioed from the radar-equipped bridge, the small fog-bound boat felt its way through the narrow gap known as Neptunes Bellows.

Whale Skeletons Litter Beach

The harbor itself, a drowned volcanic crater, presented an eerie scene. Along the beach were strewn the Daliesque skeletons of dismembered whales, and from the jet-black volcanic ash arose thin wisps of steam, betraying hot springs buried below. A demolished whale factory occupied the background. In the midst of ruin stood the two new huts which comprised Base B and, near them, a couple of amphibious aircraft (page 600).

Within the abandoned oil tanks the base personnel and men of the aerial survey had built houses of their own. One, in which the steward and cook lived in suburban comfort, bore the neatly lettered address, "Dexion Villa." Another carried the warning, "Out pipes, out cigarettes, or outside."

Sir Raymond, scouting along the foreshore, cavalierly rocked an old whaleboat about and then discovered that it was chockful of explosives. No casualties occurred. The yachtsmen's only losses were the ends of their ties and the tail of Commander Parker's shirt (since he was tieless), snipped by their hosts and pinned to Base B's trophy board.

Prince Philip had now been able to inspect

* See "Year of Discovery Opens in Antarctica," by David S. Boyer, National Geographic Magazine, September, 1957.

609

Roman Burian

Trailing Its Rippling Nylon Line, a Harpoon Head Thuds Home in the Flank of a Whale

An explosive charge in the harpoon, if planted in a vital spot, proves fatal. But sometimes a wounded whale, sounding deeply, has to be played like a monstrous fish from the ship's mast. Reeled in, the whale is shot once more if necessary, buoyed with compressed air, marked with flags, and released for collection later.

seven out of the twelve Falkland Islands Dependencies bases at one crack—a fabulous achievement in a region of such generally malignant weather. Next he set out for the Falkland Islands themselves, with the Governor, Sir Raynor Arthur, aboard (page 607).

Sir Raynor introduced the ship's company to a "Falkland Islands sandwich" (a slice of hot mutton between two slices of cold mutton) and told one tale after another of the sturdy inhabitants, a highly individualistic lot. They have, he said, a system of voluntary prohibition: anyone can put his own name down on the list. A man and his wife had recently signed up. But the husband had added a patriotic proviso:

"There h'ain't no more loyal man in these islands than wot I am. I must 'ave two days to celebrate when 'Is Royal 'Ighness is 'ere."

On the morning of January 7, East Falkland hove into view, looking like one of the Scottish Hebrides, a low green shore, treeless, the peaty soil covered with a coarse grass. Even the islanders' homes seemed like crofters' cottages, with the notable addition of greenhouses built along their southern walls to protect sweet peas, fuchsias, and roses from the probing wind.*

Highlight of the day's festivities was the Sailors' Race, a 300-yard gallop. Riders, all from *Britannia*, included Prince Philip (gray jersey, brown trousers tucked into his socks); the governor (impressive in a hacking jacket and gaiters); the admiral (sweater and jodhpurs); and Mike Parker (yellow pullover and yachting cap).

Prince Philip Wins Sailors' Race

It took two false starts before the field of nine got away. In the home stretch the Duke, on Itata, pulled a length away from Mike Parker, on Flame. As Prince Philip flashed across the finish line, the band broke into "All the Nice Girls Love a Sailor."

Later, on horses comfortably upholstered with native sheepskin saddles (page 606), the party rode over the island, seeing peat being cut and stacked, wool from the omni-

* See "People and Penguins of the Faraway Falklands," by Olin Sewall Pettingill, Jr., National Geographic Magazine, March, 1956.

← Chained Whale Serves as a Buffer Between Ships

Its flukes cut off, a week-dead sperm whale protects the flank of the catcher moving alongside *Britannia* to pick up Prince Philip. Each time the royal yacht and catcher squeezed the carcass, an awesome gust arose, enough to stagger the toughest seaman.

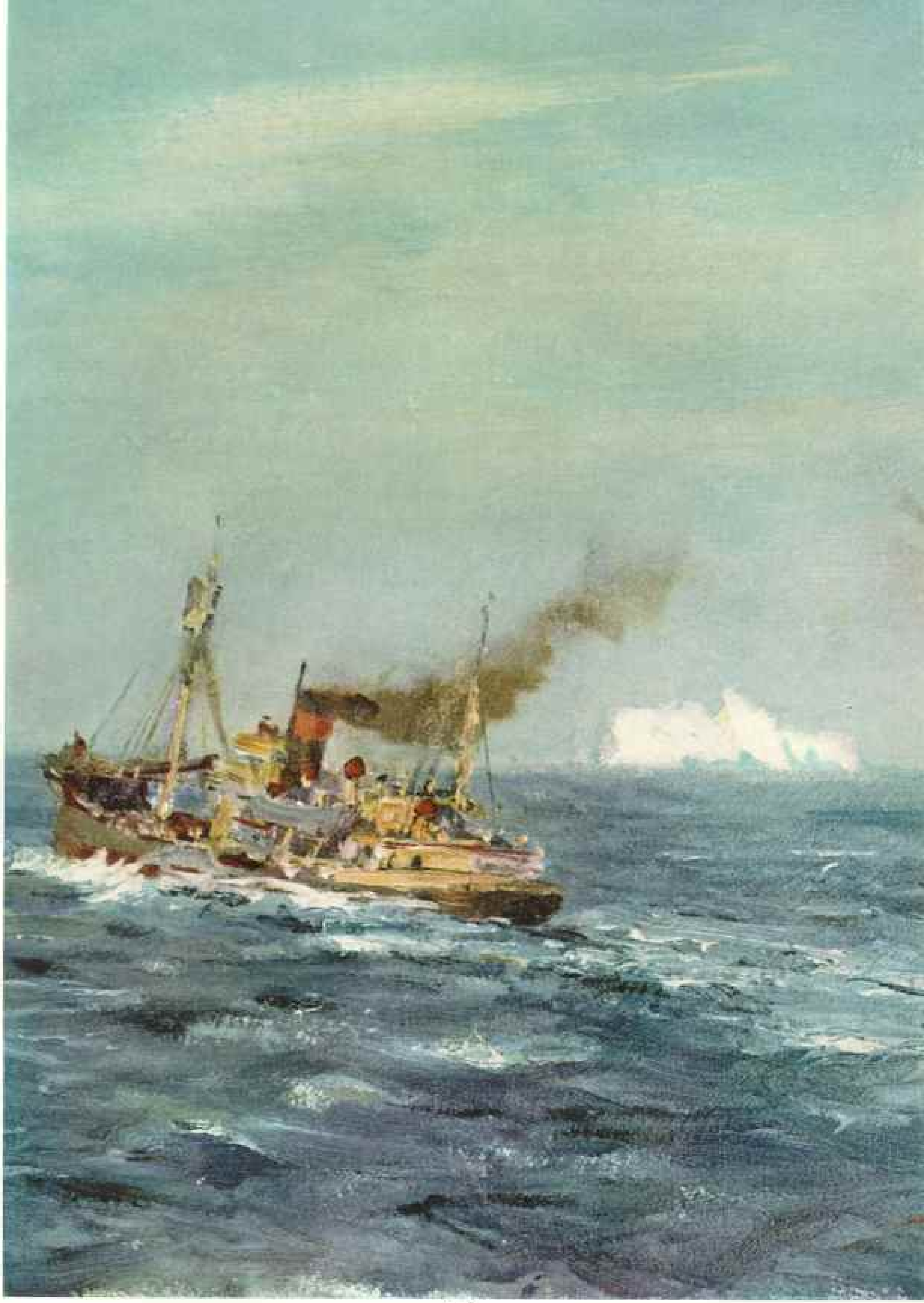
Ship's catwalk at upper right enables the skipper, who is also gunner, to run from bridge to gun deck at the critical moment.

The Ship Lurches → in an Atlantic Swell

Keeping his camera hand free, the Duke of Edinburgh braces against the catwalk rail as the catcher and its fender whale rock against *Britannia*. Chinnery takes a firm grip.

© National Geographic Society

Mighty Flukes of a Diving Baleen Whale Churn the South Atlantic to Foam



613

Belching Smoke, the Catcher Drives In for the Kill: Painting by Edward Seago

present sheep being sheared, spun, and woven. Switching to a Sea Otter amphibian, the Duke surveyed the islands from the air before departure.

Falklanders, Prince Philip had been cautioned, are reserved folk, but sometimes disconcertingly frank. One man whom he met at various functions merely gazed at him fixedly and said nothing. Finally, at the farewell party on *Britannia*, the chap threw caution to the winds and approached the Duke. "Your beard isn't anything like as good as most of those I've seen on board," he said, and quietly vanished.

En route to Fox Bay in West Falkland, Commander Adams found a black-browed albatross marooned on the veranda deck, uncertain of its ability to take off on so short a runway. Trundling the gawky bird over to the rail, he heaved it into the wind, and, with such a start, the albatross was able to acquire sufficient speed to remain airborne. It was noted in the log that the controls of one albatross were checked. She was briefed for local flying and limited aerobatics, and duly launched. "She went off like a bomb," observed Parker with satisfaction, "circled the ship once, dipped her wings, and zoomed away."

Ailing Falklanders Air Complaints

At Fox Bay Prince Philip was interested to find a radio-medical system in operation, rather similar to the one he had inspected in Australia. When someone on an outlying farm felt under the weather, he would go on the air with his complaint, and his audience would be not only the doctor but anyone with a receiver. As one sheep farmer's wife informed the Duke:

"Makes me feel a bit queer like, going to a party in Stanley and meeting folks I've never seen before and yet knowing all there is to know about their insides."

As *Britannia* turned her bow toward South Georgia, the Falklanders happily told all hands that, if they had not yet experienced churlish weather, they could be sure of getting their fill on this leg. Undaunted, the royal yachtsmen pressed on. After all, they had not only their reliable gyrostabilizers but the lucky Maori greenstone as well. By this time it had been rubbed to a high finish.

Britannia sailed with charmed impunity past tabular bergs as much as five miles long. The sea remained unruffled. Overtaking a catcher in active pursuit of a whale, the yacht skipped along in its tortuous wake for two hours. The whale, rising every few minutes to blow, dived and jinked and circled, never quite presenting its back for a clean shot. When *Britannia* broke off the chase, it was still at liberty.

The birds of South Georgia took over the responsibility of welcoming *Britannia*. Six shags in close formation flew the length of the ship. Penguins porpoised away on all sides. Albatrosses and giant petrels hovered respectfully overhead.*

Prince Embarks on Whale Catcher

Since no whales were at the moment being processed in the Salvesen factory at Leith Harbour, Prince Philip embarked on the catcher *Southern Jester* and headed for the whaling station at Grytviken. On the way he became friendly with the captain, Nochart Nilsen, now 63 years old but still known as South Georgia's best gunner. In his 25 years at the trade, said Nilsen, he had shot 5,000 whales—60 already in this season. As an impromptu sample of his prowess, he swiveled his gun at a floating crate 70 yards off, a speck on the waves, and blew it out of the water with one shot.

In Grytviken's bay five catchers of the Compañía Argentina de Pesca, moored abreast, flew their colors and fired a salute with their harpoon guns as His Royal Highness approached. Donning rubber boots, he plunged manfully into the carnage where, under a cloud of shrieking gulls, a 70-ton baleen whale was being dismantled. In three-quarters of an hour the flensers, wielding knives like scalpels, had carved the monster to ribbons and dispatched the blubber to the cooking pots. Everything was processed, it was clear, save the smell, and that seemed likely to remain indefinitely.

Magnificent, stark, the great peaks behind Grytviken rise to nearly 10,000 feet. Even from the distant comfort of the yacht it seemed to those on board almost incredible that Sir Ernest Shackleton and his companions could ever have crossed the icy passes of these cruel mountains on foot and weakened as they were.

On a headland above Grytviken has been erected a simple cross honoring Shackleton's

* See, in the National Geographic Magazine: "A Naturalist in Penguin Land," by Niall Rankin, January, 1955, and "South Georgia, an Outpost of the Antarctic," by Robert Cushman Murphy, April, 1922.

© National Geographic Society

Kodachrome by Michael Parkin

Prince Checks Camera for Action Aboard a Whale Catcher. Harpoon Gun Stands Loaded

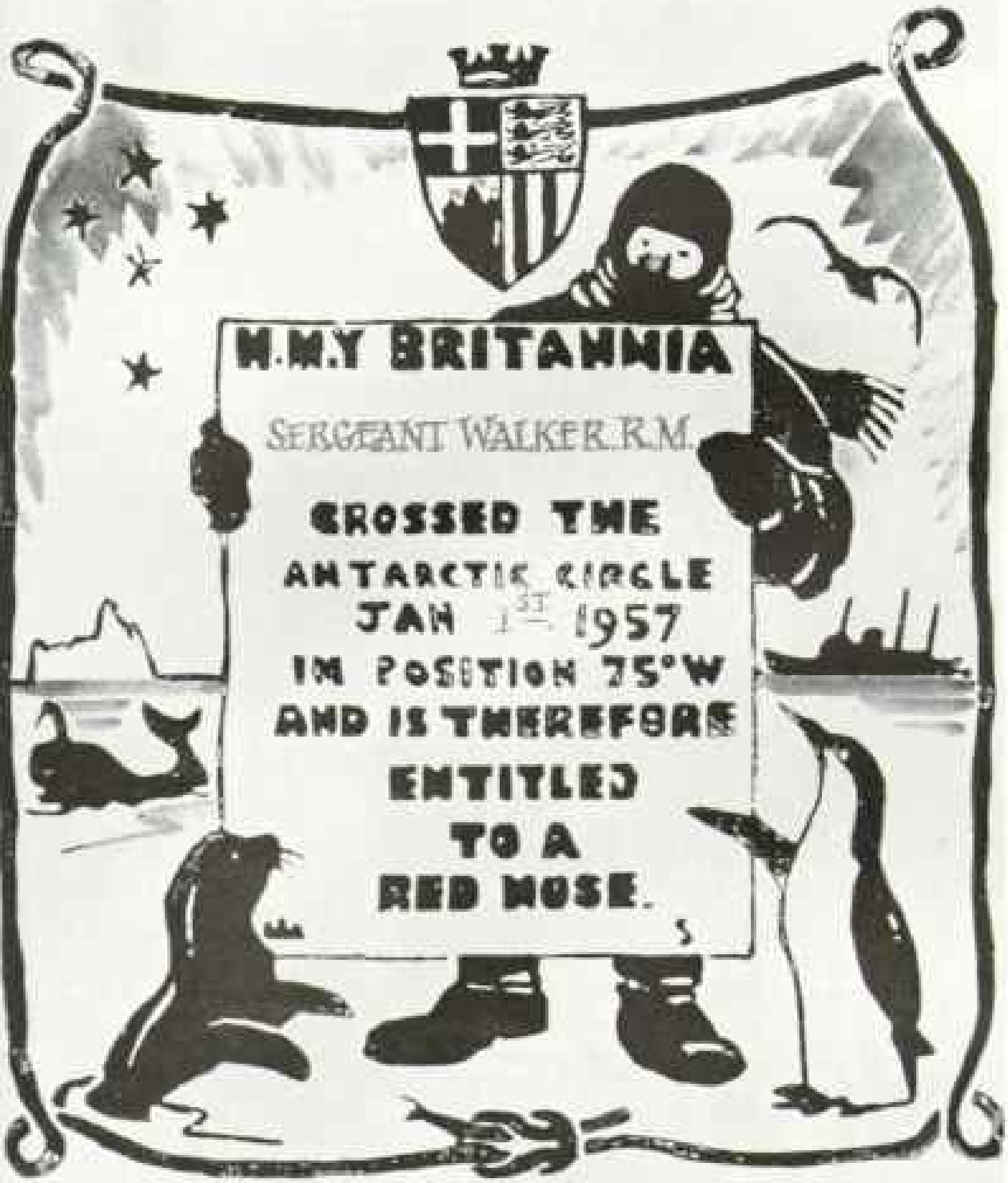
The whaling crew's youngest, a lad from Angus, Scotland, leans over the gun for a look at the 4,715-ton *Britannia*. Launched in 1953, the royal yacht cruises at 20 knots. A filtering device on its stack "washes" oil smoke.

A fearsome weapon, the harpoon gun works like a muzzle-loading cannon, but with an iron shaft instead of a ball.

Here, at the end of the shaft, the barbs are seen tied back; they fan out only after the harpoon has found its mark in the whale. Usually the coup de grace is given by a time fuse that explodes the head of the harpoon like a burst of shrapnel.

➔ Cargo boom swings Prince Philip on to the whale catcher in a basket. Showing this picture to London school children, the Prince said, "It actually looks worse than it is."

Ronald Rosery →



616

Philip's Badge Surmounts a Certificate He Helped to Design

The red "S" tip of a compass needle suggested the color for Sergeant Walker's "red nose" credential. Explorers entering the Arctic Circle would get blue-nose papers.

↓ The Prince takes his nightly turn inking a linoleum cut.

memory (page 618). Sir Raymond, who had accompanied Shackleton on the *Nimrod* expedition, which came within 112-odd miles of the South Pole in 1907-09, walked out on the promontory to stand there for a bit. For him, Shackleton was something more than a figure from history books or a schoolboy legend.

Britannia was not yet through with whales. Hearing that a fleet of catchers was hunting about 200 miles northeast of South Georgia, she put to sea and by morning was in the midst of the melee.

Four catchers were in hot pursuit of a school of finback whales. In an hour Prince Philip saw two whales harpooned (page 609).

One of them, struck mortally, leaped its full length from the water, like a hooked salmon, and crashed down again with a monumental splash. The catcher, using its mast as a gigantic fishing rod, reeled it in slowly. Here and there floated whales already dead, inflated by compressed air to prevent their sinking and impaled with flags and electronic beacons to assist their collection later.

Altering course slightly for Gough Island, *Britannia* moved on, sighting as many as 25 icebergs at one time—what Prince Philip dubbed "a frieze of icebergs," a collective worthy, perhaps, to rank with the Queen's own noted "foam of flag officers" or "ocean of admirals," coined one evening as she dined amid a group of navy officers awash with gold braid.

A few more days at sea brought a landmark signifi-

cant, if intangible: in longitude 17° 43′ *Britannia* completed her circumnavigation of the globe. Coincidentally, as a memento of the yacht's sally across the Antarctic Circle, each member of the ship's company received a "Red Nose" certificate. No run-of-the-mill commercial products these. They were designed by Prince Philip and Mr. Seago and printed individually from a hand-cut linoleum block over many a laborious evening, with the Duke taking his turn at the press. The half-dozen people who had been to the Antarctic before received postgraduate certificates entitling each to a Purple Nose.

Gough Island, sighted the same afternoon, held a special attraction for Prince Philip. In 1955-56 he had sponsored an expedition here of young Cambridge scientists to map this all but inaccessible spot. They had done their job and left, and now their hut was temporarily occupied by four South African meteorologists.

The Duke came ashore in a dinghy to explore. The island is reputed to lodge some 10,000 seals, but the only one His Royal Highness could catch a glimpse of was a baby intently occupied in giving itself a scrubdown. Less bashful and quite engaging were the rockhoppers—penguins crowned with jaunty yellow feathers. As they bounced upstream to their rookery, they looked like a costermonger's carnival.

Family Names Few on Tristan

Precedent took another tumble at Tristan da Cunha next day when an Admiral of the Fleet sailed himself ashore. A small-boat enthusiast from boyhood, the Duke took the tiller of a native longboat and brought himself and his passengers smartly onto the beach.

Strict segregation of the sexes appeared to be the fashion. The men lined the foreshore; the women assembled on the cliff, scarves over their heads. No donkeys were to be seen; they had all been driven to the other side of the island to keep them from eating the flower-decked arch of welcome.

Some 250 souls inhabit Tristan da Cunha, but they have to get along with about seven family names—Glass, Green, Lavarello, Repetto, Swain, Hagan, and Rogers—names handed down for the most part from the soldiers, seamen, and stonemasons who clung to the island after the British garrison withdrew in 1817. When two men find themselves with the same Christian and surnames, the elder is called "Big" and the younger "Little," regardless of their respective sizes.

The islanders measure a man's wealth by the number of potatoes he has in storage. But they supplement their diet and their income with crayfish and other seafood, marketing them through a small cannery.*

Marriage usually doesn't take place until 21—not surprising considering the time it must take to court a girl. The boy comes to his chosen one's house and quietly joins the family circle. This can go on night after night. At last, if the girl succumbs to this exuberant wooing, she knits him some socks with colored rings and asks for his clothes to wash. They are now engaged.

"Ridge Where the Goat Jump Off"

A slight eccentricity can be noted in Tristan da Cunha's place names, too. The main settlement is known, conventionally enough, as Edinburgh, after a previous Duke. But other spots bear such titles as "Ridge Where the Goat Jump Off," "Down Where the Minister Land His Things," and "Tommy's Eye Loose"—a curious pronunciation of "Tommy's Oil House."

In the afternoon a soccer team from *Britannia* took on the islanders on a bluff back of town. The sloping pitch gave some advantage to the side playing downhill—as long as they could put on the brakes before going over the hill. Of the many fervent bits of advice from the bystanders, the most frequent were: "Mind the precipice!" and "Keep it on the island!"

For the evening dance the Royal Marine Band had come ashore, its instruments being carted up from the beach by oxen. Here Prince Philip was introduced to the "pillow dance," in which the man places a cushion before a girl; they both kneel on it, kiss, rise, and join a "snake" shuffling about the room. Then it's the girl's turn to choose a partner in the same manner.

The administrator's wife chose the Duke, the Duke chose a little girl of the Glass clan, and the ball was on, one of the merriest Tristan da Cunha had enjoyed for a long time. The fun was no whit lessened when Prince Philip left the islanders his going-away present: a new record player and sound recorder, with a selection of the latest discs.

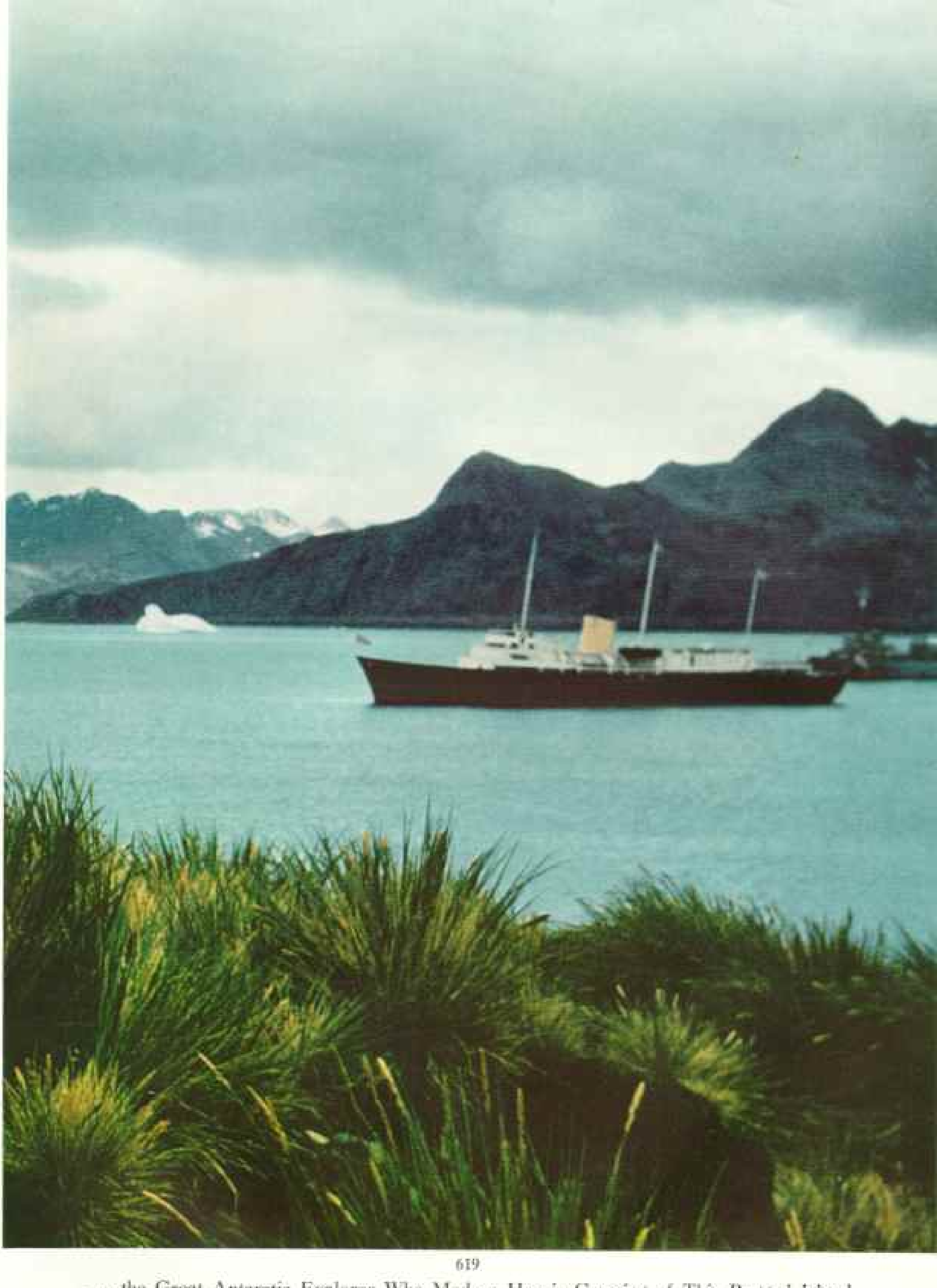
* See "New Life for the 'Loneliest Isle,'" by Lewis Lewis, NATIONAL GEOGRAPHIC MAGAZINE, January, 1950.

© National Geographic Society

On South Georgia the Prince Pays Tribute to the Memory of Sir Ernest Shackleton . . .

In late 1914 Shackleton sailed into the Weddell Sea to cross the Antarctic Continent. Pack ice crushed his ship *Endurance* to splinters. Stranded, the party drifted to Elephant Island.

Picking a crew of five, the explorer sailed 800 miles to South Georgia, crossing one of the world's stormiest seas in a whaleboat. By superb seamanship, he succeeded in reaching the island's deserted northwestern shore.



619

. . . the Great Antarctic Explorer Who Made a Heroic Crossing of This Rugged Island

Unable to sail around South Georgia, Shackleton and his companions crossed mountains and glaciers to a whaling station near Grytviken, and then organized rescue parties that finally saved every member of the original expedition. In 1922 Shackleton returned to Grytviken for another antarctic trip. He died here, and shipmates raised the simple cross to their leader. *Britannia* lies amid icebergs just calved from a glacier.

Unique Naval Event: An Admiral of the Fleet Sails His Hosts Ashore

A small-boat enthusiast from boyhood, Prince Philip gladly took the longboat's tiller and ferried the Tristan da Cunha welcoming party from *Britannia* to the island. Administrator P. R. Forsyth Thompson sits on the right. ↓ Twin babies and assorted youngsters on Tristan da Cunha pose for posterity and a chance to tell their children in turn: "The Prince? Why, I was standing right next to him!"

621

Tristan's Still Roofless Community Hall Gets Cheering News of Prince Philip's Gift

To people of this isolated mid-Atlantic island, musical get-togethers mean much. The Duke's thoughtful present: a battery-powered phonograph, sound recorder, and the nucleus of a record collection. Islanders display their own gifts—model boats for Prince Charles and a spinning outfit for Princess Anne—on a table at right.

Ascension Island: the "Cinder Heap's" Brown Volcanic Cones Puncture Blue Atlantic

Portuguese seamen discovered the lava-built isle in 1501, but, as one wit put it, the English took control "as soon as it had cooled." Until 1922 Britain rated the 34 square miles as a man-of-war with a naval officer as governor.

During World War II U. S. engineers carved an aircraft landing field out of the volcanic rock. Today Americans are completing here an electronic station, the last in a chain of 12, for the tracking of intercontinental guided missiles.

Britannia lies off a cable and wireless installation at Georgetown (right).

← Kodachrome by Prince Philip

St. Helena Youngsters, Draped Across Iron Banisters, Slide Down to Jamestown

Built in 1829, the 699 steps climb to an old fort. Moat and wall, below, guarded St. Helena when it was a port of call in pre-Suez Canal days. Napoleon died here in exile in 1821.

© National Geographic Society

Steaming along the coast of St. Helena five days later, *Britannia*'s company felt a twinge of sympathy for the exiled Napoleon; from the sea, few places look more desolate. Yet the interior proved astonishingly lush and attractive. For nearly 2,000 feet one climbs up through cactus-studded lava, to emerge in a saucerlike valley green with New Zealand flax, Norfolk pines, and blackwood.*

The island's 5,000 inhabitants once depended almost entirely upon flax production, but coffee is now becoming important, too. Pests complicate life considerably: trees apparently vigorous will suddenly keel over at a touch, utterly eaten out by termites; and the governor told Prince Philip he was ready to declare war on the myna bird—a minor war, at least.

Napoleon Asked for Sunken Walks

The Duke was pleased to find Longwood, Napoleon's home, well restored from the ravages inflicted on it by termites. The gardens where the emperor paced restlessly are bright with hibiscus and jacaranda; the paths are sunken, as of old, so that the guards outside could not stare at him over the hedges.

Youth and crabbed age both play their part on St. Helena. Age is formidably represented by the governor's tortoise, Jonathan, reputedly at least 180 years old—already 40 when he first saw Napoleon. Youth can be seen to advantage any day at the top of Jacob's Ladder, the 699-step staircase connecting Jamestown with the old fort on top of the bluff. The youngsters lie across the guardrails, shove off, and go whistling down.

As Prince Philip watched, one boy rocketed toward the bottom, only to meet halfway along an old lady with a market basket, wheezing up the stairs. The Prince shut his eyes, waiting for the crash. But the boy, his toes curled around the rail, merely applied his prehensile brakes, hopped nimbly around her, and whizzed onward.

At sea again, a climactic event took place: judgment day for beards. The ship's proud output of shrubbery was paraded before a grave jury composed of Lord Cilcennin, Sir Raymond, Commander Adams, and Chief Writer Barrett, and prizes were given for the bushiest, the most elegant, the handsomest, the most colorful, and "the one which didn't quite." Photographs were duly taken to convince posterity that such beavers had actually existed, and the camera's click had scarcely died away before the great molt began. By the time *Britannia* sighted the volcanic slag-heap known as Ascension Island, pink, clean-shaven chins had popped up like peonies all over the ship.

Ascension's scant agriculture is concentrated high on cloud-ringed Green Mountain, where enough grass can be grown to support almost a thousand sheep and a few cattle. Wild goats no longer overcrop the vegetation; the rifles of the American garrison in World War II cleaned them out.

The sooty terns which used to give pilots nightmares by insisting on nesting along the airstrip have finally consented to breed at one side. Ascension is troubled by far fewer planes than landed here when the island was a staging point on the South Atlantic ferry system. But an American four-engine transport still arrives twice a week to bring stores and, as a morale booster, a fresh movie.

Old place names from Ascension's heydays still hang on—Teapot Alley on the British side, from coaling-station times; and Miracle Mile in the American sector, reminiscent of the Army Engineers' achievements here.

Remote as it is, the island still has a role to play in global strategy. It is being developed now as a guided-missile observation station. Prince Philip, inspecting this growing installation, was given a hearty welcome by the full-bearded American contingent.

Dancing Camel Welcomes the Prince

Gambia was to be *Britannia*'s last real fling before berthing at Gibraltar—and quite a fling it was. In a wildly colorful reception Gambian Boy Scouts fired a 21-gun salute, a military band blared joyfully, and 4,000 school children marched past Prince Philip. An old man tied himself in knots and kissed the sole of his foot, a camel danced, and a procession of lantern-lighted boats bobbed on the river.

Later, accompanied by Governor Sir Percy Wyn-Harris, an Everest veteran, the Duke went "bolon-bashing"—crocodile-hunting—up a muddy creek, or "bolon." For 20 miles the banks were lined with pelican platoons, blue and white herons, and ibises, while bee-eaters and even an eagle glided overhead.

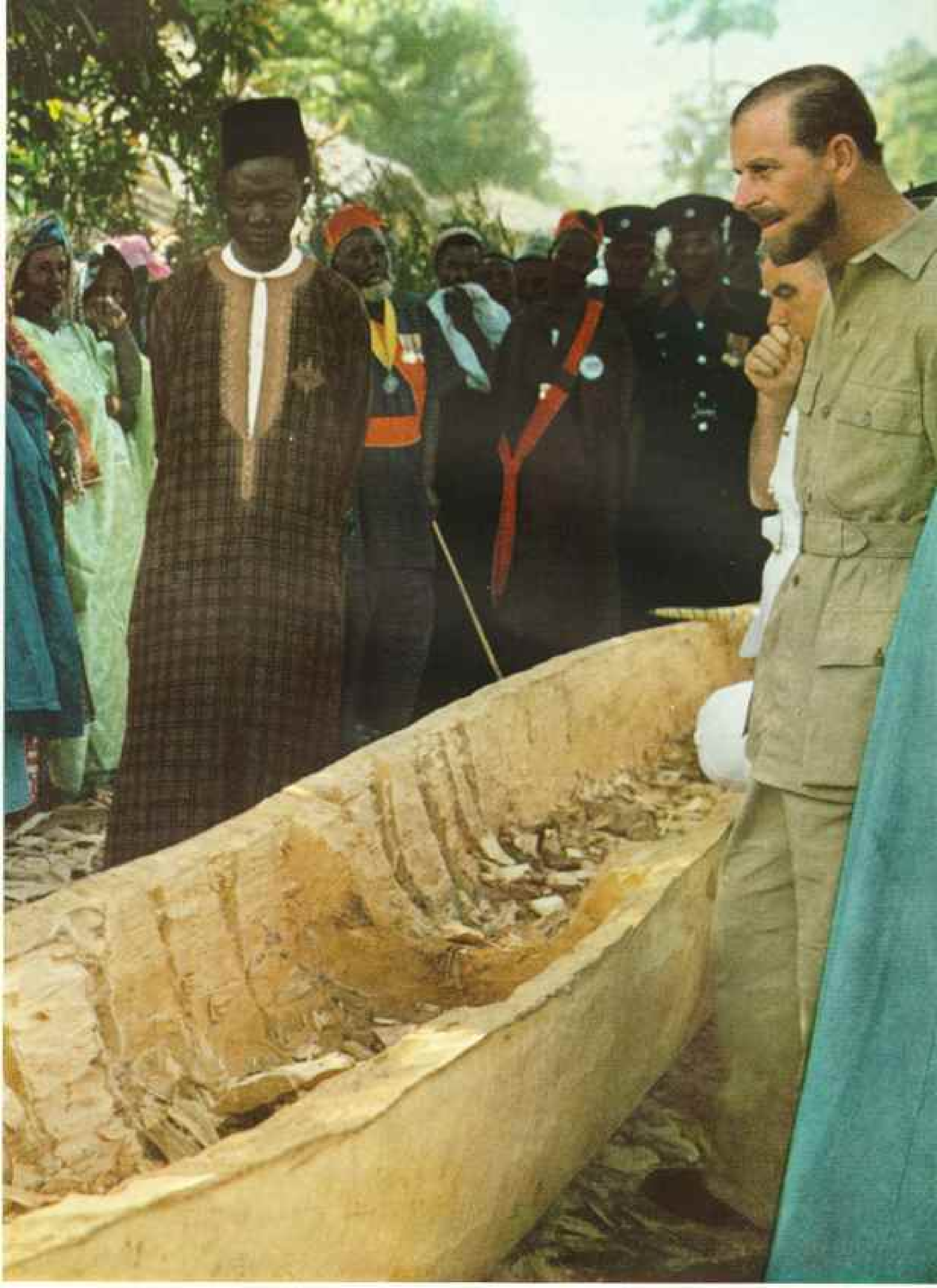
Near the village of Salekini the party passed a dugout loaded with rice, a sight which

* See "St. Helena: the Forgotten Island," by Quentin Keynes, National Geographic Magazine, August, 1950.

