

VOL. 134, NO. 1

JULY, 1968

NATIONAL GEOGRAPHIC

**THE CANADIAN NORTH
EMERGING GIANT**
DAVID S. BOYER 1

**HYENAS, THE HUNTERS
NOBODY KNOWS**
HANS KRUIJK 44
BARON HUGO VAN LAWICK

**LOMBARDY'S LAKES,
BLUE JEWELS
IN ITALY'S CROWN**
FRANC SHOR 58
JOSEPH J. SCHERSCHEL

**FOREST FIRE:
THE DEVIL'S PICNIC**
STUART E. JONES 100
JAY JOHNSTON

**THE BONINS AND
HARD-WON IWO JIMA
GO BACK TO JAPAN**
PAUL SAMPSON 128
JOE MUNROE

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR

Editor, 1899-1954; President, 1920-1954

Chairman of the Board, 1954-1966



THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization for increasing and diffusing geographic knowledge and promoting research and exploration. Since 1890 the Society has supported 442 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; more than 26 million maps distributed each year; its books, globes, atlases, and filmstrips; 30 School Bulletins a year in color; information services to press, radio, and television; technical monographs; exhibits from around the world in Explorers Hall; and a nationwide series of programs on television.

Articles and photographs of travel, natural history, and expeditions to far places are desired. For material used, generous remuneration is made.

MELVIN M. PAYNE, President

FREDERICK G. VOSBURGH, Vice-President and Editor

LEONARD CARMICHAEL, Vice-President for Research and Exploration

ROBERT E. DOYLE, Vice-President and Secretary

THOMAS M. BEERS, Vice-President and Associate Secretary

GILBERT M. GROSVENOR, Vice-President and Associate Editor

HILLEARY F. HOSKINSON, Treasurer

OWEN R. ANDERSON, HERMAN J. A. C. ARENS, WILLIAM T. BELL,

HERBERT T. HENDERSON, W. EDWARD ROSCHER,

C. VERNON SANDERS, Associate Secretaries

BOARD OF TRUSTEES

MELVILLE BELL GROSVENOR

Chairman of the Board and Editor-in-Chief

THOMAS W. MCKNEW, *Advisory Chairman of the Board*

LEONARD CARMICHAEL, *Former Secretary, Smithsonian Institution*

LEO OTIS COLBERT, *Rear Admiral, U. S. Coast and Geodetic Survey (Ret.)*

LLOYD H. ELLIOTT, *President, George Washington University*

CRAWFORD H. GREENEWALT, *Chairman, Finance Committee, E. I. du Pont de Nemours & Company*

GILBERT M. GROSVENOR, *Associate Editor, National Geographic*

ARTHUR B. HANSON, *General Counsel, National Geographic Society*

CARYL P. HASKINS, *President, Carnegie Institution of Washington*

EMORY S. LAND, *Vice Admiral, U. S. Navy (Ret.), Former President, Air Transport Association*

CURTIS E. LEMAY, *Former Chief of Staff, U. S. Air Force*

H. RANDOLPH MADDOX, *Vice President, American Telephone & Telegraph Company (Ret.)*

WM. MCCHESNEY MARTIN, JR., *Chairman, Board of Governors, Federal Reserve System*

LOUIS B. WRIGHT, *Director, Folger Shakespeare Library*

BENJAMIN M. MCKELWAY, *Editorial Chairman, Washington Star*

MELVIN M. PAYNE, *President, National Geographic Society*

LAURANCE S. ROCKEFELLER, *President, Rockefeller Brothers Fund*

JUAN T. TRIPPE, *Chairman of the Board, Pan American World Airways*

FREDERICK G. VOSBURGH, *Editor, National Geographic*

JAMES H. WAKELIN, JR., *Former Assistant Secretary of the Navy*

EARL WARREN, *Chief Justice of the United States*

JAMES E. WEBB, *Administrator, National Aeronautics and Space Administration*

ALEXANDER WETMORE, *Research Associate, Smithsonian Institution*

LLOYD B. WILSON, *(Emeritus) Honorary Board Chairman, Chesapeake & Potomac Telephone Company*

CONRAD L. WIRTH, *Former Director, National Park Service*

COMMITTEE FOR RESEARCH AND EXPLORATION

LEONARD CARMICHAEL, *Chairman*

ALEXANDER WETMORE and MELVIN M. PAYNE, *Vice Chairmen*

LEO OTIS COLBERT, CARYL P. HASKINS, A. REMINGTON KILLOGG, *Research Associate, Smithsonian Institution, EMORY S. LAND, T. DALE STEWART, Senior Scientist, Office of Anthropology, Smithsonian Institution, MATTHEW W. STURLING, Research Associate, Smithsonian Institution, JAMES H. WAKELIN, JR., CONRAD L. WIRTH, PAUL A. ZAHL, and the senior officers of the Society; BARRY C. BISHOP, Secretary on leave; EDWIN W. SNIDER, Secretary*

Assistant Secretaries of the Society: CHARLES P. BIXEL, FRANK S. DELK, JOSEPH B. HOGAN, RAYMOND T. McELLOGGOTT, JR., Assistant Treasurer: WILLIAM H. McCAULEY

Leonard J. Grant, Editorial Assistant to the President; Edwin W. Snider, Richard E. Pearson, Administrative Assistants to the President; Judith N. Dixon, Administrative Assistant to the Chairman and Editor-in-Chief; Lenore W. Kessler, Administrative Assistant to the Advisory Chairman of the Board

SECRETARY'S STAFF: *Administrative: Earl Coffin, Jr., Ward S. Phelps. Accounting: Jay H. Givans, George F. Faght, Alfred J. Hayre, William G. McGhee, Martha Allen Baggett. Statistics: Everett C. Brown, Thomas M. Kent. Retirement: Mary L. Whitmore (Assistant Supervisor). Payroll: Dorothy L. Dameron (Assistant Supervisor). Procurement: J. P. M. Johnston, Robert G. Cotey, Robert C. Ellis, Jr., Sheila H. Inman, Margaret A. Smeizer. Membership Research: Charles T. Knoefland. Membership Fulfillment: Roy J. Klockenbrink. Member Relations: Paul F. Moize. Computer Center: John Goedel. Secretary's Files: Mabelle L. Downs. Promotion: Stan Jennings, E. M. Pusey, Jr., Gordon Young, Robert J. Warfel. Printing: Joe M. Bartlett, Frank S. Oliverio. Production Control: James P. Kelly. Personnel: James B. Mahon, Adrian L. Loflin, Jr., Nellie E. Sinclair. Medical: Thomas L. Hartman, M. D. Translation: Zbigniew Jan Lutyk*

NATIONAL GEOGRAPHIC MAGAZINE

MELVILLE BELL GROSVENOR

Editor-in-Chief and Board Chairman

MELVIN M. PAYNE

President of the Society

FREDERICK G. VOSBURGH, *Editor*

GILBERT M. GROSVENOR, FRANC SHOR, *Associate Editors*

Senior Assistant Editors

Allan C. Fisher, Jr., Kenneth MacLeish, John Seefeld

Assistant Editors: Andrew H. Brown, James Carruth, Robert L. Conly, W. E. Garrett, Edward J. Lincham, Carolyn Bennett Patterson, Howell Walker, Kenneth P. Weaver

Senior Editorial Staff: Lonellin Aikman, Jules B. Billard, Brown Findley, William Graves, Stuart E. Jones, Robert P. Jordan, Joseph Judge, Nathaniel T. Kenney, Howard LaFoy, Samuel W. Matthews, Burt McDowell; Senior Natural Scientist: Paul A. Zahl

Foreign Editorial Staff: Luis Marlin (Chief); Thomas J. Abercrombie, David S. Boyer, Helen and Frank Schmeider, Volkmar Wentzel

Editorial Staff: Wayne Barrett, Thomas Y. Cahly, Louis de la Haba, Alice J. Hall, Werner Janney, Jay Johnston, Elizabeth A. Moize, Ethel A. Starbird, Peter T. White

Editorial Layout: Howard E. Paine (Chief); Charles C. Uhl, John M. Lavery

Geographic Art: William N. Palmstrom (Chief); Gilbert H. Emerson (Asst. Chief). Artists: Lisa Biganzoli, William H. Brod, John W. Lothers, Robert C. Magis, Robert W. Nicholson, Ned M. Seidler. Cartographic Artists: Victor J. Kelley, Sneginka Stefanoff. Research: Walter Q. Crowe (Supervisor), George W. Beatty, John D. Garst, Jean B. McConville, Dorothy A. Nicholson, Eugene M. School, John P. Wood, Isaac Ortiz (Production), Marie L. Barnes (Administrative Assistant)

Editorial Research: Margaret G. Bledsoe (Chief); Ann K. Wendt (Assistant Chief), Elisabeth J. Chappell, Leddie L. Dinsmore, Margery G. Dunn, Jan Halderness, Levenia Loder, Frances H. Parker, Patricia Rosenberg, Elizabeth C. Wagner

Geographic Research: George Crossette (Chief); Newton V. Blakeslee (Assistant Chief), Leon J. Canova, Margaret Ladd, Virginia A. LeVasseur, John A. Weeks

Photography: John McCosnell (Chief)

Library: Virginia Carter Hills (Librarian); Margery K. Burkull (Assistant Librarian); Melba Barnes, Vera Cassidy, Katharine P. O'Donnell, Louise A. Robinson, Esther Ann Mason (Librarian Emerita)

Administration: Betty T. Sanborn, Administrative Assistant to the Editor; Harriet Carey, Virginia H. Finnegan, Joyce W. McKean, Winifred M. Myers, Shirley Neff (Editorial Assistants); Dorothy M. Carson (Indexes); Rosalie K. Miller, Jeanne S. Dulker (Files); Evelyn Fox (Transportation)

ILLUSTRATIONS STAFF: *Illustrations Editor: Herbert S. Wilburn, Jr. Associate Illustrations Editor: Thomas R. Smith. Art Editor: Andrew Poggenpohl. Assistant Illustrations Editors: Mary S. Griswold, O. Louis Muzzatenta, Charles Allmon (Incoming Photographs). Layout and Production: Arthur A. Terry. Senior Picture Editors: Charlene Murphy, Robert S. Patton. Picture Editors: Manuel L. Lopez, Jon Schmeisberger. Research: Paula C. Simmons. Librarian: Alan J. Lenzel. Barbara A. Shuttack (Assistant)*

Artists: Walter A. Weber (Naturalist), Peter V. Bianchi

Engraving and Printing: Dee J. Anzetta (Chief), William W. Smith, James B. Whitney

PHOTOGRAPHIC STAFF: *Director of Photography: Robert E. Gilka. Assistant Directors: B. Anthony Stewart, Dean Conger. Film Review: Albert Muldrew (Chief); Guy W. Sturling (Assistant Chief). Plennial Research: Walter Mancy Edwards (Chief). Photographers: James P. Blair, Bruce Dale, John E. Fletcher, Otis Imboden, Ervory Kristof, Bates Littlehales, George F. Mabley, Robert S. Oakes, Winfield Parks, Joseph J. Scheschel, Robert F. Sloan, James L. Stanfield*

Photographic Laboratory: Edwin L. Wishard (Chief); Milton A. Ford, Donald McBan, Claude E. Petrone, Carl M. Strader

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

Cartography—Maps, atlases, and globes: *Chief Cartographer: Wellman Chamberlin. Associate Chief Cartographer: Athos D. Grazzini. Assistant Chief: William T. Peelle. Base Compilation: Charles L. Stern (Supervisor), James W. Killian. Name Compilation: Donald A. Jaeger (Supervisor), Manuela G. Kogutowicz, George E. Stuart. Map Drawings: Douglas A. Strobel (Supervisor), Robert W. Northrop, Thomas A. Wall. Map Editing: Ted Duchters (Supervisor), Russel G. Fritz, Richard K. Rogers, Thomas A. Walsh. Projections: David W. Cook. Layout and Design: John F. Dorr, Harry C. Siddeley. Revisions: Richard J. Darley. Administrative Assistant: Catherine M. Hart*

Books: Merle Severy (Chief); Edwards Park (Associate Chief); Seymour L. Fishbein (Assistant Chief); Thomas B. Allen, Ross Bennett, Charles O. Hyman, Anne Dirkes Kober, John J. Putman, Berry L. Reetz, Jr., David F. Robinson

Special Publications: Robert L. Braeden (Chief); Donald J. Crump (Assistant Chief); Josephine B. Bobb, Bruce Brander, David R. Bridge, Johanna G. Furness, Ronald M. Fisher, Mary Ann Harvell, Bryan Hodgson, Geraldine Linder, Michael E. Long, Philip B. Slocum, Joseph A. Tansy

School Service: Ralph Gray (Chief); Arthur P. Miller, Jr. (Assistant Chief); Richard M. Crum, Jeanne A. Davis, Phyllis Greene, Charles H. Sloan, Janis Knudsen Wheat

New Service: Windsor P. Booth (Chief); Paul Sampson (Assistant Chief); Edward Cornish, Donald J. Frederick, Sabia Robbins, Isabel Clarke (Assistant)

Television: Robert C. Doyle (Chief); Dennis B. Kane (Assistant Chief); David Cooper; Patricia F. Northrop (Administrative Assistant)

Lectures: Joanne M. Hess (Chief); Robert G. Fleegal, Mary W. McKinney, Gerald L. Wiley

Explorers Hall: T. Keller Bentley (Curator-Director)

EUROPEAN OFFICES: *W. Edward Roscher (Associate Secretary and Director), 11 Stanhope Gate, Mayfair, London, W. 1, England; Jacques Ostler, 6 rue des Petits-Pères, 75-Paris 2e, France*

ADVERTISING: *Director: Harley L. McDevitt, 630 Fifth Ave., New York, N.Y. 10020. Managers—National: William A. Boeger, Jr.; Eastern: Joseph T. Freney, New York; Midwest: William Turgeon, Chicago; Los Angeles: Jack V. Shochan; San Francisco: Thomas Martz. Assistant: John F. Grant, New York. Travel: Robert W. Horan, New York*

COPYRIGHT (©) 1968 NATIONAL GEOGRAPHIC SOCIETY, 17th AND M STS., N.W., WASHINGTON, D. C. 20036. ALL RIGHTS RESERVED. REPRODUCTION OR USE OF THE WHOLE OR ANY PART OF THE CONTENTS WITHOUT WRITTEN PERMISSION IS PROHIBITED. PRINTED IN U.S.A. SECOND-CLASS POSTAGE PAID AT WASHINGTON, D. C., AND AT ADDITIONAL MAILING OFFICES. COVER DESIGN AND TITLE PROTECTED BY INTERNATIONAL TRADEMARK. 28-20474 YEAR, \$2.00 A COPY.

◀ **COVER:** Tile-roofed villas of Rezzonico gaze out over Italy's sunny Lake Como. Behind them tower the snow-frosted Swiss Alps (page 58).

Take a vacation from vacation problems. Visit the travel agency with pumps.



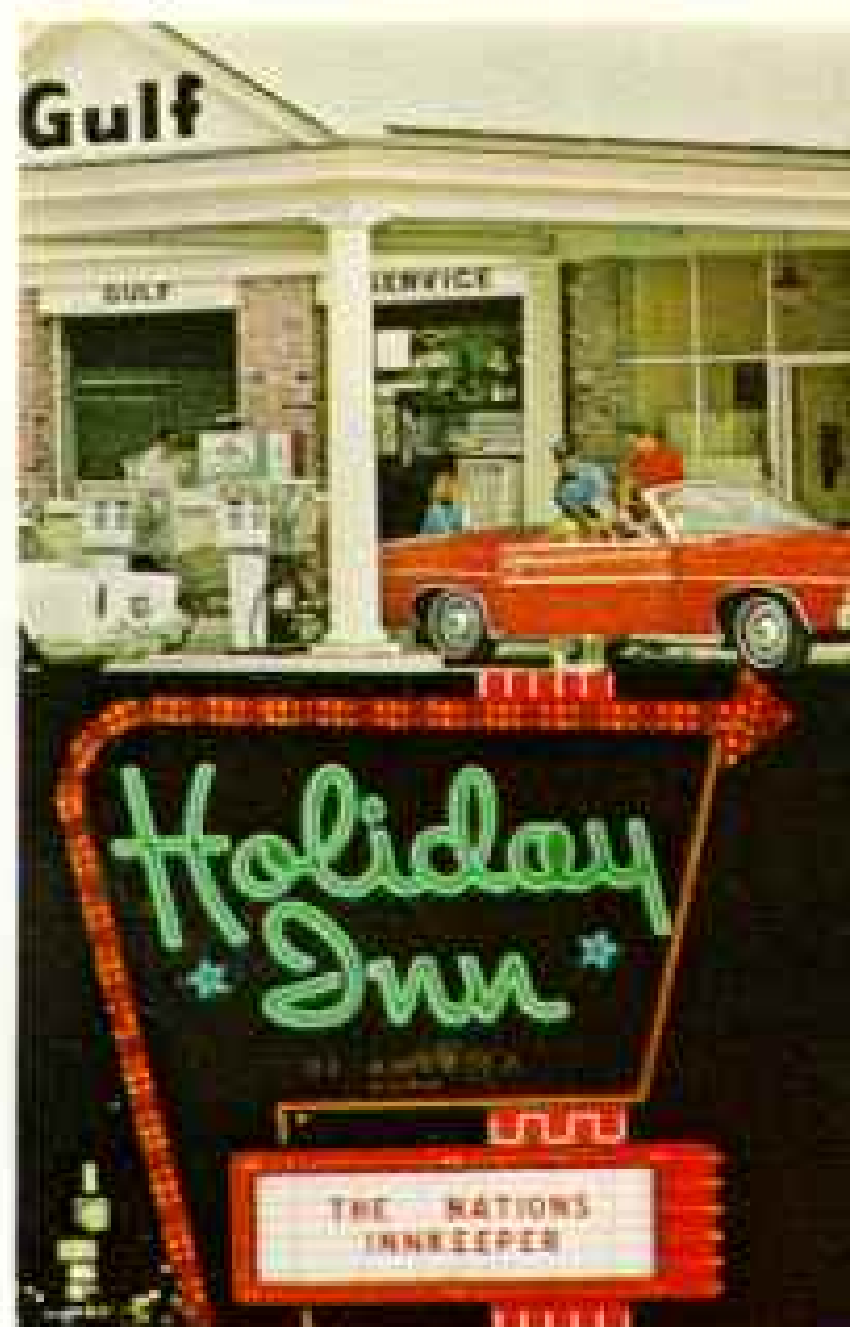
It's easy to find. We have over 35,000 of them all over America. All ready to help you get your vacation off to a great start this year.

For instance, Gulf has a Tourgide® Service to send you clearly marked maps showing the best way to get where you're going. Where to stay. And what to see along the way.

And while you're traveling, you can use your Gulf Travel Card to charge rooms and meals at any Holiday Inn anywhere in America. And at Gulf stations (or British-American stations in Canada) for gasoline, oil and other car expenses.

You can pick up an application for a Gulf Travel Card at any Gulf station. And get a Tourgide request card at the same time.

Stop in at a Gulf station. Find out why we call it "The Travel Agency with Pumps." Gulf Oil Corporation



The last time you saw America, did you only have eyes for each other?



Somehow the Grand Canyon is less grand when your new bride is standing next to it.

And Niagara Falls is less awesome.

No wonder. The most breathtaking sites in America seem to pale a little beside a bride.

Now the years have passed, and your honeymoon has turned out to be the only real trip you've ever taken.

Maybe this would be a good time to do something about that. To go back and see what you didn't see before. Or go somewhere else, someplace new. And discover it together.

America is filled with places to discover together. Places like Cape Cod. And Yellowstone Park. And the Big Sur country.

And literally hundreds more.

Your Travel Agent will be glad to help you pick one. And we'll be glad to take you there.

And if it turns into a second honeymoon, and you don't see as much as you wanted...is that so bad?

Fly the American Way
American Airlines



ENTRICHROME BY FELIP SCHUCKEL, BLACK STAR © N.A.S.

New devices probe the sea

UP FROM AN ANCIENT ARGOSY wrecked off southwest Turkey, divers seek the warm, dry comfort of a decompression chamber after working at a depth of 140 feet. Designed by George F. Bass, Curator of Underwater Archeology at the University of Pennsylvania Museum, the steel sphere holds four persons, who play chess or read while rising toward the surface. Air pumped in through a hose keeps pressure inside the chamber equal to that outside during the 40-odd minutes of decompression.

For six summers Dr. Bass, aided by National Geographic Society grants, has brought to light relics of Roman and Byzantine shipwrecks. Constantly, new tools further the undersea endeavor. From a submerged phone booth—an inverted Plexiglas bowl filled with air—divers talk to workers topside. A seabottom track 70 feet long carries an aluminum pipe that sucks up sand cleared from the diggings. A two-man submarine glides over wrecks for stereographic mapping.

As the expedition continues its harvest of history, the NATIONAL GEOGRAPHIC reports its progress in a forthcoming article. Help your friends chart a course for discovery by nominating them for Society membership on the form below.