© National Geographic Society

As Gaudy as Tropical Birds, Gambia Women Flock to a Palaver in Sankwia

The Colony and Protectorate of the Gambia, Britain's oldest link to west Africa, comprises little more than a broad river with narrow strips of land on either side. It was *Britannia's* last stop before Gibraltar.



625

A Boatbuilder Shows His Royal Highness a Half-finished Dugout Canoe

Though the Gambia River is the main highway through the land, it is little traveled; most Gambians stay ashore, raising rice and peanuts. The design of this ax-hewn canoe has not changed through the centuries.

caused the governor to beam happily. Salekini, he said, used to be a hungry village nearly all year round. Now, under a new rice-growing project, the people reap more than they can eat.

Next morning, under a canopy of baobab and silk-cotton trees, His Royal Highness opened the annual chiefs' conference (page 624). One by one, 34 chiefs in flowing robes strode with great dignity across the courtyard, slipped off their sandals, and made their homage to the Duke. Nearly all displayed amulets; one wore his across his forehead, since his father had suffered from headaches.

Britannia dropped down the long Gambia River that evening, her wake washing against the knees of the mangroves. About midnight the yacht passed Government House at Bathurst. Tiny flashes abruptly shot like sparks from the lawn. The governor, fond owner of two antique miniature brass cannons, was firing them in salute.

Britannia replied with a couple of rockets. As the stars gently exploded, lived their vivid moment, and vanished, they signaled in effect the end of the great tour.

What had it all meant? Prince Philip gave one answer when he addressed the lord mayor's luncheon in London welcoming him home. He had been away, he pointed out, four months.

"For most of my life," he said, "to be away four months from home meant nothing at all. In fact, it would have been more surprising if I had spent four months consecutively at home. This time, for obvious reasons, it meant much more to me.

"But I believe that there are some things for which it is worth while making some personal sacrifice, and I believe that the British Commonwealth is one of those things."

"Because We All Like Each Other"

To the children of Great Britain, on an informal telecast, the Prince added this about the peoples of the Commonwealth:

"They all belong to this one family of nations of ours, and I think it's worth remembering that we stick together not by force but because we all like each other."

Certainly, *Britannia*'s cruise had given ample evidence that Prince Philip liked meeting the peoples of the Commonwealth, and that they liked meeting him. The Crown, through a young admiral with a grin and a consuming interest in the world about him, had been made a bit more real, and its web of loyalties, insubstantial as gossamer but stronger than steel, a bit more binding.

Long Muzzle-loaders in Gambia Fire a Salute to the Prince and *Britannia*

How We Sailed the New *Mayflower* to America

Why Did *Mayflower II* Take the Long Southern Route? What Were the Risks She Ran? Her Skipper Reveals the Answers

By Captain Alan Villiers

It was only natural that the master of *Mayflower II* should write his firsthand account of her Atlantic crossing exclusively for the National Geographic Magazine. Beginning in 1931, when youthful sailorman Villiers told of rounding Cape Horn in a square-rigger, National Geographic Society members have read in their Magazine his salty narratives of windjammer voyages from his native Australia to England (1933), around the world (1937), and across the Atlantic (1937 and 1955). But seasoned mariner Villiers calls this year's epic voyage in the pitching replica of a 17th-century galleon his greatest adventure.—*The Editor.*

THE drum beat and the crowds applauded as I marched up the landing stage by famed Plymouth Rock behind the costumed drummer, and the sound of cheering thundered in my ears. The plaudits and the speechmaking of a wonderful welcome awaited me. But I looked back at the strange little ship called *Mayflower*, now moored safely at a landlocked buoy behind me. The greatest and most interesting sailing adventure of my life was over.

There she was, a replica—so far as that is possible—of the once obscure and commonplace ship of that name which had brought the glorious Pilgrim Fathers to that same rock, without cheers and without welcome.

Aye, there she was, 337 years later, and the hot sun shone proudly on her; but the thought that was uppermost in my mind then was not of any pride in the achievement, such as it was. Rather was it wonder that my splendid crew had managed to bring in that extraordinary ship at all.

Steamers Come Up for Closer Look

She rode high out of the water, bulky aft, lower forward, squat and apparently ungainly in her low Elizabethan rig. The masts were supported by an array of cordage rigging that, to my Cape Horning eyes at least, looked spindly and fragile in the extreme, her built-up aftercastle towering like some gaily painted fortress of the Middle Ages. Surely she was the most extraordinary, the oddest little vessel that had crossed the waters of the North Atlantic this 20th century (page 628).

No wonder the astonished steamships of all nations had come hurrying from the horizon for a closer look, whenever they had sighted us! From 16th-century spritsail on the high and unsupported bowsprit to the historically correct lateen mizzen aft, from chunky cutwater to heavy stern, from well-caulked gun ports to clumsy and enormous tops—what a ship she was!

I marveled that we had sailed her there. Yet it had not been so difficult, after all. I sailed the southern way—5,500 nautical miles to make about 3,500—from Plymouth, England, to Provincetown, Massachusetts, our first port of call (map, page 632). She had handled well; I had a first-rate crew; and the Lord was kind. The spring had been stormy and one of the most ice littered the wild Atlantic had ever known; yet we had come safely, without undue trial. For that I thanked God and the stanchness of British oak well put together.

Launching Marred by Listing Ship

I sailed from Brixham, the little Devon fishing port where the ship was built, on the evening of April 17, 1957.* The ship had all but capsized when she had been floated out of her finishing dock a fortnight earlier. Her unfinished hull was launched on September 22, 1956, and she was finished in a dry dock. When the day came to float her out of this, the tide did not rise to within a foot of the predicted level, and she could not float freely inside the opened dock.

When the shores were removed, she fell heavily to starboard, and the people assembled on the dockside ran for their lives. The small tug just scraped her across the sill; she flopped over and hung there, obviously in a state of neutral equilibrium.

"If she goes right over, just climb up the rigging," I said quietly to my sons Kit and Peter, who were standing with me on the poop. But she did not go over.

What had happened was that, partly because of the poor tide, she was insufficiently

* See "We're Coming Over on the *Mayflower*," by Alan Villiers, National Geographic Magazine, May, 1957.

ballasted to hold her high-out-the-water hull up straight under the weight of the rigging and the yards. More ballast down below soon put that to rights, but what a howl came from the pessimists all round the world! She will never make it, they shouted. She won't get out of Brixham Harbor!

If there had been any real doubt of the vessel's seaworthiness on that score, or any other, my crew could have left me. They were all free agents. At that time they had not even signed the articles, for the ship was still in her builders' hands. Not a man left, or thought of leaving. When an overpessimistic London newspaper spoke of the ship having no better than a 50-50 chance of surviving the coming voyage, my crew formed a "50-50 Club" in their mess, in derision.

"Fifty chances of getting there in 50 days," laughed the club's president, Dr. John Stevens, when I asked him about it. Dr. Stevens was signed on as "chirurgeon and apothecary," as well as seaman, in the 17th-century manner. I wasn't certain what a chirurgeon and apothecary was, precisely, and I don't think he was either. A gynecologist by specialty and a very young submarine captain of World War II, he had later become a surgeon. He had served his time in the South African training ship *General Botha* and was an excellent seaman.

The Ministry of Transport and Civil Aviation, the British authority responsible for our voyage, had ruled that all on board must be crew members and there could be no passengers, so I could carry no new Pilgrim families.

628

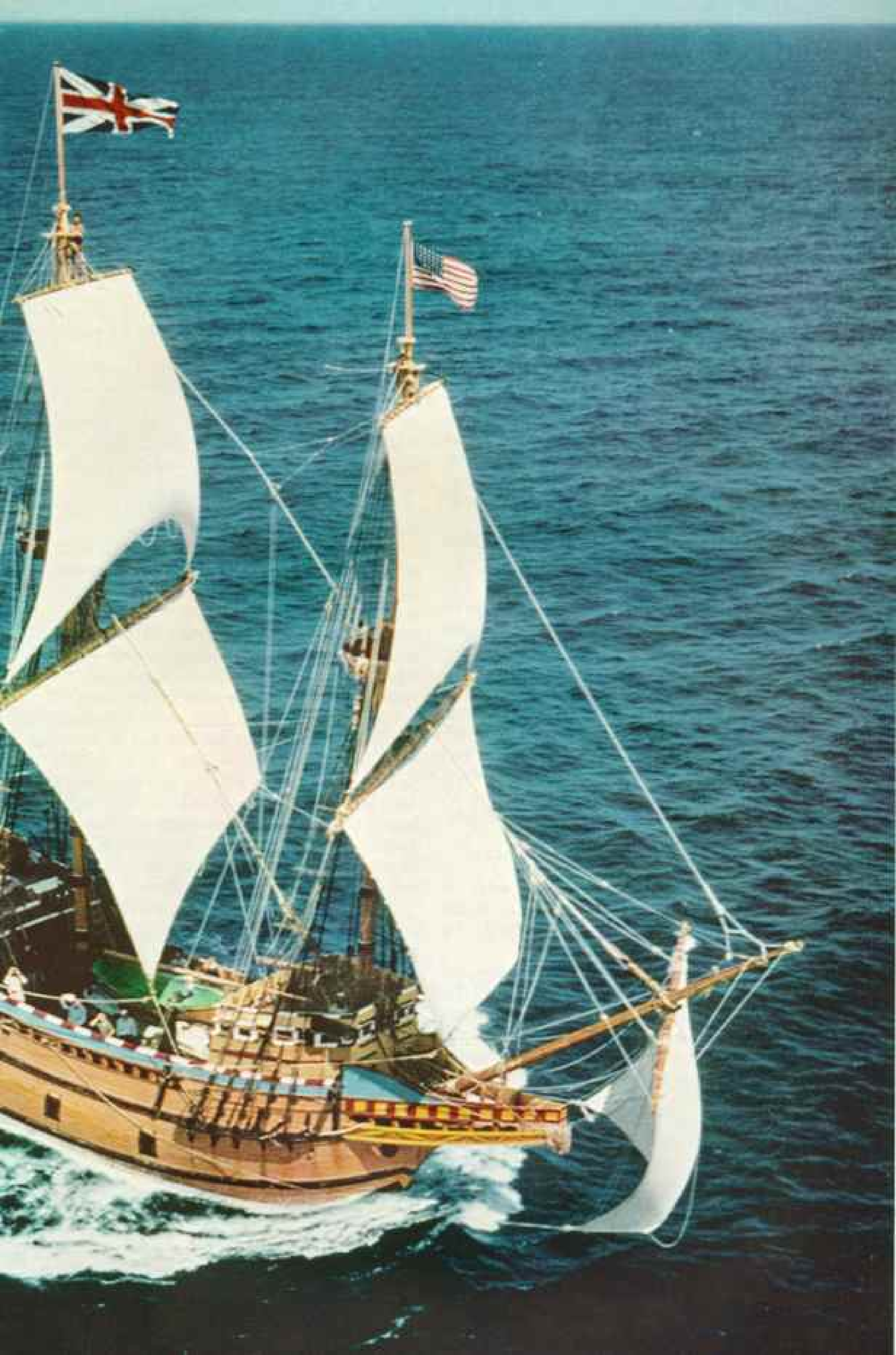
Mayflower II Reaches for the New World Under All Sail and a Blaze of Flags

Here's the ship they said could never be built, much less repeat the first *Mayflower's* Atlantic crossing 337 years ago. Well, we did it—5,500 sea miles in 54 days, which was 13 days less than the Pilgrim Fathers took.

The National Geographic photographer snapped us from a U. S. Navy blimp that was nearly level with the crewman in the main crosstrees under King James I's Union Jack. The Stars and Stripes flies from the foremast in the seafaring man's gesture of courtesy to the country in whose waters he sails. On the mizzen we show the Cross of St. George and our national colors, the British Red Ensign. We have a bit of blue paint along the rail, put there at sea. The rail was darker when we started, but I thought some color would look better (page 635).

This is the kind of day a sailorman loves. A quartering breeze fills every sail, and the cumbersome spritsail beneath the raking bowsprit pulls like a horse.

© National Geographic Society
Photographs by Luis Marden, National Geographic Staff



The ministry had ruled also that I must have inflatable life rafts for twice the number of persons carried, and I must have efficient two-way radio. These things we had, but the inflatable life rafts were so ready to inflate themselves that one blew itself up on the way round to Plymouth, and we had to replace it.

I towed from Brixham to Dartmouth because the wind was light and adverse, and it was only just around the corner anyway. But I had to tow also from Dartmouth to Plymouth Sound for the same reason, and I did not like that. There had been no real sailing trials at all, for I'd had time in Brixham only to set the sails and discover that the ship handled, steered, and tacked satisfactorily. We sailed the day the ship was handed over by the builder. My trial voyage was the voyage proper.

I called in at the lovely River Dart because the original *Mayflower* had been in there, and I went to Plymouth for the same reason. The ship had a wonderful welcome in both ports, and there was a colorful ceremony at the Barbican Quay, whence the Pilgrim Fathers had boarded their little bark. The Lord Mayor and the Town Clerk of Plymouth, England, the Chairman of the Board of Selectmen of Plymouth, Massachusetts, and all the dignitaries were there in their robes. I was pulled in by longboat by some of my sailors in their Elizabethan costumes, and it was all very colorful and interesting (pages 634-5).

Winds of Spring Wait for No Man

But I was anxious to be on my way, for the east winds of spring were blowing in the channel outside and they would wait for no man.

From April 2—the day I originally proposed to sail from Brixham—until April 15, the easterlies blew beautifully. If I had been able to sail then, I should have reached the Grand Banks of Newfoundland with a favorable wind. But I could not sail, for the ship was not ready.

I left Plymouth on April 20, and the east winds at once departed.

The sea was completely calm when I went out from the buoy off Drake's Island, in Plymouth Sound, and I had the towboat *Tactful* take me well clear of the land. When she let me go and I was under all sail, the ship swung as she willed, and for a while I was headed east toward the Strait of Dover instead of west toward America. The morning after I left, Plymouth was still in sight. I might as well have stayed at the buoy overnight.

The delay had one good effect, though: it gave me time to find a stowaway.

I was worried about stowaways. To steal passage in a ship is a crime, and stowaways are almost invariably nuisances who get ships into trouble. The *Mayflower* adventure was particularly open to the useless thrill seeker, and I feared that some young woman would choose to hide herself on board, or be "planted" there, for the sake of the story.

I had searched the cargo hold rigorously before leaving. It was jammed full of heavy treasure chests, each bulging with British goods for exhibition and trade promotion in America. Any of those chests was quite large enough to house a stowaway, male or female, but they had been examined and each was documented and manifested. I did not think anyone was inside them.

I had my children crawl all round the chests, into every hole and corner, looking for stowaways. There were none in the cargo hold, but a young man had hidden himself in a hole

Signal Flags and Navigation Gear Share → My Tiny Cabin High in the Aftercastle

A model of *Mayflower II* stands on the chart table. The wheel-like instrument beneath the square stern window is a modern azimuth circle. We set it up on the compass and took sun sights to find out how much the needle erred.

The gay little flag was given to us by an Italian cruiser that spoke us off Bermuda. A copy of an old traverse board stands beside it. Elizabethan sailors used the device to record courses and distances.

Only the open poop deck lies above the captain's quarters. Many a bash in the head the low beams gave me at sea.

Luis Marden, National Geographic Staff

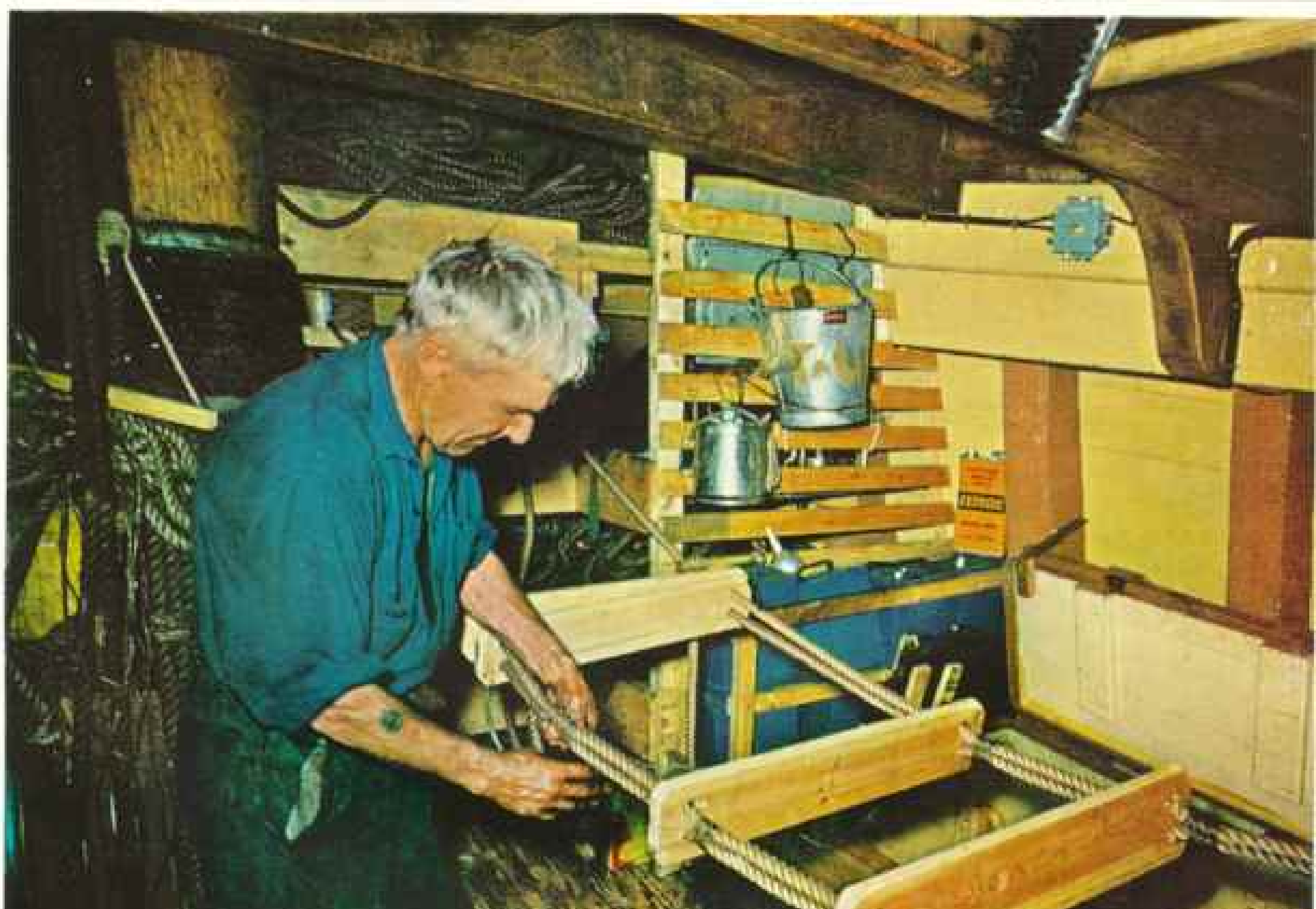
Bos'n Ike Marsh Makes a Proper Ladder → in His Locker Under the Forecastle Head

Foresail halyards lead down beside the mast behind this skillful Welsh sailorman. They make fast to the knight, a solid balk of timber set in the 'tween decks; ships have not used them for centuries. Spare cordage lies in a bin.

Incongruous wiring beside the hanging knee carries current for electric sidelights we never used. We made do with old-fashioned oil lamps, filled by the lamp trimmer from the smaller container on the makeshift slat bulkhead.

Bill Baker, the ship's designer, gave the boatswain some headroom, which is more than he did for me.

© National Geographic Society Alan Villiers



among the chests in the 'tween decks. My chief mate, Mr. Godfrey Wicksteed, found him there, and he was quickly chased up on deck and hustled over the side into a press boat which, perhaps not strangely, appeared to be waiting for him.

If I had not found him, I should have had trouble on arrival, for the young man had no proper documents. It turned out that he was one of thousands whose applications to sail I had had to refuse, so I could not wholly blame him for trying to steal a ride.

It took a couple of days to get out of the channel. I was very thankful that I did not have to beat against heavy head winds, as I had had to do for a week in the ship *Joseph Conrad* years before.* Those two days gave us a good chance to learn the ropes, which were far more complicated than in the modern square-rigger.

I was still dubious about the spritsail and the lateen mizzen, but they set and pulled well. I had prepared alternate sails—a couple of jibs, a staysail, and a small trysail—to set in case those archaic sails proved too unwieldy. I need not have worried. It was quickly obvious that the Elizabethan sailors knew what they were doing, and the spritsail in particular showed itself to be a splendid maneuvering sail. It was so far forward that its turning power was terrific, and it quite offset the windage of the very lofty poop.

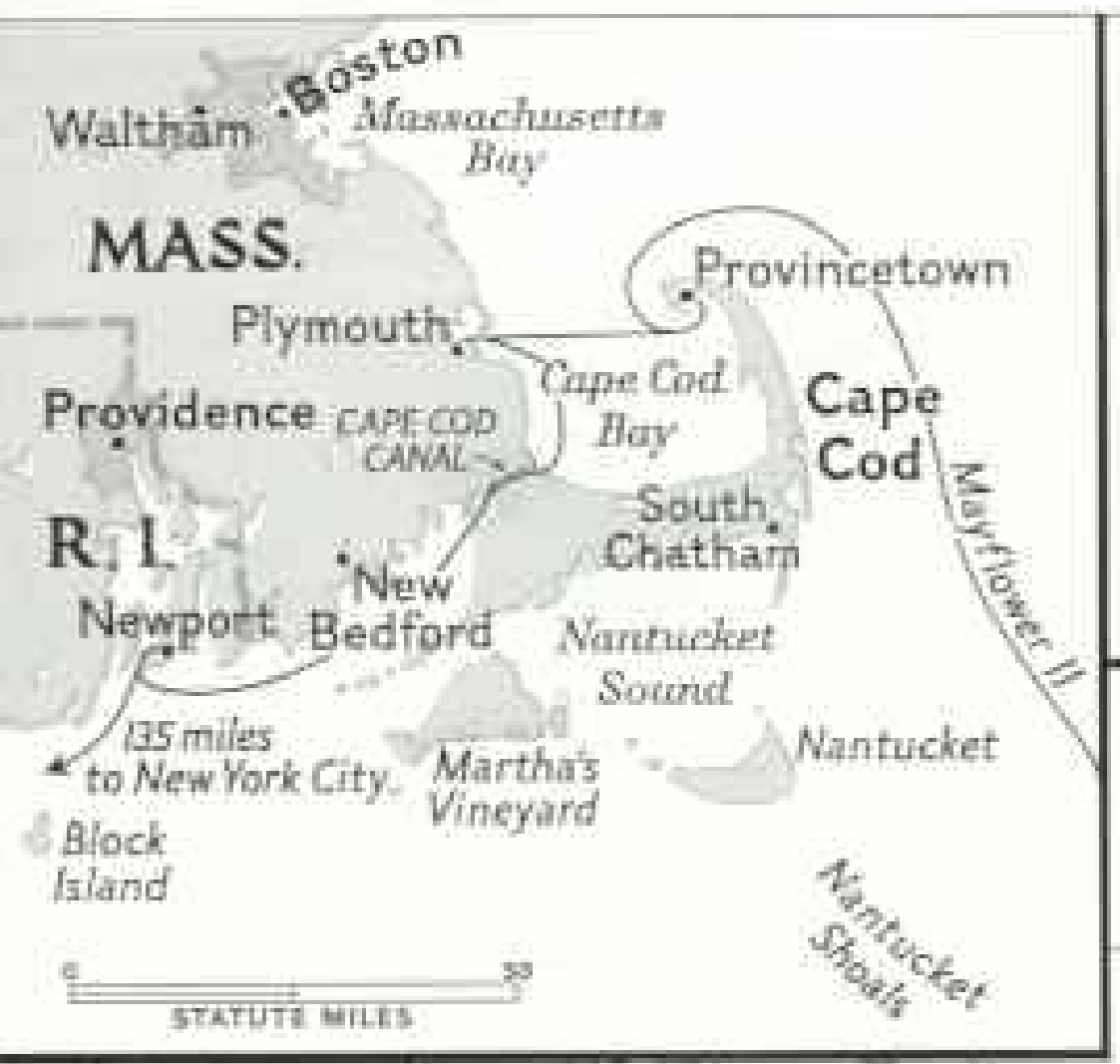
Crew Learns to Handle Sails in Dark

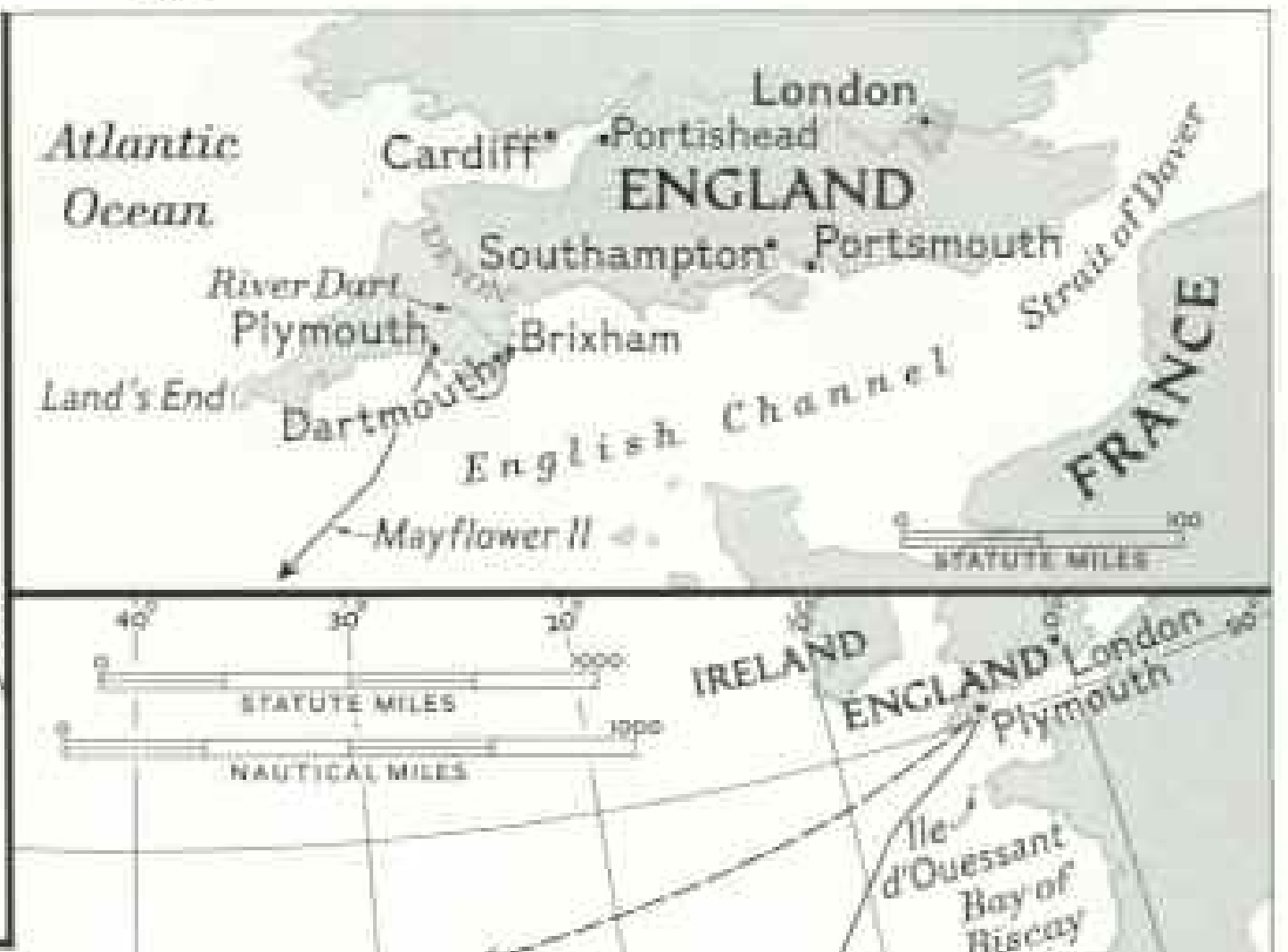
I set two watches, Mate Wicksteed in charge of one and Second Mate Adrian Small the other. By night the mates exercised their watches in sail drill, so that they would know the ropes at all times, even on the blackest night, for there was no light on deck save an oil lamp in the brass binnacle. There was also a candle lantern for the old-fashioned compass

*See "North About," by Alan Villiers, NATIONAL GEOGRAPHIC MAGAZINE, February, 1937.

Original *Mayflower* Braved the North Atlantic; Her Successor Rode the Trade Winds

The Pilgrims covered some 3,500 nautical miles in 67 days. *Mayflower II* sailed 5,500 in 54 days.





in the wooden binnacle, but we steered the ship by the modern instrument and navigated that way, too (page 654).

The old-fashioned compass was pretty good, but the candle gave a fitful light which was almost useless. As for the cross-staff, an old-time navigating instrument, it was so approximate that I did not wonder Capt. Christopher Jones, in the original ship, had fetched up off Cape Cod when he thought he was going to the Hudson River. I wondered that he had managed to arrive at all!

Perhaps we were not sufficiently expert in the use of the cross-staff. At any rate, we also had excellent modern sextants and a first-rate chronometer, as well as the latest charts.

It was just as well that the first couple of days were quiet; they gave us a chance to learn our way around. It began to blow fresh and then hard on the third morning, and the shallow, choppy sea of the channel got up and started jumping, as is its well-known habit, and the little ship began to jump with it.

And how she jumped! None of us had ever known a motion like it, not in wartime destroyers, or submarines, or LCI's, or in big Cape Horners, or small yachts. She rolled and she lurched, she pitched and she stumbled, all with a wild and completely unpredictable abandon that was extremely trying, to say the least. Even some of the old Cape Horners were violently seasick for days.

I smiled afterward when friends showed me a cartoon in a New York magazine showing a seaman approaching me to ask if he could "cheat" by taking a modern seasick remedy. Cheat! We certainly did cheat, for a firm of druggists had sent our surgeon a good supply of just such a medicine, and the demands on it were heavy.

Galleon Pitches Like Bucking Bronco

I fully expected to be sick myself, for I knew that I can be seasick in small vessels with a violent motion. But I was not sick, and was thankful at least for that, for the motion in my tiny cabin, high in the highest end of the great aftercastle, was so violent that it was a strenuous exercise to stay in there, asleep or awake. Perhaps that helped to keep me fit. At any rate, it was exceedingly trying.

So was the lack of headroom and the high sheer of the wooden deck, and the fact that the rain could leak in by the deckhead and all sides. At least it had the merit of leaking out again, or some of it did, and my bunk was more or less dry.

633 Alan Villiers

A Sailor Lays Aloft to Loose the Mizzen

Mayflower's third mast wears the three-cornered sail and sharply canted yard of the lateen rig, still used by Mediterranean fishermen and Arab dhows. This seaman casts off the sail's restraining canvas gaskets.

The trouble with those high wooden structures was that they had to be lightly built or the ship would be top heavy. Being lightly built, naturally they worked in a seaway, and when they worked, they leaked. When they leaked, I suffered. So did everybody else, for the 'tween decks leaked too, and water seeped in at the gun ports despite their calking.

"This lively little ship is altogether too historically correct for my liking," said the mate, "but I expect we'll get used to her."

We did, but it took some time.

The trouble was in part that, having more than 130 tons of inside ballast in her, most of it railway iron and old furnace bars that were stowed right down below, and then 17 tons of heavy chests on top of that, she was what sailors call "stiff"—very stiff. Which is to say that she rolled violently, like the pendulum of a clock.

She was also very short, less than 90 feet on the waterline, and so she pitched into the short, steep seas and jumped and leapt and cavorted all over them. She was like a wild

© National Geographic Society

634

Costumed Crew Waves Farewell

Lower: The Lord Mayor of Plymouth in his scarlet robes rides out to bid us goodbye. I wear my best Pilgrim suit.

635

Monochrome (upper left) and Kodachromes by Robert F. Sisson, Staff Photographer

Sails Bent and Stores Aboard, a Brave Ship Stands Ready for Sea at Plymouth, England

Behind the galleon's hull lies Barbican Quay, where the Pilgrim Fathers last trod English soil. Buildings in background overlook Plymouth Hoe, on which Drake finished his game of bowls before going out to defeat the Spanish Armada. Old Eddystone Light at left once stood 14 miles out to sea; it was re-erected here in 1884.

little bronco constantly taking an uneven series of high fences and rolling and all but falling over as she came to each one.

If the motion inboard was violent, aloft it could be dangerous. Our rope rigging had been beautifully made and well stretched, but it soon became apparent that the lanyards used to set it up were not stretched well enough by the riggers, and the play in the rigging was often frightening. To climb aloft in the topmast rigging was to be flung round in circles, for all the motion was increased a hundredfold up there, and the rigging alternately slacked and then whipped taut again as the little ship rolled, so that even the most skillful seaman had to hang on for dear life.

It was just as well that I had a grand lot of sailing-ship men and yachtsmen. Whenever it was necessary, they fought their way up there and did their work. Fortunately, the topsails were small and light, and I thanked heaven that she had no topgallants, which in larger square-riggers of that day were the sails next above the topsails.

"Phew, I never realized it would be like this!" said an Oxford schoolmaster as, windswept and wet through, he climbed out of the rigging. "Can't say truthfully that I like it much, sir!"

But he went up again and again, whenever called upon.

Rigging and Masts Worry Skipper

The wind rose and the sea rose with it, and, even though we came out into the wider waters where the seas rolled long and the short, steep-breaking crests spread out, *Mayflower*'s motion continued to be extremely violent and trying.