NATIONAL GEOGRAPHIC SOCIETY MEMBERSHIP

\$6.50 CALENDAR YEAR 1968 MEMBERSHIP DUES INCLUDE SUBSCRIPTION TO THE NATIONAL GEOGRAPHIC.

Annual dues in the United States and throughout the world are \$6.50 U.S. funds or equivalent. To compensate for international postage and exchange differentials, please remit: for Canada, \$7.60 Canadian funds (\$7 U.S. acceptable); for all other countries, \$8 U.S. funds or equivalent. 80% of dues is designated for subscription to magazine.

18-MONTH MEMBERSHIP: Applicants who prefer delivery of their NATIONAL GEOGRAPHIC to start with the July, 1968, instead of the January, 1968, issue, may *also* *request* become members and receive the magazine for 18 months from July 1, 1968, through December, 1969. Upon expiration, such memberships will be renewable annually on a calendar-year basis. For 18-month membership check here and remit: for U.S. and its outlying areas, \$9.75 U.S. funds or equivalent; for Canada, \$11.40 Canadian funds (\$10.50 U.S. acceptable); for all other countries, \$12 U.S. funds or equivalent. *This is 1½ times annual fee.*

Life membership for U.S. and its outlying areas, \$200 U.S. funds or equivalent; for Canada, \$216 Canadian funds (\$200 U.S. acceptable); for all other countries, \$250 U.S. funds or equivalent.

NEW MEMBER

PLEASE PRINT NAME OF AN INDIVIDUAL ONLY (MR., MRS., MISS)

STREET

CITY, STATE, ZIP CODE

CHECK ONE

Mail to:

The Secretary, National Geographic Society
Washington, D. C. 20036

I NOMINATE for Society membership the person named at left. (Use separate sheet for additional nominations.)

(GIFT MEMBERSHIP) I nominate and enclose \$_____ for dues of the person named at left. Send gift card signed:

I DESIRE INFORMATION concerning membership and the NATIONAL GEOGRAPHIC. (Fill in at left.)

MY NAME

PLEASE PRINT (MR., MRS., MISS)

STREET

CITY, STATE, ZIP CODE

The '68 Chryslers:



Those are real boats and engines in a real desert, and they're all engineered in the Chrysler Corporation tradition.

Take those Hydro-Vee hulls shown here. That's an advanced piece of Chrysler engineering. It combines racing sponsons and a deep V-Hull foundation, for better control, and a more comfortable ride.

For 1968, Chrysler offers 33 different models,

from 12 to 24 ft. long hull styles to fiberglass runabouts, aluminum fun boats, fishing boats, and sailboats. And we offer the greatest combination of outboards, inboard-outdrives, and all-around marine engines in the business to go with them. And throughout this 1968 line of boats and engines, you'll find a whole host of big and little differences that great engineering always makes.

just add water.



Just the way you find great engineering in our 1968 line of cars, Airtemp air conditioners and every product made by Chrysler Corporation . . . America's fifth largest industrial corporation.

*Plymouth • Dodge • Chrysler • Imperial • Dodge Trucks • Simca
Sunbeam • Airtemp • Cyclorodd • Oiltite • Mopar • Parts Division
Marine and Industrial Products • Defense and Space Products
Leasing • Financing • Insurance*

Photographed at Mesquite Southfork State Park, Texas



**CHRYSLER
CORPORATION**



WAUSAU

The little station that could

Back in 1911 a group of lumbermen gathered over a cigar store in Wausau, Wisconsin, to form this mutual insurance company.

Today, Employers Insurance of Wausau operates in all 50 states, Puerto Rico and Canada, providing full-line business coverage for

every branch of business and industry.

The fact that we've grown so fast shouldn't interest you. But the "why" of our growth should.

We like to feel it's because of our attitude. The Wausau Way of doing things, if you will.

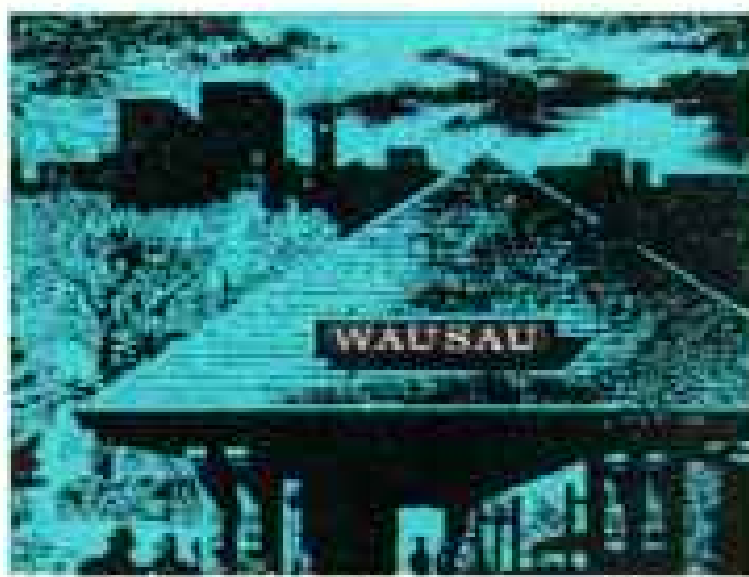
We treat each policyholder as though he were our only client. Updating coverages continually, providing 48 hour claim service coast to coast and helping to prevent accidents in the first place.

It was all uphill in 1911. And it still is today. But we expect to continue to grow because we're the people who know business insurance like nobody else in the business.

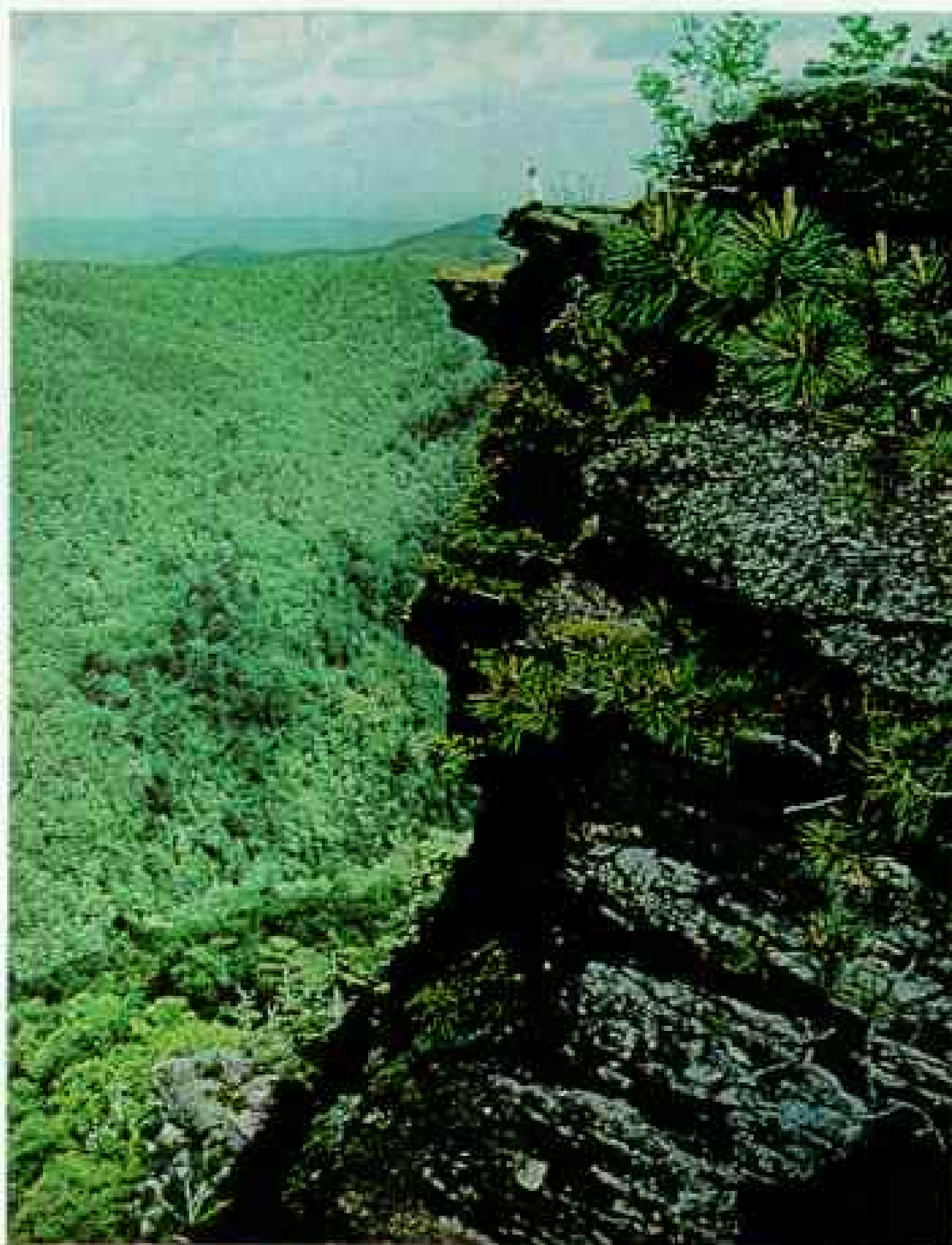
If you're interested in help with your company insurance, give us a call.

We think we can. We think we can.

**Employers Insurance
of Wausau**



Get the Wausau Story
for yourself.



Someone's been saving something for your vacation: 4950 square miles of North Carolina forests

Close beneath the Great Smoky and the Blue Ridge Mountains lie the Pisgah and Nantahala National Forests—vast areas of natural riches that belong to you. Like all 154 of our National Forests, these were saved to protect the basic renewable resources of wood, water, wildlife and recreation—all administered in combinations that provide the most benefit and enjoyment to the American people. Here in North Carolina, you can shoot-the-chutes down a sloping river, swim by a waterfall, fish, camp or even visit a Cherokee reservation. Natural wonders surround you.

It is no accident that this wild Carolina beauty is still here to enjoy. Back in the eighties, professional foresters were put to work, and one of them, Dr. Carl Schenck, started America's first school of forestry here. Then, in 1911, Congress paved the way for National Forests in the East. Inspired, the citizens of 11 Western North Carolina counties added their own enthusiastic support. Soon Pisgah and Nantahala came under the capable care of what is now the Forest Service of the U.S. Department of Agriculture. Over the years, Western North Carolina Associated Communities has helped in properly developing these public lands for the multiple uses of public recreation, scenic enjoyment and raw material for industry.

Sinclair believes that we all have a stake in preserving scenic beauty and natural environment. We hope these accounts of conservationists at work—as in North Carolina—encourage other Americans in their communities to support conservation efforts.

Visit this area and enjoy what the people saved for you. Let us help plan a trip to these or other National Forests, or to any place in the USA. Write: Sinclair Tour Bureau, 600 Fifth Avenue, New York, N. Y. 10020, Dept. G.



Another in Sinclair's American Conservation Series

Discover America by Car—It's Worth Seeing and Saving





Vitamin C is the plus in oranges. Polyunsaturates are the plus in Mazola.

Eat an orange and you get more than just good taste. You get the "plus" of Vitamin C. Use Mazola Corn Oil and Mazola Margarine and you get more than good taste. You get the "plus" of polyunsaturates.

Mazola 100% Corn Oil does more than make light, crispy fried foods and tangy salad dressings. Mazola Margarine, whose major ingredient is liquid Mazola Corn Oil, does more than make toast, vegetables or lobster taste better.

Mazola, used in place of the more saturated fats, is a simply delicious way to help balance the fats in your diet with polyunsaturates.

Mazola makes good eating good sense!



CONTINENTAL INSURANCE

(309) 674-5123

Call this collect.



With this.



If necessary, take this

DIAL-A-CLAIM EMERGENCY KIT

Instant insurance company.

Suppose you're on a trip, maybe your one and only vacation, and you crunch up your car. Naturally you're far from home and insurance agent. So how do you get your car moving again without spending the rest of your vacation doing it?

Well, if you're insured with us, you pull out the Emergency Kit your Continental agent gave you and use the emergency dime to call the emergency telephone number.

And since it's an emergency,

you can call us anytime, any day, from anywhere in the continental United States or Canada. Collect.

Of course we can't repair your car, but we can fix it so that your insurance does what it's supposed to do. And fast. Because we have one of the largest networks of adjusters in the insurance business.

In fact, we'll do anything we can to make your headache as small as possible. (That's why we put a couple of aspirins in the

Emergency Kit.)

After all, what good is an insurance company if it leaves you with a big headache?



The Continental Insurance Companies

Continental Insurance Co. - Factory's of Newark - Fire and Casualty - Commercial of Newark - Eastport Fire and Marine National - New Franklin Co. - Boston (3rd County Co.) - Broadway (Union - Burlington Junction - Niagara Fire Insurance Co. HOME OFFICES: 30 MURDEN LANE, N.Y., N.Y. 10008, 10 PARK PLACE, NEWARK, N.J. 07102)

Bermuda. Before you, blue water all the way to Morocco. Behind you, every care you ever had.

Bermuda is the different island.

It basks here in mid-ocean,
remote, apart.

Unlike any other place.

What little island do you
know with dazzling white roofs
to catch the rain, with pastel
houses cut from coral rock,
set in tropical green?

Only Bermuda.

What other island is ringed
with 80 different beaches,
some wide and smooth, others
tiny coves hidden in cliffs,
waiting just for you?

What other island can you
roam on foot, by ferry, motor-
bike or carriage, stopping
for a wayside picnic, or
to explore a vast cavern under-
ground? Only Bermuda.

Only one island of 21 square
miles has 7 golf courses.

Only one faraway island
lets you skin dive on ancient
Spanish shipwrecks or snorkel
on a coral reef. Fish for wahoo,
Allison tuna, or the wily
bonefish. Or dine on Rockfish
Chowder and Syllabub, then
dance the night away with the
limbo, calypso, or whichever.

Bermuda! Faraway. Long ago.
Old World. And 90 jet minutes
from New York.

Children love Bermuda and
vice versa. Bring the family!

Ask your travel agent in
the U.S. or Canada. Or
write Bermuda, 610 5th Ave.,
New York 10020. 6 No.
Michigan Ave., Chicago 60602.



There is only one BERMUDA



This is America's best-selling fine camera.



Here's why:

Our Honeywell Pentax Spotmatic has achieved its great popularity because it's well made, extremely easy to use, and so brilliantly designed that it lets the average person make professional-quality pictures without fuss or guesswork.

Its foolproof, uncannily accurate full-format through-the-lens exposure control assures you correctly exposed pictures under just about any lighting condition you'll ever encounter, from deep shade to shining seashore.

Its outstanding optical system—from the bright, clear viewfinder that lets you see what the lens sees, to the razor-sharp lens itself—guarantees you crisp, clear prints or slides with faithful colors and amazing detail.

The Spotmatic's simplicity of design makes it a delight to use, and its high quality of workmanship means you'll use it for a long, long time.

Finally, you get a certain feeling when you get hold of a Pentax Spotmatic. It's a combination of compact size, light weight, and perfect balance, and it makes every other 35mm single-lens reflex camera seem overly big by comparison.

See the best-selling Honeywell Pentax Spotmatic at your dealer's soon! With a superb 50mm f/1.4 lens, it costs about \$289.50, depending on accessories; with 55mm f/1.8 lens, it's about \$249.50. For literature, please mail the coupon:

*Honeywell takes the guesswork
out of fine photography.*

Honeywell Photographic, Mail Station 209
Denver, Colorado 80217
Please send free Honeywell Pentax literature
to:

Name _____

Address _____

City/State/Zip _____

Honeywell



Howard Reed is a born loser.

That's why he always travels with
Bank of America Travelers Cheques.

He may lose his car — but never his money.
Because he carries our Travelers Cheques.

If anything happens to them,
he gets a prompt refund.
Anywhere in the world.
And for the full amount.
He can't lose — the world's
largest bank guarantees it.



Sold by leading banks everywhere

BANK OF AMERICA NATIONAL, 100 N. WALL STREET, RALEIGH, N.C. 27601

What do you call a life preserver when it's not preserving a life?



Sure a lifejacket is ugly. And a lot of them are hot, humid, sticky, bulky, clumsy, itchy and confining. But you'll live through it.

Keep as many on board as the number of people your boat will hold. Keep them where everyone can grab one fast. And make sure every child, every nonswimmer wears one.

There are times when everyone should. Even good swimmers. Wearing one can make your life uncomfortable. But not wearing one can put a quick end to your comfort.

Over a thousand people lose their lives every year in boating accidents. Most involve small boats. A lot of this grief could be eliminated by wearing the jacket... and by following a few painless rules.

You should take the helm of a boat only if you're trained or if you have a lot of experience. Both is better. A novice should take the wheel only if an experienced person is on board to guide him.

Know the limitations of your boat. Do not exceed them.

Always check your local weather warnings before you take the boat out.

Never overload the boat.

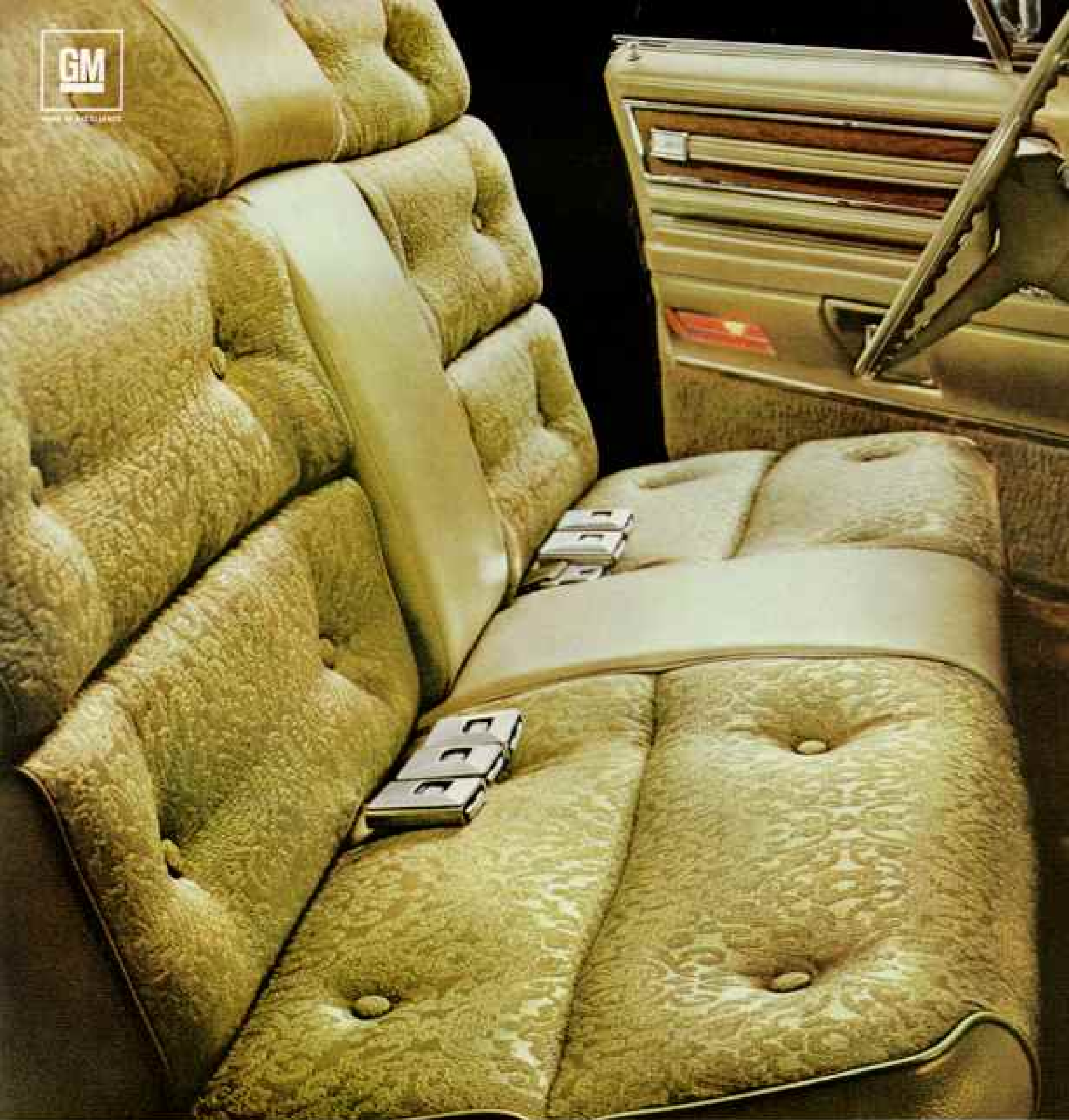
There's much you can do to make your boat safer. And much you should know in case an accident does happen.

That's why Metropolitan is offering two handy cards to keep on board the boat. "Basic Rules for Boat Safety" is one and "First Aid" the other. For your free cards, write Metropolitan, Dept. N-78, One Madison Avenue, New York, N.Y. 10010.

Someday they just might help you keep your head above water.



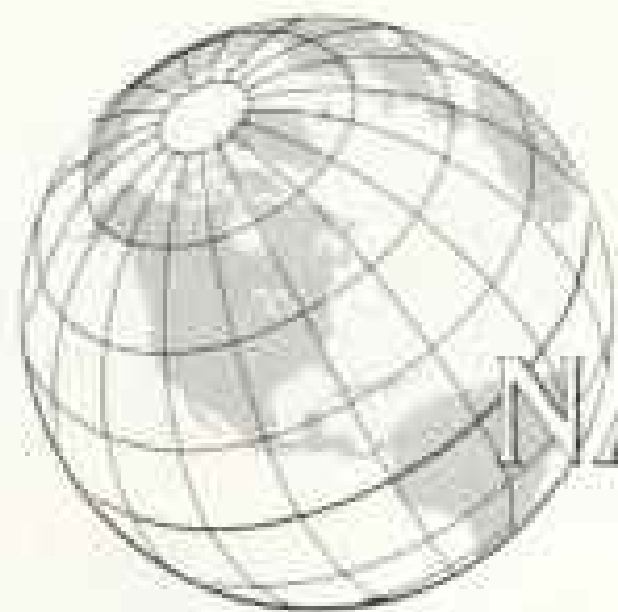
Metropolitan Life



Above, the Fleetwood Brougham interior. Below, the Sedan DeVille.

Choice seat for a memorable "Command Performance." This is a good time to ask your Cadillac dealer for a "Command Performance" . . . an opportunity to take the wheel of the elegant 1968 Cadillac and experience the responsiveness of the largest, smoothest V-8 engine ever to power a production passenger car. You will also enjoy Cadillac's quiet comfort and the convenience of its many power assists. A "Command Performance" test drive is yours for the asking.





July, 1968

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE VOL. 114, NO. 1 COPYRIGHT © 1968 BY NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON, D.C. INTERNATIONAL COPYRIGHT SECURED

The Canadian North EMERGING GIANT

C LIMB OUT OF A BUSH PLANE at any town or mining camp or Indian-Eskimo-white settlement across the far-flung Canadian North, and you step into a melting pot. The babel of tongues, the discord of accents, the misdemeanors committed against the English language must be heard to be believed.

"Of course you can't understand the English they speak up here!" A hulking, square-headed fellow named Heinrich was talking to a little olive-skinned chap named Angelo. "Most Canadians in the North," he said, "just got here from Germany or Italy! Or Portugal, or Greece. Or some other place."

The remark was more true than facetious. The Canadian North is a giant emerging from a long sleep. The size of its future is equaled only by the scope of its problems, and by its theatrical collection of people from everywhere who contribute to both. For its immigrants, who call themselves "New Canadians," the North is a big, broad-shouldered land of raw and rugged opportunity.

"This Wild Land, I Take as Mine"

It was 2,200 feet underground in northern Saskatchewan, in the dark of a uranium mine named Eldorado, that a schoolteacher from Syria with the sibilant name of Nerses S. Nerses and a geologist from Italy named Giampaolo Sassano turned their miners' lamps into my eyes and illuminated for me the strange and intimate meaning of the North for the New Canadian.

"Wherever I worked before," Giampaolo said, "either

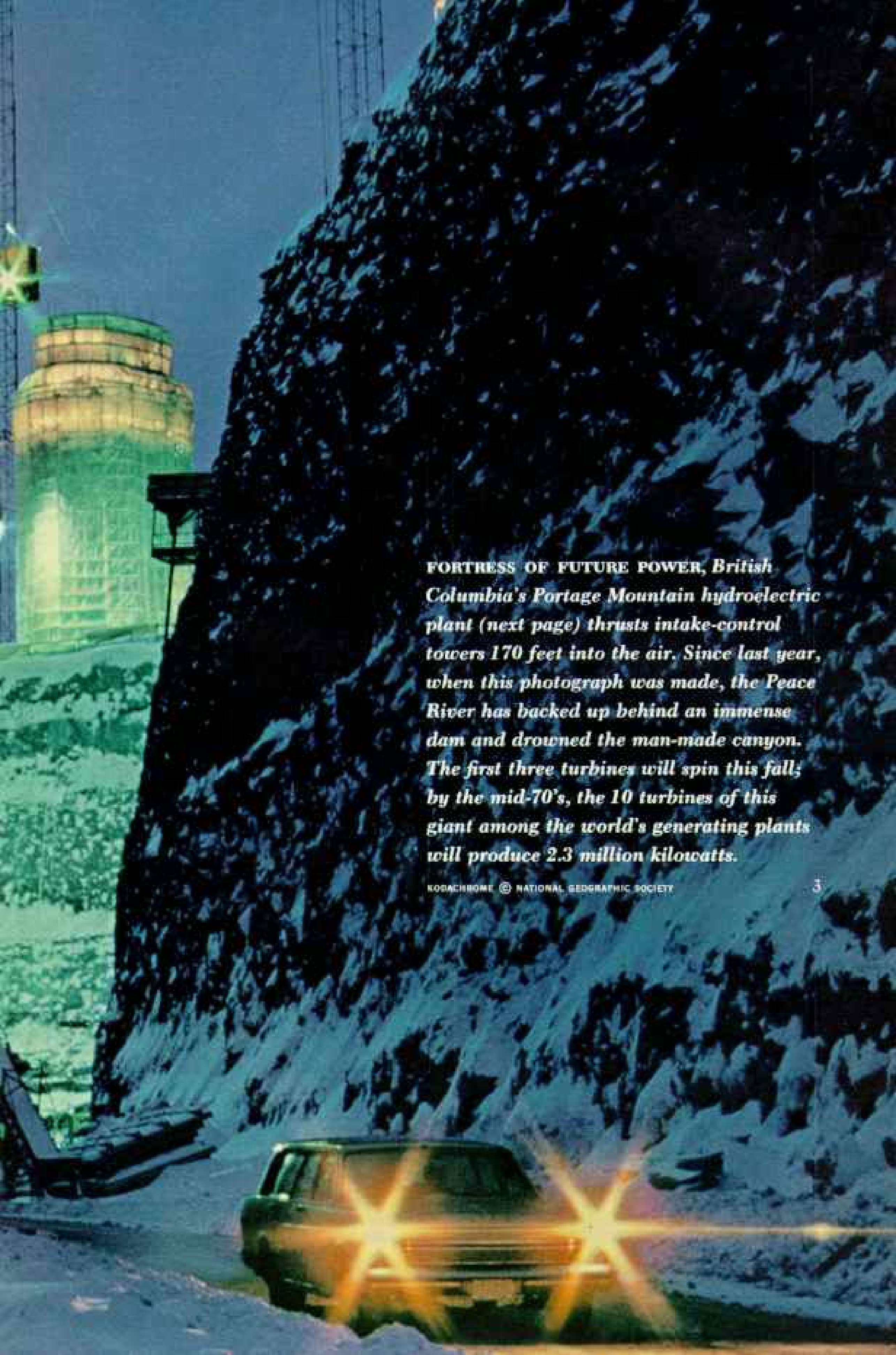


ETCHING © N.G.S.

Pioneers of a new breed, uranium miners enter a dripping underworld at Eldorado, Saskatchewan. In growing numbers, such men stake their claims to a bright tomorrow in Canada's mineral-rich North, largest undeveloped realm in the Americas.

Article and photographs by **DAVID S. BOYER**, National Geographic Foreign Staff





FORTRESS OF FUTURE POWER, British Columbia's Portage Mountain hydroelectric plant (next page) thrusts intake-control towers 170 feet into the air. Since last year, when this photograph was made, the Peace River has backed up behind an immense dam and drowned the man-made canyon. The first three turbines will spin this fall; by the mid-70's, the 10 turbines of this giant among the world's generating plants will produce 2.3 million kilowatts.

KODACHROME © NATIONAL GEOGRAPHIC SOCIETY



STYCHOMER © NATIONAL GEOGRAPHIC SOCIETY

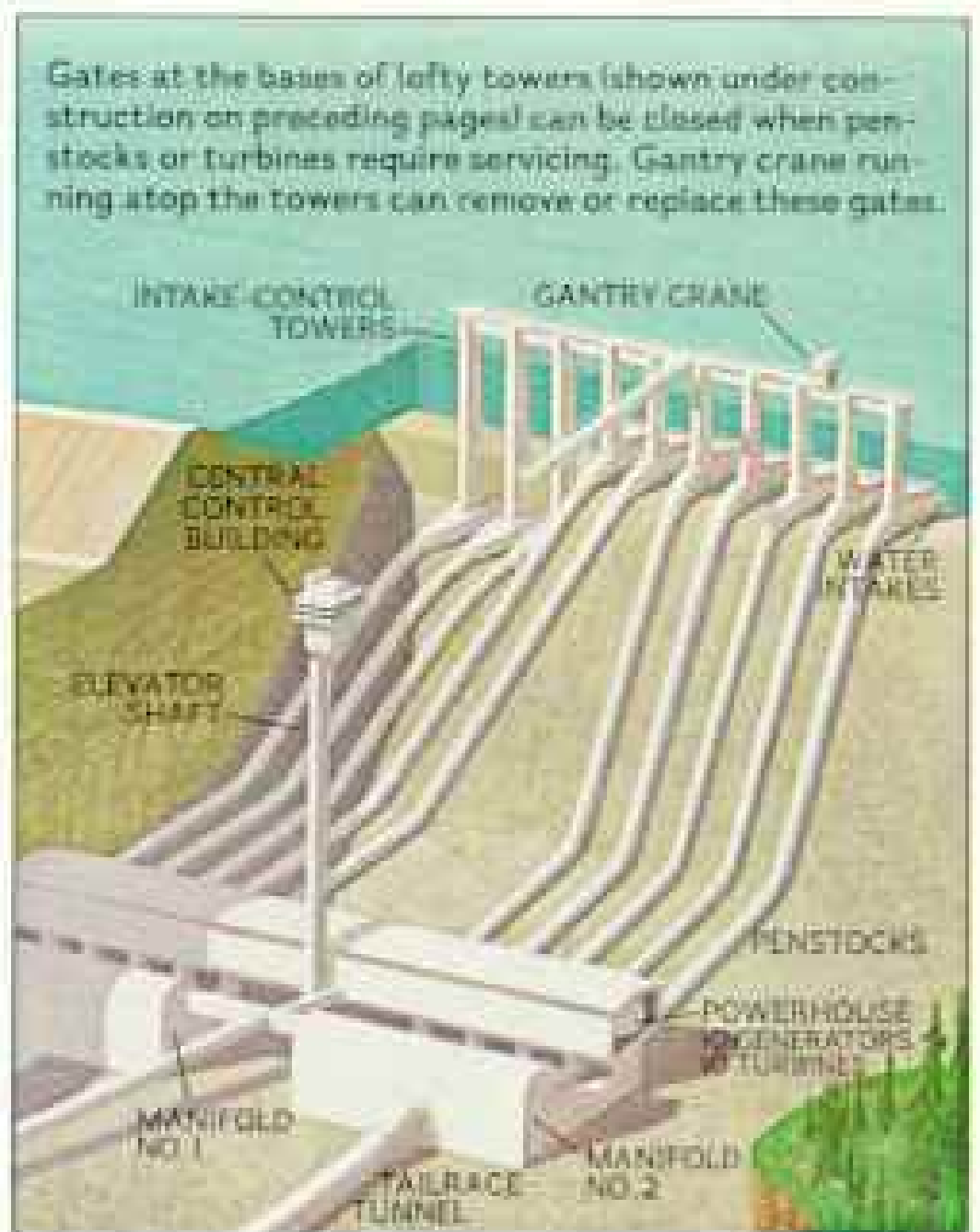
Acrobat on a web of steel, a construction worker ties reinforcing bars for the concrete lining of a penstock at Portage Mountain. Water will flow down the tube to a turbine buried 500 feet deep in solid rock. On the surface the work stops for winter, but underground it continues year round to speed completion of the 725-million-dollar project.



Taming a northwoods torrent, a 6,700-foot-long dam plugs the Peace River. Its name honors British Columbia's premier, W. A. C. Bennett. These cutaway drawings show the Portage Mountain project as it will stand when fully completed in the 1970's.

In 1793 explorer Alexander Mackenzie portaged rapids in "this almost inaccessible country." Now as a reservoir floods 640 square miles, only a few trappers and prospectors move out of the way. But already the promise of abundant power draws pulp mills and stimulates the development of rich farmlands and mineral resources nearby.

GEOGRAPHIC ART DIVISION © H.L.L.



Gates at the bases of lofty towers (shown under construction on preceding pages) can be closed when penstocks or turbines require servicing. Gantry crane running atop the towers can remove or replace these gates.

Sprayed from a gun, concrete coating will prevent erosion in the rock ceiling of a subterranean chamber. Two such manifolds, each ten stories high, receive water from turbines and channel it back to the Peace River through tailraces. At the peak of construction, almost 5,000 men worked on the dam, hydroelectric plant, and twin transmission lines to Vancouver, 560 miles away.

in the Middle East or in Europe, I felt I was working in the past. But in Canada, I am working in the future.

"I have seen nothing of Canada but this cold North. There are no olive trees here, and no *signorine* on the beaches in bikinis. But even so, this wild land, I take as mine."

Nerses interrupted.

"I came straight to the North for three reasons," he said. "First, I wanted to study the real Canada. Every Canadian knows that the North is what most of his country *is*. Then, when the time comes that I can teach geography and social science in high school, I will understand my new land. Second, I think every immigrant must do something for Canada, must work for it, help build it. Canada will do something for me later on. The third reason, I admit, is the job and the money."

We were sitting beside a little train of cars loaded with uranium ore, waiting for the cage and the dripping-wet ride back up the mine shaft to daylight. Giampaolo went on trying to put into words his curious love for the inhospitable North.

"This is no easy life, you know. Nine months of cold in winter. Mosquitoes and black flies in summer. Working underground, winter or summer. But never mind. My *bambini* will go to college and play hockey, ski and fish and hunt. They'll inherit the whole Canadian way of life."

Giampaolo flourished his geologist's Geiger counter in a sweeping gesture.

"My kids will have money, too. Uranium is booming again. And for peace this time, not bombs. The world is wanting atomic power for its homes and its industry. This Geiger counter and me, we are here. What you call it, in on the underground floor?"

Change Sweeps the Land of the Mounties

Nerses, who is working to finance a master's degree in education, interrupted again, figuratively waving his new Canadian flag.

"Even if we could get better jobs or more money somewhere else, the Canadian North is the country with the exciting future. It is undeveloped, unexplored, almost unpopulated. It is on its way up, and we will go with it."

I saw the North on its way up, and met hundreds of Canadians going with it—New Canadians and old, immigrants and old-timers, Indians and Eskimos. Summer and winter, I crisscrossed the land. Everywhere the North was coming alive, from the Alaskan

border to Hudson Bay, from the northern parts of the four western provinces—Manitoba, Saskatchewan, Alberta, and British Columbia—to the Arctic islands (map, following pages).

Once the North was a distant, unknown wilderness, a land where fact was lost in fiction, a white and boundless nowhere presumably peopled by Royal Canadian Mounted Police, Hudson's Bay Company men, and Eskimos in igloos. The North was a stage for the epic drama of the Northwest Passage; of the white man's slaughter of arctic whales; of his lust for Yukon gold and his passion for the furs of forest and tundra.

Today the North is becoming truly a part of Canada, and all Canadians know it.* They realize that they own the largest unexploited land frontier in the Western Hemisphere, and that it is vital to their future.

Oil Sands Finally Yield Their Bonanza

When I was there, they were not only busy exploiting the North; they were incorporating it into their national life and expanding their national concepts to include it—its Eskimos and Indians, its virgin vacationlands, its inestimable water and water power, and its fabulous, almost untouched mineral resources.

Everywhere, New Canadians were part of the scene—men who had left tired lands elsewhere to face the chill and challenge of the North and to pursue its riches and its rough satisfactions.

At Cassiar Asbestos Mine in northern British Columbia, they are chopping away the top of a 6,600-foot mountain (pages 28-9). Personnel Director Cam Church told me, "Our payroll reads like a United Nations roll call."

At the Great Canadian Oil Sands development in Alberta, engineers have succeeded for the first time in extracting petroleum in significant quantities from oil-soaked sand.

Bill Dunlop, to whom new construction workers report, leaned back in his swivel chair and declared: "Our northern labor supply is so short we get 'em hot off the boat. A lot of these lads arrive here without even seeing civilized Canada. They think it's a country of one seaport, a couple of airports, about a million miles of uninhabited ice and snow, and this lost place in the middle of it where mad Canadians are open-pit mining for *ruddy oil!*"

I watched, a bit awed, as an electric bucket-wheel excavator ten stories tall scooped up

*See "Canada, My Country," by Alan Phillips, NATIONAL GEOGRAPHIC, December, 1961.



Measuring a major resource, a government team working on the Hood River helps survey Canada's supply of fresh water, possibly a third of the world's total.

Eskimo bush pilot Tom Gordon ferries medicine, mail, machinery, and people to isolated outposts around the calendar.


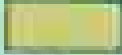
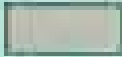





Today's frontier, tomorrow's treasure

OFTEN VIEWED as a snowbound wasteland, Canada's North—roughly, the region west of Hudson Bay and north of the 55th parallel—spreads variety and abundance over nearly two million square miles. Only some 100,000 of Canada's 20 million people live here in scattered settlements; most of the rest occupy a 200-mile-deep strip bordering the United States. With resources to support many millions, the North awaits expanded rail lines and roads, capital investment and immigration.

PHYSIOGRAPHIC REGIONS

-  **Cordilleran Region:** Steep mountains limit access to timberlands and mineral deposits. More than 70 peaks rise above 11,000 feet.
-  **Interior Plains:** Fuel-bearing sedimentary rock underlies this continental depression.
-  **Canadian Shield:** The 600-million-year-old glacier-worn plateau cradling Hudson Bay holds Canada's largest store of minerals.
-  **Hudson Bay Lowlands:** Deficient in resources, the area is believed of little potential.
-  **Arctic Lowlands and Plateaus:** Rolling terrain has some oil and other mineral deposits.
-  **Innuitian Region:** Studied only recently, this ancient mountain range, partially covered by glaciers, may be rich in fuels and ores. Its name comes from Inuit—American Eskimos.

Sand yields oil. Athabasca tar sands, mined in open pits for this huge new Alberta plant, swell Canada's output of crude oil.



Ruddy face framed in fur, a youngster at the Arctic town of Holman Island typifies Canada's Eskimos, 12,000 strong.



PHOTOGRAPHS © NATIONAL GEOGRAPHIC SOCIETY



the oil sands. The shovel's crew lives in Fort McMurray, a onetime Indian settlement that is exploding into a handsome, modern city in northern Alberta. No one knows its potential; it may become the metropolis of the entire North. The construction of Great Canadian Oil Sands' spanking new processing plant (preceding page), \$250,000,000 worth of it, is already flooding the town with new families, and this mammoth enterprise may soon be overshadowed by others.

The black, sticky tar sands lie in sedimentary beds up to 200 feet thick, spread across an incredible 30,000 square miles. They contain an estimated 600 billion barrels of oil—*twice the known oil reserves of all the rest of the non-Communist world.*

I watched bulldozers clearing Great Cana-

dian's little patch of six square miles of the oil-rich sands. Vice President Albert E. Moss gestured airily and told me that this patch alone will produce 45,000 barrels of oil a day for 30 years.

"This is only the beginning," he said happily, as we watched the sand go from the bucket-wheel excavator to the plant on a giant conveyor belt. The tar sands, in consistency a bit like coffee grounds mixed with molasses, yield up their crude oil only after a separation process using hot water, steam, and 900° F. heat. Large amounts of solid coke are also extracted in the last stage.

Though railroads have now sent a few stubby steel fingers poking into the North, you must take wings to see this awakening land. The North is the domain of the airplane.



AERIAL PHOTOGRAPH BY DAVID L. HOFFER © A.G.S.

Airborne bloodhound, a survey plane dangles a magnetometer 450 feet above Story Lake, Manitoba. The instrument picks up magnetic variations that can point the way to deposits of nickel, copper, zinc, and lead. Simultaneously a camera on board takes aerial photographs. At promising locations, Sheritt-Gordon Mines Ltd. lands a geophysical crew (right) for a closer ground survey.

On the trail of buried wealth, Lionel Baribeau and Clark DeWitt adjust loops on their portable electromagnetometer, used to home in on minerals. If they find a lode, their company will stake a claim and bring in geologists and drillers. To discover and develop a major mineral deposit may take five or six years.



To put your finger to its pulse, you must land at many throbbing little nowheres lost in a vast and virgin country.

Scheduled aircraft reach some. But you get to most by bush planes, on winter skis or summer floats. The carefree Canadian bush pilot who pancakes you onto some frighteningly small frozen lake or rushing river is the same daredevil who flew in the tough men and equipment you now see producing wonders in the wilderness.

Unending Miles of Muskeg and Water

Simply to fly over this land is to learn a strange new love. You find affinity for its stark and staring beauty—its formidable mountains in the west and, in the east, its broad and monotonous tundra that stretches away in apparently infinite loneliness.

In summer, you skim a wet green tabletop of spongy mossland and lake and bog. Canadians call it muskeg. And in winter, the landscape that flows beneath you is a pop-art floor covering, a psychedelic vision, a crazy dream. Could those be baby-blue watersnakes wriggling through an infinity of curdled milk? No. Just ice-blue creeks and streams winding their way through an endless traffic jam of snow-capped lakes. There may be 20, or even 40, million lakes of all sizes. They have never been counted (pages 14-15).