It was more than trying. It was very

637

All Hands Gather Topside for Sunday Services

A 17th-century-style binnacle, lashed to ringbolts in the planking, houses an old-fashioned compass. We did not rely on this instrument, but steered by the modern compass ahead of the wheel.

Here on the quarter-deck the helmsman keeps *Mayflower* on her course while he listens to the skipper (left).

I followed each service with a short talk on Pilgrim history.

Gordon Tenney; Black Star

the shrouds together and thus tightening the rigging) or tightening of the lanyards made much difference (page 640).

Shifting Yards Gouge Masts

The main yard and the fore-yard jumped in their gear, and though I tried to fix this by fitting wooden saddles where these yards rested on the masts, the yards still jumped and dug into the wooden masts at every pitch and roll. I put up battens. I rigged all manner of chafing gear, for the chafe aloft was terrible. I did all I could, but much of the violent play in the rigging remained.

It seemed to me that the topmasts were too light, and I would have liked to see the foremast a much heavier spar. It was stepped in the curve of the cutwater, right forward, and it stumbled and threw

worrying to me, too, for I noticed that the rigging was working far more than I cared to see, and I wondered just how long it might stay with us.

My crew and I were used to ships with steel masts and steel-wire rigging, and the whole complicated array of a modern square-rigger's masts and yards stays put. It does not work with the ship's motion. You know where you are with it. Of course, you could be dismasted in a steel ship just as well as in a wooden, and many such ships did lose some or all their masts. But such accidents were unusual. You could rely on your rigging, as a rule, so long as you looked after it.

Looking aloft at this wooden, rope-supported stuff in the new *Mayflower*, I wondered (page 648).

I hated to notice the way the fore- and mainmasts worked, and the bowsprit. These masts were vital, but I could see the main masthead shift a good foot laterally with each heavy roll, and no setting up of the catharpins (old-fashioned gear for drawing

all its rigging jerkily forward, like a hard-mouthed horse tugging at its reins, whenever the little ship tried to stand on her head, which was far too often.

The fore-topmast was little better than a knotty broomstick, and the vital bowsprit was stepped in the 'tween decks, wedged by the heads, secured with one gammoning (a rope lashing around it), and entirely unstayed and unsupported in all other respects—no bobstay, no guys, no stays of any kind. Nor could there be, if the spritsail was to be used, as used it must be, for the fore-and-aft stays forward were not fit to carry jibs.

Leaks and Thumps Cause Concern

As for the leaks, the water poured into the mates' cabins and the 'tween decks leaked. There was a seepage into the hold, not serious at first, but who could say how it might grow if I had to punch the ship into too many hard westerly gales? The after gun ports leaked, and the leaks could not be fixed from inboard, or from outboard either.

Something aft was going "thump-thump-thump" at every heavy pitch, with considerable and alarming violence, nor could the reason for this thump be traced. It never was, though I traced six others. I feared it might be something adrift on the heavy rudder, but there seemed nothing wrong there.

Just how well could I fight a ship like that to windward, across the whole North Atlantic in the spring of the year, and a wild spring at that? The easterlies had gone—wasted, because the ship was not ready. I wondered, too, how I could carry enough sail to keep her fighting when it blew really hard.

Could the masts and yards stand it? I knew the rope rigging itself was all right, for skilled hands had made it. But I seriously doubted the capacity of the ship to carry sail enough to keep her going against hard westerly winds—against any hard winds.

I walked the reeling, tiny poop, or tried to walk it, grabbing for support at bulwarks or rails at every turbulent toss or wild roll. She was deep in the water, deeper than she was designed to be, and she was dragging badly and setting up a wild eddying wake like a twin-screw steamer's, though she had no screw. I wondered how wise I was to persist in trying to sail the northern route, in high latitudes.

The weather forecasts spoke of gales—heavy gales, westerly gales—right in my path. If a bad gale blew up, I could be in trouble.

Those weather forecasts were a modern improvement that had never bothered Captain Jones. Well, I knew what I was heading into if I stayed in the north. If I allowed that ship to be dismasted, how could she be rigged again? I had not enough spare spars aboard for that.

What would be the alternative—go back? The original had done that, twice. But I was determined not to do anything of the kind. No, we were at sea. The eyes of the world were upon us, more even than we realized then. I would go on.

But I made my decision. I would not force the ship by the northern route if the winds were adverse. The wind then was in the northwest and fresh. I fell off a bit, and let the ship go free, bounding along west-southwestward to pass out clear of Ile d'Ouessant and all Biscay, well out, so as not to be drawn into that wild zone, no matter what the wind might do.

"10-knot Ship" Makes Only 7½

I knew that Captain Jones and his contemporaries were accustomed to take in all sail in hard blows of wind, and even to strike their topmasts and send down their course yards, the spars for their lower canvas. I could do that, too, perhaps, but not with land under my lee. And where would that sort of seamanship get me, if there were too many gales? The whole North Atlantic weather plot at the time shrieked of westerly gales. I had a passage to make, not a drift backward.

The wind stayed in the north, blowing almost at moderate gale force. The sea got up. The wind shrieked. The vessel flung herself all over the sea. The carpenter was running here and there, coping with more and more emergency leaks—none serious, but all worrisome—for the ship had not been built under survey and, toward the end, had been hurried up a little.

I had one other worry. The ship, which was alleged to be capable of 10 knots (on

---

← **Setting Sun Makes a Golden Galleon of *Mayflower*, Becalmed in the Channel**

The Devon coast looms astern. Our sails hang useless; spritsail sheets trail in the water. The restless ship pitches mercilessly, and some crewmen turn a bit green. Two days of this—then came a fair nor'wester, and we romped away for the open sea.

© National Geographic Society
Robert F. Sisson, National Geographic Photographer

Sailormen Rig a Stunsail Boom to Give *Mayflower* Extra Speed West

We wanted to follow *Mayflower I*'s track, but the winds willed otherwise. For 11 days after we dropped the English Channel astern, the nor'wester blew, driving us steadily south. Then, near the latitudes of the Canary Islands, we found the northeast trades, and we headed west in the path of Columbus.

Here *Mayflower II* bowls across the Atlantic in the balmy flying-fish weather of the trade-wind belt. Five of her hands run a spare spar outboard from the fore-yardarm. On it we raised a small studding sail, a trifle of fair-weather canvas to give the ship more drive (page 654). Capt. Christopher Jones of the first *Mayflower* probably had no such sail. The fore-yard has footropes, something else *Mayflower I* didn't carry, so far as we know.

An authentic catharpin runs athwartships from port to starboard shrouds. This gear has been obsolete since wire rigging replaced rope. Rope stretches, and we spent hours at sea setting up, or tightening, our cordage. One way of taking the play out of shrouds was by shortening the catharpins.

Another antique piece of gear is the martinet, the web-like arrangement of ropes and deadeye below the man with the white shirt. It hauled the leech of the foresail up to the yard.

A parrel holds the heavy yard to the mast; its wooden rollers act as bearings and minimize chafe. You can still see parrels on some sailing ships.

Black bands around the mast are tarred hemp. Old-timers, who called them woolding, used the bands to strengthen the stick, but I think our fine Douglas fir had no need of them.

© National Geographic Society

Alan Villiers

what data I know not), proved very quickly that she could do only about 7½, though she "ghosted" well in light winds and slipped easily up to 4 or 5 knots. Maybe she was laden a little too heavily—probably she was.

What it all added up to was that I had to go the southern route, or else take a chance on not arriving in one piece at all—to run down before the northerly winds west of the Bay of Biscay and past Finisterre, and sail to the region of the northeast trade winds. They would blow me across on my westing as they had blown Columbus and the Roanoke and Jamestown ships and many a thousand more.

This was the kinder way to go. But it was also much longer and, in the spring and early summer, the trade winds might be light. I might not find them at all. I would have to sail southward of the Canaries, down beyond the tropics' edge, and then make westing for 3,000 miles, almost to the outer West Indies, then swing north again on a wide curve west of Bermuda, with the Gulf Stream (I hoped), and cross the stream finally and make landfall on Nantucket Shoals Lightship. I would be lucky to make it in 60 days.

Well, we had the food and the stores. We could keep the sea for 70 or 80 days, if need be. The vital thing was to keep that rigging where it was, and to get along. We could well be 60 or 70 days beating along the northern route, too—if we were to make it that way at all.

As for fresh water, we had enough if it was rigorously rationed. It was handed out with strict parsimony, anyway, none for washing and very little for cooking. A 30-gallon tank above the galley was pumped full each morning by Carpenter Edgar Mugridge, who alone could rig the pump.

Cook Guards the Water Supply

The only tap was in the galley, where Chief Cook Walter Godfrey was supreme dictator and water guardian (page 647). We tried to make the 30 gallons last two days, not one, for we could not say how well our fresh water might keep, though it was in steel tanks.

We had no refrigeration. This lack was a considerable hardship to the handful of Americans aboard, Boys' Club boy-of-the-year Joe Meany, able seaman Andy Lindsay, a writer, and a couple of photographers, but no one else minded it.

Young Joe was a first-rate boy (page 663). Never at sea in his life before, he flew the Atlantic to join us. The ship was a bit of a shock to him at first, but he could take it. Both he and the English lad, Graham Nunn, developed into splendid young seamen, thoroughly useful on deck and aloft.

"Where can I find another seagoing sailing ship to serve in?" asked Graham, when the voyage was nearly over. And I did not know the answer to that one.

Seagoing Cat Attends Lifeboat Drill

My decision made, the wind continued in the north as if it were in thorough agreement, and the little ship passed the bay—140, 150, 155 miles a day, even 164 one day, which was about the best she ever did. I tried to get her up to 8 knots, but I never did. The only way would have been to throw some of the treasure chests over the side, and I could scarcely do that.

Past Finisterre, past the whole coast of Portugal (well out of sight), past Madeira's lovely isles (also out of sight) I romped along, as if the little ship were loving it. Instead of gray northern skies, now the sun shone and the decks dried, and Felix the little kitten came up on deck and gingerly tried out his sea legs.

Felix was young when he joined, but he soon settled to the life. Third Mate Jan Junker made him his own little life jacket, and he came to lifeboat drills along with the crew. Felix ate anything and everything. We had plenty of canned fish and milk, and he thrived. He grew to like the ship's food so well that when later small flying fish sometimes landed on *Mayflower's* deck, Felix sniffed at them disdainfully and returned to his canned sardines.

Day followed day, and I came among the Canary Islands, still with a good north wind. It was exhilarating and it was wonderful! By nights the moon shone and the ship was incredibly romantic. By night and day the good wind filled the round-bellied sails, and the ship did her best to hurry along. Looking aft at the quarter-deck and the shapely after-castle, sometimes I could hardly believe that the ship was real.

My crew were all settled down. Cook Godfrey was performing wonders in the minute galley, which had been designed for northern latitudes and was a hot little Hades down south. He baked bread three times a week and turned out nourishing two- and three-course meals three times a day. Our canned,

643

Gordon Tenney, Black Star

A Northeast Gale Sends Us Racing to Leeward. The Watch Tails On to Shorten Sail

Next two pages: The ship staggers under lower sails. Spray rattles on our oilskins as we scud on.

dried, and salted food offered far wider variety than formerly was the case in sailing ships, and our meals were varied and well balanced.

After the 11th day, I served out lime juice to the mariners daily, as required under British law to prevent scurvy. Hence the expression "Limeys." This lime juice used to be vile tasting and sometimes galling stuff in the old Cape Horners, but ours was the best, and everyone, including Felix, drank it.

We had managed to take care of most of the chafe aloft, mainly by painstakingly turning out hundreds of yards of "baggy wrinkle" to be twisted round the shrouds or sewn onto mats which were secured in the tops.

Baggy wrinkle is made by tucking rope yarns into lengths of marline or good spun yarn, and making it takes time, a lot of time. Well, we had some time and plenty of hands. Fighting chafe aloft was the first big job, and it went on throughout the first month at sea.

Crewmen Double as Seagoing Postmasters

In the meantime we had bowled through the Canaries, often at our maximum speed of 7½ knots. I had radio aboard and had informed the authorities on both sides of the Atlantic which way I was going. I reported the ship's position daily to Portishead in England and South Chatham in Massachusetts, and once a week sent out a brief summary of progress. The world knew where we were.

All went according to plan at first, and it looked as if we might have the extraordinarily good fortune to make something of a record run, by the southern way—and this in a ship that could do little better than 7½ knots! Her merit was her capacity to slip along easily in quiet winds, and our good fortune was in the continuance of good winds.

But then the wind fell light and all but died on us. In the region where the northeast trade winds should be blowing steadily and lustily, at first we had very light and variable breezes, then the lightest of light airs, and then no wind at all. It was exasperating, but it did the ship no harm.

Calking, preventing chafe, painting, and the general work of the ship went on uninterruptedly, though we also had another chore we could have done without. This was to cancel the stamps on thousands of special covers which had been prepared for the crossing, a philatelic activity new to me but apparently a well-established and highly popular practice. My crewmen included no ex-mailmen and no stamp-lickers or cancelers, but all got manfully on with the job in watch below as well as watch on deck, to have it finished with (page 649).

Live Lobster Gives Two Men a Tussle →

Like the Pilgrims, we had no refrigeration. Fresh meat became an obsession after days on salt pork and canned stuff. This magnificent lobster, gift of a fisherman met off the New England coast, brings a smile to bearded Second Mate Adrian Small, but Boatswain Marsh is too busy with the formidable cutting claw to be amused.

A crewman hangs wash on the small boat.

In the calms we swam. I should say, the lads swam. I cannot, and this was no place to learn. We all had good life jackets if we needed them, anyway. My Royal Navy jet pilot, young John Winslow, who was on leave from the British Fleet Air Arm to sail with us, and Joe Meany and Graham Nunn proved to be excellent swimmers. Even Mr. Godfrey, the cook, jumped over the side and went for a swim in the Atlantic.

"First time I ever went swimming willingly in that blasted ocean!" he shouted as he climbed back aboard.

It had to be perfectly calm to allow swimming, for *Mayflower* slipped along at faster-than-swimming pace with the slightest breath of air.

I always posted shark lookouts, too (page 652). Big sharks somehow find a ship when she is becalmed. They follow her garbage, I suppose. And hungry big sharks can be man-eaters, or at least man-maulers. I took no chances. I was the legal guardian of my minors, as well as master of the ship.

On other days I put out our sea boat, an eight-foot pram the builder had given us. It was lightly built and low, but we had fortified it with a couple of empty drums for buoyancy and some old life jackets lashed under its

(Continued on page 655)

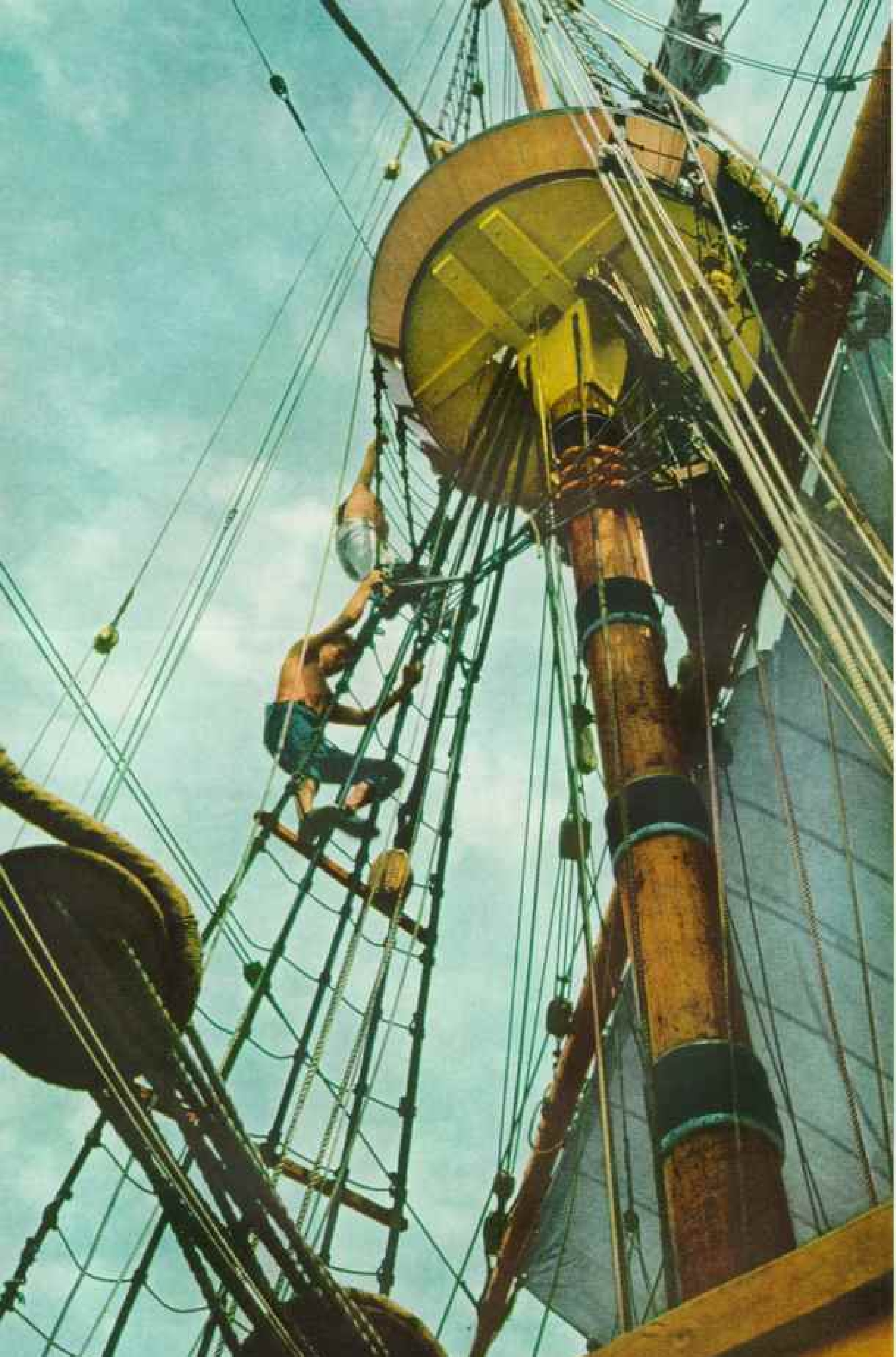
Cook Pops His Bread into the Oven →

For 54 days Walter Godfrey cooked for 33 hungry men in this airless cuddy beneath the break of the poop. I'd have preferred the first *Mayflower*'s brick oven, but it wouldn't meet today's fire regulations. We used a diesel stove; its fuel regulator hangs on the bulkhead.

Godfrey helped conserve our water supply by guarding the spigot at left, the only one in the ship.

© National Geographic Society
Kodachromes by Alan Villiers

LONDON



© National Geographic Society

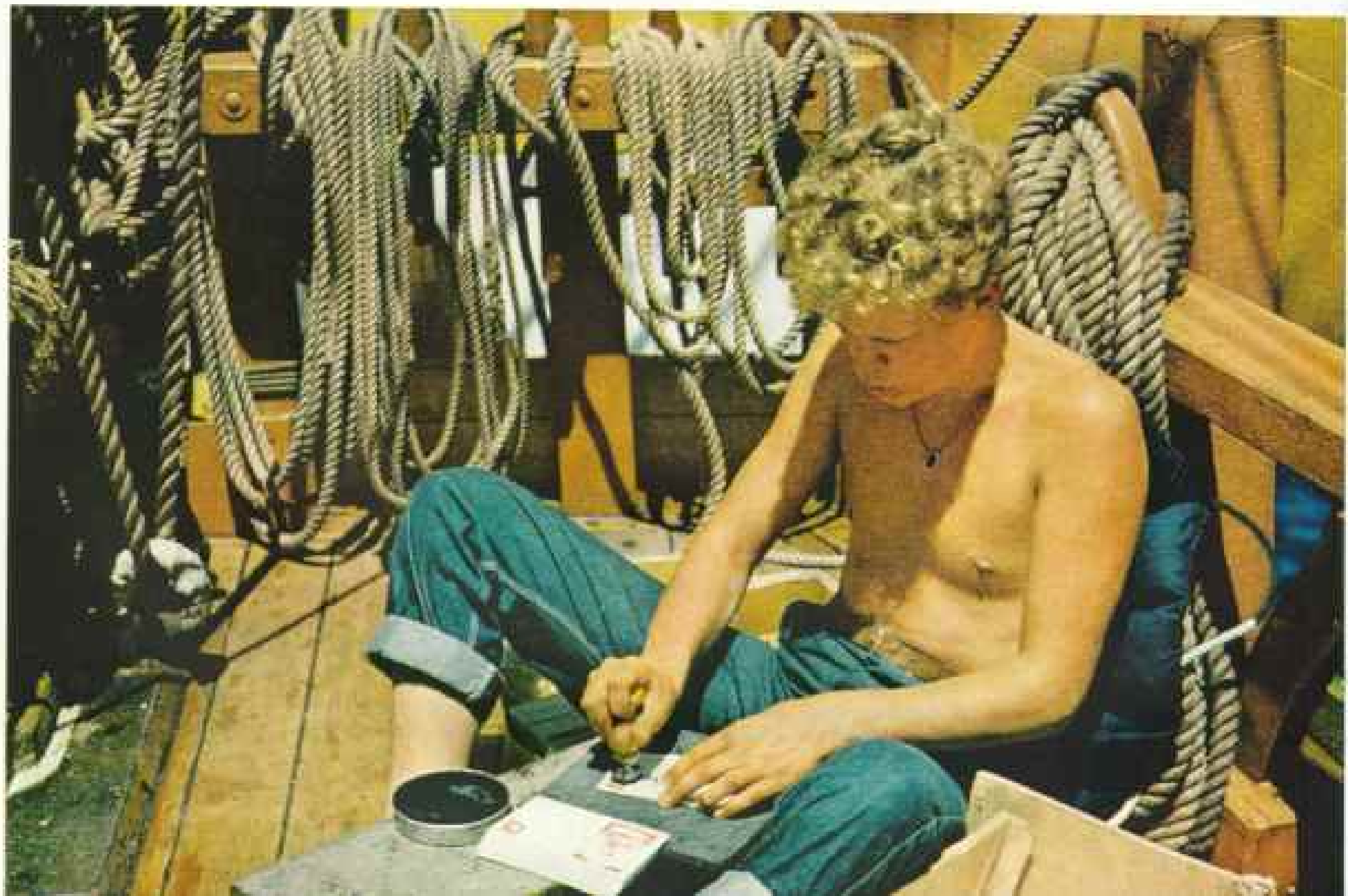
Alan Villiers

← Catfooted Sailors Race to the Foretop

Unfamiliar rigging baffled us at first, but eventually we learned how to handle all our 300-odd items; we had to. Here two hands scramble aloft to shake out the furled fore-topsail. They go the sailor's way: up the ratlines and over the side of the top. Huge dead-eyes and lanyards at lower left help stay the mainmast.

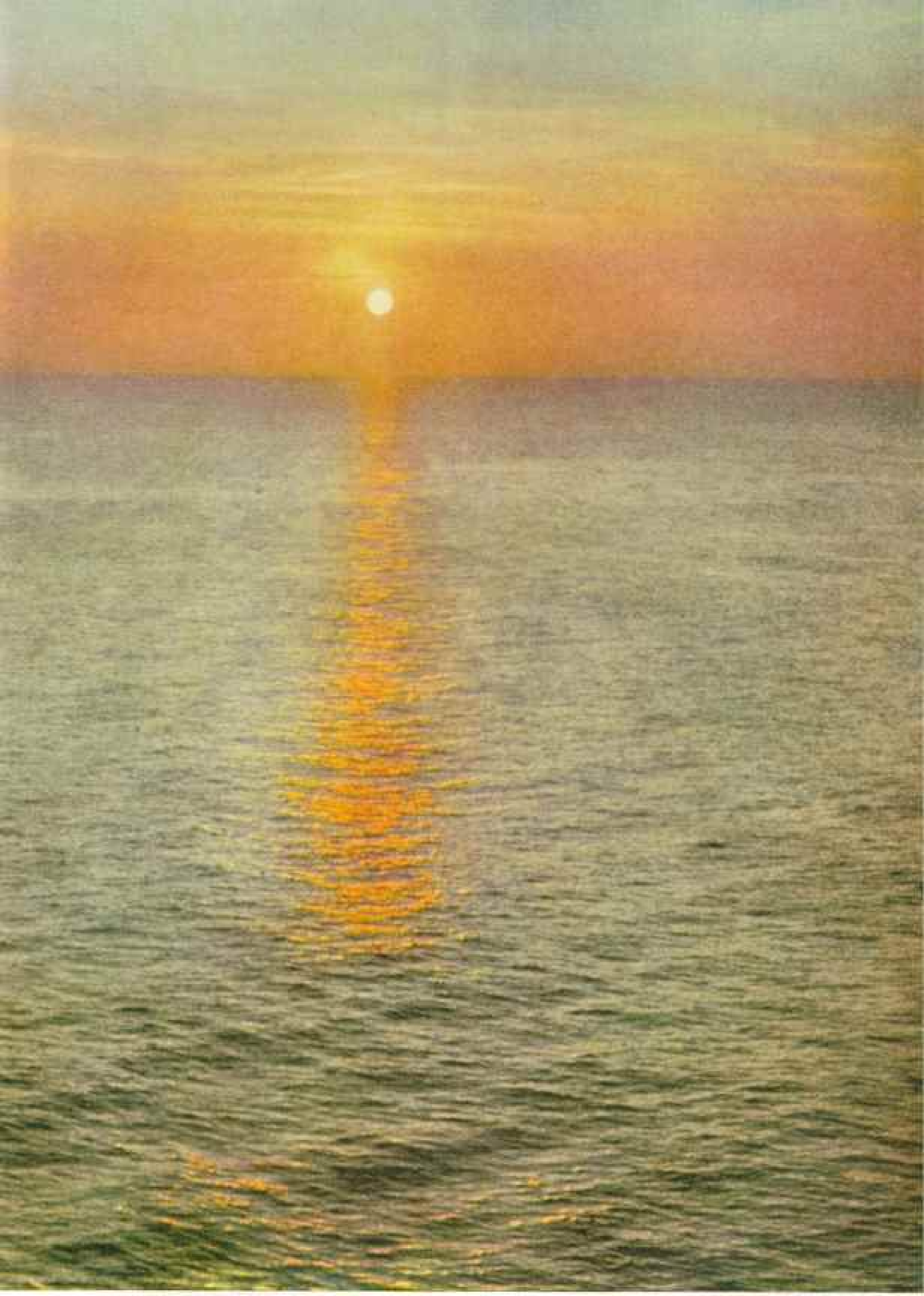
↑ Morning Watch Swabs the Quarter-deck

Brixham folk gave us the ship's bell, cast in 1638. ↓ Graham Nunn, English cabin boy, cancels some of our 140,000 pieces of commemorative mail. He works on the forecastlehead. The spritsail's starboard lifts, braces, clew line, and other gear hang neatly coiled on their pins, each in its place.



© National Geographic Society

A Lonely Argosy on a Coppery Sea Heads into the Sun 50 Miles off New England



651

Annunciation by Bill Haddon, Fla.

"You Look Like a Beautiful Old Painting," a Passing Ship Signaled *Mayflower*

© National Geographic Society

652

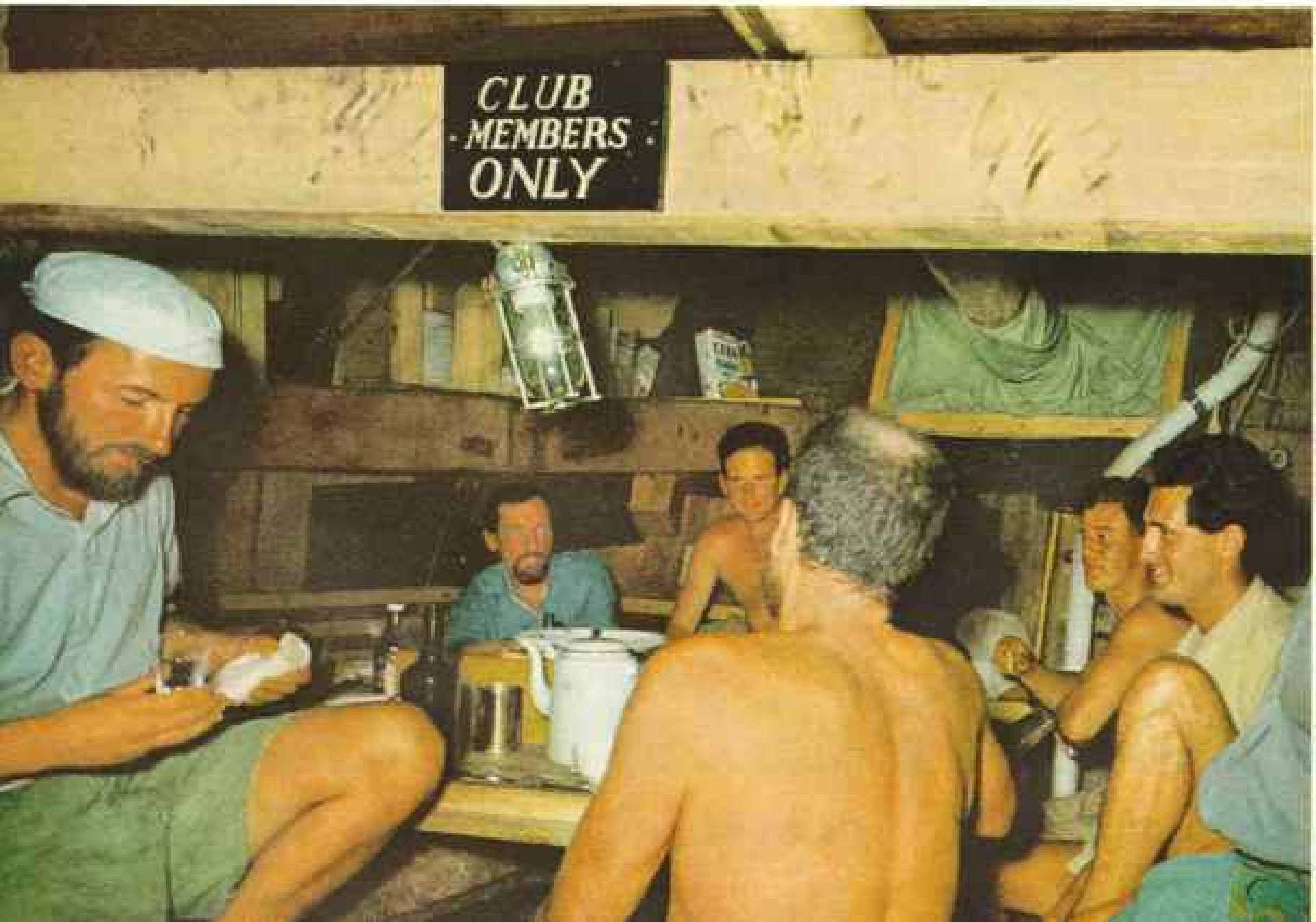
Alan Villiers

↑ Shark Watch Guards a Mid-sea Bather

↓ Foremast hands, meeting in their mess room, formed the "50-50 Club" when a British newspaper gave us only half a chance of crossing the Atlantic. *Mayflower*'s tiller, moving above their heads, creaked constantly. To keep out following seas, we sewed the canvas coat across the tiller's opening in the stern. Dr. John Stevens, in white cap, was ship's surgeon.

Calm Glues Us to Our Own Reflection →

Weary of the sails' slatting, we brailed up the mizzen and hauled the mainsail up in its gear. I went out in a small boat with my camera. From across the water I heard the sounds of a ship on a windless ocean—creaking of spars, slap of cordage, and thump of the rudder in the heaving Sargasso Sea. Photographer Villiers was happy; shipmaster Villiers was vexed.



← Modern Sextants Help the Mates Find the Ship's Position on an Azure Sea

Fair trade winds swell our flaxen sails, including the silly little triangular stunsail off to starboard. To let more wind reach the foresail, we hauled up the mainsail's weather clew (its lower right corner, out of sight).

Chief Mate Godfrey Wicksteed (left) and Second Mate Small knew how to use our copies of 17th-century navigation instruments but never quite trusted them. "There've been a few improvements," remarked Mr. Wicksteed.

---

only thwart. Two crewmen were a full load for it.

We had a motorboat, too, with a Lister air-cooled diesel engine. It was an all-hands, half-the-morning job to get this big boat overside, and I hoisted it out rarely.

I put it out once when a flat calm lasted three days, to see if it could tow the ship, but *Mayflower* was too heavily laden and it could move her only at about a knot, which she was doing anyway. Elizabethan seamen often towed their ships with their own longboats, I knew, but not in the open sea.

Towing by our diesel boat was out, and I must say that I did not mind that. So I used the boat instead for a little photography, to get outboard and take some shots of the ship at sea. Every man and boy aboard was given a run in the boat, and everyone except the 58-year-old boatswain, expert modelmaker Ike Marsh, had at least one camera. Most had two or three cameras, and *Mayflower*, rolling there in a long, oily swell, her sails slatting and banging against the masts and shrouds, was probably the most photographed ship at sea (page 653).

She looked beautiful, in spite of the calm conditions which do not show a sailing ship at her best. Sometimes she would drop behind a swell with her hull in a trough and the longboat in another, so that only the upper works and the sails could be seen, and she looked as if she were being overwhelmed in the sea. Then she would leap up again on the crest of the swell, in slow but constant defiance.

Her colorful hull, gaily painted in patterns of browns and reds and greens and blues, looked at its best in the light of the late afternoon sky, and the view from her quarter was superb. She looked like an outsize museum model come to life, and we were all glad that we were there to have the privilege of sailing in her, despite the fact that she had twisted most of us a bit at first.

As for myself, I was thrilled to be her master, doing my best to sail her to Plymouth, Massachusetts, where she belonged. But I'd have been a little more thrilled had the wind blown better. In two successive weeks I was able to sail less than 500 miles.

This quite upset all hopes of an outstanding passage. I began to wonder whether we would ever come in at all. I could understand the mutterings of Columbus's crews, very likely on that selfsame spot, when the ship rolled sullenly and their mystic master kept to his iron resolution—westward and always west, toward the new land!

Mayflower Follows Discoverer's Wake

We saw the golden sargassum weed in the sea, and it grew and grew, and I thought, too, of what Columbus must have wondered, seeing that, and his crews taking it for sign of land where there was no land, not for another thousand miles and more. For the golden weed goes round and round, and the sailing ship may come sailing into a profusion of it almost anywhere along the Atlantic's tropic edge.

I thought often of Columbus as I walked my high poop, little different from his in the *Santa Maria*. Sometimes there were extraordinary sunsets, brooding, melancholy goings-down of the burning sun that seemed to have a threat in them, as if the sun were telling us that it would not be back again.