It is a land scraped by eons of glaciation, scrubbed by monstrous sheets of ice. Crawling down from the north, they cut millions of striations, like fingernail scratches, into the rock. When the ice sheets melted, they left a land streaked with lakes.

The entire expanse is a cold, wet desert. Its

Telltale chatter of Geiger counters pinpoints a narrow vein of uranium ore 2,200 feet underground at Eldorado, Saskatchewan. To guide miners, these geologists will spray the vein with paint.



EXTENDING RIGHTS AND REDUCING © N.S.S.

Powdery uranium oxide, called yellow cake, clings to a filter press at the plant of Eldorado Mining and Refining Ltd. A ton of ore precipitates into three and a half pounds of the concentrate, not harmfully radioactive at this stage. The yellow cake goes to a refinery in Ontario or abroad for further processing into fuel for nuclear reactors. In the 1950's Canadian uranium mines supplied military stockpiles; a second boom, now in progress, provides atomic fuel for peaceful uses.





rainfall averages scarcely ten inches a year, yet it traps and holds and freezes the water. Evaporation is slight, and there is little vegetation to drink water from the ground.

Canada holds a sizable portion of all the fresh water in the world; estimates range from a seventh to a third. Some of it flows usefully through that narrow east-west strip of the continent where most Canadians live, pressed close to the United States border. But vast quantities of water are frozen in the barren North. Each year much of it melts, to spill uselessly into the Pacific and Arctic Oceans.

Possible slip in subtraction causes more anxiety than does a droopy petticoat for an Indian student at Good Hope Lake, a road-maintenance camp in British Columbia. Her teachers, a husband-and-wife team, came from Vancouver on a year-long assignment, part of Canada's push to extend education to all her citizens. As recently as 1955, few Northerners had access to formal education; now the vast majority of school-age children attend classes.

Sounds from a city intrigue Indian children of Fort Resolution in the Northwest Territories. They listen to a tape during a slide show about skyscrapers, go-go clubs, and freeway traffic. Hostess Georgina Blondin, a Slavey Indian, center, answers questions aboard the Mackenzie River Centennial Barge. Last summer the showboat, a floating feature of Canada's celebration of 100 years as a confederation, brought exhibits of modern technology and urban life to towns on the river and Great Slave Lake.

"Water is one of our most magnificent resources," I was told one day by W. O. (Bill) Findlay, resident manager of the Portage Mountain hydroelectric project (pages 2-4). We were deep in the clanging darkness of the world's largest underground powerhouse. It is being constructed on the Peace River by the provincial government of British Columbia. When its last turbines are installed in the 1970's, it will be one of the world's biggest producers of electricity.

"Water means not only power," Bill said. "It means a habitat for fish, for birds, for game. And hope for people. The provinces and the states to the south need more than electricity. They need drinking water, bath water, irrigation water, and industrial water."

Sundry U. S. promoters keep covetous eyes on the North's water. One multibillion-dollar scheme would divert the Peace and other rivers, now flowing to the Arctic, southward through British Columbia and the prairie provinces to the plains states. Some of the water would reach the desiccated U. S. Southwest, and even Mexico. Imaginative as the idea is, it ran into an early roadblock. All good modern Canadians are born with one gene that renders them suspicious of massive U. S. economic incursion into Canada.

But some are slowly realizing the illogic

it, mile by monotonous square mile, nearly two million of them.

Some mapped regions are being intensively cross-flown by planes trailing electromagnetic survey devices, to pinpoint areas richest in minerals (pages 8-9). Many of the great mines actually producing wealth today were discovered years ago by old-style, foot-slogging, pork-and-beans-eating prospectors. But the new sophisticated aerial and ground techniques have begun to locate more and greater mines for tomorrow.

I flew early one blue winter morning from



STACORRE © R.S.S.

of being overprotective of Canada's surplus water. "After all," one man said, "we're selling the North's electric power. And our oil and gas, uranium and gold and silver, nickel and copper and lead and zinc. Some of our most serious politicians would be ready today to sell a few billion dollars worth of water, too."

As of today, however, no one knows exactly how much water there is, or where. A nationwide water survey, now being accelerated (page 6), is still a long-term project.

In mineral production, including petroleum, the North is running wild; yet the surface of the land has scarcely been scratched. Most of the North is untouched and unknown, except to the tireless aerial cameras of the Canadian Government, which is slowly mapping

Old Crow, northernmost Indian settlement in the Yukon Territory, toward Eskimo country in the Northwest Territories. Under the skis of our plane ranged the Richardson Mountains of the Yukon-N.W.T. border, standing proudly with ridges and peaks wearing their winter dress of frozen marshmallow topping. Beside me sat Ernest A. Côté, Canada's Deputy Minister of Indian Affairs and Northern Development.

"Our modern North began to emerge at the end of World War II," he said. "Its development accelerated during the cold war of the 1950's. That period—when our two countries rushed to face the Russians over the roof of the world—came to us as a latter-day blessing."

The North sprang to life when United



NEVER COUNTED, NEVER NAMED, myriad lakes spangle the Arctic shore near Tuktoyaktuk. Shining like silver coins, they serve as landing places for planes on floats or skis, as fishing grounds, and as reservoirs in a land where rain and snow yield only ten inches of moisture a year.





With an Indian interpreter (left), Mounted Police Cpl. Joseph Roenspies visits an ill and elderly Indian of Arctic Red River. Besides dispensing welfare payments and collecting taxes as the government's sole representative, the officer also serves as radio operator, mailman, veterinarian, and druggist to the town's 87 residents.



Behind bars but not forgotten, inmates of the new Yellowknife Correctional Institution benefit from an exemplary prison program. Some 90 percent of the offenders, both men and women, were intoxicated at the time of their crime, so anti-alcohol therapy plays a major role in their rehabilitation. The reformatory also provides job training, basic education, and counseling.



EXTENDING (ARREAR) AND FRODOCHORE BY DAVID S. BRYER © N.A.S.

States and Canadian military invaded it to establish airbases and the DEW Line—Distant Early Warning radar stations to spot planes or missiles (page 28).^{*} To get the military men and civilian scientists safely there and sheltered came bush pilots and boat captains, contractors and construction men—all hungry for adventure and big wages.

Back, too, came the North's prewar prospectors, in search of lead, copper, nickel, iron, silver, gold, and now uranium. With them this time marched a new breed, men motivated by the aroma of oil. Behind them all were big development companies—Canadian, U.S., British, and, later, French and Japanese—all eager to exploit new treasures in an exploding, unexplored, open-ended world.

"Our resources in the North," Mr. Côté said, "are Canada's future. In a way, it is fortunate that they are deep-frozen and difficult

to reach and to exploit. It gives us time to plan their development and conservation.

"We have no spare time at all for our other major problem. We've got a social crisis in the North. It involves Indians, Eskimos, and whites. And it's a matter of now!"

The Indian and the Eskimo have highlighted the entire romantic history of the North, but today they are shadowy figures in a new and muddled picture.

Pushing in force into their developing North, Canadians find they can no longer regard the natives as simple aborigines, to be given guns, trinkets, and firewater in exchange for furs. Eskimos and Indians obviously have to be converted, somehow, into full-blooded and fully privileged Canadians.

Planes Solve Problems—and Create Others

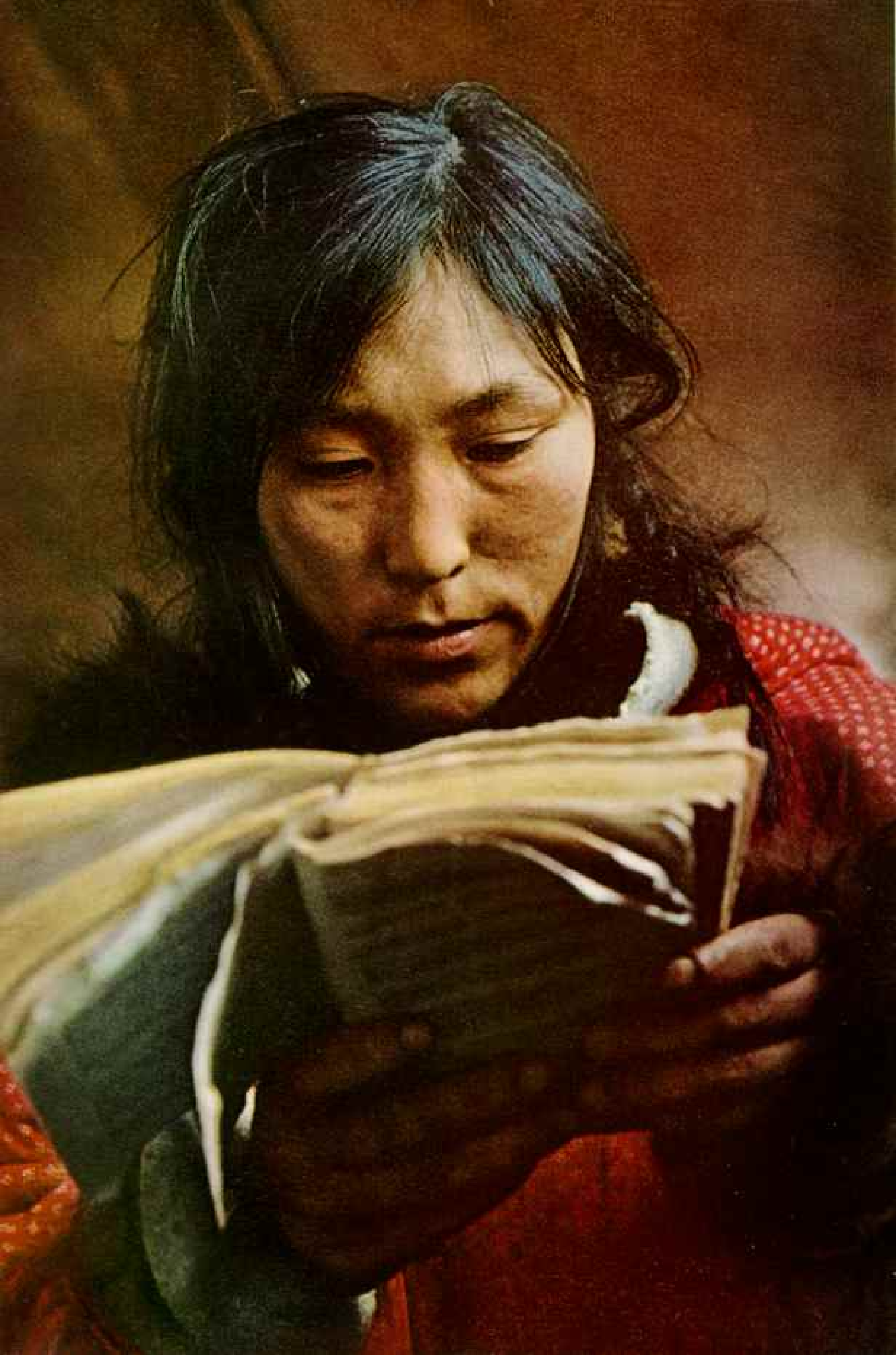
"As we moved into the North in the 50's," Mr. Côté recalled, "we began to realize that the Indians and Eskimos had to be given a radically new status. Colonial lands were achieving independence. In the United Nations, Canada was encouraging and applauding this upsurge of self-government and human rights. How could we do so, in all logic, if we failed to give Indians and Eskimos the same life other Canadians have?"

I was soon to see the problems in detail, and to witness what Canada was trying to do about them. Our ski plane crunched onto the ice of the mighty Mackenzie River, near its mouth in the Arctic Ocean. We had reached Inuvik, 50-million-dollar headquarters town of the Far North. Three thousand souls, native and white, occupy the model city.

Besides government offices and laboratories for field scientists, Inuvik boasts one of the finest elementary and high schools in all Canada. By bush plane from a score of outlying settlements, Indian, Eskimo, and white children come to this boarding-school complex. Here they wear miniskirts beneath their muskrat parkas and receive a quality of education that could never be delivered to their far-flung, isolated hamlets. The Canadian Government, I would learn wherever I went, is placing its money on the youth of the North.

Unfortunately, air services to the settlements contribute to problems for the older generation. They bring in rivers of Canadian whisky from government liquor stores. Liquor lessens the natives' fitness for their traditional lives of hunting and fishing, and makes them poor employees on the white man's jobs.

^{*}See "DEW Line, Sentry of the Far North," by Howard La Fay, NATIONAL GEOGRAPHIC, July, 1958.



Wherever I landed, I heard the same story: "Liquor is the curse of the North!"

The curse is not confined to the natives. In one office I saw posted this sign of the times: "Wanted—Janitor and night watchman. Prefer non-alcoholic." More than half the North's 100,000-odd inhabitants are white, and they add to a staggering consumption of alcohol.

Why? Everybody has answers.

Boredom: "Nothing to do. No television or movies. No sports or drama clubs or music groups. No civic enterprise or pride."

Lack of family life and responsibility: "Half the white men are single, or here without their wives, and half the native women aren't married to the men who father their children."

"Motel" Brings Hope to Alcoholics

An old-timer, a man who'd lived with Eskimos and Indians, told me why they, particularly, go the way of drink.

"The Indian and the Eskimo," he said, "simply weren't brought up to accept the white man's standards—the eight-hour day, the five-day week, the semimonthly paycheck, the down payment on the house, the new car, the bank account. They were born worshipping freedom—to sit and talk, or not talk; to go fishing when the spirit moves them, or when the fish are running; to take off after the cari-

bou or after the bottle, to hunt or to drink when the time seems right. And if that happens to be in the middle of some tedious job that some white man wants done for mere money, well, let him find someone else."

I stumbled one night across a symbol of Canada's determination to solve this affliction of the North. I was driving from the airport into Yellowknife, new capital city of the Northwest Territories.

Through the taxi windshield gleamed a handsome ranch-style building of pink stucco with blue-and-yellow latticework windows. The whole vision was brightly lighted and more attractive than any hostelry I had seen north of the 60th parallel.

"Now there's my idea of a real motel," I shouted over the squawking of the taxi's radio and the ruckus of the tires in the gravel. I was thinking how hard it is to find a room of any kind in the booming North, and recalling nights I had survived in old, run-down hotels.

The cab driver smiled. "You might be able to get in there tomorrow," he said, "but not tonight. That 'motel' is the Yellowknife Correctional Institution."

Next afternoon I sat down at teatime in the gaily decorated living lounge of the ladies' division of the new Northwest Territories' medium-security reformatory. Behind those

Reading a prayer in her own language, an Eskimo woman worships at the 40-year-old Anglican Mission at Coppermine. An Eskimo deacon leads the service. In summer, men of the Arctic port work on construction sites, on wharves, or on the tundra as guides for prospecting parties. In winter they fish and hunt.

Polka-dot parkas bloom at the Anglican Mission on a fine April Sunday. Eskimos travel by dog sled from as far away as 100 miles to attend winter church festivals here and at the town's Catholic mission.



deceiving blue-and-yellow steel latticework windows, I joined a covey of uniformed "girls" (page 16).

"You'd better sit here on this chesterfield, out of the sun," one said thoughtfully. "You wouldn't want a prison-bar-striped suntan. Tinned milk or fresh for your tea? Is the hi-fi too loud for you?"

Superintendent (not warden) Clarence Francis Wilkins had given me a tour of this hospitality house. Now he had paroled me to interview "supervisors" (not guards), and "inmates" (not convicts). They were searching for a word even more genteel than inmates, Mr. Wilkins said. Meanwhile, he had introduced each one to me as Miss, Mrs., or Mister.

I had ogled the menu on the bulletin board of this beguiling prison: sirloin steak, baked potato, tossed salad, apple pie, coffee, tea, or milk. And I had admired the prisoner cooks artfully at work in their stainless-steel kitchen. It was easy to accept an invitation to stay for dinner, served on a white linen tablecloth.

The attractive white girl at my left was waiting trial for attempted murder under the influence of alcohol. All my table companions—in fact, 90 percent of the prison's inmates—were there because of liquor, I learned.

Segregation Lingers as a Problem

In Fort Smith, I heard how a lingering segregation delays the emancipation of the Eskimo and the Indian. An official of the Department of Indian Affairs and Northern Development put it frankly:

"We pretend to have a policy of integration," he said. "But it's a poor pretense. Look at these new government houses—all segregated from the Indian side of town. We're following the same pattern in Yellowknife. And you've seen it in Inuvik. The truth is that most of us, in our souls, are segregationists. The Indian and Eskimo sense the chill."

To be sure, there are some solid integrationists as well. Some are missionaries, both Catholic and Protestant. A few are businessmen; more are schoolteachers and nurses. Many are children—grade-schoolers, or high-school teen-agers alive to today's surging of civil rights. Some are government officials.

In Fort McPherson, a government schoolteacher tried to explain the problem and the long-range policy. "Lots of government people are here really to help the native, not just for the bonus salaries and the adventure. But we're trying to close an awful gap. The Indian and Eskimo are caught in a half-red, half-white no man's land. It may take a generation;





ERTACHOME (ABOVE) AND BODACHOME © W.A.S.

Mass graveyard of mired pack animals in 1897, treacherous White Pass was called "a stinking abattoir" by gold seekers of the Klondike rush. But by 1900 the White Pass and Yukon Railway had chiseled a narrow-gauge line from Skagway, tunneled a mountain, background, and reached Yukon River boats at Whitehorse. Today, the railroad's shining aluminum containers, loaded with supplies, ride train, freighter, or truck.

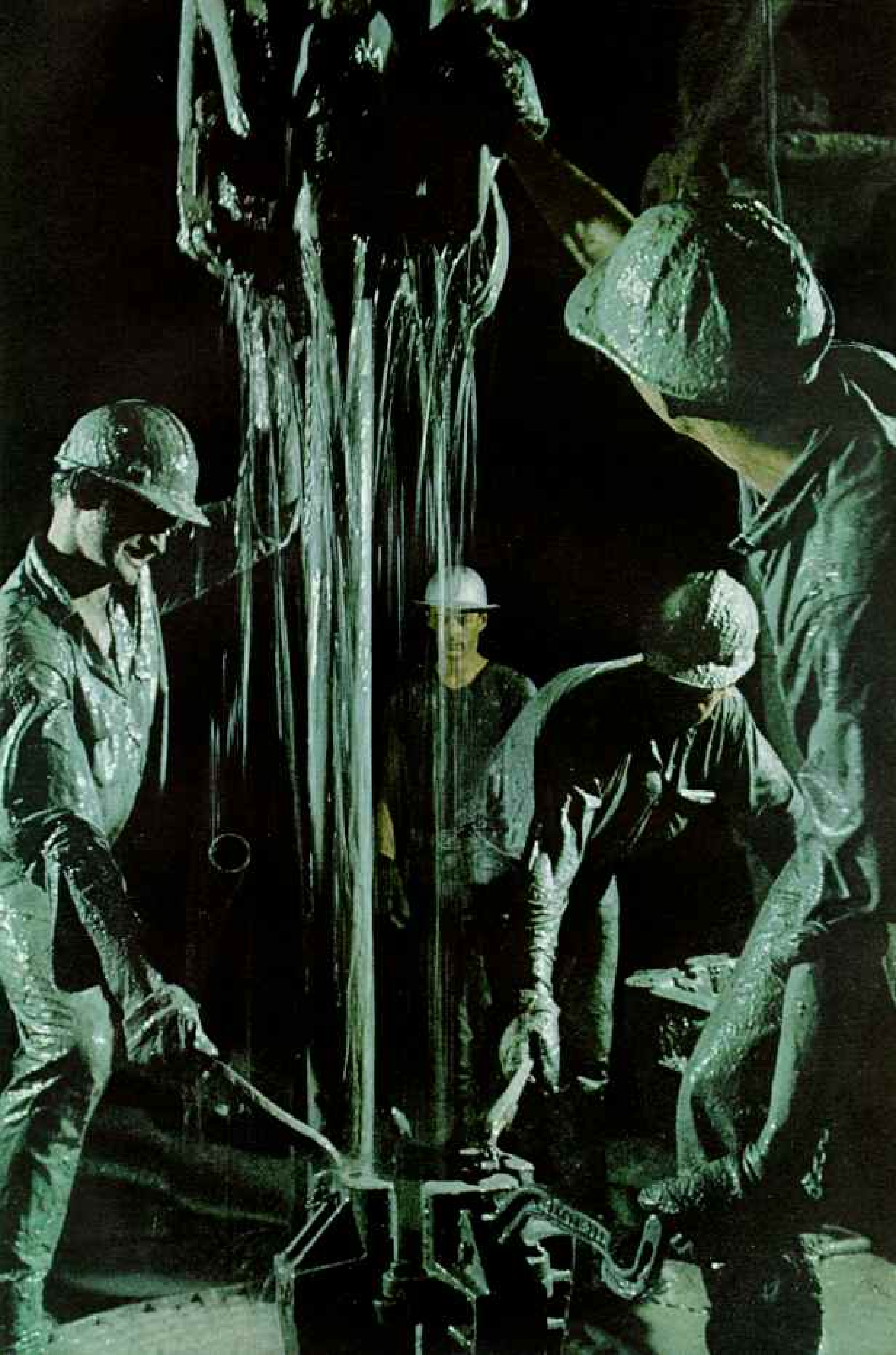
He once drove huskies: Now Eskimo Charlie Allen runs a diesel engine of the Great Slave Lake Railway to the lead-zinc mines of Pine Point, Northwest Territories. The new railroad recruited and trained Mr. Allen and some 70 other Arctic Eskimos.

we hope to get today's kids into an integrated world in the 1980's."