The distant roll of ominous thunder, the threatening display of the heavy clouds piled high in a dark and gloomy overcast sky, the odd rain squall bursting down with a temporary puff of freshening wind from the east to hurry the little ship westward, and the sea turning black with the rain and the darkness of the heavy clouds—all these helped me imagine the forebodings of Columbus's dis-

---

← Five Unbarbered Sailors Gather in the Great Cabin to Swap Yarns

The Pilgrim Fathers signed the Mayflower Compact of 1620 in the original galleon's counterpart of this compartment in the stern. Jet pilot John Winslow of the British Royal Navy, in checkerboard shirt, lists one of the signers in his family tree. Man in the center is Warwick Charlton, whose idea it was to build *Mayflower II*.

Reproductions of ships' candle lanterns hang in the austere cabin. We could hear our burbling wake through the stern window.

© National Geographic Society Alan Villiers

The Galleon Heels Under a Press of Sail; an Off-duty Watch Lazes on Deck

On a day like this I sent a radio message ashore:

"Beautiful blue sea, more often marked by golden sargassum weed than by the whitecaps of breaking water. Pilgrim Fathers should have come this way instead of by the boisterous and ice-littered northern route."

Mayflower holds a breeze from over the starboard beam. To meet it, we have braced the yards around a bit. The foot of the foresail carries an extra piece of sailcloth that can be quickly unlaced in the event of too much wind. Old-fashioned sailormen knew this as a bonnet. We rarely used the mainsail's bonnet; it obstructed the officers' and helmsman's view.

Looking like a manta ray, a canvas ventilator abaft the forecastle funnels air into the stuffy 'tween decks.

Two men lounge on the green canvas cover of our longboat, which has an air-cooled engine the Pilgrims would have envied. It was a hard job to get the heavy boat into the water. We used a special boom for swinging the boat over the side.

When it rained, we set the red fuel drum beneath a sail to catch fresh water for bathing. Had the Pilgrim Fathers felt the need of a bath, they would have had to requisition a wooden cask from their cooper, John Alden.

Wind-whipped washing flies from a line to port. A man on the forecastle hangs out another string.

British authorities insisted we carry life buoys lettered "Mayflower, London." The Pilgrims would have wondered what they were.

© National Geographic Society
Kodachrome by Alan Villiers

traught crews. Go back, go back! the dark and threatening skies seemed to be saying, you are sailing to the edge of the world!

But they went on, and so did I, with the lightning silhouetting the ship with fitful and brilliant flashes, to leave her rolling in a darker and apparently more permanent blackness than before.

We rolled along, not fast, perhaps. But steadily, steadily we crept toward the west. Then the trade wind freshened again, and we bowled along once more with a bone of white foam curling in our teeth.

Steamers Whistle in Salute

During much of this passage we were outside steamship lanes and saw little traffic. When we did sight steamships, they gave us a wonderful welcome. As we approached the area of the West Indies, we began to see big liners and many tankers. Some of the liners came miles out of their way to blow upon their sirens and give us a salute, while their passengers were almost as busy taking photographs as my crew were.

The French liner *Colombie*, on the run between France and the Antilles, gave us a wonderful welcome, steaming round us at slow speed twice. But another liner that rushed round us at upward of 20 knots set up so huge a wake that we jumped and rolled until I feared for the fore-topmast again, and was afraid that the whole foremast might come down. That liner passed less than 50 yards away, and might at least have slowed down.

The tanker *Belgian Pride* put out a parcel in the sea for us as she passed slowly by, a ship's length away. When we picked it up in our pram, we found it contained chocolates for the lads and Belgian cigarettes and other useful things, including a bottle of Eau de Cologne for my wife, in case she was aboard.

I was often sorry that she was not with us, especially when we came the southern way. But no women was the rule, and unfortunately that must also include the best of wives.

Some of those steamers seemed reluctant to pass us by at all. One, a British Fleet tanker bound for somewhere in Venezuela for oil for the Mediterranean Fleet, signaled across: "You look like a beautiful old painting," and slowed down to 3 or 4 knots, the better to enjoy the view. It was evening. *Mayflower* must indeed have been beautiful. We were bowling along at about 4 knots, and all the sails were curved with the wind above the graceful hull. For once she was reasonably steady, for the wind held her so.

The Italian liner *Lucania*, the Royal Fleet auxiliaries *Olna* and *Tide Austral*, a small freighter called *Tennyson*, the tanker *Border Sentinel* were among the ships that saluted us, and all these meetings were pleasant. Sometimes the radioman would tell me that some ship with which he had been in touch during the night was doing its best to intercept us, to be somewhere along our course. But our course was unpredictable, and we did not see them all. All kinds of ships, of all nationalities, were interested.

The most stirring meetings we had were with some warships hurrying across to the great International Naval Review that was part of the Jamestown Festival. Out of the dawn on the morning of June 5 came two long, lithe gray shapes and, when they saw us, they formed station on us, one out on either quarter. At 6 o'clock they came dashing along, manning ship with all hands fallen in fore and aft in spotless whites, and, as they passed us, they cheered ship resoundingly. They dashed splendidly ahead, one on either beam, passing us closely; then they slowed down and each dropped a boat, coming smartly to us and boarding us with presents of Italian fruits and wines.

These were the Italian cruisers *San Giorgio* and *San Marco*, a beautiful pair of magnificently designed and well-run ships. We dipped our old Red Ensign in salute and cheered ship wildly, for we knew it was not often that a British merchantman had been so honored, for *Mayflower* was a plain merchantman and in no sense an official vessel.

Ornate Aftercastle Towers Above the Sea

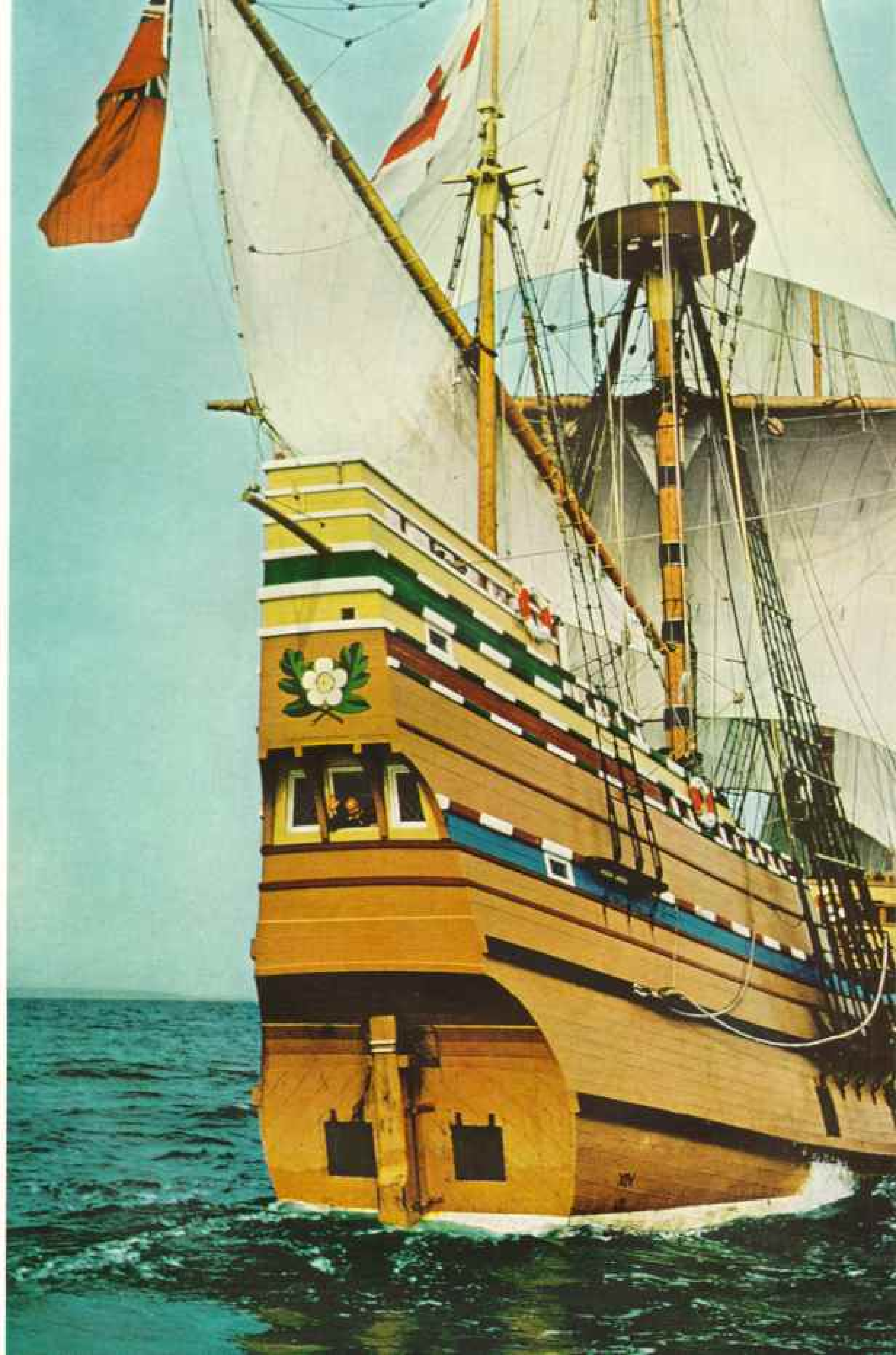
Reasonably concluding this ship was unique, maritime authorities let the picture of the May-blooming hawthorn flower take the place of the lettered name and hailing port. Tiny window above the flower helps to ventilate and light the captain's cabin (page 631). The small protruding spar, called a bumpkin, carries a block for the sheet of the lateen mizzen, the aftermost sail.

Two gun ports, dogged down and thoroughly calked, pierce the transom beside the massive rudder.

Roman numerals above the waterline show the ship is drawing about 12½ feet of water. Main sheet leads to a block on the topsides below the mizzen shrouds.

And that's Villiers waving from the great cabin.

© National Geographic Society
Newman Bumstead, National Geographic Staff



660

Alan Villiers

All Sails Set, the U. S. Coast Guard Academy's *Eagle* Overhauls Us off Nantucket

More canvas and 300 years of improvement in square-rigger design gave the white bark an edge in speed. I knew the *Eagle* well, having sailed in her from New London to Europe (see the July, 1955, National Geographic).

As the boat from the *San Giorgio* approached our lee channels, the officer aboard flung wide his arms and shouted, looking up at us, "Magnificent! It is magnificent!" We liked that.

Later the very same morning four destroyers of the United States Navy, led by the *Ault*, came out of their way to speak us. In a gathering Gulf Stream rain squall that broke upon us and sent us scudding under all plain sail at our best speed, foaming along, the destroyers formed up in line ahead and raced past, a magnificent sight in the black rain and spume.

A little later came more destroyers, this time British, and with them, afar off on the horizon, a great gray shape like the ambling top of Table Mountain. This was the Royal Navy aircraft carrier H. M. S. *Ark Royal*, with her accompanying destroyers, *Diamond* and *Duchess*.

They greeted us with signaled and shouted messages of good will, for they came close enough to yell across the waters, and the giantess of a carrier tore by along my weather side. This left me becalmed, for the great bulk of her took all the wind from my sails and I had no control over my ship for the moment—for many moments, it seemed, for it took a long time for that monstrous gray shape to pass to windward of me. Her flight deck was crowded with ratings who ran about to get a better view, and a couple of helicopters flew off to take photographs. These had the grace to keep clear of me.

Extra Canvas Cuts Visibility

Sub-Lt. John Winslow, recognizing his squadron commander in one of the helicopters, dashed below and reappeared almost immediately in his full naval uniform, golden wings emblazoned on his sleeve, and stood in the waist waving and cheering with great enthusiasm. He would have been in the *Ark Royal*, he said, had he not come with us. Afterward the carrier steamed down our lee side, which gave me a chance to show our paces too. 7 knots, compared with her better-than-30.

These were the high lights. On other days the ship's life went on, quietly and pleasantly. I was six weeks at sea before I reached my last important turning point, on 65° West and 25° North, and that day the wind swung obligingly round to south-southwest.

But it did not stay there. I had bent all the bonnets in the quiet trade winds to try to give her better speed, accepting the handicap that forward visibility was then nil from poop and quarter-deck (page 656). The lookout was kept on the foreyard or the sprit-sail yard, which were the only places one could see from.

Sargassum Weed Gilds Dark-blue Sea

Generally there was nothing to see but sea, sometimes a deep and perfect blue, sometimes dark with overcast or golden with great patches of sargassum weed, with the sunshine streaming in the leaded windows aft and the happy sound of the bubbling wake heard from the big stern windows of the great cabin.

I liked the great cabin (page 654). It was the only decent cabin in the ship. It was a bare but invitingly romantic room right above the tiller flat, on the main deck. We ate our meals in there. It was also radio room and recreation space for the watch officers and other persons on board.

The mariners had their mess in the tiller flat, which was so hot and stuffy that they preferred to eat on deck and live there too, if they could, and if the rain squalls allowed.

There was a lot of rain in the western sector of the North Atlantic, which was just as well. The lads leapt around bare skinned with cakes of soap tied to their heads, and scrubbed and scrubbed and gave themselves a wonderful time. A good shower in falling rain water was a wonderful luxury, though they kept themselves clean at all times. When there was no rain, they washed in sea water with detergent mixed with it, and did their laundry by the same means, washing out the detergent by dragging the garments overside.

Sometimes big swells came down into the tropic belt from farther north, reminding me of the wisdom of my decision to go south, for these swells and high seas spoke of heavy gales elsewhere in the Atlantic—right across my path, had I gone the other way.

The big swells picked the stiff little ship up and shook her like a St. Bernard shaking a wet puppy, while everything aboard fell over, even Felix the kitten, asleep in the shade under the longboat. Felix quickly learned how to stay asleep while rolling, and did not bat an eye. *Mayflower* was a happy ship, and I was very glad of that.

"This is the first ship I've ever been in where everybody is cheerful before breakfast," laughed Chief Petty Officer Charles Church, from the Royal Canadian Navy. C.P.O.

© National Geographic Society

Mayflower Moors in Plymouth, Massachusetts. Yachts Press In to Pay Their Respects

The galleon's shallop, built in Massachusetts to save our carrying it across the ocean, rows out to pick up our landing party. A reception committee waits beside the colonnade over Plymouth Rock.

Luis Marden, National Geographic Staff

Where the Original Pilgrims Landed in Solitude, Thousands Greet 1957's Voyagers

Crewmen work aloft, furling sails. A reproduction of an early Pilgrim house stands framed between our masts. To let us in, Plymouth dredged its harbor, which had grown shallower than the 1620 haven.

Church was loaned to us and was a specially selected representative from the Royal Canadian Navy Sailing Association. He was a first-class man in all respects.

Gulf Stream Gale Tests Men and Ship

I had gone to a great deal of trouble to choose a crew which would be not only competent but also harmonious, for lack of harmony aboard a small vessel could be hellish. My selection worked out splendidly. All hands pulled happily together, and the ship's spirit was always good.

This was tested more than once, particularly in a bit of a Gulf Stream gale which blew up on us, unforecast and unheralded, on a day near the end of the passage.

The morning of that day—it was Saturday, June 8—began with the sea lumpy and confused and the air hazy and humid, after a wild middle watch during which the wind had been jumpy with fresh squalls. I had had to lower the two topsails and bunt them up, but they were not then secured. They lay in the tops, ready for use as the squalls passed again, for I did not foresee any serious worsening of the weather.

That Gulf Stream is a bad place, and I was always cautious. It was my job to be one jump ahead of the weather and to have my ship under control at all times, not risking her rigging but getting the best out of it and her.

Some of those squalls were hard, but I expected them to pass. But pass they did not, or if they did, it was only to return again from some other direction, a little harder. I

Humanity Throngs Plymouth Harborside to Welcome Us Ashore

One of the greeters drums us up the landing stage. I follow, second in line. Next come Warwick Charlton; Stuart Upham, the ship's builder; Chief Mate Wickstead; and the two cabin boys.

Charles Allmon, National Geographic Staff

secured the tops'ls and ran on under the courses, spritsail, and unbonneted lateen. The bonnets, being fine-weather canvas, were off both the foresail and mainsail then. The sea was getting up throughout that squally day, and I was sorry that the spritsail was so big. Neither it nor the courses could be reefed.

The spritsail was in one piece, and in a breeze of wind it put a heavy strain on the unstayed bowsprit. When the bonnets were in, the courses could not be reduced any more in area without taking them right in. How could I sail the ship if I took all the canvas off?

The wind continued to freshen, and to head the ship. It was also blowing against the current, setting up a nasty sea in which the ship jumped and labored heavily.

The rain squalls were now so blinding that I kept a constant lookout on the foreyard, though it was still day, and had the hand-operated foghorn in operation on the forecastlehead. We could not see the ship's length ahead. Some tanker or big freighter might loom up there at any moment.

So nightfall came—wild, with the threat of growing wilder. I took the lateen in and watched the other canvas anxiously. Would the sunset take the wind and quieten the sea? What could I do, if it did not? The squalls still freshened. The mainyard was bending like a wand. The wind screamed in the rigging, and the bowsprit was working altogether too much.

I remembered in Governor William Bradford's account of the first *Mayflower's* voyage (I read from Bradford after prayers for the assembled crew each Sunday morning) how he had said that in high winds Captain Jones took in all sail, and the ship lay—as he put it—"a-hull," just left to herself in the raging waters. Well, we had often spoken of trying out such conditions. Now it looked as if we had them.

"Mr. Mate!" I shouted above the wind. "All hands on deck! Port watch for'ard to get the spritsail off her, and then the fore! Starboard watch take in the main! We will lie a-hull."

The four mates struggled along the reeling decks to carry out these orders with great interest. They were all delighted not just to be in *Mayflower II*, helping to sail her, but to be in a square-rigged sailing ship again at all. It was not blowing such great guns just then, and I fully expected to remain a-hull—hove to, we call it—only an hour or two, at most until midnight.

Sailors Fight Thundering Canvas

But as the watches began to struggle with the sails, a mighty squall came down, and the ship leapt up on the crest of a great breaking sea while the wind shrieked with the strength of a full gale! The spritsail had not been taken in during a storm before, for our other hard winds had been favorable (I made them so, off Biscay, when I fell away before them). Now it proved a handful.

"Clew lines and buntlines! Haul away now!" shouted the mate from his post at the fore part of the forecastlehead.

665 Charles Allmon, National Geographic Staff

Yankee Youth Gets a "Well Done!"—a Pat on the Back

The Boys' Clubs of America chose Joseph M. Meany, Jr., of Waltham, Massachusetts, as the outstanding junior citizen of 1957. As a reward, we signed him on as ship's boy to work with Graham Nunn, similarly selected in England (page 649). Here I introduce Joe to the crowd at Plymouth.

A Chief Shakes Hands in Provincetown; His Forebears Hid Out in the Woods

Here on Cape Cod the first Pilgrim landing took place November 11, 1620. Four days later an exploring party led by Capt. Miles Standish saw half a dozen Indians, who promptly ran off.

Spending a day at Provincetown, we enacted the signing of the Mayflower Compact. Chief Wildhorse of today's Wampanoags, dressed in his feathers, came out with the welcoming committee. He shakes hands with Edgar Mugridge, who helped build the ship at Brixham and made the Atlantic crossing as her carpenter.

Mail from Home Cheers Seaman Michael Ford

Our papers specified Plymouth as the port of entry, but United States officials kindly came aboard at Provincetown, attended to the formalities, and brought us our mail. Then we made sail and crossed Cape Cod Bay to Plymouth.

© National Geographic Society

Leonard J. Grant (above) and Charles Allmon, National Geographic Staff

"Haul up now! Lively there! Aho-o-o-o! Oh haul now! And again!" The boatswain's rhythmic shouts could be heard above the wind, while the mariners hauled together.

But the buntlines were insufficient, and the clew lines were hauled fully up before the sail was anything like smothered, and it began to thrash and thunder there while the whole bowsprit waved and writhed like a great fishing rod playing a whale.

It was the purpose of the sail's gear—those buntlines and clew lines—so to haul the canvas up to the yard that a mariner or two could easily pass ropes around the sail afterward, to secure it properly and prevent it from blowing out.

It was dangerous to go out there. The mate ordered his men to don life jackets. It was essential to get a spilling line around the sail, but this could be done only at risk of life—perhaps grave risk of life.

The ship was leaping like a wild thing, the wind was screaming, the whole bowsprit shuddering and shaking and banging about as if it would snap off at any moment, hurling itself, the spritsail yard, and the spritsail away with it into the boiling and malevolent sea, which was now abeam and throwing the ship about most violently.

Out dashed the second mate (in this emergency, all hands had come to get the spritsail in first), fighting his way outward along the high-steeved, writhing bowsprit. Out climbed Joe Lacey, Andy Lindsay—my best able seamen. Out leapt Beric Watson, from Leeds in Yorkshire, who never had been to sea before.

Crew Leaps Aloft to Furl Sail

I feared for them, for if the bowsprit went they died. The ship would run over them. Life jackets would not save them. I had no boat to put out in that kind of sea—in any kind of sea apart from the mildest of weather.

They fought their way to the spritsail yard, swarmed on to its footropes, and passed the spilling line, its hauling end inboard.

"Heave away again! Heave lively now!"

Up came the thrashing sail, its wilder turbulence quieted now, though the whole bowsprit still waved alarmingly. The four lads, showing little regard for their own safety, tore at the sail, both hands, skinning up the canvas, getting the gaskets around.

And so they defeated it, and came in again, and I was proud of them. Three of them had been in square-rigged ships with me before, two around the Horn.

With the spritsail in, the two courses came in without great trouble, for there was more gear on them—plenty of buntlines and big leech lines, called martinets, which smothered the sides and kept them quiet.

"Aloft and furl!" was the order. The mariners swarmed aloft.

"Down helm!"

The wheel spun down—into the wind. Right down, putting the rudder to windward.

This was the crucial test. Would she lie like that, more or less quietly, with the windage of the high poop keeping her shoulder to the sea? Or would she just wallow hopelessly in the great troughs, threatening to roll her masts out? We didn't know. No one had tried the maneuver in a ship like that for maybe two centuries.

The mates and I watched anxiously.

Hove-to Galleon Rides Out Storm

We need not have feared. She came up, shoulder to the sea, lying safely and quietly with an easy motion, falling off a little and then coming up again, like a duck with its head under its wing asleep on a turbulent lake.

We went down below, into the great cabin, to splice the main brace, for the work had been somewhat strenuous, and it was quiet and peaceful down there, almost as in a church. The wind howled outside, but the stern windows were closed. No sprays drove in. No tumult of breaking seas swept across the decks.

"I was never so quiet in a ship in a gale of wind at sea before, nor felt so safe," said the mate, in some astonishment.

Indeed, it was amazing. I reflected that the Pilgrim Fathers, who tossed through many such a wild night in Atlantic storms, at least knew tranquillity in great gales. While their ship fought on to windward, they must have suffered dreadfully in the wet, close hell of the 'tween decks. But when she was a-hull, they also knew peace—peace in the midst of storms.

All night the gale howled, and I was glad I had her under bare poles. It seemed to me that I was only just in time. Instead of easing, the gale worsened and blew hard even after daylight the following morning.

It was the middle of the forenoon watch before I could get safely under way again. I

© National Geographic Society

We Drive into New York Harbor Using Only God's Good Wind for Power

B. Anthony Stewart, National Geographic Photographer

Manhattan's Craggy Skyline Looms Ahead of *Mayflower* and Her Welcoming Fleet

had drifted to leeward perhaps 40 miles and probably lost at least 70. What did that matter, so long as the ship was safe? No damage done, nobody hurt.

This proved to be the last hazard. Now I had only to make landfall on Nantucket Lightship and get the ship to Cape Cod. Soon the sea smiled again and the last remnants of the gale were gone. Under all sail I pitched on toward the Nantucket Shoals.

On the morning of the 52d day I was among the swordfishermen and the New Bedford draggers, who gave us a cheering welcome and some lobsters and fish (page 647), but I had been set to westward of my landfall, and it was the following morning before I came at last round Nantucket Lightship—53 days out from Plymouth, England, having sailed 5,400 sea miles.

From departure to landfall was reckoned the sailing ship's passage—from the last land she left to the first she sighted. What happened after that did not matter much, short of shipwreck. Escorted by a couple of Coast Guard cutters, two United States Navy blimps, and some small craft, I stood away with a beam wind bound out well clear of Nantucket Shoals, toward Cape Cod.

Seamen in Elizabethan Dress Get a Broadway Ovation

My wife Nancie waves from the parade car. Rear Adm. Gordon McIntosh, superintendent of the United States Merchant Marine Academy at Kings Point, New York, rides beside her. I hold the movie camera. My companion on the rear deck is James J. O'Brien, New York Deputy Commissioner of the Department of Commerce and Public Events.

Chief Mate Wicksteed and Second Mate Small lead the marching crewmen. Scotty Anderson-Bell carries Felix, the ship's cat.

B. Anthony Stewart, National Geographic Photographer

What a welcome we had! At daybreak that morning the mighty liner *Queen Elizabeth* came out of her way, slowing down gracefully, to blow a salute on her siren, which must have disturbed her passengers at that early hour, and to make us a welcoming hoist of signal flags. For an hour or so there were only three ships together on the wide Atlantic in sight of each other, and two were square-riggers and the third the *Queen Elizabeth*—what an odd combination!

The second square-rigger was the handsome and clipperlike *Eagle*, the United States Coast Guard's training bark, which my good friend Capt. Karl Zittel was taking off on her annual training cruise with midshipmen, bound for Europe. Karl sailed close, slowly overhauling my much slower and deeply laden little ship, and we were able to speak to each other and exchange greetings (page 660). It was wonderful to see the *Eagle* again, for I had sailed in her, keeping my hand in with the square-rigged ships.*

After that came an absolute horde of aircraft and ships: blimps and jets and bombers, private planes and transport planes, aircraft hired by newspapers or just diverting from their routes to welcome the strange little ship in at last from the sea. Freighters, passenger ships, a submarine curiously named the U.S.S. *Bang*, fishermen, powerboats of all sorts, sailing yachts, giant supertankers—all saluted us.

The sun shone and the sea flattened, and the little new *Mayflower* put her best foot forward, bounding along with the beam wind at an average 7.7 knots. I knew that, because the accompanying Coast Guard cutter *Yankton* timed us and told me.

Tug Lends a Hand on Last Lap

It was the mate's birthday, the good old mate who had given up a comfortable berth as headmaster in a school ashore to come back with me and help sail *Mayflower*. He was a great help, too—he and all the mates, and Walter Godfrey the cook, Ike Marsh the boatswain, Edgar Mugridge the carpenter, Charlie Church the leading hand, Peter Padfield, Dr. Stevens, John Winslow—all of them. The mate was 59 years old and, at the turn of the watch, both watches sang for him by the break of the poop. "Happy Birthday to You," they sang—singing for the mate in a square-rigged ship! I doubt that such a thing had ever been done before. But that was the kind of ship I like to run.

* See "Under Canvas in the Atomic Age," by Alan Villiers, NATIONAL GEOGRAPHIC MAGAZINE, July, 1955.

She had worked out that way, and the Lord had been kind to us. I was devoutly thankful, for it could easily have been otherwise.

And then next morning, off Cape Cod, it blew up hard again, and the storm warnings were out. I kept the ship under sail until she was past the lighthouse, but the wind was heading me, and I might have beat there for a couple of days. There were tide races and rips in the sea where the tumbling waters might still dismast me in that kind of wind.

So I took a tow for the last few miles, from the *Yankton*, which was a most efficient tug, and towed into the moorings at the special buoy which had been laid down for us at Provincetown—old Provincetown, with its wonderful safe harbor, where the original *Mayflower* had first come and the famous Compact was signed (page 666).

Then I went on to Plymouth and moored off the rock, for the ship is a good-will gift to Plimoth Plantation and is to remain permanently moored in Plymouth, I hope for the next 300 years (page 662). But her berth was not ready, and to prepare it would take time. After a glorious two weeks in Massachusetts, I accepted Mayor Robert Wagner's invitation to bring the ship on down to the Summer Festival in New York, while Plymouth made ready her permanent berthing.

The welcomes in Provincetown, Plymouth, the Cape Cod Canal, and Newport, Rhode Island (where I touched for a day while southward bound), were spontaneous and wonderful, and the great welcome to New York was a glorious climax (pages 668-71).

A Wind the Pilgrims Never Knew

Escorted by all manner of yachts and commercial craft, I sailed *Mayflower II* in past the Statue of Liberty. A couple of helicopters hovered near by, and one came so close that the blast from its rotor backwinded me. No square-rigged ship can sail with two winds, and I lost control—right there off Governors Island. The wind was fresh, the channel narrow, the harbor so full of tugs and launches and sightseers that I had little room left to handle the ship.

Caught aback by a helicopter! It was an odd accident to happen, right in the harbor. Perhaps it signified the inability, after all, of the little ship from the early 17th century to fit into the hectic life of these days. The helicopter pilot was not even aware that he had inconvenienced us.

I took a tow from the Dalzell tug that was accompanying us and secured to a barge at the Hudson River Day Line pier at mid-Manhattan. The voyage was over.

Hervey Garrett Smith (Left) Immortalized *Mayflower II* in a Masterly Painting

Here the artist stops to examine a wooden deadeye as I show him about the ship. His painting for the National Geographic is as accurate as it is beautiful.

Neal P. Dallis, National Geographic Photographer

A 20th-century Saga of the Sea on Canvas

Marine Artist Smith Knew Every Sail and Spar Before He Painted *Mayflower II* as a Supplement to This Issue

By Hervey Garrett Smith

MAYFLOWER II had been hit by a vicious black squall in mid-Atlantic. Under the press of too much canvas she heeled alarmingly, unable to regain her feet. I was alone in the foretop, struggling desperately to muzzle the clewed-up topsail. Just as I managed to pass a gasket around the bunt, the ship took a wild lurch. I lost my balance . . . and nearly fell out of bed!

Night after night I sailed *Mayflower II* in my dreams, as a necessary preliminary to painting her portrait for the National Geographic Magazine. Nightly I set, trimmed, and furled each of her sails, for how can you paint a ship under sail intelligently unless you know how to sail her?

Artist's Forebears Followed the Sea

I have been a small-boat skipper all my life, and even though sailing techniques change through the ages, the principles of sail-handling endure. So I sailed the new *Mayflower* in fancy, through fair weather and foul, striving to bridge a gap of more than three centuries and make her live. I lived with her day and night, studying her lines, her construction, and her rigging, analyzing those elements that give her character.

To me, such inordinate interest was natural. All my forebears followed the sea in one way or another, as sea captains, yacht skippers, fishermen, shipbuilders, or just plain clam diggers. The lore of the sea was common table talk when I was a child; I was a frequent visitor in the homes of seafaring men and in their shipyards and sail lofts. I loved the smell of tarred hemp; heard the squeal of the rigger's serving mallet; knew the "chud, chud, chud" of the shipwright's adze.

Mayflower II embodies these ancient, almost lost arts. Here is marlinspike seamanship in its purest form—tarred hemp and flax canvas and a sailor's horny hands!

Some will laugh at *Mayflower II*'s stern, towering 26 feet above the water. But 150 years were to pass before the stern was reduced to what we consider a normal height.

Some will ridicule the 40-foot bowsprit, unsupported except for the rope lashing in the beak, and they'll picture it gyrating wildly in a gale. Yet not until about 1700 were bowsprits supported by a bobstay.

Re-created with great fidelity, this ship is a true museum piece; a practical, working exposition of the arts of the shipwright, rigger, and sailmaker as practiced in the early 1600's. Chief credit goes to naval architect William A. Baker, of Hingham, Massachusetts, who spent the better part of six years in research to re-create the plans of the original ship.

Through his sympathetic help I came to know the ship intimately and soon fell in love with her. He spent many hours with me, making notes and sketches, going over his plans, and showing me the beautifully detailed scale model built from them.

When the supreme moment came and I saw the real ship for the first time, my reaction was that she looked just as I *knew* she would. I felt I had seen her before, many times. My eye traced every sheet, halyard, brace, and buntline; followed every shroud and stay; noted every spar; and caught each detail of hull and deck fittings. Everything was exactly where it should be. "After all," I thought, "what did you expect—mistakes?"

That night she lay in Provincetown Harbor under the dim light of a hazy moon, her anchor light swinging high in the fore rigging as she rocked gently to a light ground swell. With the harbor asleep, all evidence of the present seemed blotted out. The scene had an air of unreality; I had the feeling that at any moment it might all quickly vanish.

Before starting to paint—in fact, long before I ever laid eyes on the new *Mayflower*—I made numerous sketches of her from various angles, seeking the vantage point that best revealed her true character and uniqueness.

Special Copies for Framing

For members who wish to frame Hervey Garrett Smith's great oil painting of *Mayflower II*, special reproductions have been made on heavy chart paper. They may be obtained, unfolded, by writing to the National Geographic Society, Dept. M, Washington 6, D. C. Price $2.50 each, postpaid. Size, including ample borders for framing, 22¼ x 28 inches.

674

A Look Aloft Reassures the Artist

A distinguished career as a marine artist prepared Hervey Garrett Smith for the task of portraying *Mayflower II* for members of the National Geographic Society. He is the author of three books—*Boat Carpentry*, *The Arts of the Sailor*, and *Marlinspike Sailor*. Here, in New York Harbor, he checks *Mayflower*'s details before the final printing deadline.

But what is it, specifically, that gives a ship her beauty and individuality?

In a broad sense, it is a combination of many things—her silhouette, her proportions, the rake of her masts, and the shape of her bow and stern. But to the naval architect—and to the artist—it is the shape and nature of her sheer, the line of her main deck at the sides from bow to stern. In *Mayflower II* it is the thin, red rail below the open bulwarks.

Beauty Begins with Sheer Line

The sheer line is one of the first to be established in designing a ship, and in it the architect reveals how much of an artist he is. A straight line has no beauty, nor has an arc of a circle; the sheer sweeps the length of the ship in a constantly changing curve.

The graceful sweep of *Mayflower II*'s wales, her rails at the quarter-deck, and lastly the poop are all related beautifully to the main sheer. Your eye is carried up and up to the extreme top of the poop, which is the final focal point. All lines meet the perfectly designed rake of the stern in a manner that cuts down the apparent height, and there is no feeling of awkwardness.

As in all ships of the period, her sides have considerable tumble home, or slant inward from the perpendicular. Tumble home has a definite relationship to the sheer, although it may not be apparent, and its effect is to lend gracefulness to the whole.

Near the End of a Long Voyage

Her color scheme is distinctive and gayer by far than in ships of later centuries. Were I to change her, I would eliminate the red and green diagonal segments on her rails, for they break the sweep of her sheer lines. But they have been properly authenticated, and who am I to tamper with tradition?