By then, with high school, trade school, or even college educations, they will be modern Canadians, having and understanding all the privileges, as well as the responsibilities, of their white brothers. That, at any rate, is the theory and the hope.

Magnificent new job-training centers and schools are rising everywhere. In Fort Smith I listened to a smiling man in a somber cassock—His Excellency Paul Piché, Catholic Bishop of the Mackenzie District of the Northwest Territories—and learned that government is not alone in struggling with this phase of the social crisis.

"To graduate into Canadian society," he said, "the natives need special help. They are behind,



below, and bewildered. What we are trying to do here at Grandin College is to help some of them rise to a level of leadership. We are trying to instill self-respect, self-confidence—pride, if you will—in being an Indian, a responsible Canadian Indian.”

Grandin College today works in tandem with a government high school. The mass education of Indians and Eskimos is an undertaking scarcely 15 years old, and many more years will be required to determine its over-all success or failure.

“But last year, every one of our Indian and Eskimo kids passed!” Bishop Piché grinned.

A government administrator in Aklavik illuminated more of the background of the Indian and Eskimo problem. “We ignored them for decades, you know. Then we had a sudden agony of conscience after World War II and began to smother them with welfare handouts. That era of the dole sapped their sense of responsibility. And it almost buried their pride.

“Happily, we’ve outlived both the do-nothings and the do-gooders. Our philosophy today is to help the natives in every basic way—schools, homes, jobs, medical care—but to get them to work to pay for more and more of what they get.”

“Become Canadians—and Get Lost”

I saw that philosophy beginning to change the North. It will, when it finally succeeds, mean the end of the Indian and the Eskimo as ethnic groups.

“The government can’t say so,” the administrator told me, “but the plan is really to equip them to become Canadians and get lost.”

They get lost in varying ways.

In Tuktoyaktuk, I sat baby-sitting with Vancouver businessman Dave Anderson. He had adopted the North, married an Eskimo, and we were awaiting his wife’s return from the Inuvik hospital with their third child.

In Inuvik, Eskimo Elijah Menarik runs the local radio station and is married to a white Canadian. “In 50 years,” he said, “there won’t be any Eskimos left.”

I flew with Canada’s first Eskimo bush pilot, Tom Gordon (page 6), who has white blood in his veins. He popped me down onto the ice of a tiny frozen lake, introduced me

to Eskimos Billy Kikoak and Joseph Pokiak and their two magnificent teams of sled dogs. “You can spend the day herding reindeer with Billy and Joseph, and I’ll pick you up before dark,” Tom said.

Billy and Joseph are two of half a dozen reindeer herders employed by Sven Johansson from Finland, who is proving for the government that European reindeer can be domesticated in the Canadian North as a major source of fresh meat.

Pork Chops No Match for Reindeer Heart

With the two dog teams, we moved 5,000 reindeer a few miles across the tundra to new grazing grounds. Toward evening, Billy shot a reindeer and, with the dogs watching like disinterested gentlemen, butchered it there on the snow.

We loaded the meat and the pelt onto sleds, returned to the herders’ tent camp, turned up a gas stove, tuned in the theme song from *Doctor Zhivago* on the radio, and sat down cross-legged on reindeer rugs to eat, just as Tom Gordon landed to rejoin us.

“Any part of the reindeer is the best meat.” Billy gestured toward a bagful of neglected pork chops he’d brought along from his base camp at Reindeer Depot. “I goes for the roasted ribs and the tongue and the heart, myself. Then you’re really eating!”

“I’m gone from home a lot on this job. The family miss me a lot. But we know whether things goes fine on the radio here.

“My kids is all in school for nine months at Inuvik. The rest of the time, I take ’em out and teach ’em how to herd the deers, and how to fish and trap muskrats. I want them to know what Eskimo life is, how to do these things. Then, if they can’t make it in the white man’s world, maybe they can fall back on the land and make a life of it somehow.

“I hope, though,” he concluded, “they’ll make it as Canadians, go on to high school, maybe be pilots like Tom here, or work in an office, or teach school.”

More than church and state are in on the job of bringing the native into full Canadian citizenship. Even a railroad plays a role.

The Great Slave Lake Railway, a branch of the Canadian National, is a brand-new 75-million-dollar tapline into the developing

Tight-lipped in struggle, mud-drenched oilmen drill through the night at Alberta’s rich Rainbow field, discovered by Banff Oil Ltd. in 1965. Here they pull pipe to change the bit.





RESEARCHER BY DAVID S. BOSTER © A.S.P.



Arctic tundra explodes skyward during exploration for oil near Tuktoyaktuk; one chunk earlier shattered the windshield of the snowmobile in which the photographer sat. Seismic crews of Imperial Oil Limited map shock waves from the blasts to reveal variations in underground formations. This crew lives in a trailer camp pulled on skids by tractors; other explorers move by helicopter.

Northwest Territories. Its rails are the first to penetrate a region larger than all the United States east of the Mississippi, yet containing fewer people than live in Winston-Salem, North Carolina. This N.W.T., as residents call their Northwest Territories, is burgeoning. New towns are being born. Some old and sleepy ones, like Hay River on a spur of the railroad, are having a dramatic rebirth.

The story of the Great Slave Lake railroad and its Eskimos was told to me by the man who directed the building of the line, W. H. (Pat) MacIlroy. We sat with an engineer in the cab of a diesel locomotive. Behind us five more engines added their power. Careering and screeching for a mile behind them came 107 ore cars. Loaded at Pine Point Mines in the N.W.T., the most dramatic new source of lead and zinc on the globe, the concentrates were destined for smelters in southern Canada or elsewhere around the world.

"We were happy partners with Pine Point," Pat was saying. "We finished laying our track well ahead of schedule. Pine Point's concentrator wasn't yet operating, so they shipped high-grade ore out raw. It was so rich that they paid off their entire \$25,000,000 investment in a year."

Added dividends came to Great Slave. The rail line ran through what turned out to be Canada's two most spectacular new oil strikes. Rainbow and Zama Lake fields became the densest gathering of trailer camps, seismic-exploration crews, drill rigs, pipelines, helicopters, and bush planes ever mustered for an assault on the underground wealth of the North. They required massive freight imports by rail. Besides that, the new Great Slave Lake line helped the wilderness town of High Level become one of the North's biggest producers of lumber.

Ticktacktoe on a grand scale: Bulldozers plow grid lines across northern Alberta to guide seismic crews. Banff Oil estimates reserves here in the billions of barrels.



Dream town that nickel built, multimillion-dollar Thompson rose in the past decade from the spruce-and-muskeg wilderness of northern Manitoba. International Nickel Company of Canada, Ltd., founded the Burntwood River town for employees of its nearby nickel-

Where do Eskimos fit into this pulsing arm of the developing North? "You might say we're enticing Eskimos down from the Arctic islands by offering them refrigerators," Pat said. "We're trying to build a complete staff of competent Eskimo and Indian railroaders. We think it makes good sense to employ in the North people who belong to the North."

On a second train I met Eskimo Charlie Allen (page 20) from Inuvik, who was one of half a dozen locomotive engineers among some 30 Eskimos already working for Great Slave. The voice of his brother Joseph, brakeman on the train, kept coming in over a walkie-talkie and punctuating our conversation. "Slow ahead, Charlie. Two cars. One car. Ten feet. Three feet. That'll do."

"Joe's just married a nurse from Ottawa," Charlie told me as he released the air-brake lever. "I guess he's left the Eskimo way of life for good. Me too, probably."

Too many single Eskimos have quit on the job, Pat told me. Either the northern Alberta climate was too hot for them, the southern hospitality too cold, or the wages too easily spent. The emphasis in recruiting has shifted to Eskimos with families.

"We worried at first about homesick wives," Pat confided. "But we needn't have. The wife of one of our Eskimo shop mechanics flew her kids back to the Arctic in a panic of nostalgia; then she turned around and came back on the next plane. Seems the youngsters were missing their hot baths in the tub and their



KESSELHORN © NATIONAL GEOGRAPHIC SOCIETY

producing complex, largest in the free world. Now some 17,000 Thompsonites enjoy modern homes, shopping centers, schools, a library, a hospital, and a golf course. An all-weather highway, railroad, movies, radio, and taped television shows link Thompson to the rest of Canada.

cold Cokes in the 'fridge.' And she herself suddenly realized she had a love affair going with a modern kitchen and an automatic washing machine."

"Canned" TV Brings Hockey to Thompson

In the course of time, I rode the North's other railroads, all of them roads to riches.

Into the northern reaches of Manitoba go two avenues of steel, one to mining country around Lynn Lake, one to Churchill on the frozen shores of Hudson Bay. In six weeks of open water in August and September, ships from Europe come to Churchill to collect grain railroaded from the prairie provinces. The line also carries men and machines to build a mammoth hydroelectric complex on

the Nelson River. When finally completed, at a cost of nearly a billion dollars, the project will produce more than six million kilowatts, enough to power New York City.

Trains on both lines go southward burdened with minerals from Manitoba's mines. At Thompson, when I was there, the free world's largest nickel-producing mine-and-smelter complex was growing even bigger. "We're spending \$100,000,000 in the next three years to develop new ore bodies and surface facilities," I was told by General Manager H. W. Peterson.

Thompson, carved out of the bush, is one of the plush places of the North—as well as the biggest (above). It offers 17,000 people beautiful homes, hotels, theaters, shopping

centers. I sat with a new friend, John MacDonald, in a hotel that has extension telephones in the bathrooms; coat and tie are *de rigueur* in the cocktail lounge.

"This is no longer the wild North," he told me. "We even have 'canned' television. We get the hockey games on tape about four days after they're played. That's great. We read the papers, find out when each score was made, set an alarm clock, and just tune in for the big moments."

Trains were loading nickel concentrate when I reached Lynn Lake. Sherritt-Gordon Mines, too, were spending money for the future. I flew in on a bush plane with company field geologists following up an aerial magnetometer find (page 9).

"You can just forget the location of this place," one said when we landed. "It's a professional secret."

He was Joop Langelaar, a gangling young New Canadian from the Netherlands.

"If I find a few feet of copper or nickel showings," he said, "I radio in. They might want to stake a large area right away. The message goes in code."

I found the mining boom even more intense when I rode a fourth railroad, into Whitehorse in the Yukon. I arrived on the White Pass and Yukon railroad (pages 20-21). Completed in 1900 to carry would-be millionaires into the fabled Klondike gold fields, the White Pass has only now begun to flourish.

"We'll probably carry out more wealth every year than that wildest gold rush in history produced in its entire life span." The words came from a civic promoter, but a



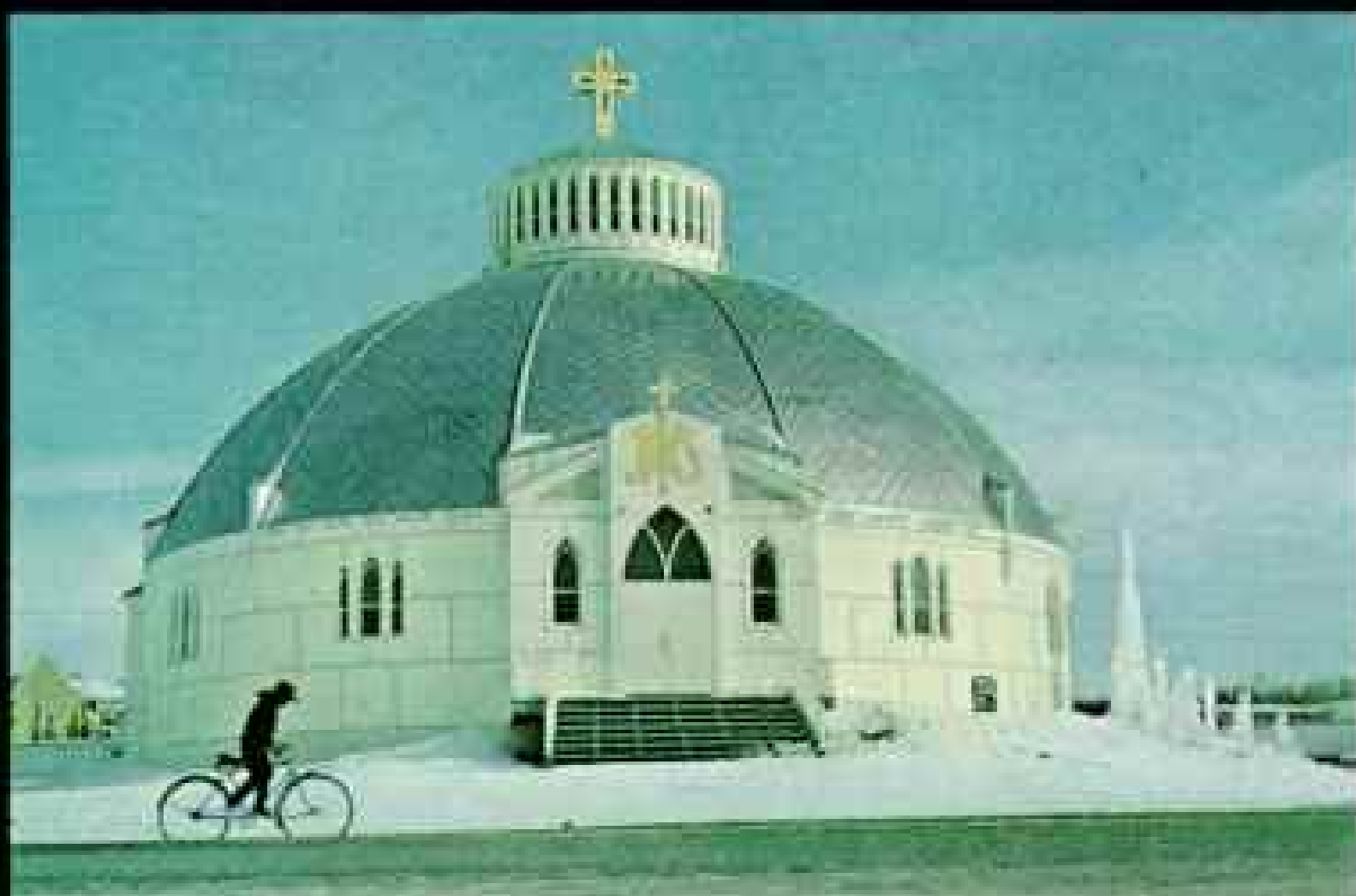


KIDDECHUBERS © NATIONAL GEOGRAPHIC SOCIETY



Mountaintop sinks below sister peaks during open-pit mining for asbestos on 6,600-foot Mount McDame in British Columbia. The Cassiar Asbestos Corporation Ltd. scoops out 3,000 tons of ore a day and processes it into 280 tons of silky fibers used in heat-resistant materials. Canada supplies about 40 percent of the world's asbestos.

April sunset on the Arctic's rim glows beyond the DEW Line (Distant Early Warning) station at Tuktoyaktuk. Crossing harbor ice where the Mackenzie River meets the Arctic Ocean, an Eskimo sledge driver heads for home at 10:30 p.m. Construction of the joint U.S.-Canadian radar chain in the mid-50's spurred the North's economy, putting Eskimos to work building wharves, offices, and airstrips. In summer, river barges off-load freight at "Tuk" for ships plying the Arctic coast.



IGLOO-INSPIRED, Our Lady of Victory Church serves Roman Catholics in Inuvik. Fisheye lens shows Father Joseph Adam in the round plywood-aluminum church. Built by the congregation, the structure reflects the creative drive behind this model community of the Far North. Government engineers chose Inuvik's elevated site in 1954 to replace flood-ridden Aklavik (pages 32-3).

KODACHROMES © H.S.I.

very soft-spoken one—A. P. Philipsen, president of the Whitehorse Chamber of Commerce. "Anvil Mining Corporation has just started spending \$56,000,000 to tap their billion-dollar find of lead and zinc on Ross River. That investment alone beats the first-five-year take of the gold rush."

By 1969 Anvil's ore will be going to smelters in Japan, reaching Pacific tidewater over the railroad that once carried in gold seekers. It already hauls out \$30,000,000 worth of asbestos per year, from Cassiar in British Columbia (pages 28-9) and its new sister mine at Clinton Creek in the Yukon.

Buffalo Graze on Mineral-rich Lands

The rush to exploit the North even seems to go too fast, and too far, for some people. I heard talk, for instance, about mining in Wood Buffalo National Park.

Rich ore bodies are thought to underlie this nature reserve in northern Alberta. It definitely contains the continent's largest deposit of pure gypsum, exposed for all to see; it probably also conceals reserves of petroleum. And no doubt there is further treasure, for the park is twice as large as any other national park in the world—almost as large as the entire Province of Nova Scotia.

Unfortunately for would-be exploiters, the park is the protected pasture of 12,000 buffalo that Canada rescued from extinction and intends to preserve for posterity.

"I think it would be just fine," a man named Ed Olson told me, "if Canada made a survey of mineral wealth in the park. But only against some remote day of national emergency. The North today, and for a lot of tomorrows, has oil and gas and lead and zinc coming out of its ears.

"I don't doubt that the park's resources are fabulous. There are miners and oilmen who would just love to get their hands on it.

"But you can take something straight from me: They're not going to, if we can help it!"

Gray-eyed W. Edward Olson, Superintendent of Wood Buffalo, is ordinarily a quiet man, when he talks about the hundreds of species of mammals and birds that occupy his 17,300-square-mile domain. The park is also the nesting ground of the whooping crane, that famed species snatched back from the fate of the dodo by the most ardent conservation campaign in history.*

Ed Olson's eyes, usually smiling, now were flashing. "The government is going to create

more, not fewer, national parks in the North. We're planning to save more of this marvelous land so that your great-grandchildren and mine can enjoy it in its pristine state."

Ed went on to delineate for me some of the things the Canadian Government is planning: a park in the cold, flat, pop-art lakeland of the northern tundra; a park in the snow-covered mountains of the Yukon; a wilderness river park on the South Nahanni River in the Mackenzie Mountains.

The Nahanni is almost as mysterious as its Indian name is beautiful. To reach this legendary "River of No Return," where early explorers and prospectors met violent and unexplained deaths, I flew first with bush pilot Paul Slager to the Slavey Indian settlement of Fort Liard. Paul keeps a gas cache here for flights into the mountains. The weather was bad, and Royal Canadian Mounted Police Cpl. Bob Gilholme and his wife Mary had to help us lash the plane to a tiny, storm-tossed pier on the Liard River. The winds and waves were a bit frightening.

Paul and Bob, old friends, lapsed into typical Canadian North colloquialisms.

"Pretty poor weather to take off in, eh?" Bob's question was 50 percent statement.

"Well, I'm not very fussy about this cross-wind like," Paul admitted.

"Think you'll take a chance anyway, eh." The statement was 50 percent question. "Mind you, the forecast says the wind will keep up, eh?"

Paul grinned and glanced at me: "Ready to give it a try like?"

"You're the pilot," I said. "Just remember, I've got a wife and kids at home, eh?"

"Hang Tough, This'll Rattle Your Teeth"

Bob and Mary pushed us off, and the waves slapped a tom-tom beat against the pontoons. Paul trimmed the bucking plane for take-off, glanced back to see that my camera cases were tied down, then put the heel of his hand behind the throttle.

"Hang tough!" he shouted over the roar of the engine. "This'll rattle your teeth like. I'm not very fussy about these ones!"

I'm not so fussy about those ones myself. And I was hanging even tougher on the next landing. We flew toward the Mackenzie Mountains, then up the Nahanni River into

*See "Whooping Cranes Fight for Survival," by Robert Porter Allen, with photographs by Frederick Kent Truslow, NATIONAL GEOGRAPHIC, November, 1959.





© COURTESY OF DAVID S. BRYER © R.A.S.

Town that refuses to die: Though floods threaten their homes each fall, most of the Indians and Eskimos of Aklavik on the Mackenzie River stay on rather than move to modern Inuvik, 50 miles away. They continue to fish at their doorsteps, trap muskrat in the muskeg beyond, and hunt caribou.

Following a warm-weather freeway, a tug pushes barges down the Mackenzie. From May thaw until October freeze-up, barges and freighters of the Northern Transportation Company Ltd. deliver goods to settlements along a 4,000-mile system of rivers and lakes that extends from Waterways, Alberta, to the western Arctic.

them. There the Nahanni suddenly emerged from a rock gorge 2,000 feet deep. We flew straight at the mouth of the gorge, and I felt like a kamikaze passenger. But Paul set us onto the water right where it rushed and boiled out from between the nearly vertical canyon walls.

Not until we had lashed the plane to four trees, with four ropes, could we leave it in the pounding current. Our visit was to the Nahanni's only human habitation, the log cabin of Gustave Kraus, a trapper, prospector, and lover of solitude originally from the United States. His Slavey Indian wife Mary and their adopted teen-age son Mickey greeted us on the shore.

Earth's Heat Warms an Arctic Oasis

The Nahanni is a river of legends, many of them unpleasant—murders and corpses without heads (one stretch of the river is named "Headless Valley"). But there were also tales of a Garden of Eden along the forbidden river—a tropical paradise that defied the snow and ice of the Canadian North. Gus and Mary and Mickey have found it. Their log cabin stands on a river bar, half encircled by a flowing hot spring. Heat rising through fissures from the earth's interior makes a warm griddle of the whole area.

"The snow may be five feet deep across the river," Gus gestured over a plate of grilled moose steaks, "but around our cabin the ground stays summer-dry. Mickey can ride his bicycle all winter. Mary has hot washing water flowing by the kitchen door. Mother earth keeps us a snug 68 inside, even though it's 50 below zero outdoors. The only firewood we ever cut is for cooking."

Besides that minor geological marvel on the river, there are, for such few boatmen as ever challenge the Nahanni, 100 miles of rapids, a stairway of white water. Crowning it all is Virginia Falls, a cascade higher than Niagara. Here the Nahanni plunges into a jewel box of spray that is lost in the wilderness, at least until the day the Nahanni does become a Canadian national park.

By luck, I shot the rapids twice—once by boat, with the first tourists ever to make the trip without professional guides, and once by plane, a few feet *above* the water, with my carefree bush pilot. We climbed high above the falls, and then Paul Slager delivered the coup de grace:

"Hang tough!" he shouted again. With that, he cut power, and we glided over the brink of the falls, wetting the plane's pontoons



Unfamiliar luxury, a washing machine draws a housewife to the new "Tuk" laundromat, which also offers hot showers.



Modern house, ancient task: An Eskimo housewife at Holman Island scrapes the skin of a polar bear killed by her husband, who will sell it to the Hudson's Bay Company. Valued at \$25 a foot, the 8-foot pelt will bring about \$200 and create a prized rug. Because of the great demand for bearskins, authorities protect the species by assigning a quota to each Arctic community.

At a turning point in their lives, Eskimos of Coppermine listen to a federal official explain Canada's plans for her territories. The government expects to put every Eskimo and Indian family in new housing. Local elementary schools will allow students to live at home. For secondary education they must go to distant boarding schools.



ENTRICHINES © NATIONAL GEOGRAPHIC SOCIETY

in the spray as we dropped. That particular view of the falls, I decided, would never become part of a national park tour.

The headwater streams of the Nahanni are fingers groping into the high mountains that divide the Northwest Territories from the Yukon (map, page 6). If you had been young and virile and greedy in the fall of 1897, you might have tried to reach the gold of the Yukon over these terrible hills.

More than 2,000 did. They started at Edmonton, sailed down the Athabasca River into the Slave, portaged the rapids, paddled

across Great Slave Lake, floated down the Mackenzie, then labored up the Liard and crawled, some of them, up the Nahanni.

They had battled their way 1,500 miles by water. Only after a nightmare winter of rain and snow and freezing cold, and a summer of skin-peeling sun and welt-raising mosquitoes, did they meet the awful mountains.

By then, a second winter had set in. None of them reached the Yukon in a single year. Most turned back—sick, weakened by malnutrition, tortured by the elements, and maddened by frustration, their gold-digging





*"HIDDEN IN WONDER AND SNOW, or sudden with summer,
This land stares at the sun in a huge silence
Endlessly repeating something we cannot hear."
Thus Canadian poet F. R. Scott describes the northern vastness,
exemplified by this rain-swept ridge of the Cassiar Mountains.*

Casting into churning white water, a sportsman tries his luck on the Camsell River near Great Bear Lake. With each flick of the fly, several foot-long arctic grayling rise from the rapids. The northern wilderness offers unparalleled potential for parks and recreation areas.



Deep in big-game country, Tahltan Indian guide Fletcher Day, left, sights a herd of mountain goats for a hunter from the United States. Every fall in Cassiar, British Columbia, Mr. Day outfits parties with horses, provisions, and guides for days-long rides into the haunts of the caribou, moose, grizzly bear, wolf, Stone sheep, and mountain goat.



equipment long since shoved overboard to lighten the load. Only a few staggered on, up into the mountains, and here the terrible snows imprisoned them.

A few survived and eventually reached the Yukon. But the odds against those who challenged that second winter were long. In the early spring of 1900, the bodies of two never-to-be millionaires were found sitting, frozen stiff, before the ashes of a fire in a makeshift mountain cabin. Stuck fast in the ice of their soup pot was their untasted last meal—a pair of half-boiled Indian moccasins.

In two years, more than 100,000 gold seekers came scrambling toward the Yukon from the far corners of the world. Most fought their way up the fiords and rivers of Alaska. Some 40,000 actually reached their goal and created the most tumultuous gold-rush town in his-

tory: Dawson City. Dawson sprang up on the Yukon at its confluence with a river that ran with gold (page 40). The miners couldn't pronounce its Indian name—Thronduick. They called it the Klondike.

Dawson Clings to a Happier Past

Of the thousands who poured into Dawson City, only a few hundred made fortunes, and only a dozen or so hung on to them. On Dawson's whisky-soaked bars, they plunked down their pokes heavy with gold dust and shouted for drinks for the house. They bought the company of dance-hall girls and they won or lost, at poker, \$10,000 a hand.

It was a wild town.

Today, Dawson has little left except its memories. A few sagging wrecks of original buildings from the gold rush still recall the



ILLUSTRATION © NATIONAL GEOGRAPHIC SOCIETY

all-night parties of its heyday and the deliriously drunken gold hunters who'd struck it rich, the bathtubs they filled from \$60 bottles of French champagne, the ladies who bathed in the bubbles, and the red-coated Mounties who tried to maintain order.

Two authentic miners of '98 were still alive when I was there, but they lay dying in a geriatrics ward. Dawson's closest active living symbol of the golden age was "Black Mike" Winage (page 41). He told me he washed his first pan of Yukon gold in 1900. He said his age was 98.

Dawson tries hard to keep glimmering with the spirit of the gold rush. It has resurrected a vaudeville theater from its day of glory, set up an old-time Yukon River steamboat as an exhibit, and created a museum of sorts. And tourists are steered to the old cabin of

Robert Service, whose poems are part of the Yukon's immortality. But Service wrote his fictional "The Shooting of Dan McGrew" before he ever stood on a barroom floor in Dawson City. And he didn't do that until 1908, when Dawson already was dying.

For all of that, your heart can skip a beat if you walk Dawson's ghost-town streets in the white snow. You can find them empty and at their best at midnight under a moon, or at dawn, before the first automobile has turned over and coughed the place sadly awake.

Five hundred miles south, on a spring day when the ice was melting on the Stikine River, I finally found my only true eyewitness to the gold rush.

Emma Brown was a pretty Tahltan Indian maiden of 16 when she watched "those crazy men" dragging their gear up the Stikine and



EDSCHREIBER © NATIONAL GEOGRAPHIC SOCIETY

Goal of gold seekers, graveyard of hopes: Crumbling Dawson, one-time capital of the Yukon, today holds a mere 742 residents. In 1898, "fired with the faith of fools," as Robert Service wrote, 20,000 men flooded a shack city where the Klondike River, left, meets the Yukon, frozen hard in this view upstream. Dreaming of potato-size nuggets but finding only scurvy, frostbite, and poverty, most soon moved on.

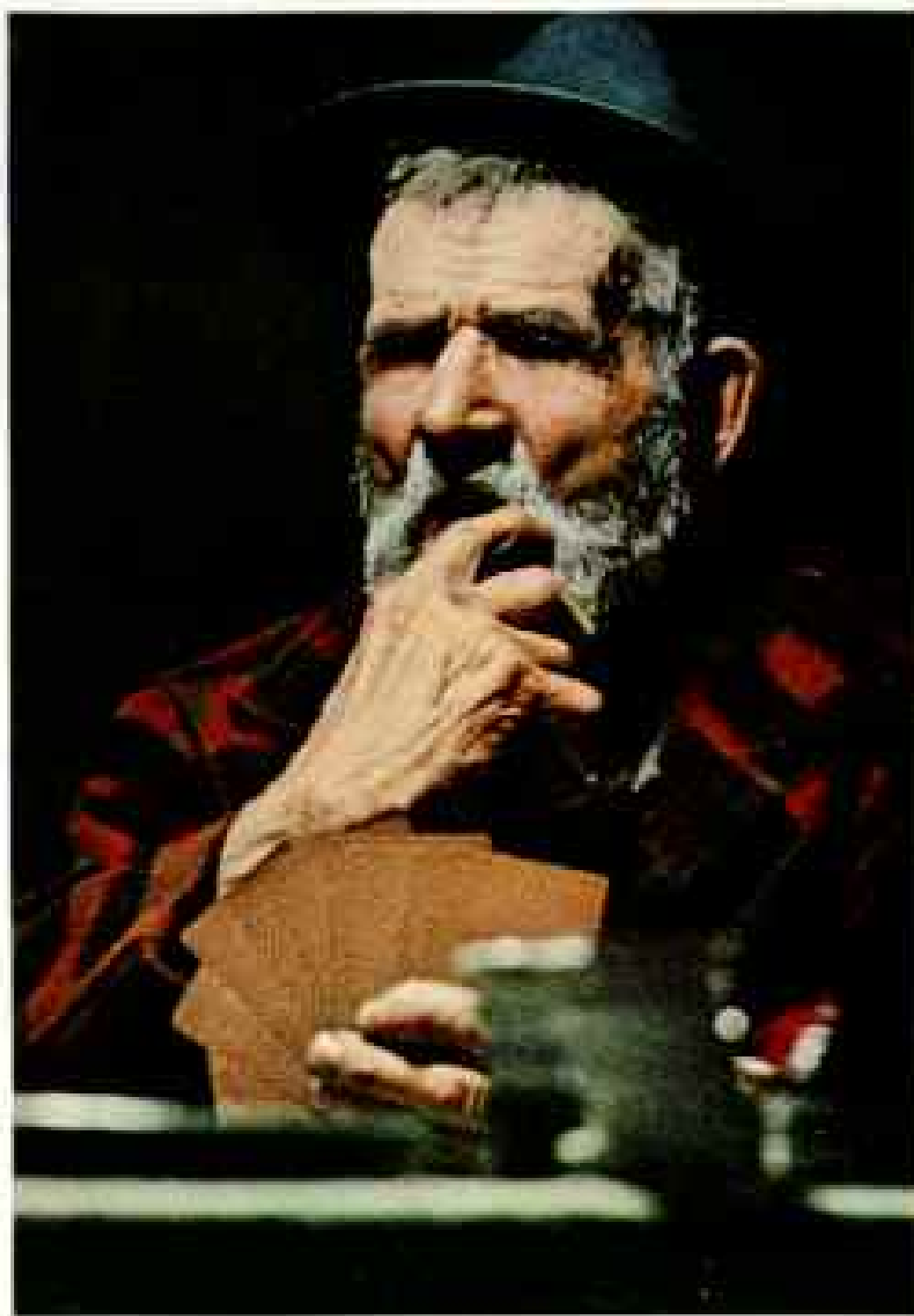


COURTESY OF NATIONAL FILM BOARD OF CANADA (ARCHIVE); RETROCHROMED BY DAVID S. BRYAN (C) N.F.S.

Paying with gold dust, a lucky miner empties his moose-skin poke at a Dawson store in 1899. Prices fluctuated wildly. One winter, flour sold for \$75 a sack, a cucumber brought \$5, and salt was worth its weight in gold. By 1900 cheechakos, or tenderfeet, found most creeks staked; within a decade placer mines were exhausted. Today only a trickle of gold leaves the Yukon, largely a by-product of copper mining.



Eyewitness to madness, 86-year-old Emma Brown, a Tahltan Indian of Telegraph Creek, British Columbia, recalls "our men made a lot of money packing in for those crazy ones."



Warned by visions of wealth, "Black Mike" Winage arrived in Dawson in 1900 as a constable of the Mounties. Now, at 98, he stays on in a one-room cabin, still trying his luck in the hills.



Shimmering curtain at atmosphere's outer limits, the northern lights appeared to Eskimos as torches guiding the dead to their final rest. Most often visible at high latitudes, as here along the South Nahanni River, the aurora borealis occurs when

then overland toward the yellow dust of the Yukon in the spring of 1898. Now she was Grandma Brown (preceding page), a "third grandmother," with four generations of descendants. She still had a beautiful face as she sat before an old Singer sewing machine and recalled those sights from long ago.

"They was camped all over the ice a few miles down there, at Glenora," she said. "It was a tent city. They was using all kinds of animals—dogs, horses, even goats—to pull their sleighs. They lose 100 men on our river that spring. They put too much on their

sleighs. Too heavy. They crash right through the ice. Those crazy men!"

But Grandma Brown has lived to see many more "crazy men" scrambling into her North to seek their fortunes and their futures. Gold? Only incidentally. It is a by-product in today's big-time mining for copper.

Where Every Other Well Pays Off

All mineral deposits are exhaustible, like the gold of the Yukon. But one pool of underground wealth may be so widespread as to stagger even the exploiters—oil. In one field



DISCHARGES BY JOHN LEVINE © 1983

high-energy particles bombard nitrogen and oxygen atoms in the ionosphere, about 110 miles above the earth.

being developed in the deep-frozen British Columbia mountains. I watched "roughnecks" drill an oil well that cost a million dollars.

"We hit oil every second well we drill," foreman Ron Purcell said. "And we're probably only on the fringes. A large part of the North is sedimentary rock. It's the greatest prospective oil field in the world—all the way into the Arctic islands. They'll be taking oil out in atom-powered tanker submarines, under the ice, one day."

The North knows that some of its renewable resources, its fish and big game and

birds, are also exhaustible. Wearing telephoto cameras, I went hunting for grizzly bear and mountain goat on the Yukon-British Columbia border. Fletcher Day, a tall Tahltan Indian (page 38), was my guide and outfitter. With us were hunters Sepp Weitgasser of Salzburg, Austria, and Don Kiesel of Falls Church, Virginia. We all got what we came for.

"This North is maybe the last refuge of great hunting in the world," Fletcher told me. "But we're beginning to run a bit low on game ourselves. Maybe someday we'll all be photographers, instead of hunters. They don't decimate the game. Don't even scare it."

Fisherman Prays for a Little One

Even fish and water in the North may be exhaustible. I flew with Dave Fowler, of the Canadian Water Survey, and bush pilot John Daykin to a dozen of the North's greatest lakes and rivers, and some lesser ones in the Arctic islands. Dave and his crew were taking the pulse of rivers never before measured, to record their flow and so help Canada determine how much water it really has (page 6).

By chance we landed at a luxury fishing camp on Great Bear Lake, where you can have two weeks of the world's most fabulous lake-trout fishing—if you can afford \$1,650.

I'm not a lake-trout fisherman by nature. I preferred flicking dry flies into rapids of the Camsell River nearby (pages 38-9). Here each cast brought to the surface several two- or three-pound hungry arctic grayling.

Later we put down where the Tree River floods into the freezing sea, and I stood on an ice floe and offered up a strange, small prayer: "Please, let it be a little one!"

I had nothing but my light fly rod, and the water was churning with the fabled arctic char, a fighting, silver-backed, pink-bellied fish. Beside me John Daykin, with heavy spinning tackle, had just watched a 15-pound char take his lure and 200 yards of line over the horizon in the general direction of the North Pole. John just stood there speechless, with an empty reel.

I was luckier. A lovely little four-pounder chose my royal coachman fly and went fighting and shaking up into a quivering silhouette against the midnight sun. Minutes later, he came flopping up onto the ice.

We fried him over a camp stove and ate him there beside the water. Then we clambered into the plane. John hollered "Hang tough!" And we roared off the freezing water and set a course south. THE END

Hyenas

THE HUNTERS NOBODY KNOWS

By HANS KRUK, Ph.D.

*Photographs by
BARON HUGO VAN LAWICK*

LIGHT WAS FADING from a gray April sky over the vast caldera called Ngorongoro in Tanzania. Within the high rim of this ancient crater lies a hidden world of plains, hills, and forest—a paradise for animals and for scientists like myself who study them. My wife Jane and I sat in tense silence, waiting. All about us herds of wildebeest and zebra were drifting to grazing places for the night. A flock of crowned cranes slowly winged toward the small lake on the crater floor.

Suddenly the scene exploded in a frenzy of action. A herd of wildebeest just ahead of us boiled in wild commotion as a large bull broke and galloped away.

I seized my binoculars. In the round field of vision I could see clearly a hyena running at full speed on the wildebeest's heels. They went head to tail, the stocky hyena having little difficulty keeping up with his longer-legged quarry. Every now and again he would leap up, biting at the tail, legs, or loins of the fleeing bull.

My heart was knocking in my throat, for this was our first observation of the hyena as a hunter.

"Look!" Jane called. She, too, was following the chase through field glasses. "Here come some more!"

From different directions, five more hyenas appeared, all at a dead run, intent on the fleeing wildebeest. He headed straight for the lake; by now he had run almost two miles and was visibly tiring. The hyenas closed in rapidly.

In a last frantic effort, the bull reached the lake and plunged in. He struggled into deep water and vanished. The hyenas came to a stop. In a moment all was still, but for the rippling water where the bull had drowned. Jane and I put our glasses down and sat there flabbergasted by the unexpected chase and its sudden tragic ending.

Cocking a wary eye, a hyena drinks before joining a pack on a prowl of Tanzania's Ngorongoro Crater. The author, a young Dutch scientist, found that the spotted hyena, *Crocuta crocuta*, long considered a cowardly scavenger, hunts by night in deadly packs, which are unafraid to tackle even a lion that tries to steal their prey.







That grim incident was one of many we observed during months of research in the great crater and in nearby Serengeti National Park (map, opposite). Scientists of many nations, invited by Mr. John Owen, Director of the Tanzania National Parks, are working in the region—studying the lion, wildebeest, zebra, Thomson's gazelle, and other animals that swarm over that magnificent grassland—to help solve the twin problems of wildlife management and conservation.*

The Netherlands Foundation for the Advancement of Tropical Research has generously sponsored my own study of the spotted hyena (*Crocuta crocuta*) and its relationship to Tanzania's game herds. Hyenas, common carnivores in much of Africa, are distantly related to the cats rather than to the dogs. Of

*In May, 1968, NATIONAL GEOGRAPHIC presented "Tool-using Bird: The Egyptian Vulture," by Baroness Jane van Lawick-Goodall—a report also based on studies in Serengeti National Park and the Ngorongoro Crater.

Drug-bearing dart fired from a gun immobilizes a hyena for marking. Like cattle brands, distinctive patterns cut in the ears enable the author and his wife to keep track of 50 Ngorongoro hyenas and 200 in the Serengeti National Park.

Notching a hyena's ear, Dr. Kruuk flags the drugged animal with a home address. Recognizing the marked ears through binoculars, he learned that Ngorongoro hyenas stick together in roaming clans which divide the crater into eight hunting grounds, each guarded against invading clans.

Earmarks of distinction identify a watchful pair of hyenas as members of Ngorongoro's Scratching Rocks Clan. Ghoulish grins recall the eerie "laughter" heard at their feasts. A golden jackal and an Egyptian vulture share this wildebeest kill. The hyenas' bone-crushing jaws assure that little will remain. Look-alike adults gave rise to a native myth that each hyena is both male and female.



STACEY/REUTERS (LEFT) AND BLOOMBERG VIA GETTY IMAGES (RIGHT)



the three known species, the spotted hyena is the most abundant.

When I began the work four years ago, I thought of the hyena, as most others do, as primarily a scavenger, dependent on the kills of braver creatures for survival—though it did seem implausible that so many of these animals could live only on what the lions left.

Now, however, after that dramatic chase in the crater, Jane and I were no longer so sure. Perhaps the folklore of generations of



tourists and hunters was, after all, wrong. We thought that we might find the answer on moonlit nights in Ngorongoro.

During our stay in the crater we lived in a small wooden cabin built by the National Geographic Society for the use of scientists. We had decided that one reason the hyena remained a relatively unknown animal was the reluctance of observers to follow him as he roamed, sometimes in packs, through the African night. That is why we took it as a





NIGHT DRAMA IN THREE ACTS: *Pursuit, capture, kill. A Burchell's zebra falls to a hyena pack in this remarkable sequence showing the nocturnal hunters in action. Fiery-eyed from the camera flash, the predators rip into their prey, ignoring the golden jackals awaiting their chance at the spoils.*

RODCHROMES BY BARON HUGO VAN LAWICK © N.S.E.

49



signal when an unseen hyena called out one evening as we were having dinner.

That long series of *whon-oops*, rising and falling until it ends in a deep, soft growl, is to me one of the most moving and evocative sounds of Africa. I listened until the last syllable died away. Then another hyena called.

"There must be several together," Jane said.

"Let's go," I replied.

Only a hundred yards from the cabin we found nine hyenas, walking close together with their tails up. They hardly noticed us as our Land-Rover eased in beside them. I switched the lights off. With only the low mutter of the engine, we cruised quietly with the silent hunters.