It was in consideration of all these factors that I chose my special view of *Mayflower II*.

For her setting I chose the sort of day all sailors like to remember. The ship nears the end of a long passage, with storms and baffling calms astern. With a fair wind over the quarter and a moderate sea, she rolls along at a 7-knot clip with a bone in her teeth. Land is now not far away, as the shadowing sea gulls show.

On her decks I have shown the watch getting a well-earned rest, their hearts and minds far outracing the ship. Utterly oblivious, they are part of a scene that lifts one's spirits and sets one dreaming of a dim, romantic past—a scene we may never see again.

Californians Escape to the Desert

City Dwellers by the Thousands Find Health and Peace in Sandy Acres Once Considered Fit Only for Jack Rabbits and Rattlesnakes

By Mason Sutherland

Assistant Editor, National Geographic Magazine

With Photographs by Charles W. Herbert

PIONEERS feared California's deserts as deathtraps, and many a prospector, his water exhausted, left his bones there to bleach. Today these wastelands are coming to life. Luxurious homes with shining glass walls rise along desert roads; beside them swimming pools sparkle in the sun. Real estate men make fortunes peddling acres of dry sand—and the boom has only begun.

In Horace Greeley's day the American pioneer marched west, but west coast people today look eastward. Tired of city noise and traffic congestion, they are driving across the mountains to the desert for solitude, fresh air, and the sight of stars. Some are permanent settlers, but most stay only weekends. On Friday and Sunday afternoons desert roads swarm with their cars.

Land Boom in a Sandy Wilderness

The vacationists' annual debate—whether to go to the seashore or the mountains—now offers a third choice: the desert. Seashore? The desert's own Salton Sea offers water as briny as the ocean's. Mountains? They enclose the high Mojave Desert to the north and the low Colorado Desert to the south.

I toured California's deserts with Charles W. Herbert, my partner with the cameras. We explored resort cities, ghost towns, and abandoned mines, but none proved as exciting as the desert land rush. We found millionaires and poor folk alike moving onto scorched patches of creosote bush. Land salesmen cited fantastic profits already made and held out the prospect of more.

Here signs in the sands advertise "Large lots, low prices" and "Unlimited water, grand view, TV." Water is pumped from deep wells or hauled in tank trucks. And Colorado River water is channeled hundreds of miles through mountains and dunes.

Roadside arrows point to new subdivisions with paved streets but not a single house. I saw an "Excellent site for a supermarket, reasonable," but not a potential customer in sight.

A spontaneous development begun in the 1930's is proceeding out beyond the reach of existing power lines and water mains. Settlers are quitting crowded cities, leasing two to five acres of unwatered Government land, and erecting cabins. Californians call these people jack-rabbit homesteaders because they build on lands that would seem desirable only to rabbits.

Most of them haul water for miles, burn kerosene lamps, and do without telephones. For company, some build identical cabins side by side, each on the border of his homesite. Once having proved up their leases with surveys and acceptable dwellings, they may buy their plots. Prices, which used to be nominal, may now run to $1,000.

Where a gravel road intersects black top, you will find the name posts of a hundred settlers beneath an arrow pointing off into nowhere. One sign proclaims "Our Haven from Slavin'" (page 699). Others announce "El Rancho Lumbago," "Rancho Costa Plenty," or such humorous variants of the many "palm" names as "No Palms" and "Calloused Palms."

Here on a mesa stands a transplanted old trolley car used as shelter while the family constructed a weekend home. Not a soul is in sight; the solitude seems overpowering, the desert pitiless.

Desert Calls with Many Voices

Why do they do it?

"Came here for my arthritis," said one man.

"Can't stand the smog," another asserted.

"When the bombs start falling," a weekender told me, "I want to have some place to run to." He showed me a cabin stocked for any emergency.

Those who follow the sun love the desert's mild winters. The hotter it gets the more skin they expose. Thousands of victims of arthritis, sinusitis, and lung disease have faith in the dry air.

Artists are charmed and baffled by the

© National Geographic Society

Horsemen Ride Through Andreas Canyon, an Indian Oasis near Palm Springs

All Kodachromes by Charles W. Herbert, Western Ways

70-foot Washingtonia Palms Wear Skirts of Dead Leaves. Offspring Sit at Their Feet

wasteland's subtle tones—an understatement in color, they call it. Botanizers enjoy the weird and wonderful flora: cactus, Joshua tree, desert mistletoe, desert holly, smoke tree, and paloverde.

The armed services favor the sandy waste as an unprotesting target for their bombs, artillery shells, and flame throwers.

Farmers harvest fruit, vegetables, and profits in the Coachella and Imperial Valleys. Here, where there is enough water for irrigation, the desert produces crops 12 months a year.*

Palm Springs Grows and Grows

Highland Californians were in topcoats as Herbert and I drove east across the mountains late in February. Ice coated the creeks, and San Jacinto Peak and San Gorgonio Mountain wore snowcaps.

Abruptly our road, the Palms-to-Pines Highway, dropped hundreds of feet in a dramatic corkscrew spiral. Below us the desert, gold and green, spread a glowing invitation. A left turn into State Highway 111 led us to booming Palm Springs, fashion capital of the desert (map, page 680).

In Palm Springs nearly everybody has his tale of the fortune lost by not investing in a "lot of worthless sand on the edge of town."

"Just a few years ago I could have bought land for $35 an acre. Now it sells for $4,000," said an old-timer. "But I was like the fellow who was offered the State of Texas for a pair of boots. I didn't have the boots."

Today homes are going up on heaps of blow sand and on ledges of the San Jacinto Mountains, the city's granite shield. Palm Canyon Drive, the palm-shaded main avenue, presents a bustling array of hotels, golf courses, driving ranges, trailer parks, and real estate offices. Home builders are buying acreage in the midst of the desert (page 688).

Film Stars Take Over the Town

A dusty Indian camp 50 years ago, Palm Springs has grown into a city of 13,000 people with a winter population of 50,000. Among friends, this sophisticated playground likes to call itself the Village. It sells only leisure, desert air, and sun.

On a sun-drenched weekend last March, all Los Angeles seemed to have moved in. Visitors filled the 300 hotels—at $10 to $150 a unit—and overflowed into private homes.

See-and-be-seen traffic on Palm Canyon Drive proceeded so slowly that passengers could window-shop all the stores (page 682).

When a woman driver killed her engine, two young men in an open sports car behind her sounded an angry horn. She turned and shouted, "Keep your shirt on!" But she was commanding the impossible. The boys wore only swim trunks, a typical costume for young males in Palm Springs.

So many movie stars make the Palm Springs area their home, or vacation there between pictures, that the Village has become Hollywood's alter ego. Bob Hope, Frank Sinatra, Jack Benny, Alan Ladd, Eddie Cantor, Desi Arnaz and Lucille Ball, and Lily Pons maintain luxurious homes. Some of them, living on the edge of golf courses, seem to eat, breathe, and talk nothing but golf (page 686).

To see the film stars is the first demand of many a feminine visitor. Next she wants to look at their houses and swimming pools.

Palm Springs claims some 1,400 pools (page 689). "If you haven't got a pool here," a visiting newspaperman remarked, "you are either broke or eccentric."

"Every noon is picnic time around our pool," said Mrs. Gayle Burns, who with her husband owns the "400," a series of one-story

*See, in the National Geographic Magazine: "New Rush to Golden California," by George W. Long, June, 1954; "The Lure of the Changing Desert," eight pages of photographs, June, 1954; and "California, Horn of Plenty," by Frederick Simpich, May, 1949.

Date Palm Needs Human Help to Produce Fruit →

Phoenix dactylifera, the date palm, was one of the first trees to be domesticated. Sumerian pottery fragments depict the palm about 3000 B. C. Egyptians some 300 years later were using its logs to roof royal tombs.

Almost as far back as history goes, man has assisted the date in pollinating the blooms, since nature's random winds are inefficient.

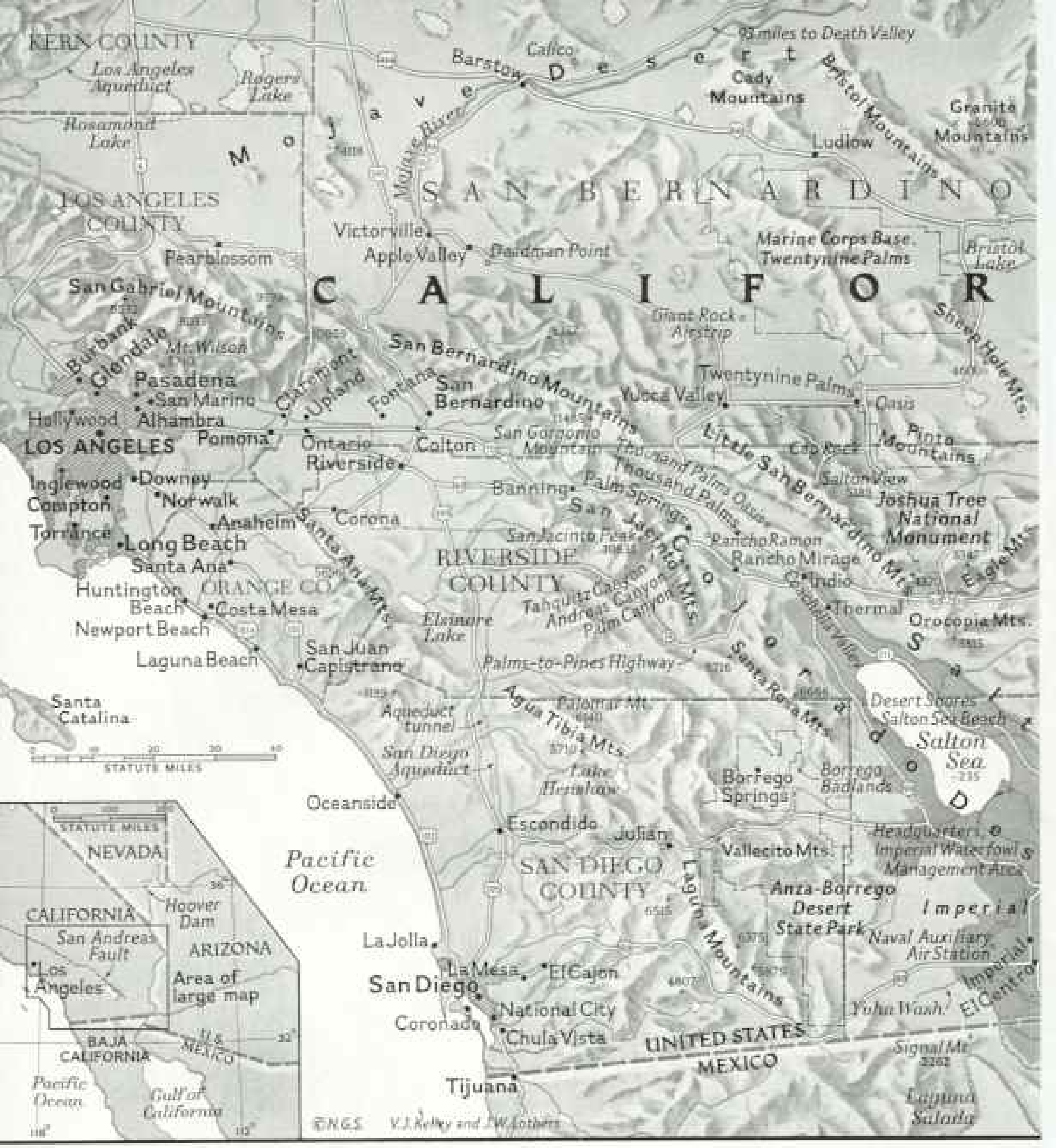
Coachella Valley growers gather the male pollen in March and April and dust it on embryo fruits of the females to ensure a substantial crop (inset). Usually they plant one male to every 50 females. Exceptional males can fertilize harems of 500 trees. Three months after pollination, bunches of the fruit are tied in paper as protection against rain and birds.

Except for experimental purposes, the seeds are never planted, for they produce variants and a surplus of males. True scions are shoots taken from the palm's base—daughter trees from a female, sons from a male. Suckers reproduce the parent's qualities exactly.

Date palms require 10 acre-feet or more of irrigation water a season, but cannot tolerate rain, which rots the ripening fruit on the stalk.

These 40-foot trees grow in Indio.

© National Geographic Society



apartments arranged around a common patio.

"I never breakfast anywhere but in the patio and always bring an extra cup, because someone is sure to join me for coffee.

"Sometimes I call my brother in Minneapolis or my niece in Pennsylvania, and they tell me it's snowing. When I say I'm enjoying the outdoors in my bathing suit, they usually say they hate me."

The typical Palm Springs residence is an 8- or 10-room rambler that dispenses with basement and attic. Its pool is walled in for privacy, and the patio, landscaped with crushed and dyed rock in lieu of grass, seems to march right into the living room. Color schemes are so harmonious one can scarcely tell where carpeting ends and patio begins. Sliding glass walls admit sunshine but roll shut if a dust storm threatens.

Any bedroom not facing the pool may have its own small walled-in patio for private sunbathing.

The spare bathroom, reverting to frontier style, may go outdoors but remain attached to the home, a convenience for wet-footed bathers. Its walls are frosted glass; its ceiling is the open sky. Climbing roses and transplanted Joshua trees overhang the shower.

681

"Conventional architecture is static and self-conscious and just doesn't fit the freedom of the desert," architect Walter S. White, Jr., told me. "We are abandoning the tyranny of rigidly parallel walls and 90-degree angles. We strive for a form that seems to spring from the ground, like a native plant."

Favorite ornaments in Palm Springs gardens are upright slabs of sandstone and huge granite boulders casually strewn about to reproduce the desert effect in one's own patio. Home builders now buy rocks they once paid contractors to haul away (page 684).

"Please don't take our rocks." Artist Sterling Moak put up this sign when he was building his home in the lee of the San Jacinto Mountains. "Boulders are plentiful here," he told me, "but they peter out down in the flat country. Even while we were putting up our house, some fly-by-night contractors drove up in trucks and carted off two-ton rocks."

I asked Chester Moorten, a desert landscaper, the value of a two-ton boulder. "Twenty dollars," he told me.

"Some rocks sell for $100," he added. "And it is getting hard to buy them except at prohibitive prices. But now and then an earthquake rolls fresh ones down from the mountains."

"Cactus Slim" Transplants the Desert

Palm Springs folk call Mr. Moorten, a lean 6-foot-3, Cactus Slim because he sets out so many cacti in their gardens. He also sells minerals, fossils, petrified wood, and bleached bones—anything that adds to the desert effect. A greenhouse back of his home, the Cactus Casa, holds startling flora, such as the bearded old-man cactus, elephant trees (page 691), and strange boojum trees, all from Mexico.

"We ship the desert all over the globe," Moorten told me. "The cactus craze is worldwide. To satisfy the demand, my wife Patricia and I regularly explore Mexico all the way to the Guatemalan border. Chasing cactus leads us everywhere.

"Almost every State in the Union has its native cactus. The Florida Everglades produce several species. We have found cactus even in Canada."

I followed Moorten and his helper one afternoon as they transplanted some 400-pound Joshua trees from the Mojave.

"Out here a home builder usually gets his scenery custom-made," Moorten said. "Otherwise it would take him a lifetime to grow a desert plant this size."

Not many desert lovers care for chollas, the dreaded "jumping" cactus, but Moorten recalls one customer, a burglarized shop-

Captured River Water Brings Life to Deserts and Coastal Cities

Dams on the Colorado and an aqueduct across the desert enable Los Angeles and San Diego to grow far beyond their limited water resources.

Irrigation canals have transformed Coachella and Imperial Valleys, once a hostile wilderness, into an agricultural empire. Shading shows where these valleys dip below sea level.

Areas to the north, including the vast Mojave, belong to the so-called high desert, where altitude tempers heat.

682

Teen-agers Window-shop Palm Canyon Drive

Standing outside the post office on a winter morning, the author watched Palm Springs visitors pass by in boots, sandals, slippers, and bare feet.

Imitation cowboys, Indians in dungarees, and sun bathers in shorts vied for attention. A woman in turquoise pants with sun-back blouse and dark glasses had flowers in her hair. Another wore a bathing suit beneath a jeweled cashmere sweater. An elderly artist passed by in shorts and long gray beard. That rare freak, a man in matching coat and trousers, was obviously an unacclimated stranger.

These schoolgirls wear tapered pants.

Sun Lovers Enjoy Tea and the Panorama of Palm Springs

This palm-shaded terrace, sitting on a ledge of the San Jacinto Mountains, commands a view of the Desert Inn's grounds, first settled portion of the city.

Mrs. Nellie Coffman, who founded the inn in 1909 as a retreat for those who needed the desert's dry air, cooked and served a complete chicken dinner to her guests for 25 cents. In 1955 her sons sold the property for $2,000,000 to a group headed by Marion Davies, the former film star.

Golf green on the left is a part of the nine-hole O'Donnell, the city's first course. Thomas O'Donnell established it in 1926 to entertain his cronies. Dispensing with a golf architect, the friends laid out the holes at a distance they enjoyed playing.

In the middle 1930's ill health forced Mr. O'Donnell to give up play but not his appreciation of the game. Daily he drove to the seventh tee, sat in the sun, and bet dimes with his friends that they could not reach the green, 185 yards away, in one stroke.

The vista takes in the open desert and the Little San Bernardino Mountains.

© National Geographic Society

684

Landscaping in Palm Springs Dictates Massive Boulders Strewn Across the Yard

Rocks tumbled from the San Jacinto Mountains ornament this unfinished home high above the desert floor. Upswept roof and long veranda are creations of architect Walter S. White, Jr. (page 681).

keeper, who ordered them specifically for their armor of barbed spines. Raids ceased abruptly when chollas took up guard duty beneath the store's vulnerable rear window.

Some visitors to Palm Springs expect to find Indians in feathers. If they see an Indian at all, he is likely to be wearing ordinary clothes and driving a limousine.

Because part of Palm Springs grew up on Indian lands, some of the tribesmen are wealthy. Survivors of the Agua Caliente band of the Mission Indians, they number only 31 adults and 64 children but own about 7,000 valuable acres within the city limits, as well as some 24,000 acres in the desert and San Jacinto Mountains. When a new member is born into the tribe, the Government allots him a two-acre townsite, a five-acre irrigable plot, and 40 acres of desert land.

Some tribesmen derive handsome rentals from city property. A few own undeveloped land outside the city worth a potential $100,000 but can scarcely buy groceries. They cannot sell or lease without permission from the guardian Bureau of Indian Affairs.

Lands remaining in tribal status include the very beginning of Palm Springs, a palm-shaded hot spring close to the center of town. Its water gushes out of the ground at 108° F., and Indians and many visitors bathe in it.

Palm Canyon, Andreas Canyon, and Tahquitz Canyon, all shaded by native palms, remain a part of the tribal trust (page 676). Indians collect 50 cents admission from every adult visitor to these canyons—one reason why the tribe never has to ask support from tax money.

Coyotes Teach Dog New Tricks

Visiting Thousand Palms Oasis, 15 miles east of Palm Springs, I met Paul Wilhelm, a writer, poet, and desert philosopher.

A large and magnificent stand of native palms (*Washingtonia filifera*) conceals Wilhelm's lonely palm-log dwelling. Seep water from the San Andreas Fault feeds some 1,000 palms in a mile-long canyon. These and others appear to be survivors of groves that encircled dried-up Lake Cahuilla, which once filled the desert floor. Shores of that vanished lake still yield fossil palms.

"You should see this place by night," Mr. Wilhelm told me. "When moonlight floods the oasis, the palm leaves glint like silver daggers. And with the moonlight come the cry of the coyote and a sense of something

685

Prospector and Burro Cross the Old Plank Road in the Algodones Dunes

Completed in 1917, the road was abandoned in the late 1920's when engineers succeeded in laying concrete across the drifting sands. Today the wood weathers and buckles within sight of U. S. Highway 80 (right), east of Holtville. Ed Rochester, who leads this one-man safari, has given up his lifelong search for gold to concentrate on the "rockhound business." He polishes gem stones at his home in Winterhaven and sells them to collectors (page 723).

out of the distant past. Scarcely a night passes that coyotes don't face the cliffs and bay at the moon and listen to the echo. I sneak up downwind just to hear their music.

"If there is a dog anywhere in the canyon, the coyotes do their best to excite him. They lured away my dog Tim and taught him to raid chicken coops. Coyotes enticed away his successor, a husky, and killed her. After that I started to trap and kill them. But then I decided to leave them alone; they taught me the nature of the wilderness. Predators are necessary. I don't kill them any more.

Writer Distracted by "Talking" Quail

"For many a morning I've been feeding the quail. Now I wish I could stop their roosting outside my door. They talk among themselves so that a man can scarcely write. Sometimes an owl swoops down on them at night. Then they take off like jet planes and wake me out of sound sleep.

"Once two half-wild burros, a male and a female, came wandering into the oasis and adopted me. They were so devoted to each other that I named them Rhett and Scarlett. If I rode off with one, the other chewed its tether and came galloping after. Together we explored canyons, Indian trails, ghost towns, and abandoned mines all the way across the Colorado Desert into Arizona."

So great are the distractions of Wilhelm's oasis in the desert that he has put a lock on his door. The idea is not to keep people out, but to shut himself in with his typewriter.

"A curl of smoke, a cloud in the sky, the rising moon—all these things tempt me," he said. "Birds, rabbits, and insects clamor for my attention. So I lock myself in my workshop.

"People who dwell in the desert," he continued, "want room for their thoughts and vision. Here there is only one voice, that of the wind, saying 'Peace and quiet.' My own nature craves solitude. It is not that I dislike civilization. But I enjoy it all the more because I live a little apart from it."

Painters, too, find it hard to overcome the desert's lazy spell.

"Nothing is less rewarding than an empty canvas," artist John W. Hilton told me. "So each morning I mentally kick myself and say, 'John, you've got to make a living.' I start smearing paint. Things take shape, but a schoolboy could do better. Finally inspiration comes, as if the reward of work. I rub out the drivel and paint over it" (page 689).

Mr. Hilton, son of missionary parents, took his first art lesson as a boy in Tientsin, China. "My teacher was an old Confucian scholar," he said, "a gentleman down to the tips of his long fingernails.

"People ask me why I paint the desert," he added. "My feeling is that it has something to give. Great philosophies and religions originated in deserts; Christ and Mohammed were desert men."

New Species Named for Desert Artist

Hilton uses light so effectively that his mountains and sands glow as with fire. The beholder instinctively looks for a hidden lamp. The artist achieves this effect with a trowel-like paint knife, applying a mixture of oil paints, beeswax, and fossil earth wax, the last a hydrocarbon mixture of uncertain origin mined in Utah and Texas. Geologists know it as ozocerite.

Ancient Egyptians used beeswax in their tomb paintings, some of which look as fresh as if they had been made last week.

"Another artist, Frank Dorland, Jr., pioneered the use of fossil earth wax," Hilton said. "My contribution was to spread it on with a palette knife."

Scenery in Mexico fascinated the artist, and to support himself there he collected plants and animals for museums. Scientists named a snake, turtle, tick, tree, and lily for him as the discoverer. He describes this portion of his life in *Sonora Sketch Book*.

Once Hilton tried to make a pet of a sidewinder, a small horned rattlesnake that sidles across the desert with an odd and ominous motion. "Don't say it was tame," he cautioned, seeing me take notes. "Make it my 'conditioned' sidewinder, because nobody can tame a rattler.

←Caddy Wagons Carry a Happy Foursome Beneath Thunderbird's Date Palms

Maintaining a home beside a golf club is the style in desert California. Eighty-five of 450 members have built houses on the grounds of the Thunderbird Country Club, 10 miles southeast of Palm Springs. They include such Hollywood celebrities as Phil Harris, Desi Arnaz, and Hoagy Carmichael. Golfers commuting between home and clubhouse customarily ride electric carts.

To keep its 18-hole course green, the club pumps water from its own underground lake. Bermuda, rye, and bent grass are planted together, so that when one goes dormant another is sure to be in season.

© National Geographic Society

↑ Desert Homesites Command High Prices

Rancho Ramon, a subdivision five miles from the center of Palm Springs, sells climate, health, and a fashionable address. A 60-by-120-foot plot brings $2,000 to $5,000. Streets, electricity, and city water are included in the price. Here a salesman talks to prospects. Distant Palm Springs lies under the San Jacinto Mountains, its shield against stormy weather.

Bathers Enjoy Their Indoor-Outdoor Pool →

Every Palm Springs family "in the swim" has its pool, usually the central feature of a walled-in patio. Some pools, however, march right into the house.

Carpeting in this living room rolls down to water's edge. Pink water fills the Mexican wine jugs. Granite boulders in the yard are the fashion in desert landscaping.

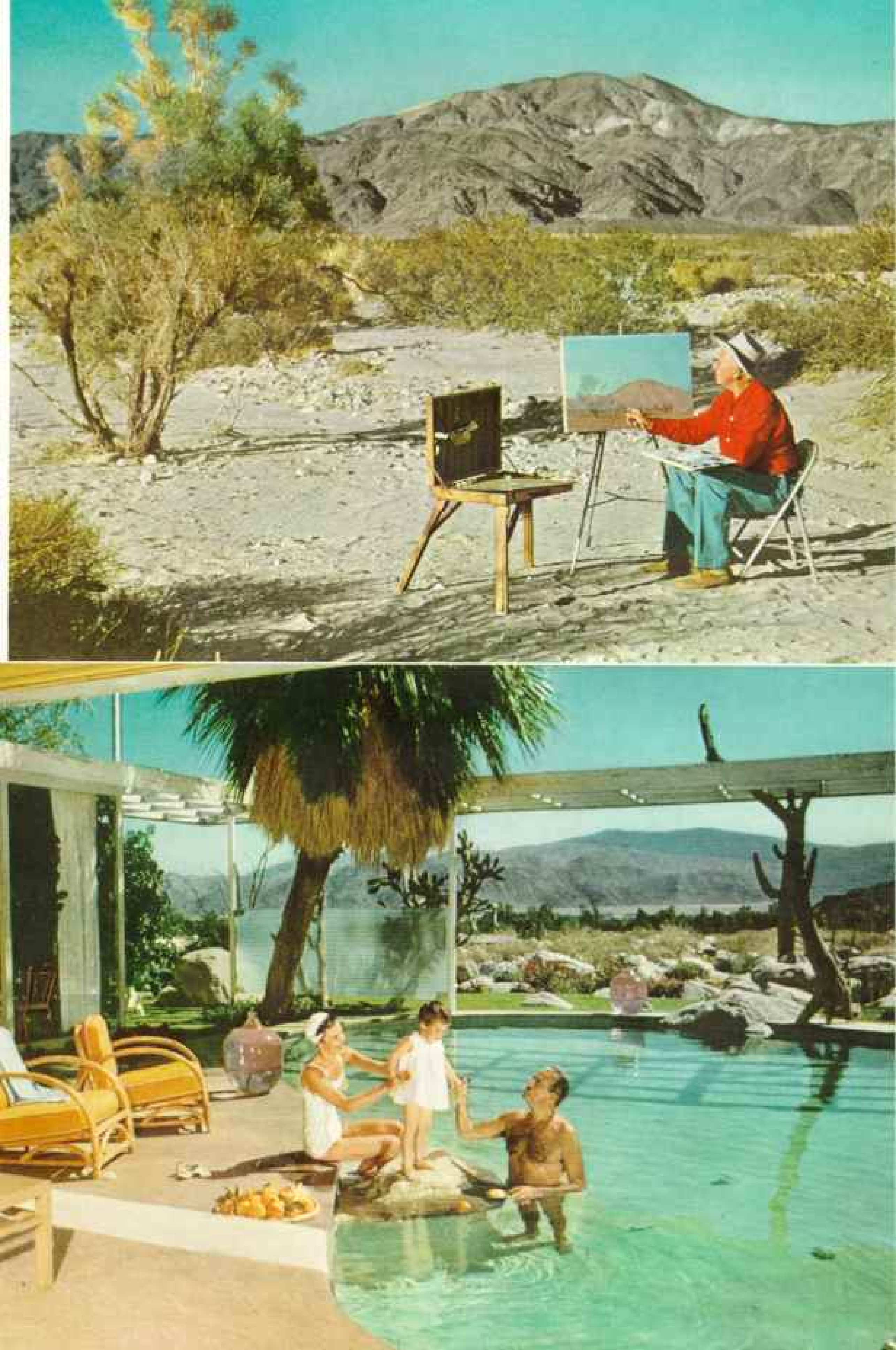
Mr. and Mrs. Raymond Loewy, seen with their daughter Laurence, annually spend four winter weeks at their Palm Springs home. He is a noted designer of ocean liners, Scenicruiser buses, electric locomotives, and automobile bodies.

Smoke Tree Has Its Portrait Painted

Opposite page, upper: "This is my desert!" says artist John W. Hilton. "I have wandered its canyons and ridges on foot and horseback, crossed its plains with cars and jeeps, dug into its vitals for semiprecious gems. I have camped alone under its matchless stars. I have been caught in its sandstorms and experienced almost fatal thirst, yet I love it—every grain of drifting sand, every twig and spiny plant, each reptile, rodent, or insect that crawls its floor, and the breathless miracle of its delicate flowers in spring."

The thorn-laden smoke tree dispenses with leaves during the dry season to conserve moisture. Dead-gray branches tinged with blue can easily be mistaken for a puff of smoke.

© National Geographic Society



"I kept a sheet of glass between us and let my captured snake strike at me. Time after time he bruised his ugly head against the invisible glass barrier until he realized the futility of attacking. At this stage I could handle him—gently.

"And then a visiting photographer made a movie of me and my sidewinder. The snake wriggled up my shoulder and looked me in the eye.

"The photographer showed his film to a New York audience that included the late Raymond Ditmars, the noted authority on reptiles. They tell me that when Ditmars saw the snake crawling up my neck, he yelled, 'Fake! Stop the film! No one can do that with a sidewinder.' He was satisfied when the trick was explained.

"When I in turn saw the film, my blood ran cold. Seeing the deadly little snake so close to my jugular convinced me I had been a fool. The slightest movement could have prompted him to strike. I never played with sidewinders again."

Hilton lives in Twentynine Palms, which calls itself the "biggest little town in the United States" because its 4,000 residents spread their homes across 100 square miles of the Mojave Desert.

Houses stand far apart because people settled there in the days when they could still claim 160 acres of Government land. In fact, rival business sections sit a mile apart, tugging customers in opposite directions.

One stimulus to growth is the Marine Corps Base four miles north of Twentynine Palms, where men practice desert warfare with tanks, flame throwers, and rockets, disturbing no one but the lizards.

Shaggy Lily Grows 40 Feet High

About 17 of the 29-odd palms that named the town still grow at the Oasis, once the community center. Now it is the headquarters of Joshua Tree National Monument, half a million acres of spectacular scenery (page 721).

The Joshua tree (*Yucca brevifolia*) is a member of the lily family, ranging up to 40 feet in height and 14 feet in circumference. Since it grows no annual rings, its age cannot be determined, but estimates go as high as 500 years.

Mormons trekking westward are believed to have named the plant because its shaggy, upstretched arms reminded them of Joshua at prayer.

Grotesque is the word most commonly applied to these overgrown lilies. By moonlight they appear positively weird, raising their twisted arms to the moon as if in supplication to a pagan goddess.

The road to monument headquarters follows a gently rising plateau. One can guess the altitude by observing the changing vegetation. Scarlet-tipped ocotillos and cholla cacti give way to Mojave yuccas; Joshua trees take hold around 3,000 feet.

Suddenly at Salton View, 5,185 feet in the sky, the land falls away thousands of feet, and the plateau turns into ravined mountains, the Little San Bernardinos.

If the day is clear, the overlook reveals the Salton Sea, 235 feet below the ocean, and San Gorgonio Mountain, 11,485 feet above sea level. Down in a trough lies the San Andreas Fault, the earthquake maker that wrecked San Francisco, a great rift paralleling the Pacific coast for 600 miles.

Giant Rock: Flying Saucer Headquarters

As we drove into the Mojave Desert one evening, twilight touched the mesas with mysterious purple. Though the sun had sunk below the horizon, its dying rays spotlighted four military jets blazing like meteors high overhead. Through the gloom below, a single-engine plane labored like a pterodactyl flying out of Sir Arthur Conan Doyle's *Lost World*.

A dusty road led us to Giant Rock Airstrip, a hard-dirt runway on an old dry lake.

Giant Rock is named for its commanding feature, a house-size boulder strangely marooned in a sea of sand, like an egg balanced on end. Old-timers tunneled a basement room out of the rock; the lamp-lit dungeon serves as the airstrip's lounge.

Giant Rock's other-world atmosphere suits the flying-saucer enthusiasts who meet here for their annual Interplanetary Spacecraft Convention.

Hundreds of delegates attended the 1957 convention, filling motor lodges as far away as Palm Springs. Many slept under the stars at the airstrip, keeping a lookout for hovering spaceships. Close by, a small observatory searches the skies for heavenly bodies and unidentified flying objects.