They were obviously at home in that night world. Vast Ngorongoro spread before us, bathed in the cold light of a full moon, the blue crater walls rimming the horizon. A wildebeest grunted in the near distance.

"They're not interested in wildebeest tonight," I remarked.

Jane nodded in agreement: "There are hundreds around, but the hyenas aren't even looking at them."

Bottle baby. Solomon, the author's pet hyena, accepts milk from Mrs. Kruuk, whom he seemed to regard as his mother. The youngster one night almost fell victim to a cannibalistic adult hyena (page 52).

ESPANOWE BY HANS KRUIK © R.S.S.



We rolled onward beside the pack for more than an hour. Once they crossed a deep stony gully, and we had to drive a long way around to catch up, a tense chase in the eerie moonlight.

The ground began to slope upward sharply, and the going became very rough. At the same time the hyenas broke into a faster gait, as if they had scented their quarry.

Zebra—Target for Tonight

Then the thunder of hoofs rolled through the night, and a dozen zebras galloped down the hillside in a tight formation. The car jolted, bounced, and almost turned over as I fought the wheel to turn quickly on the steep slope. We took up the chase.

The hyenas had formed a running arc of flashing teeth behind the small herd; now one zebra dropped back to fight.

"It's the stallion," Jane said. "He's going to defend his mares and foals."

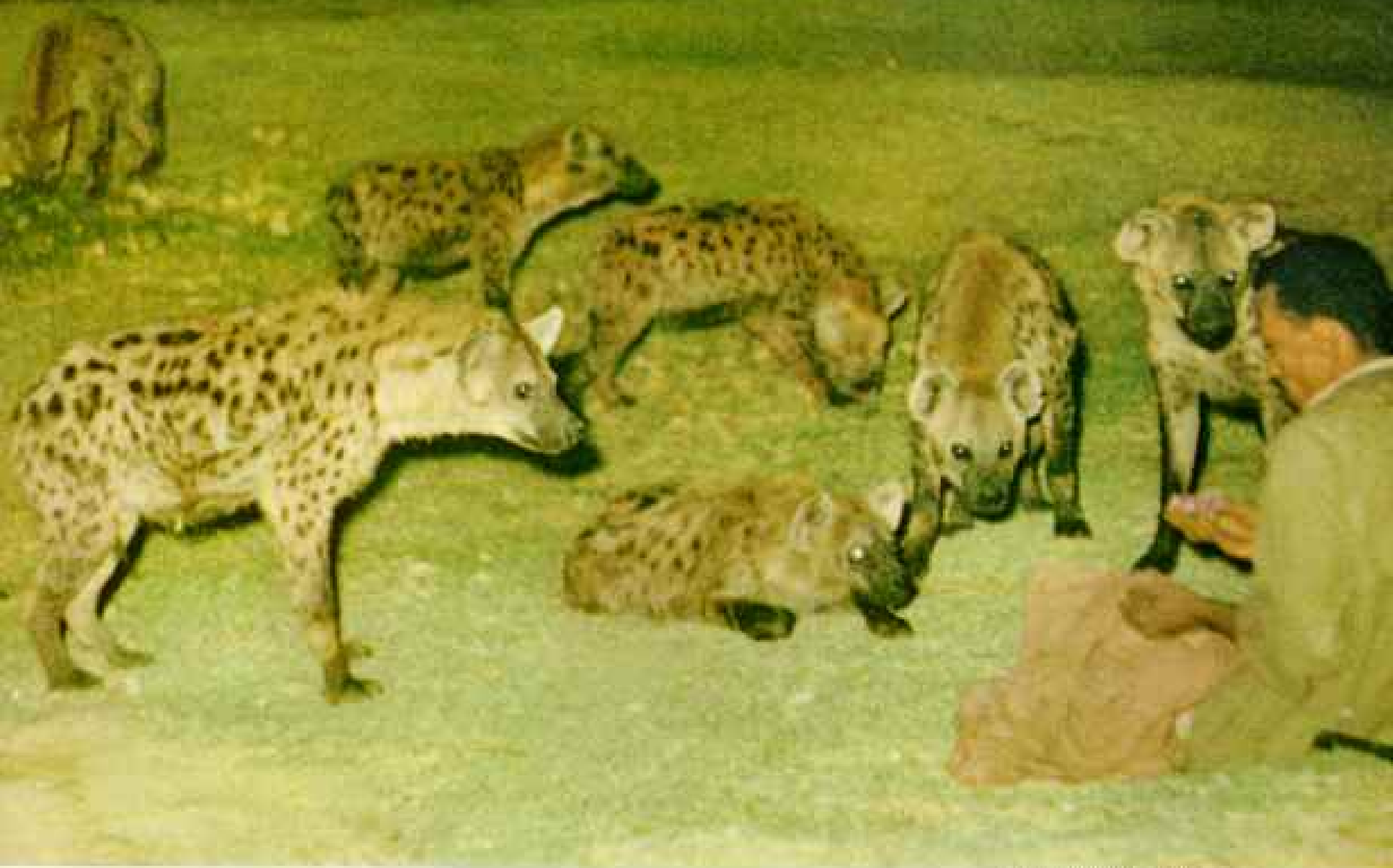
The stallion kept a short way behind the others, wheeling to bite and kick, leaping from side to side as the hyenas converged. The mares and foals, however, seemed unable

to take advantage of his delaying tactics; without his leadership they milled about, filling the night with high-pitched barking cries.

At last one hyena broke through the stallion's defense, reached a mare, and clung to her loins with his teeth. She tried to struggle on, but another and then another of the hunting pack sprang from the darkness. Three minutes after she was caught, the mare sank heavily to the ground (preceding pages).

In the end there was a throng of 30 hyenas at the scene; within an hour, the calm of the night had returned to the hillside. A bird cried. The swinging balance of life and death that is primeval Africa seemed to pause, if just for a moment.

In time we became familiar enough with the ways of the hyenas to predict their quarry. A zebra hunt always involved a large pack working as a team. Wildebeests were worked at first by one or two individuals, with the others joining in as the chase progressed. Gazelles were run down by single hyenas, hunting on their own.



EXHIBITION BY HANS KRIEGER © R.S.P.

Drawn by a handout, the town scavengers of Harar, Ethiopia, gather like pet dogs around a hyena-man with his bag of scraps. Every night the animals enter the city, serving as prowling garbage collectors. Extra feeding supposedly ensures their tameness, but townsfolk still keep their children off the streets after dark.

Still, we worried. Could popular opinion be *that* far wrong? Were our observations the exceptions rather than the rule?

One night on the Serengeti, we witnessed a remarkable incident that helped provide the answer. A wild chase by two hyenas had finally brought down a wildebeest. More and more hyenas arrived; the jackals came, darting in and out around the kill. As the crowd increased, growls, yells, and the typical hyena "laughter" filled the air.

Hyenas Attack a Hijacking Lion

Suddenly the hyena alarm call sounded, a series of soft, short grunts. Immediately there was silence. From the nearest clump of trees a tawny lioness came streaking through the moonlight. The surprisingly soft alarm calls now sounded everywhere, and the hyenas scattered in all directions. The lioness settled next to the abandoned wildebeest carcass.

"Well," I said, "that's the end of that."

But, amazingly, the hyenas regrouped, in

an angry mood, with tails raised and manes bristling. They crept toward the eating lioness, keeping largely to her rear. Only the swishing of her tail betrayed that she noticed them; when they came too close, she growled deeply and they jumped back.

But only for a moment. Suddenly one dashed forward and bit the lioness on the rump! She leaped up and lashed with her claws—but back came the hyenas, lowing and whooping, forming a mob behind her. Again one leaped forward and bit—and the next thing we knew, the lioness was running back to the bush, driven off the kill.

Their triumph was brief. Soon two black-maned male lions appeared, trotted up to the feast, and claimed it. This time there was no argument. The hyenas all lay down in the grass, forming a rough circle around the lions.

The hours passed. Dawn came. About an hour after sunrise, as Jane and I were preparing to start for home, a car appeared, bumping across the plain with a load of tourists. It

circled the scene and came to a stop, with cameras poking out of the windows.

One of the tourists, a lady, looked out at the hyenas and said to the others, "Look at them—they're waiting for the spoils." None of them considered the possibility that the lowly hyenas might be waiting to reclaim their own kill.

During our months in Africa, we made thousands of observations, by day and by night, that gave us a new picture of animal relationships, quite different from the one we had accepted. We discovered that hyenas will indeed eat the remains of a lion kill—but lions will also take the kill of hyenas. Both are scavengers, if the opportunity presents itself.

In the Serengeti, hyenas and lions do most of their own killing. In Ngorongoro Crater, however, lions almost never kill for themselves, but rely on the hyenas to do it for them! In the dozens of episodes that Jane and I witnessed in the crater, only four times did we see a lion feeding on its own kill.

We tested our conclusions by tape-recording the sounds of hyena packs gathered around their kills. When these tapes were played over a loudspeaker set up in the crater, the lions were usually not long in showing up.

Foundling Hyena Adopts a New Home

There is no better way to get the "feel" of the behavior of an animal than to have one constantly around in the house. Thus we were delighted when we heard that African park rangers had found a young hyena near one of the remote guard posts of the Serengeti National Park. We went to collect it immediately.

It was a tiny, round, week-old cub, still pitch black, whimpering and unable to walk. We named him Solomon, and he soon became the delight, and the bane, of both our lives (page 50).

He regarded Jane and me as the senior members of his family and considered our house in Seronera, in the Serengeti, as his den. More than anything else, he loved riding in the Land-Rover to look at the animals!

One day we came upon a pride of lions basking in the afternoon sun. I rolled up to within a few feet of them. Solomon watched them through the window in a detached, interested manner. But as soon as I turned the vehicle downwind and he caught a whiff of lion, he became terrified and struggled to leap from the window.

On one dark, moonless night, as I lay awake in our house at Seronera, a sudden, high-pitched yell, the sound of hyena fright, brought me to my feet in alarm. Solomon! He liked to prowl around outside at night; when he had cried out before, he had always come rushing back to the safety of the house. This time the cry seemed to be moving away into the bush.

Grabbing a flashlight, I jumped right out of the window and ran toward the cries, shouting at the top of my lungs. Afterward I realized what a fool I had been, running through the thornbush on a pitch-black night, barefoot and clad only in pajamas.

Two hundred yards from the house I caught up with Solomon. His bedraggled little figure hung from the jaws of an adult hyena, which had him gripped tightly by the throat. At the sight of a pajama-clad wild man, leaping about with a light and screaming, the adult dropped its prey and ran.

I brought Solomon home with a gashed throat, punctured windpipe, and broken jaw. It took many doses of penicillin and weeks of

In a scramble for safety, a hyena dodges the horns of a mother wildebeest bent on protecting a newborn infant. Hyenas can run almost tirelessly and up to 40 miles an hour, outpacing all but the fastest animals in life-or-death races. As hunters, hyenas attack from the rear, felling the victim, then tearing it apart.

Snarling a warning, a hyena drives off interloping vultures and takes over spoils already picked to the bone. The two species may help each other find the next meal. Hyenas sometimes watch for vultures swooping down to a kill. When airborne, the birds can see prowling hyenas at great distances. Hyenas permit vultures to share a feast only when their own ravenous appetites are eased.

Sneak attack: A stalking hyena lunges at the head of a baby rhino, helpless with a broken hind leg. Its huge parent appears slow in reacting, possibly because she has already defended her youngster for at least ten hours. Even lions, if old or crippled and alone, may fall victim to the bold ferocity of hyenas.



SCAVENGING (TOP) AND DISCHARGES BY BRAD WILK FOR LEWIS © N.S.B.





STACHURSKI © NATIONAL GEOGRAPHIC SOCIETY



Hyenas bite a young lion muscling in on a feast. Here it crouches to protect hindquarters and turns to defend itself. Shortly the lion fled the field, briefly leaving the spoils to the rightful owners. Upraised whisk-broom tails of hyenas tearing at the carcass signal their excitement.

But two big cats are too many, and this time the hyena pack reluctantly shares its kill with the visitors, in a scene rarely if ever photographed before. Surprisingly, the author found that Ngorongoro lions seldom do their own killing, relying instead on the hunting skills of hyenas.



patient care to pull him through. It was our first inkling of cannibalism in hyenas.

Poor Solomon—civilization was altogether too attractive to him. He liked nothing better than stealing into the house of the chief park warden and eating the butter from the breakfast table before the warden appeared. He was fond of the cheese and the company at the Seronera Lodge, but the manager drew the line when Solomon suddenly appeared in the bar.

Finally we had to choose: Lock him up or find him a home. Regrettably we shipped him to the Edinburgh zoo, a year-old hyena too tame to return to the wild. I hope he still gets a nip of cheese and butter once in a while.

Hyenas Serve as Garbage Collectors in Harar

One place where people and hyenas get along together is the old walled city of Harar in Ethiopia. As part of our study, Jane and I made a visit there and walked at night through its winding medieval streets. Even though we had been warned, we were aghast at our first sight of several large hyenas also walking the streets, picking up bones from butchers' stalls and even accepting tidbits from human hands (page 51). They seemed as tame as dogs. We passed a side street, and Jane nudged me. A woman lay sleeping along the side of the road.

"She wouldn't be doing that with Serengeti hyenas around," Jane said.

An Ethiopian at the hotel explained the unique arrangement. "People here are at ease with the hyenas, and the hyenas with the people. We give the hyenas a large present every year, for instance a dead cow, and if they accept it, they will not harm anyone. But if they should refuse our gift, we know they would give us trouble."

The hyenas keep Harar's narrow streets clean. At the end of a long, hot day, one needs little imagination to realize what an important task that is.

Most Africans, however, have a well-founded dislike for the hyena. Every so often newspapers tell of hyenas attacking villages, killing or maiming people. Like wolves, they sometimes go for cattle. Once a herdsman in the Serengeti asked me for a piece of hyena skin, which he would grind up and feed to his cattle to protect them from this evil. I gave him a piece, and he later assured me it had proved effective.

But the hyena in the wild, the aggressive hunter that competes with the lion, is the unknown animal—and the one that Jane and I returned to Ngorongoro to investigate. We used darts fired from guns to drug the animals for a brief period. While they were immobilized, we clipped small triangles from their ears; we marked in this way 50 individuals that could be recognized on sight (pages 46-7). From the observations that followed, amazing patterns of behavior began to emerge.

We found that about 420 adult hyenas live on the 100-square-mile floor of the crater, but that each marked animal stayed, with his comrades, in a particular area. The hyenas, in short, lived in groups that we called clans. Further, the clans had divided the crater into eight

hunting ranges, each clearly marked in the hyena mind, so to speak, but not defined by natural boundaries. The line dividing two clans might run across an open plain.

How are these boundaries maintained? Once again we found the answer on a moonlit night by mingling with a hunting clan. Instead of a hunt, we witnessed a war.

We had been following a pack from what we had labeled the Clan of the Scratching Rocks, after some rocks near their den where zebra used to come and rub themselves. The pack charged a herd of wildebeest, singled out a cow, and chased her for more than a mile before pulling her down—far from their own range. Soon afterward, Jane and I were surprised when the alarm call unexpectedly sounded. All the Scratching Rocks hyenas jumped away from the kill and stared at a group of newcomers rushing toward them. First there were four of the strangers, then five, then six—all with tails up and manes

bristling. The wildebeest carcass was forgotten as fierce fighting broke out.

Hyenas seemed to be everywhere around the Land-Rover, in a storm of snarls, growls, and fangs. I was desperately trying to report the event into a recorder, but soon gave up. My last entry was, "No use trying."

On the field of battle there were now about 30 animals in two small armies—hyenas within each group sticking closely together, tails bent forward right over their backs.

"There," I said to Jane, "among the newcomers—one with marks in the top of its left and the center of its right ear."

Jane snapped on her flashlight and thumbed quickly through her notebook. "An old female," she said, "from the Lakeside Clan."

Then we understood. The Clan of the Scratching Rocks had killed in the range of the Lakeside Clan, and now they were being attacked for violation. The conflict continued for about 15 minutes, with first one side and



ERICH HEINE, JAROSLAV VEJNARSKI © N.G.S.

Sleeping mother makes a soft pillow for her cub. Adult females in the Serengeti were found by the author to weigh as much as 130 pounds—more than their mates—and to rule hyena life. The mother's size helps her guard her young against sometimes cannibalistic fathers. Usually whelped as twins, the black cubs are reared in dens clustered in clan communities. Spots appear in a few months, but hyenas need two years for full growth. They may live to an age of 25.

Hyenas laze in the sun (right); one nurses a half-grown offspring, its ear visible in the center. Hyenas love to wallow in water, but even frequent licking with rough tongues fails to improve their unkempt appearance.



then the other uppermost. Gradually the Lakesiders prevailed, and the Scratching Rocks hyenas, licking their wounds, slowly scattered and drifted back to their own grounds.

Females Dominate Hyena Clans

Once we understood the clan system, other observations began to fit into place. The clans are dominated by females, a most surprising fact among carnivores. It is a matriarchal society. The females usually stay within the range of their own clan, but males sometimes change clans. One of the marked males, in fact, belonged to two clans at the same time.

The females in a clan bear their cubs in dens clustered together, but each attends to her own offspring. The dens consist of large holes in the open grassland, sometimes dug by other animals; males are tolerated near them, but not too close to the young cubs. Little Solomon's misadventure was a vivid reminder that occasional cannibalism occurs;

a mother hyena may have to protect her offspring against the teeth of the father.

These things are true in Ngorongoro, but do they also apply to the Serengeti? There the herds of wildebeest, zebra, and gazelle are constantly on the move; they cover hundreds of miles, crowding into some areas and leaving others empty for long periods. Hyena society seems less organized; there is not as much pack hunting, and there is more solitary hunting, especially for gazelle. In the midst of the migrations, both the territorial system and the clan system undergo changes.

Many questions remain to be answered. What keeps hyenas' numbers in check? What is behind their selection of prey? It is through the study of problems like these that we will come to understand the basic laws underlying this animal society—and perhaps be better able to manage one of the majestic resources of our planet, the vast animal communities of Africa.

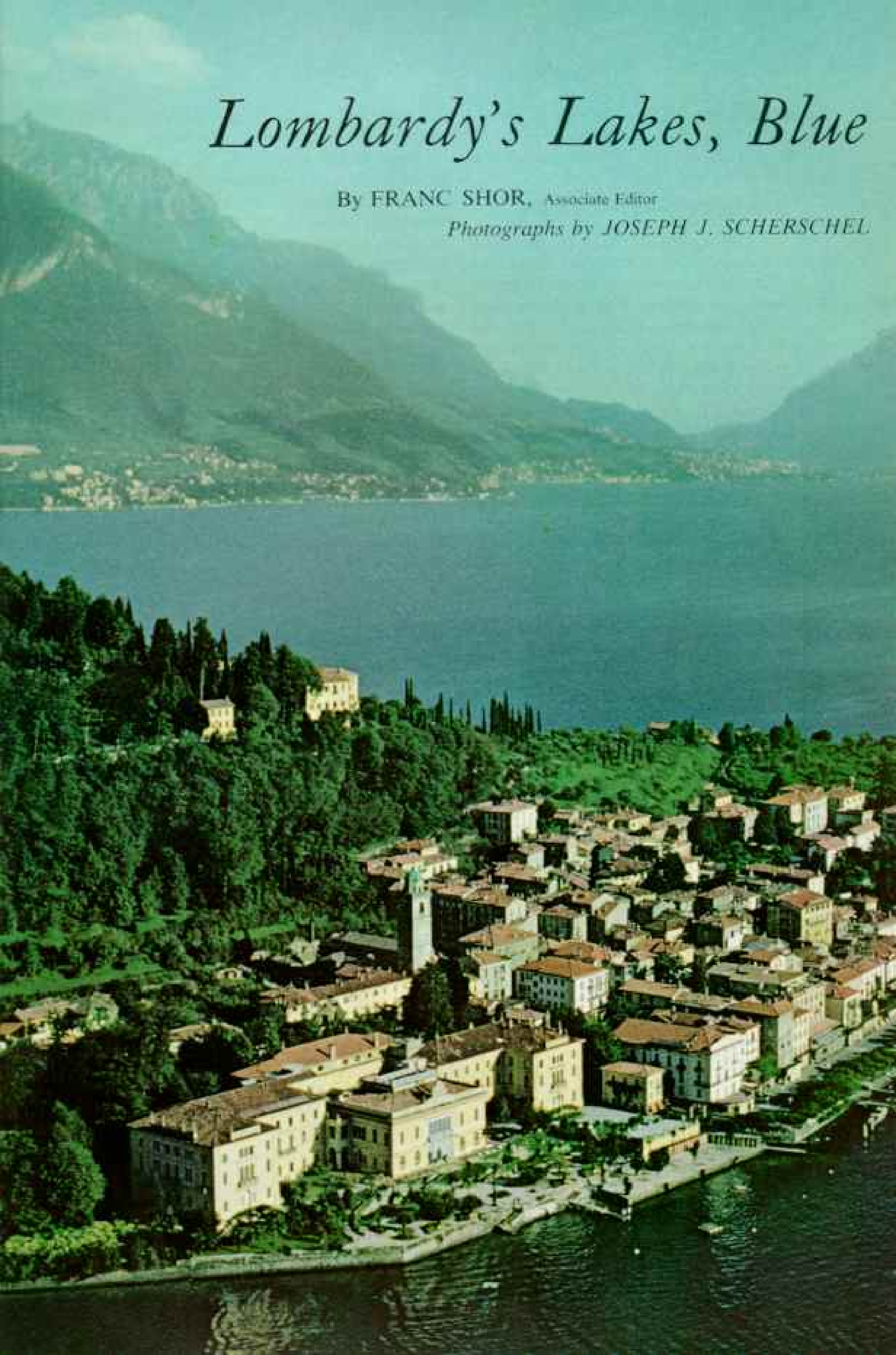
THE END



Lombardy's Lakes, Blue

By FRANC SHOR, Associate Editor

Photographs by JOSEPH J. SCHERSCHEL



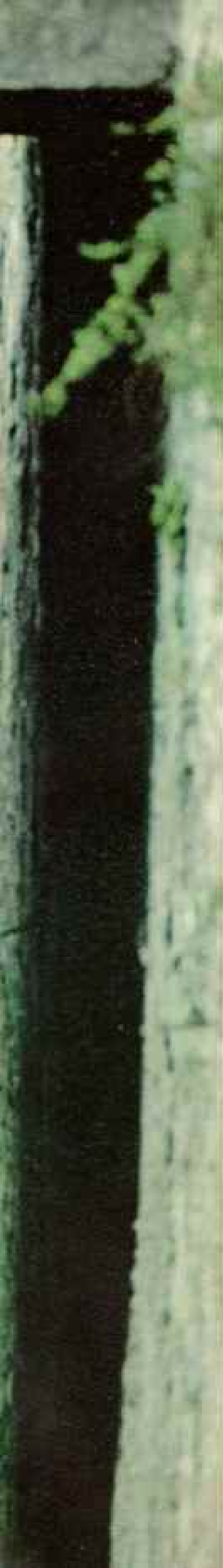
Jewels in Italy's Crown

BELLA BELLAGIO: Embraced by Lake Como's azure arms, beautiful Bellagio dreams in the sun. These splendid heights and serene waters typify Italy's lake country.