The Mojave town of Pearblossom, whose road signs proclaim it to be the "last frontier of Los Angeles County," showed us no pear blossoms, but its suburban development spoke

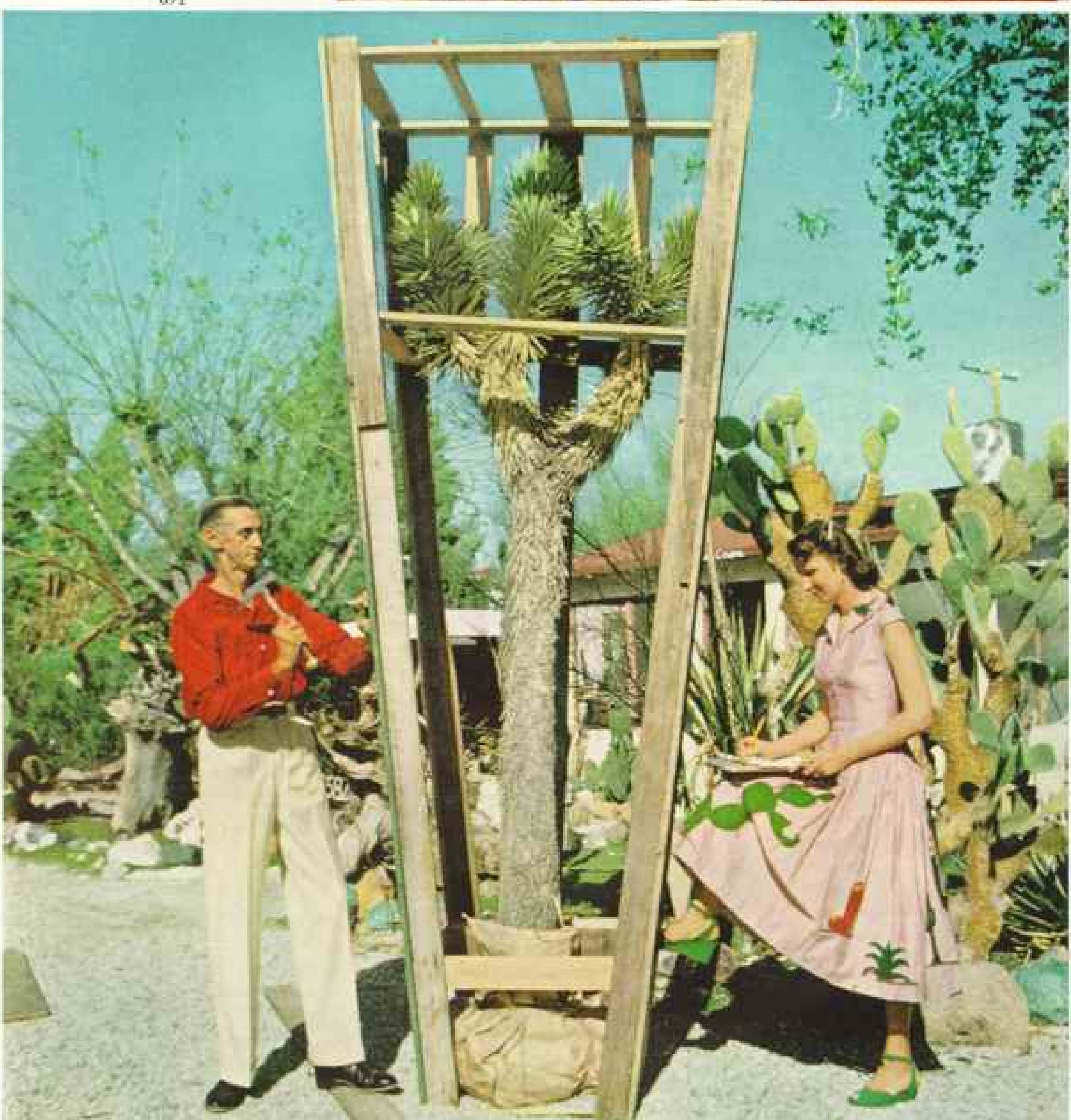
(*Continued on page 699*)

Elephant Tree Spreads Elephantine Branches near Borrego Springs

"*Bursera microphylla*, the elephant tree, is so rare in the United States that only a few hundred are accessible," says plant explorer Chester (Cactus Slim) Moorten, below. "In Baja California, under the spell of moonlight, I have seen groves whose brown trunks and branches suggested a herd of elephants."

Cactus Slim and his wife Patricia, at their Palm Springs home, crate a Joshua tree for shipment to an eastern conservatory for use in a bird habitat.

© National Geographic Society



Trailer Park Families Play Shuffleboard in a Village on Wheels

Some 200 trailers, most of which never move, shelter residents of Sahara Park, in Palm Springs.

Tenants effectively disguise the transient appearance of their homes by adding glassed-in living rooms and sodding the sand. Having invested approximately $1,500,000 in fixtures on their landlord's property, they claim the most luxurious trailer court in the Nation. Gas, electricity, air conditioning, television, and swimming pool are but a few of their conveniences.

Most residents are retired folk. During the summer they scatter like birds.

Some trailers are so long they require special permits to ride the highways. Others are too wide—14 feet—for legal transit, so when on the road one half of the trailer nests within the other. Parked, they expand to full width again.

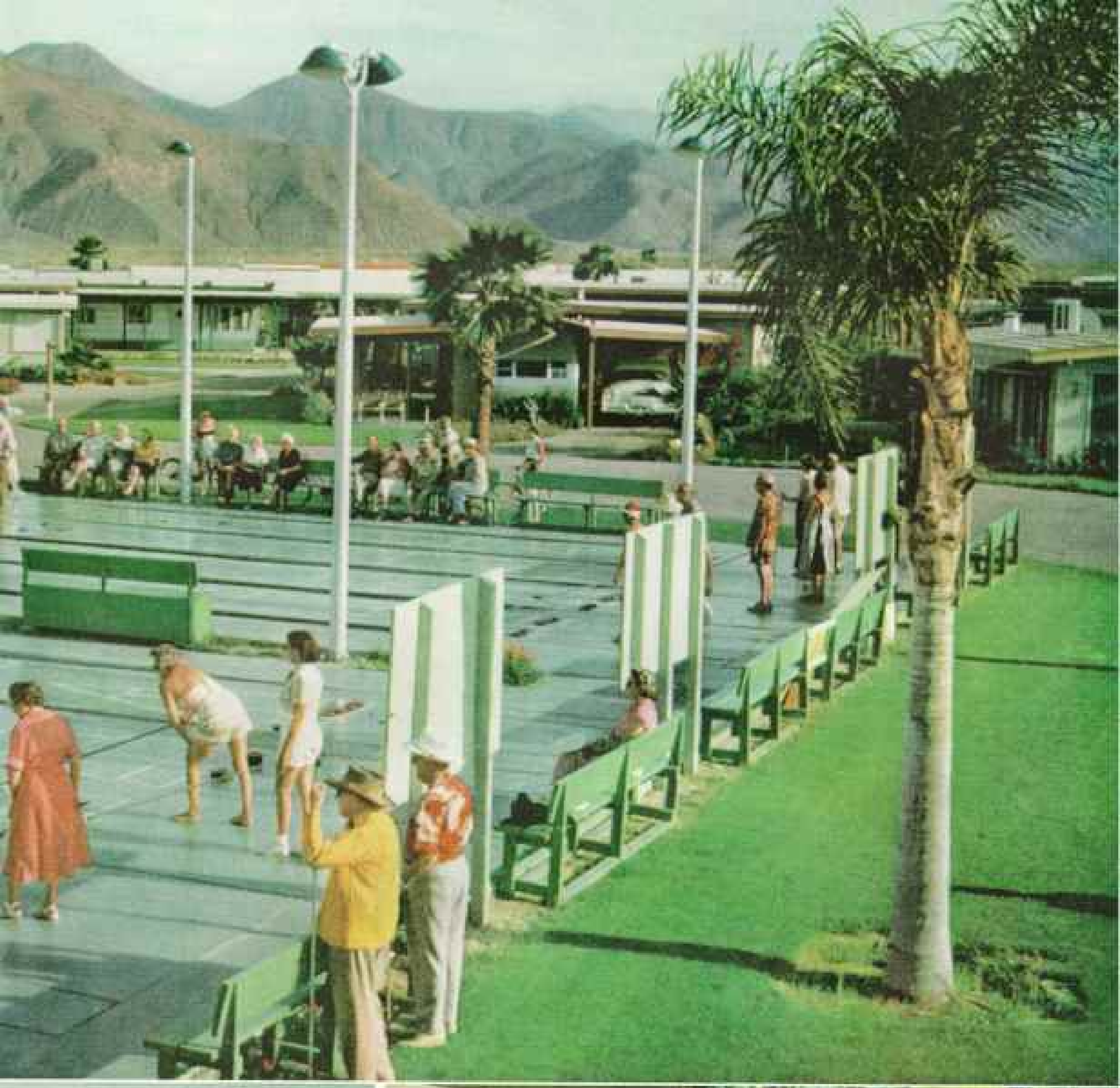
➔ Evening brings out the shuffleboard players, sometimes to meet the champions of other trailer parks.

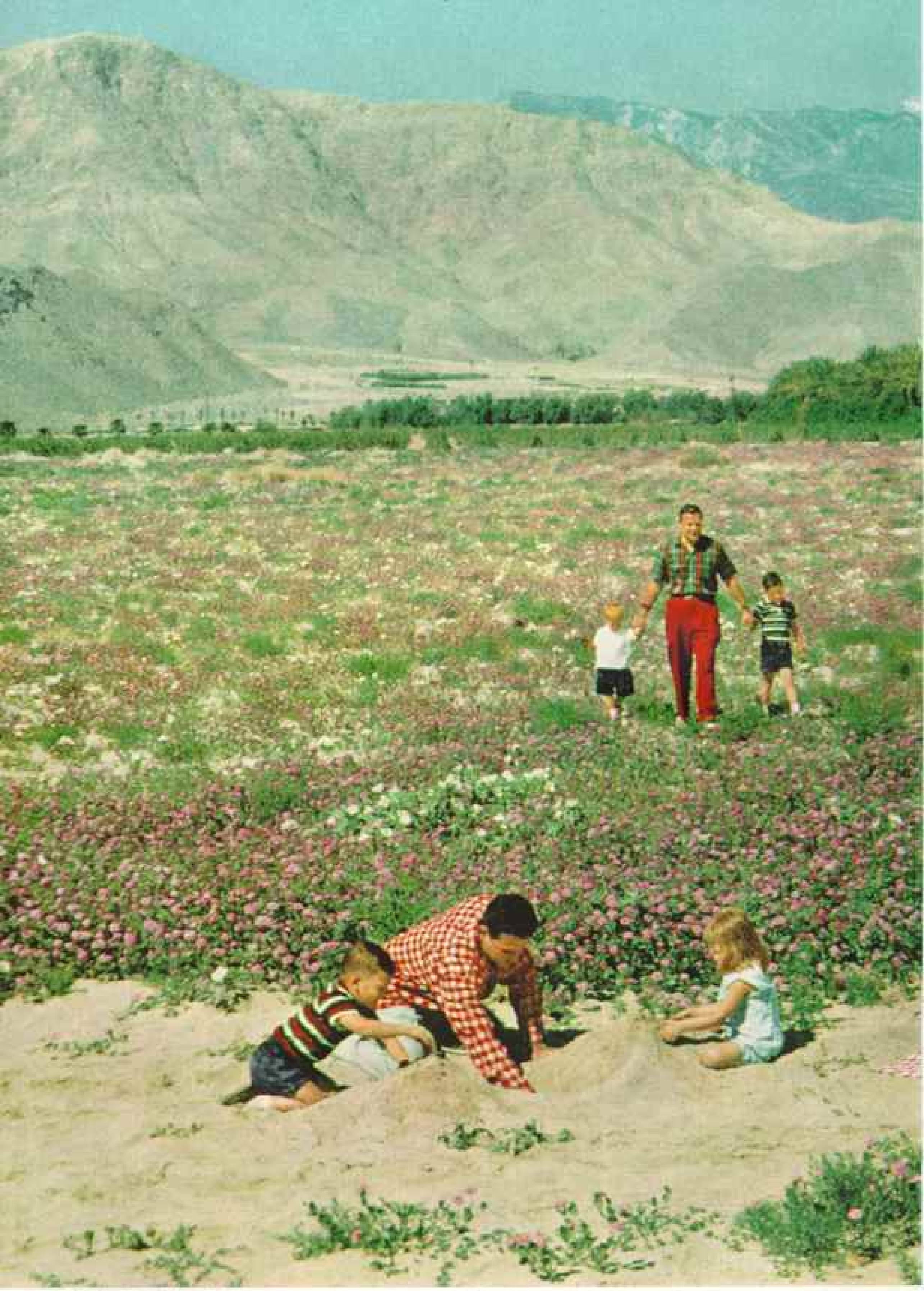
Opposite, below: Weather is so mild and rain so infrequent that the letter boxes at Sahara Park's post office go outdoors.

➔ John Yde waters his wife's flowers. Joshua tree and cactus are transplants.

© National Geographic Society

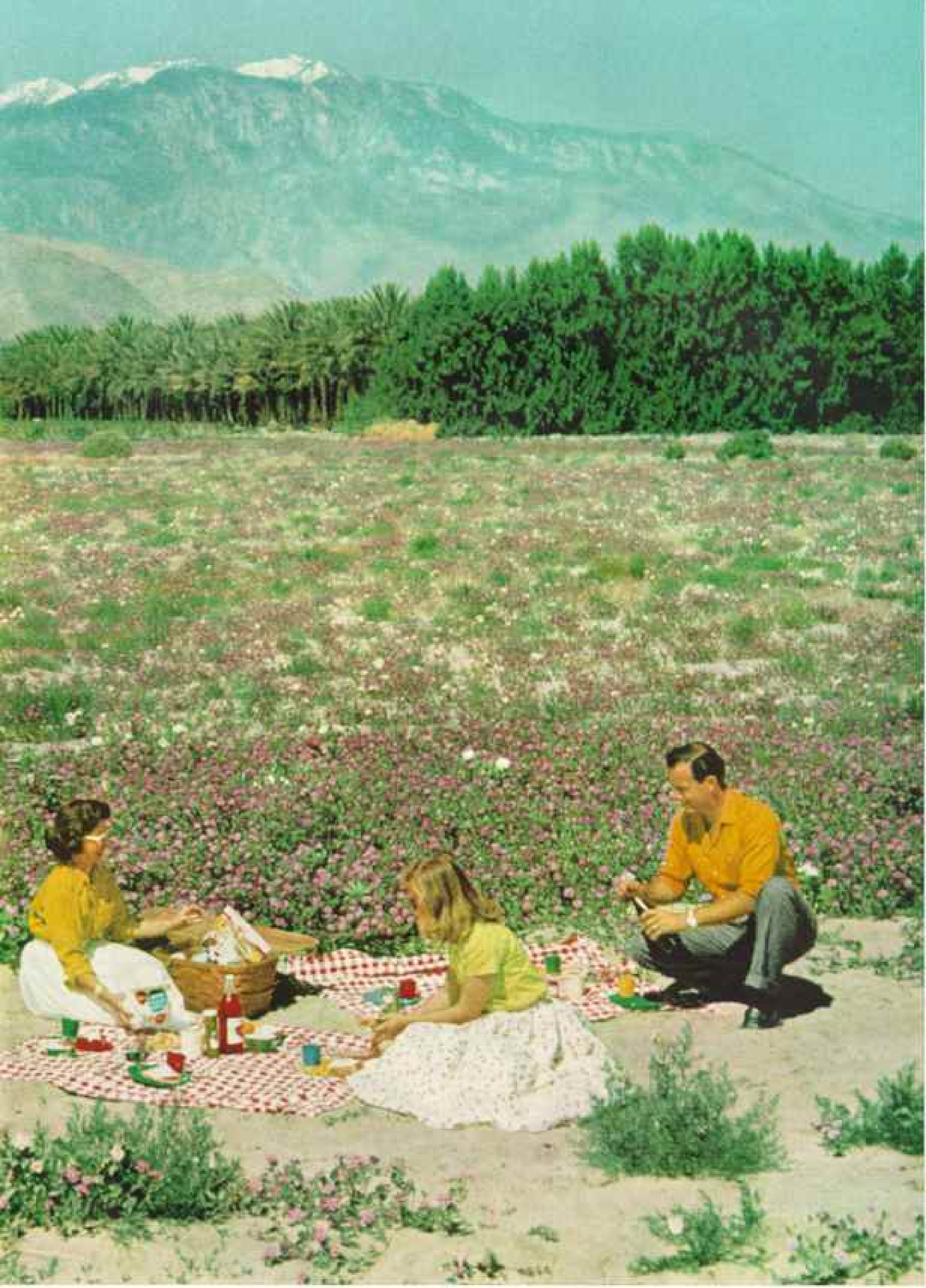
All Kodachromes by Charles W. Herbert, Western Way





© National Geographic Society

Wild Sand Verbenas Spread a Feast of Color After a Spring Shower in Rancho Mirage



695

Twenty Miles Separate Picnic Weather on the Desert from Snow in the San Jacintos

Glass Turns Violet in a Desert Garden →

Many a housewife in the arid West sows a strange crop. In place of flowers she plants glass, particularly old pieces containing manganese. After a few years, intense sunlight oxidizes the manganese, forming a compound with a purplish color.

This fine collection, belonging to Mr. and Mrs. William B. Hatch, Jr., of Twentynine Palms, is tended by their daughters, Martha (left) and Elizabeth, with dog Chum.

"City people," said Mrs. Hatch, "come out here and try to buy these pieces, but we won't sell. When we entertain, we set the glass on our table, where it makes a sparkling sight."

Bowl-like objects at opposite corners of the display are street lamps discarded because they changed color.

← Ghost-town Marshal Wears Hair Long and Pistol Loaded

"Calico Fred" Noller is the manager and peace officer of Calico, a dead town come to life in the Mojave Desert. From 1880 to 1896 Calico produced many millions of dollars in silver. With free silver's defeat in the Bryan-McKinley campaign, the metal's price tobogganed, the miners moved out, and Calico folded.

Walter Knott, a ghost-town enthusiast, has revived Calico. One by one he is restoring each ruin or erecting a faithful copy. ↓ Calico's Bottle House was built of glass when bottles were plentiful and lumber scarce. This building is a reproduction. Two views show exterior and interior.

© National Geographic Society

699

volumes about the land hunger of city dwellers (opposite).

Amid the brush and Joshua trees, we found transplanted cityfolk reverting to rural ways and helping one another build cabins. Some of these dwellings sat carelessly in dry washes, where the first flash flood was sure to carry them away. Flimsy outhouses lay on their backs, knocked down by high winds like victims of a Halloween prank.

When Wahoo Sam Crawford, an old-time outfielder for the Detroit Tigers, was elected to baseball's Hall of Fame this year, reporters vainly sought him in his accustomed haunts in Los Angeles. He had gone to Pearblossom for the weekend.

We met no athletes in Pearblossom, but as we drove away our jeep flushed a convention of long-eared high jumpers, the Mojave's true jack-rabbit homesteaders.

Desert Pool Offers Trout Fishing

Touring Apple Valley, 100 miles northeast of Los Angeles, we found the real estate boom in full blast. One mild Sunday in March we saw half a hundred salesmen in cowboy togs standing in wait for visiting prospects.

The discovery of an underground reservoir fed by snow-capped mountains has given Apple Valley an almost unlimited water supply and encouraged developers to subdivide the desert.

To see the valley's flowing water, I went to the Stoddard Jess trout and turkey ranch, where pumps dip into the sunken Mojave River, 150 feet below the surface.

This water flows out of the ground at 57° F., an ideal temperature for trout. Last year Mr. Jess raised two million rainbows. These he marketed or offered alive in an angling pool on the ranch; the largest measured 36 inches.

← Weekend Campers Repair Their "Jack-rabbit" Home

In the midst of brush and Joshua trees, Lloyd and Mary Zondler hung out a house number (left). "It was a mistake," they acknowledged, "because the tax assessor saw it and left a notice arbitrarily rating the cabin's contents at $50."

Each Friday afternoon the Zondlers load a half-ton truck with water, firewood, and provisions and drive the 65 miles from Burbank to Pearblossom. On Sunday, rather than set the desert afire, they bundle up all their trash for burning at home.

The author saw Mrs. Zondler, in what seemed a curious maneuver, pick up a pair of binoculars and survey the desert. "Bird watching?" he asked.

"No, people watching," she laughed. "We have a protective association, and neighbors keep tab on one another's cabins while they're gone."

Homesteaders' Arrows → Point to "Five Acres of Dreams"

Jack-rabbit pioneers from big cities find refuge from fumes and confusion among the sagebrush and Joshua trees off the Yucca Valley-Victorville road. "Do-it-yourself" builders create everything from one-room shacks to four-room cottages. "Our Haven from Slavin' " bespeaks their philosophy.

← Young Settler Gets an Outdoor Bath

Pamela, the German shepherd, chases chipmunks and guards Morna Ruth Kimberlin from rattlesnakes. Until Morna's father, Robert, drilled a well, he hauled water nine miles in the trailer tank (background), and Anne, the mother, made bath water do double duty by irrigating peach trees. They live near Pearblossom.

"As far back as we can remember," Mr. Kimberlin said, "my wife and I always wanted a home of our own. But how could we afford one without going head over heels in debt? This cabin was the answer: materials cost $300; the labor was our own."

© National Geographic Society

© National Geographic Society

Blue Angels, the Navy's Precision Team, Cross Imperial Valley at 600 Miles an Hour

Based at Pensacola, Florida, these Grumman jets demonstrate daring wing-to-wing maneuvers before crowds all over the Nation. Here they head for El Centro and the annual Naval Air Weapons Meet.

All Kodachromes by Charles W. Herbert, Western Ways

Magic Water, Born in Snow Peaks a Thousand Miles Distant, Turns Parched Sand Green

"Bail out!" the Navy advises the flyer who gets in trouble over the desert. Green irrigated land is feasible enough for an emergency landing, but the desert terrain is deeply pitted with washouts and gullies.

Trout fishing on the desert! It sounds incredible; yet fishermen crowd the pool every weekend. They need no license and observe no limit. A dollar fee buys rights to tackle, bait, and free cleaning for all the fish one can catch. Each trout over eight inches costs an additional 35 cents; smaller fry are free.

Twice a day, at feeding time, the tanks seethe with hungry fish; in the evening the trout jump for flies, as in a mountain stream.

400 Million Worms Enrich Soil

Trout, however, are only a part of the crop. Last year the Jess ranch raised 85,000 broad-breasted turkeys and cooked the scraps from slaughtered birds to make a protein fertilizer.

Five acres are given over to some 400 million earthworms. When we visited the worm fields, we found sprinklers wetting down trenches packed with decomposing vegetation. Each day the worms eat their own weight in trash and convert it into soil.

"Worms are nature's most effective plow," said Joe Boileau, a ranch official. "They mix and aerate the soil and enrich it with their castings. Worms and turkey fertilizer have built up some of our topsoil three feet in 15 years."

Another unusual farm in Apple Valley is Rookwood, a pheasant ranch.

"We raise 75 to 90 thousand birds a year," owner Alfred Rooks told me, "and sell dressed and frozen ones at $1.45 a pound. We also sell live ones for release by gun clubs."

Touring the cages, we saw pheasants native to India, Burma, Mongolia, China, Formosa, and Malaya. With the exception of one species, the four-pound, blue-eared Manchurian, all the males were gaudy, all the hens drab.

"As none of the hens will hatch her eggs in captivity," said Mr. Rooks, "we use electric incubators that can hatch 30,000 eggs at one setting.

"You will notice," he continued, "that the birds' upper beaks are clipped. Captive pheasants can be bloodthirsty little cannibals. If one bleeds, the others jump him like sharks."

Our tour brought us to a cageful of peacocks—strange birds, I remarked, to be strutting among so many pheasants.

Mr. Rooks corrected me. "Peacocks," he said, "are a species of pheasant, and they're highly edible, too. Ancient Romans often dined on breast of peacock."

A logical adjunct to the pheasant ranch is a millinery shop. There workers pluck and wash the feathers of marketed birds, cement them one by one onto forms, and create hats that sell for $25 to $150.

While driving west along U.S. Highway 60-70, we saw several mammoth buildings planted in the mountains. From a distance they could have been mistaken for grain elevators or castles. Closer inspection revealed pumping plants of the Metropolitan Water District of Southern California (page 716).

Five widely separated plants take Rocky Mountain snow water to the faucets of Los Angeles and 77 other communities. From Parker Dam, on the Colorado River, they lift water 1,617 feet over the mountains to six and a half million people.

Metropolitan's aqueduct is the largest and longest in the United States. Including a branch to San Diego, the line runs 621 miles, 104 miles of it through tunnels. Built in the 1930's, it represents an investment of $290,000,000. An expansion program now in progress will cost another $200,000,000, and all this is paid for by the consumer communities, without Federal subsidy.

Chemical Fertilizer Shatters Mountain

Driving seven miles from the pumping plant, we stopped to watch an army of miners and engineers gnawing their way through a mountain of iron ore (page 717).

California grew rich on gold and silver but until recent years had to rely on the industrial East for most of its steel, the metal that makes nations strong.

Eagle Mountain Mine's ore body—54 percent iron—was known in the late 1800's, but no demand arose until wartime 1942. In that year Kaiser Steel Corporation established a plant in Fontana, California, and hauled ore from Eagle Mountain, 160 miles away.

Today Kaiser and other western producers supply about 55 percent of the West's steel needs. Since the customer always pays steel's freight costs, the San Franciscan, for example, prefers to foot the bill from Fontana (or Provo, Utah) rather than the higher tariff from Pittsburgh, Pennsylvania.

As sirens screamed a warning to clear out of the pit, I stood on a high terrace and watched explosives packed into drill holes blast some 10,000 cubic yards of rock free from the ore body.

Blasting crews used ammonium nitrate, more widely known as a chemical fertilizer.

703

California Caliph Holds Arabian Nights Court

Dates, ripening in fall and winter, are the featured exhibit every February at Riverside County Fair and National Date Festival, Indio. Fair-goers dress as Arabs, park under palms, and watch camel races and pageant in a Baghdad-like setting.

"We have a cast of 150 people," says G. L. Christiansen (left), stage manager, who doubles as the Caliph of Baghdad. "Young people enter the dressing rooms in blue jeans and emerge as Arabian princes and princesses. It reminds me of a larva changing into a butterfly. A few men grow beards for the festival, and one has to look twice to recognize a brother."

Fair-goer Wears a Vegetable Bonnet →

Tender young Turkish turbans are edible; grown, they make striking ornaments, especially at Halloween.

San Diego County exhibited the squashes at the California Mid-Winter Fair in Imperial. "When you plant the seeds," said the grower, "you never know what color combination will come up."

© National Geographic Society

"Put this stuff on your roses and they bloom," a Kaiser foreman said. "And it is safe enough for the farmer, who cannot set it off even with common detonators."

Leaving the high desert, photographer Herbert and I drove to the fertile Coachella Valley, most of which lies below sea level.

Everywhere in Coachella's sands we observed the shiny remains of tiny snails that Spanish pioneers called *conchillas* (little shells). One version says that an Anglo-Saxon cartographer, mistaking the word, made it Coachella. Like the Imperial Valley, it is a part of the Colorado Desert, which is named for the river.

Coachella Valley is important to Americans because it grows many of their seedless grapes, early cantaloupes, pink-meat grapefruit, and about 90 percent of the domestic date crop.

Indio Shaded by Lofty Date Palms

Visitors might mistake the valley for an Oriental oasis; some 4,500 acres are green with the fronds of lofty date palms. Streets in the town of Indio are named Arabia, Saidy, and Deglet Noor. Falling dates rattle the

roofs of motor lodges set among the palms. Refreshment stands offer date candy, date ice cream, and date milk shakes. Signs on highway 111 invite the traveler to a date garden for an illustrated lecture on the "Romance and Sex Life of the Date." Actually the love life of a date palm requires man's assistance (page 679).

Plant explorers introduced North African varieties into Coachella Valley in 1903. Some of these palms are now more than 50 feet high, requiring so much labor to climb that they have become unprofitable. As a rule, only roadside date stands charging premium prices make much money these days. Some despairing owners cut and burn their palms.

If date palms are a rarity in the American landscape, what would you say of a smoke tree and desert holly ranch? Lloyd Rooke devotes 42 acres to these out-of-the-ordinary plants on his Desert Lakeshore Ranch near Thermal. To the delight of eastern visitors, Californians use desert holly and smoke tree cuttings in flowerlike dry arrangements.

Heretofore these plants have been cut wild in the desert, but, says Mr. Rooke, "we have an idea we can tame them. No one knows how they will respond to irrigation or whether they can resist diseases and pests common to cultivated plants."

Desert Holly Glows in Lamplight

Mr. Rooke conducted me around his two-acre "forest" of smoke trees just two inches high. Had I been parachuted into this grove, I might have imagined I was in a field of young beans. My guess would not have been far wrong, for the tree is a member of the pea family. Blossoming late in spring, the mature tree turns into a bower of minute, indigo-blue sweet peas. Bees so love the bloom that they often attack anyone approaching.

The better to conserve moisture, growing smoke trees dispense with leaves during the dry season (pages 689 and 710). Seen from a distance, the dead-gray branches often look like a puff of smoke. Since the tree is sensitive to frost, citrus planters avoid the spots where smoke trees have refused to grow.

Mr. Rooke experimented eight years and tested hundreds of strains before he attempted a commercial stand of desert holly. Now he has 40 acres, which he irrigates and cultivates. Before Christmas he cuts, crates, and ships the crop. Markets are growing.

Desert holly, a member of the goosefoot

El Centro Lettuce Moves from Farm to Cooling Shed in an Hour or Less

Much of Imperial Valley's seasonal labor could not be accomplished without the help of migrant Mexican nationals, who can rightfully live in the United States only while employed under contract. This crew works for H. H. (Mike) Hubbard (page 714).

Since lettuce does not mature all at one time, several harvests are necessary. Men in the foreground select and cut the ripe heads. Others, moving behind the machines, hand them up, and riders pack them in cartons. A truck, keeping pace, receives the load.

Each mobile packing unit covers 10 to 20 acres a day and harvests five to six carloads.

↑ Swiss Americans Dance at Harvest Time

Some 75 families carry on the Swiss tradition near Holtville, Imperial Valley. These performers celebrate February's Carrot Carnival.

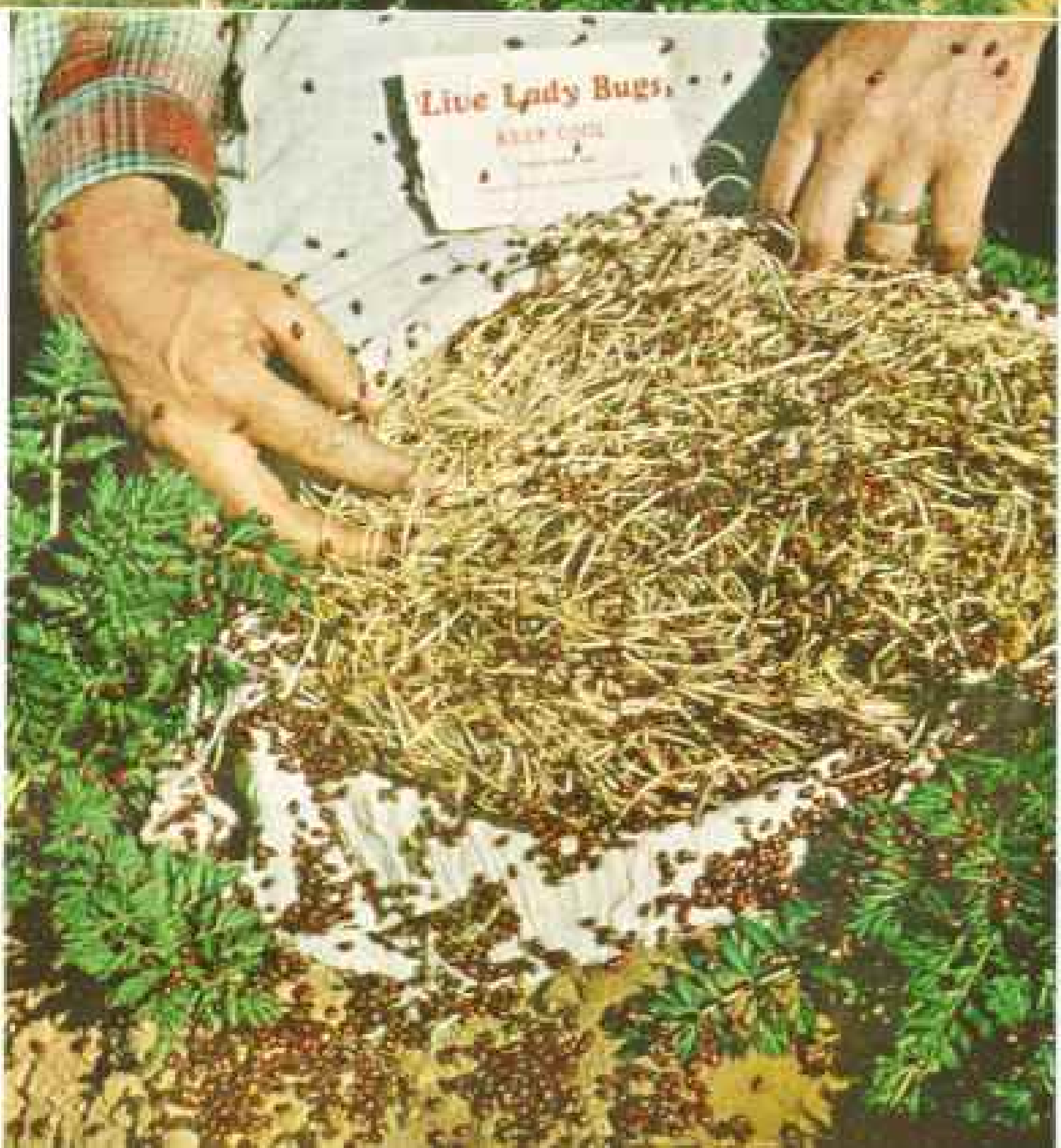
←Joe Maggio (left), popularly known as Holtville's carrot king, started "from nothing" in 1940 and built a "million-dollar operation." At harvest time he has as many as 2,000 employees in one field. His assembly-line organization digs, selects, ties, washes, ices, crates, and loads carrots in less than two hours.

"This ranch has shipped 42 carloads a day," says Mr. Maggio. "Figure 346 crates to the carload and 72 bunches to the crate—that means enough carrots to feed 1,046,304 families, a Chicago-size market."

A Sackful of Killers —Live Ladybugs →

Collected in the mountains and held in cold storage until needed, ladybird beetles are released in Mr. Maggio's fields to devour aphids. One gallon will police 10 acres.

© National Geographic Society



family, has crinkly leaves like the true holly. When it has water, the plant is gray-green and succulent. Dry, its leaves wear a natural varnish that reflects lamplight with a silvery sheen.

A few feet above Mr. Rooke's desert ranch a prominent beach line, the so-called travertine rocks, runs along the Santa Rosa Mountains. Formed when the Colorado River emptied into this basin, vanished Lake Cahuilla left its indelible signature 40 feet above the ocean level and 275 feet above Cahuilla's shrunken survivor, the Salton Sea. Above this line the rocks are plainly of granite; below it water has coated them with a coral-like calcium carbonate.

Mr. Rooke led me up the rocks to places where long-vanished Indians had carved picture writing. A modern "Betty and John," like Kilroy, had added their names.

Salton: America's Dead Sea

From these rocks we could glimpse the 40-mile-long Salton Sea shimmering between Coachella and Imperial Valleys. This desert bowl, 235 feet below sea level, is the deepest depression in North America after Death Valley, a minus-282-foot dry sink 210 miles to the north. Water, fed by the Colorado River, escapes only by evaporation, leaving a briny solution the consistency of ocean water (page 712).

In recent years Salton Sea has been rising and flooding its shores. Helen Burns, owner of a Salton Sea resort, has had to move her beach house three times.

One April afternoon Mrs. Burns and I sat by the edge of the sea and watched as a dust storm rolled in until we could see scarcely 200 feet.

Imperial Dam Across the Colorado Makes Deserts Bloom in Two States

Stretching 3,473 feet and raising the river level 23 feet, the dam gives birth to California's All American Canal (foreground) and Arizona's Gila Main Canal (below intake gates at upper right).

Three desilting basins in the center remove mud picked up by the river on its 300-mile journey from Hoover Dam and flush it into channels at right. Dams and basins save farmers and the Imperial Irrigation District about $1,400,000 in desilting costs a year.

Life line of the Imperial Valley, the All American Canal flows entirely through U. S. soil (page 718). Before engineers rerouted it in 1940, part of the big artery ran through Mexico.

Twenty feet deep and a maximum 232 feet broad, the canal can divert 15,000 cubic feet of water a second. A branch canal waters Coachella Valley.

← Children on a Desert Outing Gather Easter Eggs Beneath a Smoke Tree

"This might well be the land of the Easter bunny," says Mrs. Helen Burns, whose Salton Sea Beach resort stands close by (next two pages). "If our many long-legged, long-eared jack rabbits won't qualify, then surely our many little cottontails will."

"All that water out here in the midst of the desert," she mused; "a crazy place where pumice floats and ironwood sinks. One minute the water is glassy calm. Then a wind sweeps down from the mountains, and in five minutes the sea looks angry and green, with whitecaps four feet high.

"In summer the electrical storms are terrifying. But they are beautiful. We sit on our porch and watch them like a show. First the thunderclouds gather. Then lightning silhouettes the Chocolate Mountains. The wind strikes almost with hurricane force. Rain falls in sheets, and the dry washes run with water three feet high.

"Twice out here I have seen a blue moon; I didn't believe there was such a thing. And then the mirages!

"You'd think you'd see water in the desert. But here we see dunes and mountains above the sea. I've seen the sun come up double over the sea; it all looked so real I couldn't tell which sun was false."

At the swampy southeastern end of the Salton Sea, where the Imperial Valley begins, we toured a farm where nobody worries about crop surpluses or price supports. This place is strictly for the birds, and its customers are always satisfied.

Here, in the Imperial Waterfowl Management Area, the State plants grain and lets wild birds harvest the crop. Hunters are welcome in season because their license fees help feed the migrating ducks and geese using the refuge as a way stop.

Farmers close by fight off hungry waterfowl with Army surplus flares, star clusters, and revolving searchlights. But the birds are not an unmixed nuisance. Sea birds that camp beside the Salton Sea at night follow Imperial Valley irrigators by day and devour insects flushed out of the ground.

Sixty years ago the Salton Sea and the Imperial Valley did not exist as we know them now. No map showed prosperous El Centro, Brawley, Holtville, and Calexico, and men mined salt in dried-up Salton Sink.

In the middle 1800's a few visionaries first talked about diverting the Colorado River into the desert—most of it below sea level—for irrigation. But not until 1901 did engineers breach the Colorado's western bank, channeling water into the valley by way of a canal through Mexico.

Within a few years silt clogged the intake canal, making a new cut necessary. Flash floods in 1905 breached the cut, and soon the Colorado abandoned its channel to the Gulf of California and washed two outlets to the Salton Sink. New farmlands faced ruin, but in those far-off times the Federal Government was unable to help.

Valley Saved from Runaway River

The fate of the entire valley rested with one man, E. H. Harriman, president of the Southern Pacific Company, whose rails crossed the valley. He had to decide whether to risk millions of dollars in company funds, and his answer was yes.

Southern Pacific engineers built a trestle across 1,100 feet of the broken bank. They mobilized hundreds of laborers, including Indians, assembled flatcars, and hauled rock as far as 480 miles. Men and flatcars then dumped 80,000 cubic yards of fill into the gap faster than the torrent could carry it away. By February, 1907, the river was harnessed and the valley saved. Salton Sea is a reminder of the averted catastrophe (page 712).

In 1940 the new All American Canal, the Western Hemisphere's largest irrigation system, bypassed Mexico and began delivering desilted water to the valley (pages 708 and 718). Coachella Valley gets water through a branch canal.

Agriculturally, Imperial is the Nation's seventh ranking county in value of farm products, surpassed only by Fresno, Kern, Los Angeles, Tulare, and San Joaquin, all in California, and by Maricopa, in Arizona.

Imperial County's alluvial soil is hundreds of feet deep, and the valley is a natural hot-

---

← They Set Up Sandstone Tenpins and Bowl with Sandstone Balls

The author (left) observed these odd concretions in Yuha Wash, west of Imperial Valley. Rockhound Ira Huffman (second from left) opined they had been shaped as surf rolled them back and forth on a vanished beach. Ed Stevens (center) once hunted Peg-leg Smith's lost gold strike in this stony wilderness (page 723). Eva Wilson and Grace Huffman (right) alternate as bowlers.

© National Geographic Society

712

Ocean Fish Are Planted Below Sea Level

Because Salton Sea lies so close to population centers, the State has sought to introduce a large marine game fish. Such a prize, the flavorsome corvina, or white sea bass (below), seems to have caught on. "We know they're spawning," said a marine biologist, "because we've caught some young ones. If their food supply holds out, they could 'explode' and fill the sea before many years."

To avoid heat, this tank truck made a 200-mile night run from the Gulf of California. Here, at Desert Shores, it dumps live cargo, 400 corvina. Mexico and the United States waved the fish through customs inspection. Fatalities during the average haul are about 5 percent.

Bathers and Skiers Throng Salton Sea, Desert's Dead Lake

During spring, summer, and fall swimmers stream to this below-sea-level resort, bringing their boats, trailers, tents, dark glasses, and sun-tan lotion.

Skiers, finding the water uncrowded and usually calm, arrive from the Pacific and Atlantic. Skis rest on sand during this lull at Salton Sea Beach.

Speedboat records have been set here. Drivers say the density of the water and the low altitude (minus 235 feet) make speed conditions ideal.

Evaporation removes six feet of water from the lake every year. But inflow from rivers and irrigation systems usually exceeds that figure, causing the water to rise. Lagoon on left shows winter's spillover; summer's heat may dry it up.

Barnacles, introduced by boats or seaplanes during World War II, have taken over the salt sea until they now attach their raspy shells to every possible residence—rock, chain, even drowned sagebrush.

Another new denizen is a marine worm, favorite food of a transplanted seven-inch Gulf croaker. The latter, in turn, feeds a sports fish recently introduced (below) from Mexico.

© National Geographic Society

house. Mild winters allow an off season for vegetables and an early season for melons and grapes, most of them commanding premium prices.

So long as snow melts in the Rockies, valley farmers get water whenever they want it. "We don't pray for rain," they say; "we telephone for it." A call to the Imperial Irrigation District produces the exact amount needed. Rain—about three inches a year—is not wanted. These advantages result in some phenomenal yields.

Farming in the Imperial Valley has become so costly, complex, and mechanized that a small operator finds it hard to get started.

"It's a million-dollar operation," said H. H. (Mike) Hubbard, who grows a share of Imperial's $16,000,000 lettuce crop on the outskirts of El Centro (page 704). "I have $150,000 tied up in equipment; yet I'm considered a medium-size farmer.

"You can't count the nickels and stay in the lettuce business. Pinch on water, fertilizer, or insecticide, and your crop will be inferior or come in late. When that occurs, the buyers move on to your competitor's field, which is of better quality. Out here the backward farmer goes out of business quickly. The only way to survive is to make improvements all the time.

"Hot weather, diseases, and the market are lettuce growers' hazards," Mr. Hubbard continued. "Hit a high market and you're rich; hit a poor market and you're ruined. If you're not growing marketable lettuce, you're growing ulcers."

Desert Heat Controlled—Indoors

J. H. Edgar, a pioneer businessman, told me he doubted that all the valley held a thousand people when he went there in 1902.

"In those days," he said, "men got their water from ditches. They'd let the dirt settle in a pail, and then drink. Butter, when there was any, sold by the bottle because there was no refrigeration. Dirt roads meandered around bushes. Later they were straightened, banked up, and divided into two sections, which were alternately flooded and dried smooth to lay the dust. Horses and mules died in harness under the 120-degree sun, and people lived in tents or brush ramadas."

Today climate indoors is controlled. The average valley man lives in an air-conditioned home and drives an air-conditioned car to an air-conditioned office.

Men used to pack their families into the mountains during summer. Nowadays vacationing wives have been known to quit the beaches in July for the air conditioning back home.

"Twenty years ago," Paul A. Jenkins, publisher of the *Imperial Valley Press*, told me, "valley folk built shacks, figuring on clearing out to some cooler spot when they retired. Now they build substantial homes; air conditioning and rock-wool insulation make the difference.

"Old people now stay in the valley, among their friends. I myself could retire, but where would I go? What would I do? I tried a distant resort recently but got so bored I took the first plane back to El Centro."

Golf Balls Soar Across Mexican Border

Across the border from Imperial Valley, Mexico irrigates some 222,000 acres with Colorado River water, which is guaranteed by treaty with the United States.

Sitting face to face, Calexico, California, and Mexicali, capital of the Mexican state of Baja California Norte, are as close as sisters despite a high barbed-wire fence slicing them down the middle. Their police departments cooperate closely. A phone call sends fire engines of one town roaring through the international gate to help the other. Mexican and American school children get together every two years and parade through both cities.

I found Mexicali shops selling comic books entitled *Davy Crockett, Guardian de la Pradera* (prairie). Mexican papers shouted news about President Eisenhower; the headlines called him Ike.

Many members of Calexico's International Golf and Country Club are Mexicans. The club's greens adjoin the international fence. As the golfers stroke balls, Mexican children beyond the fence imitate them, batting stones with sticks. In return for a coin, a small brown hand will return a golf ball hit over the fence.

The dramatic difference between desert and irrigated land was unforgettably brought home to me last April when I rode a United States Navy jet trainer above Imperial County. Drought and water drew knife-blade lines between barren sands and green fields.

My pilot was Lt. Robert C. Maich, of the Fleet Air Gunnery Unit at the Naval Auxiliary Air Station, El Centro. Talking over the intercom, he pointed out flyers' targets—aban-

(*Continued on page 723*)

715

It's Gold! Miners Pan a Sample in the Pinto Mountains

Desert sands have been worked so thoroughly that a man might starve trying to wash placer gold. This ore comes from an old hard-rock mine being reworked. Leslie Spell crushes rock in the mortar, and Sam Laxton, beneath hard hat and lamp, estimates its value.

Editor Harry Oliver Rides His Rocking Burro

A member of the Liars Club, Mr. Oliver lives at Thousand Palms in a citadel-like structure he built with adobe bricks and named Old Fort Oliver. A former movie art director, he left Hollywood for the desert, "where even the horned toads are genuine." He is 70 years old.

Oliver publishes the *Desert Rat Scrap Book*, a collection of western humor, on light cardboard, and says it is the "only newspaper you can open in the wind." From it come these items of his philosophy:

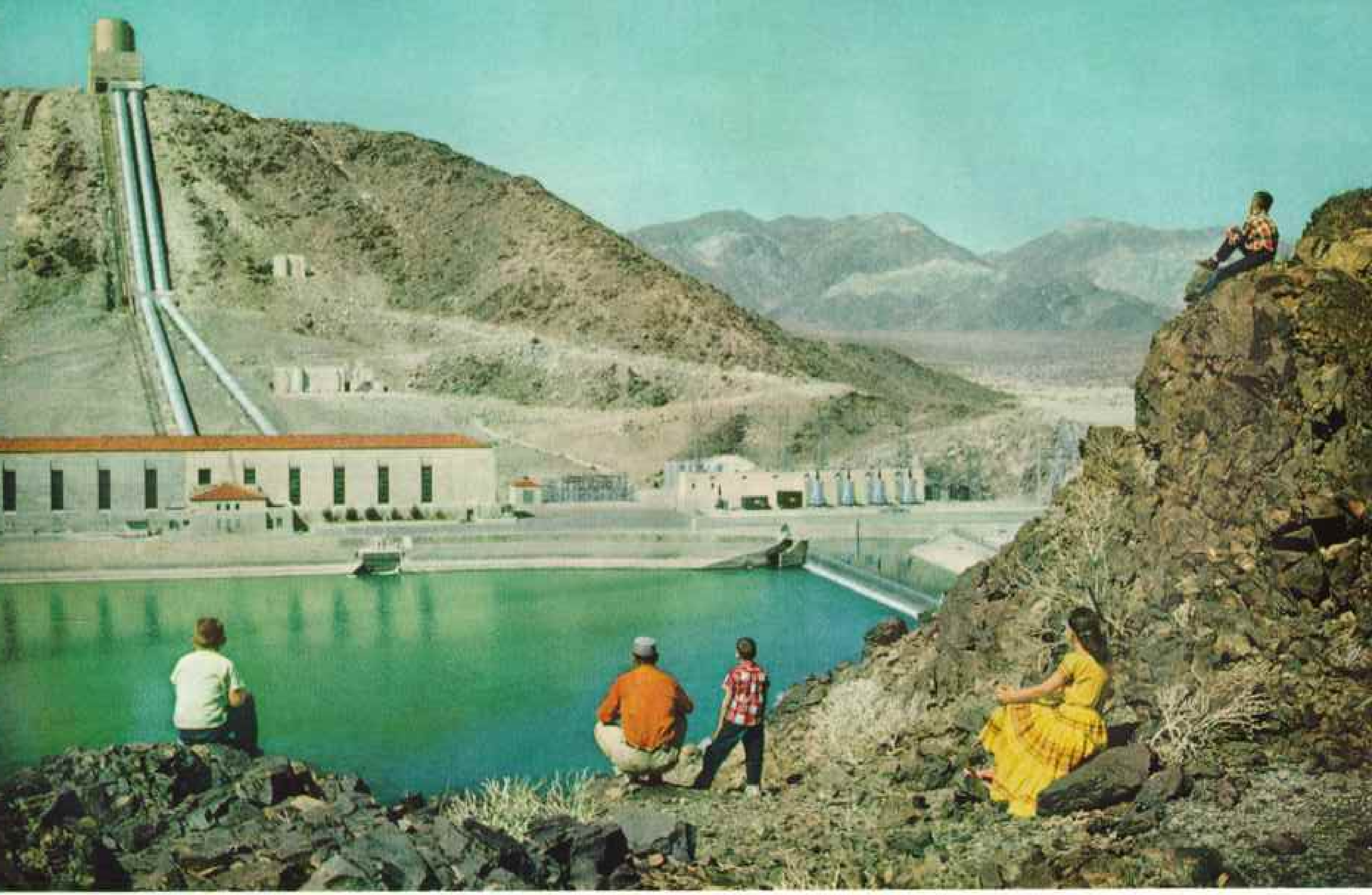
"Relaxation don't tire you so much in the desert as in other places."

"One of the greatest labor-saving devices today is *mañana*."

"The worst part of doing nothing is that you can never take any time off."

Oliver, who has two lively legs, carries the wooden one in memory of Peg-leg Smith.

© National Geographic Society All Kodachromes by Charles W. Herbert, Western Ways



© National Geographic Society

↑ Eagle Mountain Plant Pumps Colorado Water 438 Feet up a Hillside

With unremitting labor, this lonely installation in the desert throbs with the lifeblood of 78 southern California communities, including Los Angeles and San Diego. The plant is one of five that pump water through the Colorado River Aqueduct to some six and a half million people.

Two 10-foot pipes lead from pumps to the lofty surge chamber. An empty space on the mountainside awaits a third conduit that will increase capacity to a billion gallons a day.

← Common Fertilizer Rips a Mountain of Iron Ore

Safe on a ledge, the photographer caught the explosion at Kaiser Steel Corporation's Eagle Mountain Mine. This yellow cloud of nitrous oxide followed the blast.

Ammonium nitrate, a chemical fertilizer, did the work. In 1947 a shipload of the compound blew up, triggering explosions that destroyed a large part of Texas City, Texas. Its value as a cheap, effective explosives ingredient had long been known.

Charges were hooked together with detonators timed so precisely that a series of shocks took place 9 millionths of a second apart.

This view shows the remains of a mountain that has been cut down bench by bench. Electric cables to the shovels rise on stilts to let trucks run below them.

© National Geographic Society

719

Dunemobiles Track Imperial County's Sandy Sahara

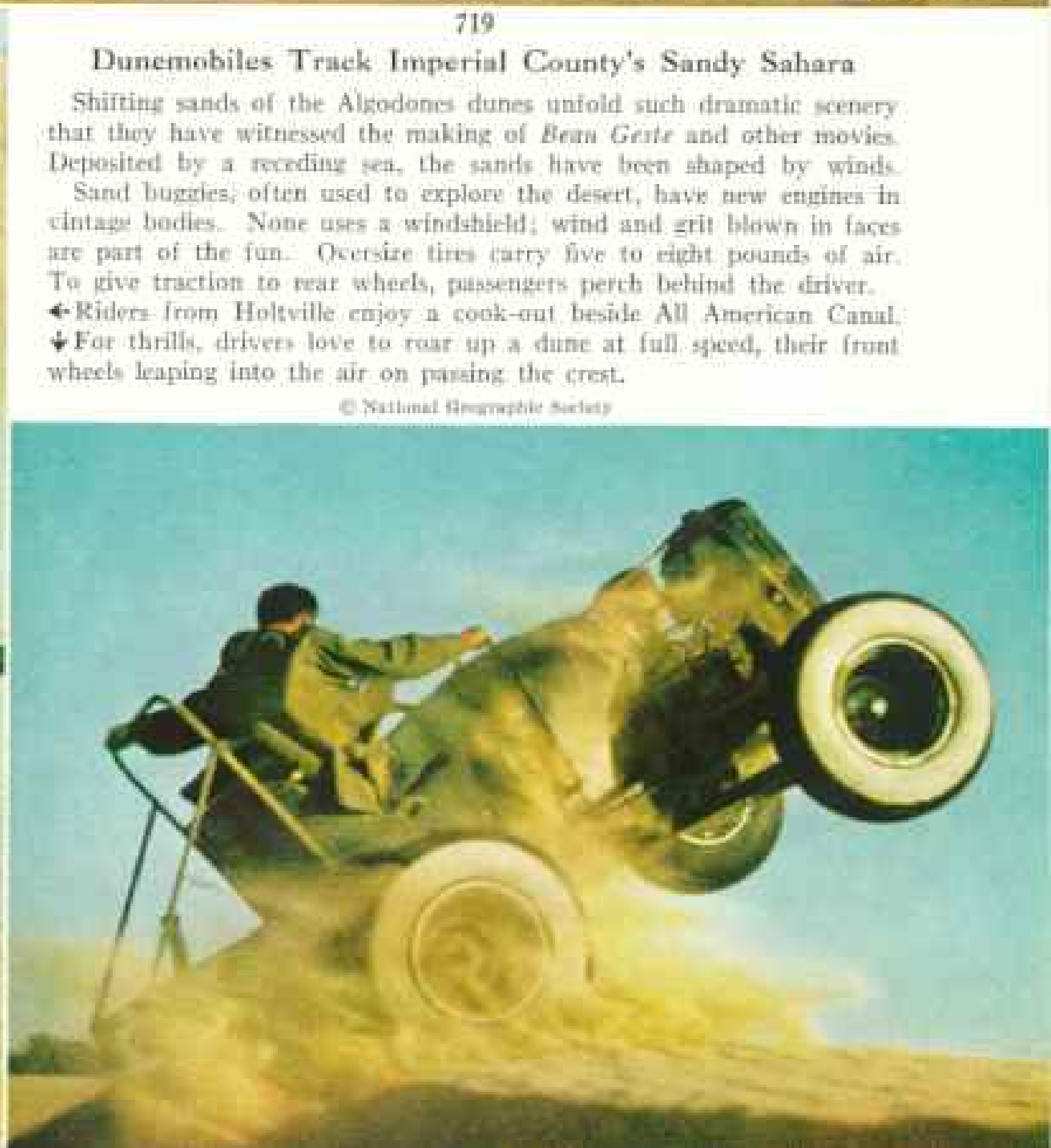
Shifting sands of the Algodones dunes unfold such dramatic scenery that they have witnessed the making of *Beau Geste* and other movies. Deposited by a receding sea, the sands have been shaped by winds.

Sand buggies, often used to explore the desert, have new engines in vintage bodies. None uses a windshield; wind and grit blown in faces are part of the fun. Oversize tires carry five to eight pounds of air. To give traction to rear wheels, passengers perch behind the driver.

←Riders from Holtville enjoy a cook-out beside All American Canal.

↓For thrills, drivers love to roar up a dune at full speed, their front wheels leaping into the air on passing the crest.

© National Geographic Society



© National Geographic Society

↑ **Four Palominos Pull Hay Riders Past Deadman Point**

Conquistadors, gold seekers, pioneer traders, and camel caravans passed close by. Many motion pictures used the setting. Legend says Kit Carson killed an Indian here. These holidaymakers come from Apple Valley Inn.

↓ **Visitors Hear a Lecture in Joshua Tree National Monument**

Giant branching yuccas grow on all sides of Cap Rock, so called for its balanced headpiece. Park Superintendent Samuel A. King (in uniform) delivers a nature talk. Inset: A cauliflower-white bloom adorns the Joshua's arm in spring.

© Animal Geographic Society

Navajo Dancer Juggles Eight Hoops

Once a year Sherman Institute, a school operated in Riverside, California, by the Bureau of Indian Affairs, holds open house—a day for visitors to meet the 1,000-odd Indian students. Authentically costumed as Navajos, Papagos, Comanches, Kiowas, and Apaches, boys and girls stage a style show on the campus.

Taking underprivileged Navajo and Papago children with little or no previous schooling and little knowledge of English, the school gives them a five-year training in the three R's and a trade. Seventy-five percent of its graduates enter community life in southern California.

"A few go on to high school and graduate with honors," says Superintendent Myrthus W. Evans. "We have almost no disciplinary problem. When a teacher leaves the classroom, there is no disorder. These children appreciate an education."

↓ Visitors watch young artists at work on a Navajo sand painting.

© National Geographic Society

doned tanks and bull's-eyes outlined in the bare ground.

"Except for carrier flying," he said, "we consider this to be the finest flying duty in the Navy. The desert is a sea of sand, and it gives us plenty of room to operate. Along the coast you'll run into fog, but here the sun shines all but two or three days a year. Certain targets can't be assessed at sea, and ashore one may not find a safe place to fire. Delivering the goods is our business, and in this desert we have all the targets and the room we want."

Landing, I witnessed some target practice at the station's Naval Air Weapons Meet. Under the eyes of umpires, screaming jets pumped bullets, rockets, and inert bombs into abandoned vehicles. Fighter pilots, diving like meteors out of the sky, brought their maneuvers down to the eye level of some 5,000 spectators.

The Blue Angels, the Navy's precision flying team, demonstrated evasive tactics, wing tip to wing tip and back to belly (page 700). Four pilots, each appearing from a separate point in the compass, timed their dives so precisely they crisscrossed the field only seconds apart from collision. Soaring aloft in formation, they broke apart like fragments of a star shell, the green and pink smoke from their wing-tip tanks weaving fantastic patterns in the air.

Gold Gone from "Boy-load" Mountains

Everywhere in the desert one hears tales of fortunes won in gold and silver. Crumbling headframes and heaps of mill tailings attest the energy that men sank into the ground.

Veteran prospector Ed Rochester, at his home in Winterhaven, pointed to the Cargo Muchacho Mountains and said:

"If I went out there looking for gold today, I'd starve to death. But in their time those mountains yielded millions. Old-timers packed out the gold in muleloads. The story was that even kids went up there and took out all they could carry; that's how the mountains got their name, Cargos Muchachos, or Boy Loads. Today there's more money in the rockhound business!"

With that Mr. Rochester switched on an electric motor and began polishing gem stones.*

Ira Huffman, an El Centro rancher whose hobby is geology and rockhounding, took us prospecting in the Yuha Wash, a Dantesque wasteland west of the watered area (page 710). His battered jeep, equipped with bedsprings on top so he could sleep out in a rattlesnakes' den if necessary, wheezed up mountains of oyster shells left by the receding Gulf of California. We drove across layers of sandstone that had been folded and cracked by cataclysmic earth forces until they looked like torn pages in a stone book. We found sandstone concretions shaped like birds, toadstools, and hippopotamuses. Finally we explored an apparent coal field—acres of black stones the size and shape of coal lumps.

Story of Lost Mine Recalled

One of our party, Ed Stevens, an old-time prospector, searched the "coal yard" and gathered a double handful of nodules coated with black hematite. They were about the size and shape of walnuts, with a finger-size cavity through the center.

"These stones never fail to remind me," he said, "of the time I hunted Peg-leg Smith's lost gold mine 54 years ago."

Peg-leg's lost mine, one of the West's most fabulous bits of folklore, has lured hundreds of dream chasers, and more than one has died trying to find it.

Kentucky-born Thomas L. Smith was a reckless, fur-trapping mountain man. Hit by a bone-shattering Indian arrow, he helped cut off his own leg and thereafter hobbled around on a clumsy wooden peg.

In 1829, while traveling from Yuma, Arizona, to sell furs on the west coast, Smith and his party got lost and ran out of water in the Colorado Desert. Seeking a spring, Smith scouted "three small buttes," ever thereafter the beacon of the Peg-leg mine searchers. He found no water but, legend says, picked up some small black stones that showed a coppery glint.

"There was enough to load a hundred wagons without half trying," he is reported to have said.

Peg-leg carried away pocketfuls of the "copper," thinking he might use it in place of lead. In Los Angeles he sold his furs, squandered his money, and learned his copper was gold. In the 1840's Peg-leg organized a hunt for the mine; he died in 1866 without having found it.

And now Mr. Stevens reminisced of the days when he searched for the Peg-leg mine.

* See "'Rockhounds' Uncover Earth's Mineral Beauty," by George S. Switzer, National Geographic Magazine, November, 1951.

Beauty Queens Meet at the Mexican Border

Nancy Lee Williams, costumed for the fair and rodeo in Imperial County, faces Fernanda Esquer, who represents the Mexicali Press Association. They stand at the end of the high wire fence running between Calexico, California, and Mexicali, Mexico (page 714).

"It was in 1903," he said. "Two friends and I made up a burro train and followed an old Indian trail east out of Julian. We covered the Borrego Badlands and all the places we thought Peg-leg could have strayed into. We found plenty of other minerals, but none of his black gold nuggets. My hunch is that blow sands must have covered up his strike.

"Once I thought we were close. It was in this very spot, the Yuha Wash, that I found the hematite nodules. 'This is it!' I said to myself, but how wrong I was!"

Stevens is one of those old-timers who preserve the lost-mine legend with an annual trip to Borrego Springs, where they have erected a monument to Peg-leg Smith. Gathering round the flickering light of a campfire, they declare the Liars Club in session. Stevens has won the contest twice.

"Once while on Peg-leg's trail," he told the delegates, "I lay rolled up in my blankets on a hillside of bare stone. As the night grew colder, I could hear layers of stone contract and chip off. Before long I heard the click-click-click of little round stones rolling past me. Switching on a light, I saw a pile of black nodules tumbling down the hill. I tried to follow, but the stones outsped me, and I lost the trail in the dark. But I followed it in the morning, and it led me to a heap of black nodules encrusted with gold. And if you don't believe me . . ."

With that, Stevens's confederates carried onto the Liars stage a box of his worthless hematite nodules painstakingly weighted with lead and salted with gilt paint. By campfire light they looked like the real thing!

Prospectors haven't found Peg-leg Smith's gold mine and maybe never will. But California's burgeoning desert has produced another kind of bonanza.

And most of the new desert dwellers—pheasant growers, lettuce farmers, artists, and movie stars—wouldn't trade the sun, sky, and solitude that brought them there for the richest claim yet found.

Notice of change of address for your National Geographic Magazine *should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your January number, The Society should be notified of your new address not later than December first. Be sure to include your postal-zone number.*

The exclusive new Readymatic Changer in use

New Kodak 300 Projector is ultra-portable— yet shows your color slides bigger, brighter!

The handsome new Kodak 300 Projector is so compact, it stands no higher than a modern telephone . . . and closes into its own case for easy carrying.

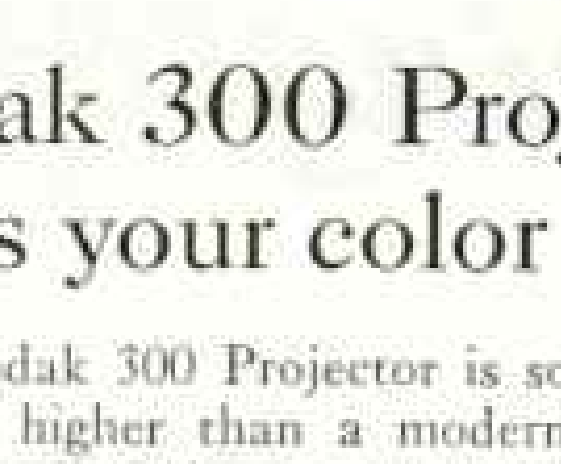
Yet this striking, modern-design projector throws *bright* screen images. Gives *big* pictures, too, in an ordinary living room—thanks to its "wide-angle" lens.

You'll like the smooth, even glide of its great new Kodak Readymatic Changer. It loads up to 36 slides in cardboard mounts, makes changing simpler than ever.

See the new Kodak 300 Projector demonstrated at your photo dealer's. It's only $64.50, or as little as $6.45 down. And it's made by Kodak, so you know it's good.

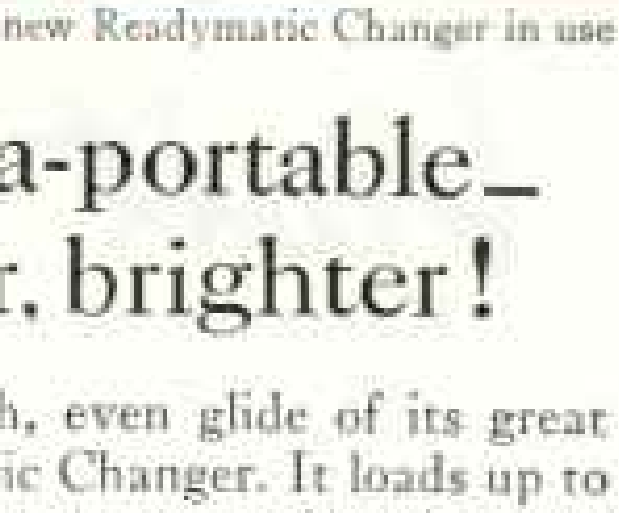
Prices are list, include Federal Tax and are subject to change without notice.

So light, easy to store. Carries like a briefcase. Measures 11x11x5 inches with matching self-cover.



Convenient controls on top make it easy for you to elevate and focus fast with just two fingers.

New Kodak 300 Projector with automatic magazine changer, $74.50, or as little as $7.45 down.



Camera-projector outfit with new Kodak Signet 40 Camera, $138.50, or $13.85 down.

EASTMAN KODAK COMPANY... Rochester 4, N. Y.

Kodak
TRADE-MARK

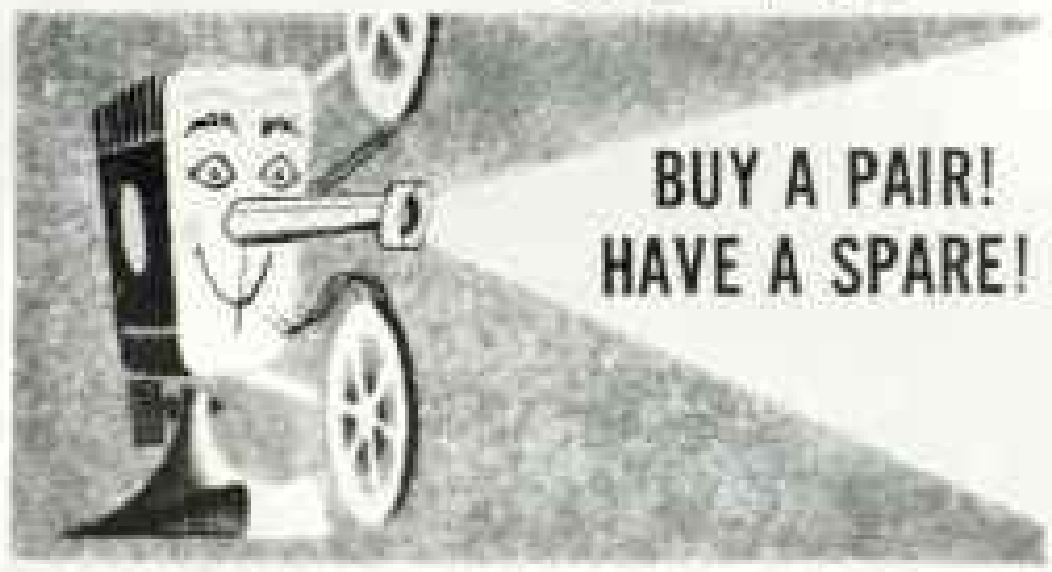
When You Compare the

Minolta 'A' 35mm
COLOR-SLIDE CAMERA

You don't have to be an expert to see that the Minolta 'A' is poles apart from other 35mm cameras in its price class. Exclusive features are so obvious...such as the famous Rokkor 4-element, 45mm f/3.5 lens, the brilliant, single-window, coupled rangefinder, fully automatic film transport and shutter cocking lever and the fully synchronized Optiper MX precision shutter with speeds from 1/300th to 1 sec....And the price, at dealers anywhere is only **$49.95**

CHIYODA KOGAKU SEIKO CO., LTD., Osaka, Japan
New York Office . . . . . 150 Broadway, New York 38, N. Y.
U. S. Sales Agent • The FR Corporation, 951 Brook Ave., N. Y. 51
Canadian Agent • Anglophoto, Ltd., Montreal/Toronto/Vancouver

BULB BLOW?
SPOILED SHOW?



BUY A PAIR!
HAVE A SPARE!

GENERAL ELECTRIC
PROJECTION LAMPS
For All Slide and Movie Projectors

GENERAL ELECTRIC

Visit Washington

Shrine of American Patriotism
There's so much to see...and remember!

Everywhere you look there's beauty... everywhere you go there are points of interest —the White House, the Capitol, Congress, Mt. Vernon, historic memorials. You'll never forget the experience.

FOR PLEASANT TRAVEL...GO B&O

You'll ride in comfort along B&O's scenic route and enjoy B&O's outstanding courtesy and tasty food.

***FREE!* 52-PAGE PICTORIAL GUIDE TO WASHINGTON**

Where to go! What to see! It's all in this descriptive book. 32 illustrations; street map. Mail coupon below.

J. F. Whittington, Gen. Pass. Traf. Mgr.
Baltimore & Ohio Railroad (Dept. AD) Baltimore 1, Md.
Please send me, without charge, a copy of your "Pictorial Travel Guide to Washington"

Name_____

Address_____

City_____ Zone____ State_____

TOURS AND SPECIAL FARES

Talk with a B&O representative or your local travel agent—or write to us for information on sightseeing tours and savings on round-trip fares. Special rates for organized groups.
Make your plans now!

BALTIMORE & OHIO RAILROAD

You can save a lot of calories by sweetening with Sucaryl

and you can't taste the difference

WEIGHT WATCHERS' CRANBERRY BAKED APPLES

6 medium red cooking apples
2 cups cranberries
2 tablespoons Sucaryl solution
½ cup water

Set oven at 450°F. Core apples and pare one-third of the way down. Place in a shallow baking dish. Combine the remaining ingredients in a small saucepan and cook until berries pop. Fill center of each apple with a tablespoon of the cooked cranberries; pour remainder over apples. Cover with aluminum foil and bake for 30 minutes. Remove foil and bake 5 to 10 minutes longer. Makes 6 servings.

Sucaryl makes it easier for you to watch your weight . . . by giving you wholly natural sweetness without bitter aftertaste, without one single calorie.

You use Sucaryl practically anywhere you would sugar . . . in coffee, tea or any other drink . . . on fruits and cereals. Cook with it, bake with it; any Sucaryl-sweetened dish tastes just like its sugar-sweetened twin. Sucaryl, of course, is for anyone sensibly counting calories, and for those who cannot take sugar. Your drugstore has Sucaryl in tablets or solution. Low-salt diets call for Sucaryl Calcium. Abbott Laboratories, North Chicago, Ill. and Montreal, Can. Abbott

Get your new Sucaryl Recipe Book—free at your drugstore.

Sucaryl®

Non-Caloric Sweetener—No Bitter Aftertaste

UNUSUAL TELESCOPE BUYS

See the Stars, Moon, Planets Close Up!

3" ASTRONOMICAL REFLECTING TELESCOPE

60 and 120 Power — Famous Mt. Palomar Type: An Unusual Buy!

Assembled—Ready to use! You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, star Clusters, Moons of Jupiter in detail, Galaxies! Non-breakable aluminum covered tube. Equatorial mount with lock on both axes. Aluminized and overcoated 3" diameter high-speed f/10 mirror. Telescope comes equipped with a 0.6X eyepiece and a mounted Barlow Lens, giving you 60 and 120 power. An Optical Finder Telescope, always so essential, is also included. Sturdy, hardwood, portable tripod. Free with scope: Valuable STAR CHART and 272-page "Astronomy Book." **Stock No. 85,050-D, $29.50 f.o.b. Barrington, N.J.** (Shipping wt. 10 lbs.)

Order by Stock No.—Send Check or M.O.—Satisfaction Guaranteed!

A REAL ASTRONOMICAL TELESCOPE! MT. PALOMAR TYPE

With this scope you can see the craters on the Moon, the rings of Saturn, double stars. Mirror guaranteed to give theoretical limit of resolution. Rack and pinion focusing, removable mirror cover, counterweight. Real equatorial mounting—only one adjustment follows stars! Aluminum tube. 4 Power Finder Telescope. 2 standard size Eyepieces and Mounted Barlow Lens give you powers of 40X, 90X, 120X, 270X. Mirror f/11. Mirror corrected to better than ¼ wavelength.

Stock No. 85,006-D. ..... **$74.50 f.o.b. Barrington, N. J.**

Order by Stock No.—Send Check or M.O.—Satisfaction Guaranteed!

WRITE FOR FREE CATALOG-D

Over 1000 Optical Items! 72 Pages! Hundreds of Illustrations! We are America's No. 1 source of supply for experimenters, hobbyists. World's largest variety of Optical Items. Bargains galore . . . War Surplus—Imported—Domestic! Microscopes, Telescopes, Satellite Telescopes, Infrared Snooperscopes and Parts, Prisms, Lenses, Reticles, Mirrors and dozens of other hard-to-get Optical Items.

Write for FREE CATALOG-D

EDMUND SCIENTIFIC CO., Barrington, New Jersey

What Venus de Milo is to sculpture

ZEISS IKON

is to cameras

Zeiss Ikon Contaflex, now in four models from $153, at leading dealers. Send for booklet.

World Famous Zeiss Ikon Cameras are Precision-made in West Germany

CARL ZEISS INC., 485 Fifth Ave., New York

CLIP this Coupon

Sun plus Fun All Winter

EL PASO

Heart of the International SUN COUNTRY

SUN Most winter sun of major U. S. resort cities*. Play, relax, explore outdoors every day. Many scenic wonders.

FUN Golf, ride, shop. Bullfights, fiestas, gay night life in Old Mexico just across the Rio Grande. Come! Have winter fun!

*U. S. Weather Bureau Figures compiled by American Airlines.

Write for FREE Folders today.

El Paso Sunland Club

395 San Francisco St., El Paso, Texas

Please send me free literature.

Name_____

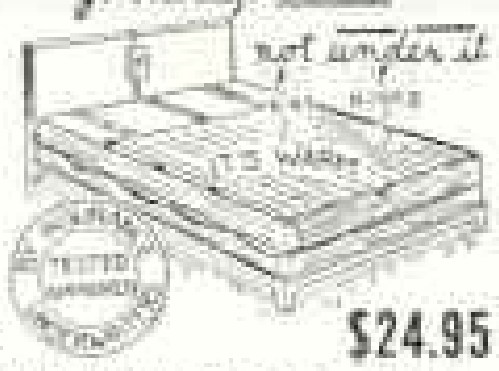
Address_____

City_____ State_____

Afford yourself the finest in modern sleeping comfort. **The Electro-Warmth Bed Warmer** automatically puts a dry soothing warmth in the bed where you want it.

Warms the Bed—Not the Bedroom

You sleep ON IT not under it



See our ad in Sept. '57 National Geographic Magazine. Mail postcard for comparison chart & additional information.

ORDER DIRECT from

THE ELECTRO-WARMTH CO.

4113 Aspen St., Dept. G11, Washington 15, D. C.

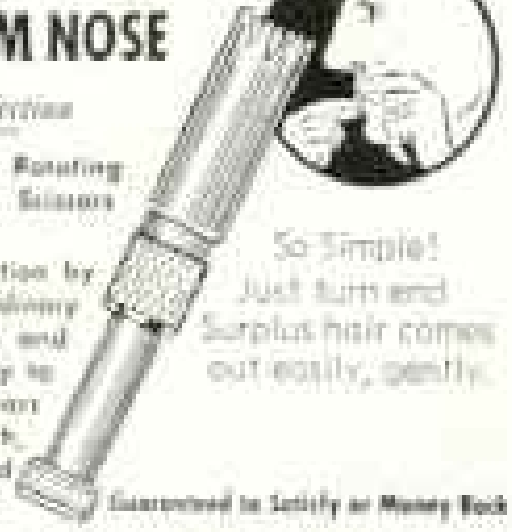
$24.95 Postpaid

DON'T PULL HAIR FROM NOSE

May Cause Fatal Infection

Use the Hollis **KLIPETTE** Rounding Scissors

You can cause serious infection by pulling hair from nose. Ordinary scissors are also dangerous and impracticable. No better way to remove hair from nose and ears than with KLIPETTE. Smooth, gentle, safe, efficient. Rounded points can't cut or prick skin.



So Simple! Just turn and Surplus hair comes out easily, gently.

Guaranteed to Satisfy or Money Back

HOLLIS CO. • 1133 Broadway, New York 10, N. Y. • **Dept. N-1**

Enclosed is $1.00 for KLIPETTE. If I am not entirely satisfied, I may return it within 10 days for refund.

Name_____ Address_____

IF YOU BUY SHOES THAT DON'T FIT . . .

. . . you have lost only the cost of the shoes. But if you buy poorly fitted insurance you may be out thousands of dollars in case of loss.

So don't buy your insurance without the skilled advice of a local, independent insurance agent or broker. He is a man who thinks in terms of the value of your policy if you have to collect on it.

He has a professional mind about insurance. He knows property values and the sizes of judgments in today's lawsuits for damages. He knows the kinds and the amounts of insurance you should carry and can arrange for you to pay your premiums monthly, quarterly or semi-annually, if you desire.

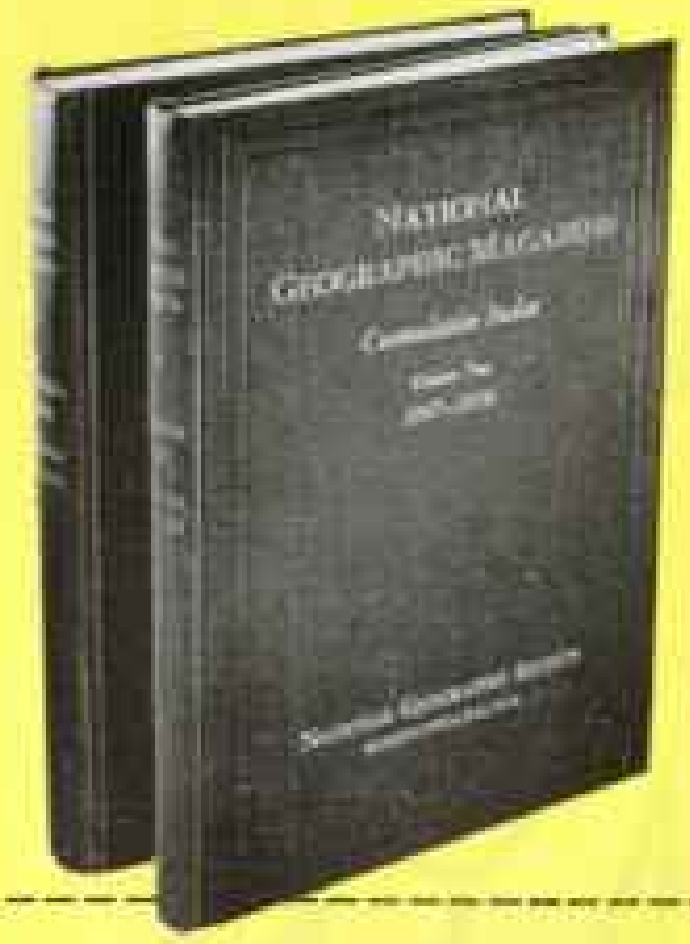
And if you ever have a loss you may be sure that he will be on hand as a friend to give you the help you may need.

For the name of a nearby America Fore Agent call Western Union by number, ask for Operator 25.

America Fore
INSURANCE GROUP

★ The Continental Insurance Company
★ Niagara Fire Insurance Company
★ Fidelity-Phenix Fire Insurance Company
★ The Fidelity and Casualty Company of New York

NATIONAL GEOGRAPHIC MAGAZINE



Cumulative Index

VOL. I, 1899-1946
and a new revised
VOL. II, 1947-56

An indispensable reference tool available to you for use with the NATIONAL GEOGRAPHIC MAGAZINE is the Cumulative Index. These two volumes are an open-sesame to the wealth of knowledge contained in The Magazine since 1899. Its entries are as close to home as your own State and as far afield as the two Poles. Use of the Cumulative Index converts your copies of the NATIONAL GEOGRAPHIC MAGAZINE into a finger-tip encyclopedia of the world. Nature subjects, authors, titles, topics, pictures, and maps—all are there, and so easy to find.

The new Volume II, just off press, is the complete key to the magazines you refer to most frequently, 1947-56. (It takes the place of the old edition covering 1947-51.)

Included in this new Volume II is a fascinating 200-page history telling of the National Geographic Society's growth from a small struggling organization to a world force for knowledge and understanding, told by the man best qualified to tell it—Dr. Gilbert Grosvenor, for 55 years the guiding genius of The Society and its Magazine. With a wealth of photographs and anecdote, he recalls the trials and triumphs of building "the Magazine with no future"—as scoffers once dubbed the NATIONAL GEOGRAPHIC—into the world-renowned publication it is today. Dr. John Oliver La Gorce, President-Editor 1954-7, contributes an account of The Society's activities today.

The Cumulative Index may be purchased as a set for $10.00 or in separate volumes for $5.50 each.

☐ Cumulative Index, set of 2 Vols., $10
☐ Vol. I, 1899-1946, $5.50
☐ Vol. II, 1947-56, $5.50

To National Geographic Society, Dept. 711, Washington 6, D. C. Enclosed please find $_____ for which send me the volumes indicated.

NAME

ADDRESS

CITY, ZONE, STATE

FOR A MERRY CHRISTMAS THE WHOLE YEAR THROUGH—

Gift-Memberships

IN THE NATIONAL GEOGRAPHIC

For this Christmas, here is a gift—that is really 12 gifts—enhanced by frequent map-supplements. An entire year of exploring, adventuring, and learning in the brilliant color pages of the NATIONAL GEOGRAPHIC MAGAZINE awaits the recipient of a gift-membership.

To present this gift please use the membership form in the front of this magazine. For additional gifts kindly list names and addresses on a separate sheet.

TRACKWALKER WITH A PH.D.

Melvin Janes, a friendly, sandy-haired man in his early forties, may well be the world's only trackwalker with a doctor's degree.

Since 1953, Dr. Janes has trudged many a mile along railroad tracks from Maine to Texas. His mission: to check with his own eyes the killing power of a unique railroad-bed weed destroyer.

Weeds are a menace to railroad men. They are a fire hazard; wheels slip on them; they hold moisture which rots the ties and undermines the roadbed; they make maintenance difficult. More than 50 kinds of weeds grow along the tracks. Some die easily and stay dead—but many are too tough for ordinary weed killers.

When Mobil scientists developed a promising new oil-based killer—AGRONYL R—Dr. Janes took to the tracks to check it out. It killed the weeds, all of them. Moreover, it's heavy and doesn't blow on to adjacent farmland. It leaves a film that discourages new growth (and also helps keep the tracks from rusting).

You can't buy AGRONYL R herbicide for your garden weeds. It wouldn't work in your home sprayer anyway. It was created for a specific job —and it does that job without equal.

In the same way, Dr. Janes and his fellow scientists develop countless other Mobil products for the special needs of *your* business, *your* car, *your* home. Whether it's a motor oil or a gasoline or a gear lubricant, it's unique in its field. And you can depend on its quality—for it is a product of Mobil's master touch in oil.

For more information about Mobil research and development activities, write to Room 2400, Socony Mobil Oil Company, Inc., 150 E. 42nd St., New York 17, N. Y.

Mobil

SOCONY MOBIL OIL CO., INC.

Leader in lubrication for 91 years

Insure trouble-free automatic projection! 36 slides are permanently indexed-stored-protected in each magazine . . . only $2.25. Your photo dealer has the Airequipt Automatic Slide Changer for most projectors . . . with your first magazine, $14.95.

Send for 12 pg. booklet, "25 ways to improve your slide shows."

AIREQUIPT MFG. CO., INC.,
Dept. N11, 20 Jones St., New Rochelle, New York

Switzerland

sunny cradle of winter sports

. . . with its eventful days and nights and a calendar that offers something for everyone. There are art exhibits, stage plays, concerts and opera. You can join in the gala events at the fabulous Swiss winter resorts or enjoy the picturesque folklore of the tidy Alp-side villages. You can go masquerading at gay carnivals in Lucerne and Basel or at the riotous "Escalade" pageant in Geneva, with mummers, floats and all the fun of Mardi Gras! Switzerland, with its most efficient transportation system, is only brief hours from all major European cities. Make a date to live this winter!

See the expert, your local Travel Agent. Or write to:

Swiss National Tourist Office

Dept. 382, 10 West 49th St., New York 20, N. Y.
661 Market St., San Francisco 5, Cal.

Travel and Vacation Logic

1st Premise:

A winter vacation in sunny Arizona or fun-loving California.

*

2nd Premise:

A delightful, relaxing trip to either or both of these regions on one of America's finest trains—the GOLDEN STATE.

Conclusion:

* A Happy *
* Winter *
Holiday! *

Mail coupon for complete information

R. E. King
Gen'l Passenger Traffic Mgr.
73 La Salle Street Station
Chicago 5, Illinois

☐ I am interested in a trip to
☐ Also send information about your

NAME
ADDRESS
CITY ZONE STATE
(IF HOW SCHOOL STATE GRADE)

You may be richer than you think!

Have you ever shopped for a camera and found that you couldn't afford one as fine as you wanted? One that just seemed to fit your hand . . . with the versatility to meet any photographic challenge . . . and with a big, authoritative lens up front?

Well, sir, you *are* richer than you think. For Argus has designed the C-44 just for you . . . at a price you can afford. **Only $99.50** with a 50mm, f:2.8 Cintagon lens . . . and every ounce the camera you've always wanted!

The specifications speak for themselves:

50mm, f:2.8 Cintagon Lens . . . to capture beauty in full color almost anywhere you'd care to take a camera.

Wide Range of Shutter Speeds . . . up to an action-freezing 1/300th of a second.

Lens-Coupled Rangefinder-Viewfinder . . . lets you dial into razor-sharp focus, and compose, through one window.

Bayonet-type Lens Mount . . . lets you switch lenses in seconds.

"M" and "X" Flash Synchronization . . . for plug-in flashgun or strobe.

ACCESSORIES:

50mm, f:1.9 Cintagon lens: $89.50 • 35mm, Wide-angle lens: $56.50 • 100mm Telephoto lens (shown in profile view above): $59.50 • Variable Power Viewfinder: $14.50 • L-44 clip-on exposure meter: $17.50 with case • California Saddle Leather case: $10.00 • Plug-in flashgun: $8.75.

argus®

A CAR IS A MUST IN EUROPE...

THIS ADVERTISEMENT IS OF PRIME IMPORTANCE TO EVERYONE PLANNING TO GO TO EUROPE THIS YEAR:

You know what a car means to you *here* . . . *Abroad*, it will mean even more. There are so many places to go, so many things to see and yet the time is so short. *Only a car of your own* will give you the complete freedom you deserve for your vacation.

THE PANHARD: 5 Passenger Sedan one of the best selling cars in France today! Combines Three Cars in One!
1. Comfort of a Large Car (183 inches)
2. Economy of a Small Car (40 m.p.g.)
3. Performance of a Sports Car
(Six-time winner of the Le Mans 24-hour Race.)

CITROËN — one of the greatest names in automobiles, offers you the possibility of having a car delivered to you DIRECTLY FROM THE FACTORY, brand new, with all necessary documents. *Order your car here, and have it ready for you anywhere in Europe.* Also, this is the cheapest way to travel because the factory repurchases the car in dollars at a guaranteed price. CITROËN has a car for *every* budget.

CITROËN DS 19 is one of the cars you can buy and bring back to the U. S. for further savings. It is the only car to feature as standard equipment, hydraulic transmission, disc power brakes, power steering and the unique CITROMATIC® air-oil suspension. Also available is the PANHARD 5 Passenger Sedan, one of today's best sellers in France, and the extraordinary CITROËN "2CV" 4-door 4-seater, the most economical car in the world.

FOR FREE BOOKLET, *"Europe Geographic Plan," write or visit the factory showrooms today!*

CITROËN
CARS CORPORATION
300 PARK AVENUE, NEW YORK 22, N. Y. • EL 5-2872
8423 WILSHIRE BLVD., BEVERLY HILLS, CALIF. • OL 3-4745
S. A. ANDRE CITROEN, 133 QUAI DE JAVEL, PARIS 15, FRANCE

FLOODLIGHT! **SPOTLIGHT!**

$5.60 less battery

It shoots a brilliant, 800-ft. spotlight — a widespread floodlight! It's sturdy, it's economical, it's so very handy! Don't be without one. Uses 6 V. battery. See your dealer.

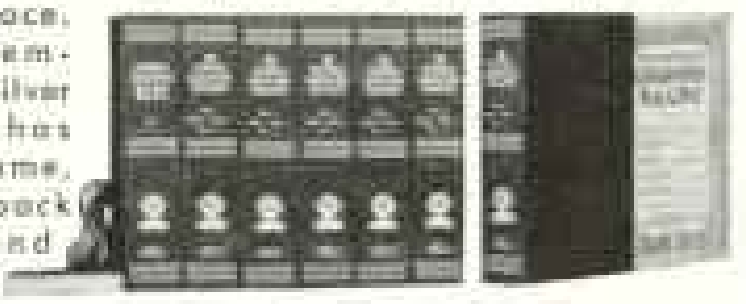
DELTA ELECTRIC CO.
Marion, Indiana

Delta POWERlite
2-LITE ELECTRIC LANTERN

Your National Geographics will stay neat and clean in these handsome files that look like books. Back issues become valuable library volumes in rigid "slip covers." Unlike expensive binding, copies are not mutilated, are easy to remove and replace. Dark brown, embossed cover. Silver stamped front has spaces for Volume, Dates. Money back guarantee. Send check or M.O. to HIGHSMITH CO., INC. FORT ATKINSON 5, WISCONSIN

NOW!
KEEP BACK ISSUES NEAT AND HANDY AS BOOKS

Cartoned set is 7 files. Six files hold 36 issues (three years), plus one Map File



7 FILES $4.95 POSTPAID
($5.95 outside U. S.)

---

the right light for indoor movies...
Smith-Victor Bar Lights

Model L41 priced at $5.95
(without lamps)

Ask your favorite camera dealer to show you how Smith-Victor Bar Lights brighten any inside scene for sharper, clearer action. Prices start as low as $3.95. So easy to operate. Smith-Victor Bar Lights make fine gifts, too.

Write for free copy of "Inside Pictures Made Easy"

Smith-Victor, Griffith, Indiana... the world's largest exclusive manufacturer of photographic lighting equipment

Now nylon cord gives tires lasting strength, means new freedom from fear of blowouts

Nylon's shock-absorbing toughness shrugs off the everyday road shocks that can cause unseen damage to ordinary tire cord, lead to blowouts under the stress of highway driving.

For today's heavier, more powerful cars, for the sustained speeds permitted on today's highways, nylon cord tires give you a priceless extra margin of safety. The *lasting* strength and protection of nylon cord tires have been proved in billions of miles of use by truckers.

All tire companies make nylon cord tires. Whether you choose premium or standard nylon tires, they offer you greater protection than comparable tires made with ordinary cord. Look for the identification on the sidewall. Insist on nylon when buying new tires —change to nylon when buying a new car.

NYLON CORD PROTECTS AGAINST THE 4 MAJOR CAUSES OF BLOWOUTS

1. BRUISE DAMAGE. Nylon's shock-absorbing toughness protects against impact damage caused by tire hitting a bump, hole or rock.

2. MOISTURE DAMAGE. Water can't rot nylon cord. Nylon ends blowouts due to moisture seeping in through cracks or cuts in tires.

3. FLEX FATIGUE. Nylon's resilience guards against the strength-sapping flex strain that occurs every single time a tire turns.

4. HEAT DAMAGE. Nylon gives two-way protection. It not only has greater heat resistance, but also makes cooler-running tires.

THE SAFEST, STRONGEST TIRES ARE MADE WITH NYLON CORD

DU PONT

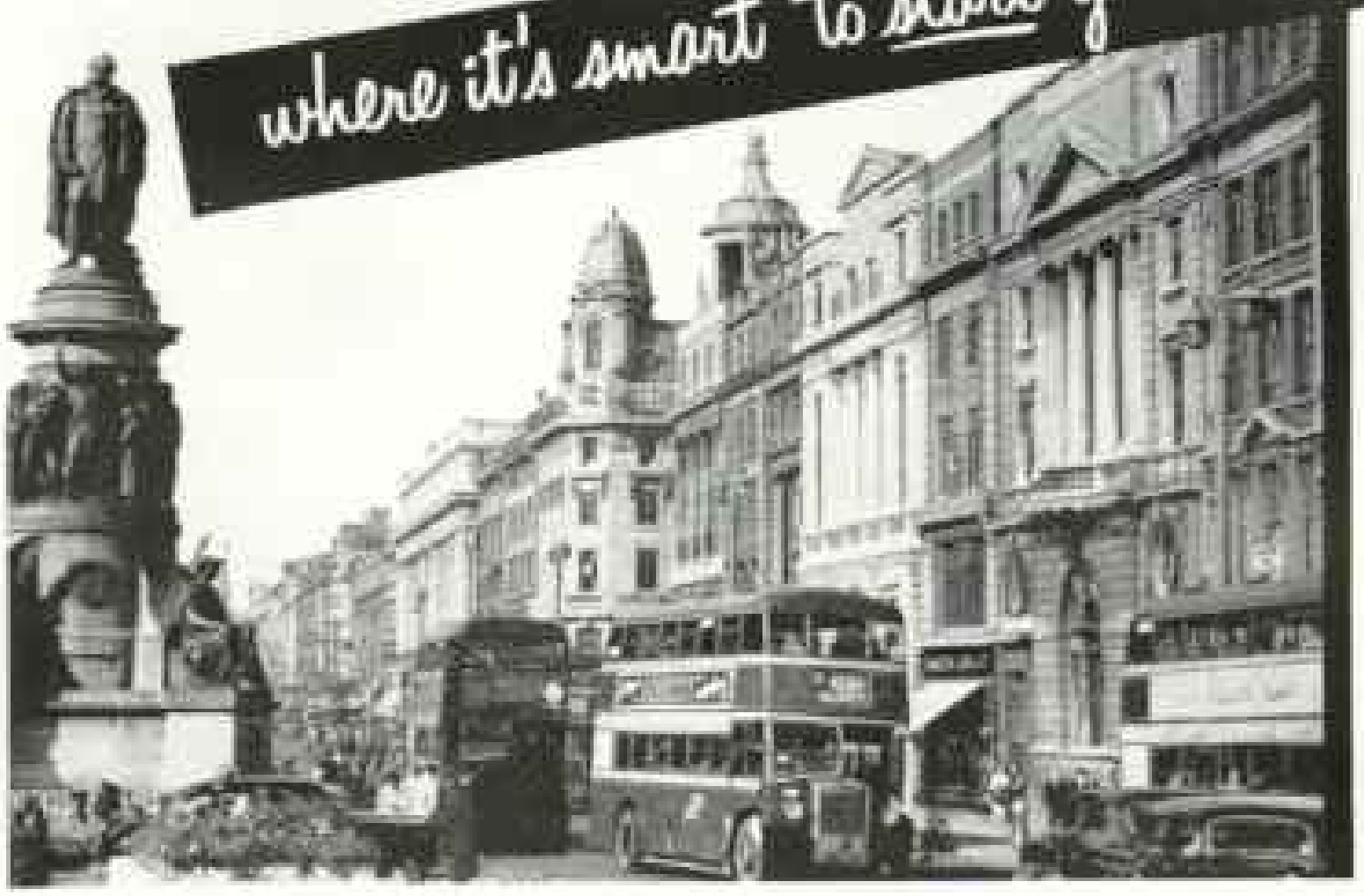
Reg. U.S. Pat. Off.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Mention the National Geographic—It identifies you

IRELAND

where it's smart to start your European holiday!



Want extra value on your European holiday next year? Then follow the fashionable trend and make Ireland your gateway to Europe. It's first stop for many sea and air services from the U. S., and you can tour Ireland for so little extra cost! Start your European trip with a smile . . . in Ireland.

Irish TOURIST OFFICE

Write Dept. J for beautiful literature.

33 East 50th St., New York 22, N. Y.

ASK YOUR TRAVEL AGENT ABOUT DE LUXE OR BUDGET TERMS

---

for your health's sake . . .

go Sedgwick!

SEND FOR FREE ILLUSTRATED BOOKLET

Est. 1893

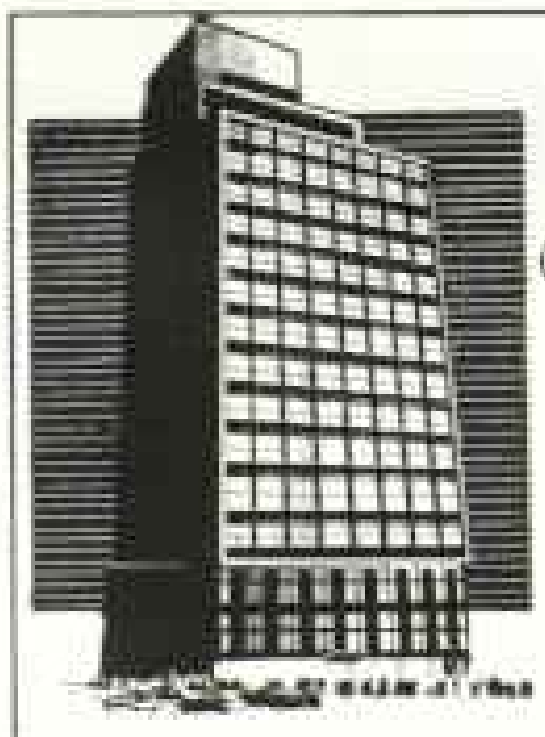
Put an end to climbing stairs. Ride safely, effortlessly from floor to floor on a Sedgwick Stair-Chair®. Quickly, easily installed; electrically operated. Costs $1400 or less (installed N.Y.C.), and well worth it!

Sedgwick MACHINE WORKS

239 West 10th Street, New York 11

Other Sedgwick Products

RESIDENCE ELEVATORS · DUMB WAITERS · FREIGHT WAITER · SIDEWALK ELEVATOR



HOTEL BAMER

Mexico City

THE MOST DISTINGUISHED HOTEL

AV. JUAREZ 52 MEXICO CITY

NOW... IN YOUR OWN HOME

AMPEX STEREO SOUND

. . . true Stereophonic Sound—the same sound you heard in "Around the World in 80 Days" by AMPEX, creators of the Videotape Recorder, makers of America's best-engineered, most-wanted home music systems. Send for free color brochure today!

AMPEX AUDIO, INC.

1030 KIFER RD., SUNNYVALE, CALIF.

PLEASE SEND FREE COLOR BROCHURE ON AMPEX STEREOPHONIC SOUND.

NAME

ADDRESS

CITY

Happy holiday homecoming by Pullman!

A full night's rest! For dad, mother and every young member of the family—sleep just comes naturally in soft, king-sized Pullman beds. Next morning everyone's fresh and rested . . . ready for a busy day.

This year let your trip itself be a holiday! Make it a pleasure all the way—by Pullman. No driving tensions or weather worries . . . no time-wasting stops for meals or lodging. The miles slip by safely and swiftly. You and your family enjoy the peace, quiet and relaxation of your private Pullman "living room." This very holiday season, take the greatest trip on earth. Home for the holidays by Pullman!

Your local Ticket Agent will help: 1. *Provide information on routes and fares.* 2. *Help you plan stopovers.* 3. *Furnish rail and Pullman tickets.* 4. *Reserve a "rent-a-car" at your destination.*

YOU'RE SAFE AND SURE WHEN YOU TRAVEL BY **Pullman**

© 1957, THE PULLMAN COMPANY

. . . the travel service of comfort, privacy and sleep!

SEVEN AGES OF THE TELEPHONE

ALL THE WORLD'S A STAGE, *and all the men and women merely players. . . . And one man in his time plays many parts, his acts being seven ages. At first the infant . . .* SHAKESPEARE

All through the years, from babyhood on, the telephone is an important, indispensable part of almost everything we do. And as the hands that grasp the telephone grow in size and usefulness, so grows also the usefulness of the telephone.

Baby Days At first the telephone is just something that rings. But soon the lusty newcomer is saying "hello, Daddy" all by himself and listening in wide-eyed wonder to the magic of Daddy's voice.

Growing Up It isn't long before the telephone becomes more than a magical fascination. It begins to be something for doing things. A particular pal to call. A part of growing up.

Dynamic Teens Life is now a whirl of activity. So many things to do. Girl talks to girl. And boy talks to girl. And there are two happy hearts when she says, "I'd love to go."

Just Married Two starry-eyed people starting a new life together. The telephone, which is so much a part of courtship, is also a big help in all the marriage plans and in getting settled.

Earning a Living The years go by and always there is the responsibility of earning a living. Here again the telephone is a speedy, willing helper. It is a part of the daily work and the progress of almost everyone.

Raising a Family Now the telephone becomes more useful than ever. For how could Mother ever run her household and raise a family without it? Friends, relatives, stores, doctors, conveniences—all are so easy to reach by telephone.

It's Grandma Now And now she's holding a grandchild on her lap. The telephone that has served her so faithfully now starts a new era of service. The cycle of life and the seven ages of the telephone begin all over again.

Working together to bring people together . . . **BELL TELEPHONE SYSTEM**

"O senhor quer a Salada de Palmito?"

There's nothing like salt air and brilliant sunshine to give you a marvelous appetite.

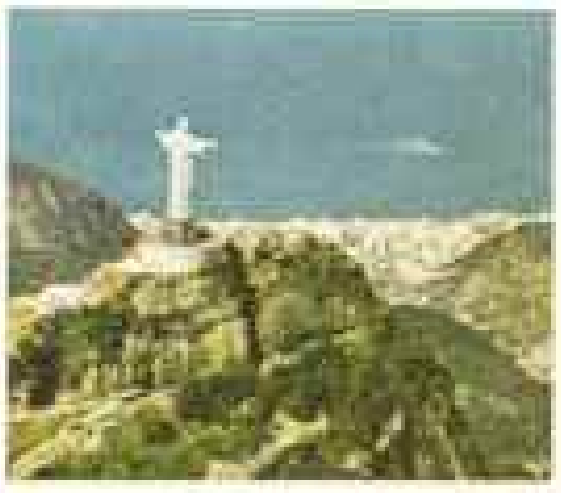
And you'll feel even hungrier when you review the flotilla of delicacies our famous chefs have prepared for you at our open air buffet.

Of course, there's always a South American specialty like Brasilian Heart of Palm Salad to tempt an adventurous appetite.

If you have spent the morning in our spacious deck pool, you'll want to tear into "Bife de Cordeiro Grelhado" or piping hot roast beef.

Along with sports and parties, you'll get a solid, bone-deep rest. You'll spend joyous days and nights ashore in exotic ports . . . make new friends . . . have the time of your life!

See your travel agent today.



Statue of Christ atop Corcovado overlooks Rio.

Old buildings near modern shops in Buenos Aires.

MOOREMACK TO SOUTH AMERICA

MOORE-McCORMACK Lines

Five Broadway,
New York 4, N. Y.

8-day cruises to South America via the S.S. ARGENTINA . . . S.S. BRAZIL. Rates from $1,110. These 33,000-ton liners sail every three weeks from New York to: **TRINIDAD · BARBADOS · BAHIA · RIO DE JANEIRO · SANTOS (São Paulo) · MONTEVIDEO · BUENOS AIRES**

So much to give and appreciate

in a Sheaffer Snorkel Pen

Only the finest Sheaffer Snorkel Pen can be proudly distinguished by the famous White Dot. For only a Sheaffer Snorkel Pen fills so cleanly, so fully, so quickly, without dunking. Its Triumph point of 14K gold is hand finished to match the owner's personal writing style. And to guard against loss, its unfailing innerspring clip firmly adjusts to the thickness of any fabric. Sheaffer White Dot Pens start at only $15.50. Ensembles, with matching pencil, at $22.75. There's no finer way to express your Christmas wishes.

SHEAFFER'S

WHEN IT COMES TO WRITING - COME TO SHEAFFER'S

©1967 W. A. SHEAFFER PEN COMPANY, FORT MADISON, IOWA, U.S.A. • IN CANADA: GARANTIA, CANADA • IN AUSTRALIA: MELBOURNE • IN GREAT BRITAIN: LONDON