CONDORCE © S.L.L. 59







BORN OF ICE, shaped by the ages, and mellowed in the warm Italian sun, the Lakes of Lombardy for two thousand years have delighted the eye, inspired the poet, and quietly invited the soul.

This is not, I hasten to admit, an entirely original observation. It has been shared, over those two millenniums, by such Roman poets as Virgil and Catullus, by Goethe and Dante, by Tennyson and Longfellow, and by the more than three-quarters of a million visitors who sojourned in the area last year.

To say simply that the lakes are magnificently beautiful, or to quote poetry which says the same thing in more elegant language, may not make much of an impression. But when you know that the area is so spectacular that it inspired the invention of photography, perhaps you will understand just how remarkable it really is.

In October, 1833, the great English scientist William Henry Fox Talbot sat "on the lovely shores of the Lake of Como," reflecting on the "inimitable beauty" before him. "It was during these thoughts that the idea occurred to me," he wrote later, "how charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper!"

Honor Shared by Two Men and a Lake

In January of 1834, Talbot returned to England and went to work in his laboratory. The remembrance of Como's beauty drove him on, as did the knowledge that the Frenchman, Louis Daguerre, was working in the same direction. The two men today share the honor of inventing photography, but Como shares with no other spot the honor of having inspired it.

With my wife and her 12-year-old twins, a boy and a girl, whom I am adopting, I spent last summer on Como and two of its sister lakes, Garda and Maggiore (map, following pages). Italy was a happy choice, for Donna lived there for years and speaks the language perfectly, and Donnali and Brian had gone to an Italian public school through kindergarten and the first grade, and had once been fluent in the language. Now six years of French and American schools had erased their early facility. It would be nice, we thought, if they could regain it.

So we flew to Milan, rented a car, and drove north for forty minutes to the city of Como. Our first view of its magnificent waterfront assured us we had made a wise choice (pages 68-9). Within a few days we realized that the twins would gain much more than language and an experience of beauty. For the history of Como, and indeed of the whole lake area, is a perfect example of the

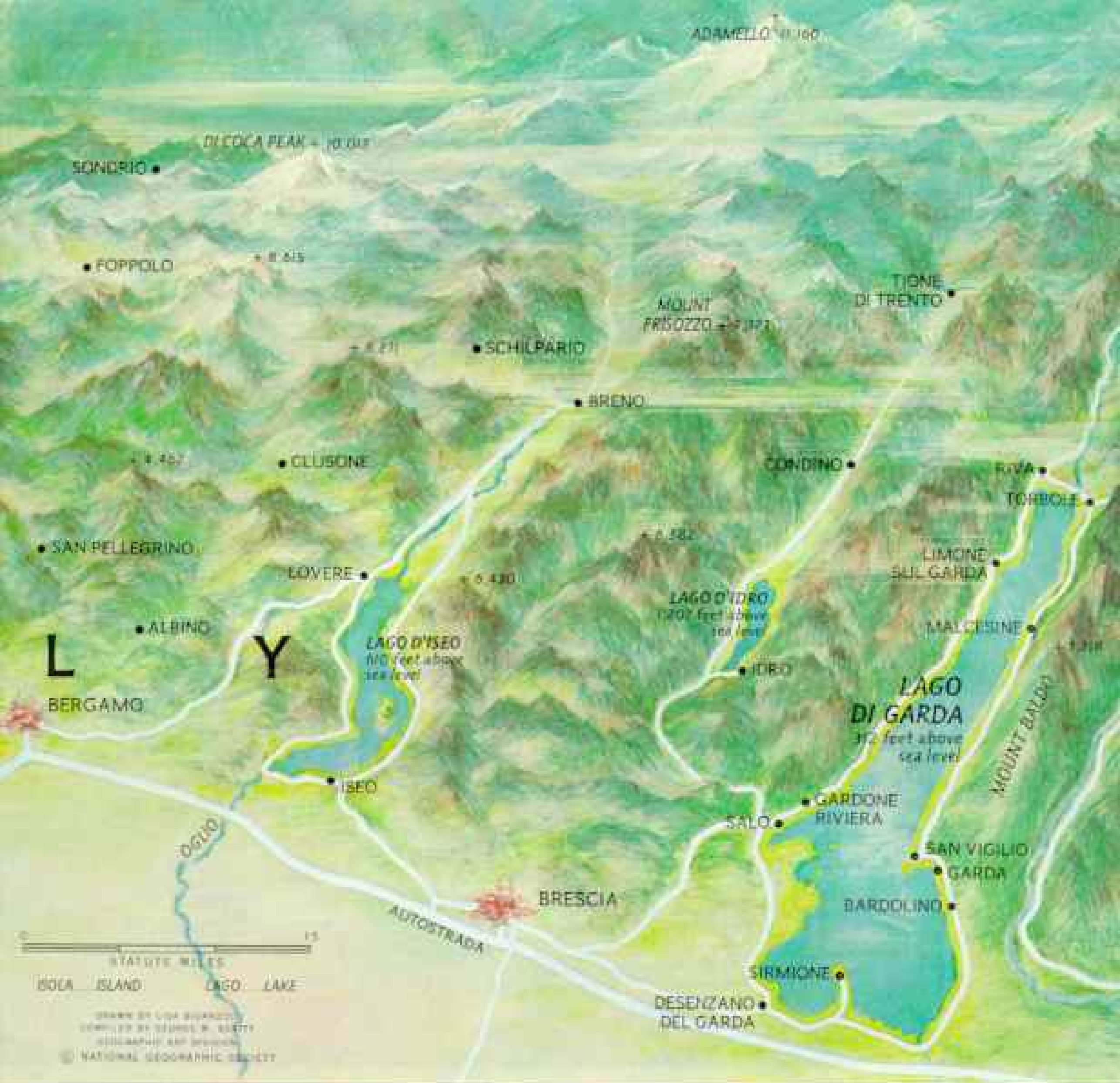
Laughter keynotes lakeside zest for life. The beauty that surrounds northern Italy's people seems to infuse them with a rollicking spirit. In Varenna, a mother pauses to joke with fishermen untangling nets after a day on Lake Como. Covering on the narrow passageway's cobbles protects the mesh. The men catch trout and pike for sale to hotels and restaurants.



Italy's Land of Lakes

CARVED from the Alps, gemlike lakes glitter in the Italian boot top. Ice, gouging southward millions of years ago, scooped out their basins, and man came to settle their shores. In time he embellished nature with the glories of Italian architecture.

The region blends soaring peaks with lush Mediterranean vegetation. The waters of Lake Orta, westernmost of the sub-alpine lakes, flow northward, eventually emptying into Maggiore, longest of the lakes. To the east of Lugano, almost entirely Swiss, sprawls three-pronged Como with its celebrated villas and resorts. Lakes Iseo and Idro, though smaller and less famous than their neighbors, play host to almost as many visitors. Largest in area, Garda marks the eastern limit of Lombardy's lake country.



turbulence of European political upheavals over 25 centuries.

Como is a historian's delight—or nightmare. Before the time of Christ it had known the rule of Etruscans, Celts, and Romans. Julius Caesar gave it city status and colonized it with 5,000 Roman citizens, among them 500 Greeks.

Rome decayed, and Goths, Huns, Vandals, and Ostrogoths ruled in turn. Then, in the sixth century after Christ, the Lombard tribe conquered the area, and their kings reigned for nearly 200 years. Local despots held sway until the Renaissance; then came a merry-go-round of French, Spanish, and Austrian rule. It was not until the middle of the last century that Como at last became truly Italian.

Dominating the city today is the magnifi-

cent Cathedral of Santa Maria Maggiore; a delightful blending of Gothic and Renaissance architecture, on which work began in the 14th century. The cupola, added in 1731, completed the building as it stands today.

An unusual feature of the cathedral is that the main entrance door is flanked by statues of two pagans—the Elder and Younger Pliny, Roman statesmen and men of letters, who had villas on the lake.

It seems odd that the younger Pliny should have been so honored. In the early second century, serving as Governor of Bithynia, he wrote the Emperor Trajan, informing him that a group of people calling themselves “Christians” were gaining strength in the province. “The method I have observed toward . . . Christians is this,” he said. “I asked



LATACCHIONE (LIPPER BOAT)

them whether they were Christians; if they admitted it, I repeated the question twice and threatened them with punishment; if they persisted, I ordered them to be at once punished."

Futile Search for a Famous Frog

Equally fascinating is the cathedral's *Porta della Rana*, or Door of the Frog, named for an intricately carved frog which was part of the decoration chiseled by the Como masons who created the structure.

In the middle of the last century a priest from Lake Maggiore acquired a 15th-century document asserting that a treasure of silver and gold had been buried beneath the Frog Door. Como authorities approved a treasure hunt, and for a week the digging went on. Unhappily, nothing was found.

We did a little searching around that door ourselves. The four of us scanned the carving inch by inch, looking for the famous frog. We found a bewildering variety of beautifully and grotesquely fashioned figures, but no frog. Discouraged, we wandered on into the piazza, when a shout from Brian stopped us.

"Come back," he urged. "This isn't the Frog Door at all. It has another name."

We hurried back to find Brian excitedly pointing to the lock.

"See," he said, "the name is printed right here. It's 'Yale.'"

Later we found that the frog had been nearly obliterated by vandals years before. More recent travel writers, who hadn't bothered to look, had kept right on describing it.

Frog or no frog, Como is a delightful place for a family holiday. The fragrant odor of



PHOTO COURTESY OF JOSEPH J. SHEPPARD, III, N.Y.C.

Elegance for rent, the hotel Villa d'Este graces Cernobbio's shore. Guests live in tasteful luxury with a golf course, tennis courts, and swimming pool at their disposal. Sightseers charter this seaplane to explore the surrounding region. Cardinal Tolomeo Gallio built the palace in the 16th century as one of a series stretching 400 miles from Gravedona to Rome. Thus, in journeying to and fro, he could always sleep under his own roof.

Aristocratic bearing marks a Borzoi and her handler at the 26th International Dog Show at Bellagio.



Champion boatmen on parade, winners of the annual lake-rowing contest on Como pass in review at Cernobbio. They must stand to handle the oars on the broad-beamed vessel. Residents call the craft "Lucias" after the heroine of *I Promessi Sposi*, a novel about the lake district by 19th-century author Alessandro Manzoni.



pittosporum hedges fills the early summer air, and flowering bushes and trees line the ancient streets of the residential sector. The lake front is a boatman's heaven, dotted with hydrofoils, steamers, ferries, sailboats, speedboats, inflated rubber craft, and the local "Lucias," rowboats in which the rower stands while he pushes the oars (preceding page).

Fishermen, too, find a happy home here. Never, I must admit, did we see anyone actually catch a fish, but everyone, from ten-year-old boys to mustachioed patriarchs, seemed to be trying.

Como fishermen, incidentally, have an unusual technique for attracting their quarry. We watched while one young man cast his baited hook a dozen yards from shore, then drew a slingshot from his pocket, filled the pouch with meal worms, and propelled them into a circle around his bait.

"One worm wouldn't attract much attention," he explained. "When the slingshot load hits the water, it brings the fish into the area. Then they see the bait—and I have a fish."

We watched for an hour, and a dozen volleys of meal worms, but never did the fisherman feel even a nibble. The fish of Como, we decided, must be the best fed in Italy.

Donna and I spent our days visiting the cathedral and the museums and talking with civic leaders about the economy. Brian and Donnali spent theirs in the paddle boats and the park. Brian's soccer ball proved a ready introduction to youngsters his own age, and we soon found that both children were regaining their lost command of Italian. They made friends in the park, shared their lunches with playmates, and joined us in the evening with tales of the day's adventures.

Crisis Caps a Visit to Como's Zoo

Only once was there a slight mishap. We drove to the park to pick up the children, and found Donnali waiting in the appointed place, jumping up and down with excitement.

"Come quickly," she shouted, "Brian's in terrible trouble!" Before we could find out what it was all about, she was off at a run for the center of the park.

We caught up with her in front of the monkey cage, and found Brian standing close

to the bars, yelling excitedly at a small ape.

"He's got my swimming trunks," he explained. "I was just watching him, and he grabbed them out of my hand. Look! He's putting them on. Hey, stop it! Those are mine. They're clean."

Donna found a guard and explained the problem. The caretaker entered the cage, grabbed the chattering monkey by the trunks, which he had succeeded in getting over one leg, upended him, and dumped him out of the shorts as one might empty a sack of flour. But Brian, I'm afraid, never again felt quite the same about his trunks—or about that monkey.

Time and Telephones Follow Local Rules

Como today is a bustling city, as bedeviled by traffic as any American town of its size. But it retains much of the charming—and occasionally frustrating—easygoing air that most travelers associate with pre-Mussolini Italy. Como citizens, for example, don't seem to be particularly impressed by the need for accurate time. Even in the post office and the telephone exchange, clocks frequently differ by 15 minutes or more.

"But why worry about such a little matter?" a Como friend asked. "We're going to be late anyhow. And what is a quarter of an hour?"

The casual attitude toward time I learned to accept, but the vagaries of the Italian telephone system frequently drove me to distraction. Let me give you an example:

Having to make an important call to my office in Washington, D. C., I booked it for two o'clock in the afternoon, Washington time, and arrived at the Como telephone exchange a few minutes before the appointed hour. I waited an hour, two, then three. Finally, when it was nearly six in Washington, I knew that no one would be in the office.

Now if you cancel an overseas call from Como, even if the exchange has been unable to complete it, you must pay a forfeit of about \$3.50. If you postpone the call for less than 24 hours, however, there is no charge. So I asked the operator to please put the call over until the next day. She shook her head.

"It is not possible, *signore*," she smiled. "Tomorrow we are having a strike."

"Then book it for the following day."

Waves of magenta, pink, and myrtle green swirl about a model at a fashion show in Bellagio's Grand Hotel Villa Serbelloni. A local designer created this gown from Como silk, produced here since 1510. At one time, mulberry trees planted to feed the silkworms surrounded the city of Como; today manufacturers import most of their raw silk from the Orient.





Como wears two hats—resort town and commercial center. The city spreads around a tip of the lake that bears its name. Hotels and cafes line three sides of Piazza Cavour, the main square, and a steamer quay edges the lake front. Many of the darker buildings of medieval Como, right center, house showrooms of the city's famed silk merchants. The first century A.D. gave Como two of its

"As you wish," she said, "but in that case, you must pay the 2,180-lira forfeit, for that will be more than 24 hours."

"Then cancel the call."

"If that is your wish," she beamed. "That will be 2,180 lire, please."

"But the cancellation is not my fault."

"It is not important," she replied firmly, with the air of a schoolteacher reprimanding an importunate pupil. "The rule is clear. If the call is postponed more than 24 hours, the forfeit must be paid. There is nothing in

the rule about strikes—2,180 lire, please."

I shook my head and paid, and walked across the street to join Donna and the twins at a restaurant. Brian had found a jukebox and was listening enraptured to a multidecibel recording of *"Snoopy Contro il Barone Rosso."* If Snoopy and the Red Baron could find their way to Como, I wondered, why couldn't modern telephone techniques?

Como has survived armed invasions for some two thousand years, but last summer it experienced a new type of onslaught. The



most famous citizens, the writers Pliny the Elder and the Younger. Paradoxically, statues of these two pagans flank the central doorway of the cathedral, left center.



EXTRADROME (LARGE) AND HIGHCHROME (S) U.S.A.

Where flowers grow in profusion, a small bouquet costs but a few pennies. Vivacious vendor in the Como flower market delivers a sale along with wishes for a happy day.

hippies of two continents descended upon the city in droves and shattered its peace with blaring transistor radios and portable record players. Long-haired and unkempt, they sat on the curb in front of the lovely cathedral and made a quiet meal at one of the many charming open-air cafes impossible.

They came from France and England and Germany and the United States, and from Italy itself. In any city they would have been a nuisance; in Como they were a disaster.

"Before World War II," a tourist official

told me, "people came to our lake for peace and beauty and sunshine. Now they want noise and more noise. We don't have it, so they bring their own. And the way they talk. . . ."

"We have a worker in the information bureau here who speaks six languages, and his English is quite good. But a couple of weeks ago a group of long-haired English boys came to his counter. 'Where is the action?' one of them asked.

"This puzzled our attendant.

" 'What *is* the action?' he asked.



Mountain stairsteps climb above Rezzonico. Terraced vineyards and hayfields overlook Lake Como,



EMILIO GONZALEZ © WILSON, GUSTAVO SERRA

where sails ride the wind. On a collision course with a promontory, a boat prepares to come about.

Lush from autumn rains, grass falls to the scythe of a farm woman on the heights overlooking Premana. A helper rakes the fresh cuttings to be fed to dairy cows. Tucked in the mountains east of Lake Como, Premana manufactures fine surgical instruments, scissors, and other products made from imported steel.

House does double duty in Premana. The Codega family, metalworkers all, gather with a few of their employees in front of their combination home and factory. Father, four sons, and their families occupy separate apartments in upper stories. In the foundry on the ground floor (below right), a smith forges a Premana ice ax, especially prized by mountaineers.





KIDNEYHOLE LAKE LEFT; AND EXTRAORDINES BY JOSEPH J. SCHNEIDER © R.S.S.

"'No, *where* is the action?' insisted the visitor.

"'Yes, yes,' said our man, 'but what is the action that you ask where is it?'

"The dictionary was no help. He finally gave our guest the addresses of two movies, a swimming bath, the museum, and the cathedral, but I am afraid he was not satisfied."

I talked with Dr. Arturo Gregorutti, then director of the Como Tourist Bureau, about the problem.

"I should think this would give you a lot of concern," I said. "Tourism must be your chief source of income here, and this sort of atmosphere won't make the ordinary visitor very happy."

"We don't like it," smiled the wiry official, fingering his neatly trimmed mustache, "but it will pass. The hippies congregate in the

downtown area, and there are a score of magnificent resorts on the lake where they never appear. And forgive me for correcting you, but tourism, while important, is far from being our principal industry. In fact, it ranks fourth. Silk is the first, then furniture manufacture, then light industry. Our economy here is very well balanced. We're about the most prosperous area in Italy."

Dr. Gregorutti introduced us to Dr. Renato Bertani, chief of the foreign section of the Como Chamber of Commerce, who supported Dr. Gregorutti's comments with statistics.

"But don't think we're content with things as they are," Dr. Bertani said. "We're launched on a new industry—plastics—and we're increasing our production of clothing.

"You see," he continued, "it's relatively easy for a new industry to establish itself



here. We have excellent communications, both road and rail, and we're only a few miles from the Swiss frontier, which simplifies export trade. Too, Milan is only half an hour away by highway, so we have access to a great pool of skilled labor."

At the *Unione Industriale di Como* we learned how Como got into the silk business.

In the 12th century, a monastic order known as the *Umiliati* brought the art of making woolen cloth from northern Germany. In the 16th century, after the Spanish occupation of Lombardy, business dropped off. In 1510, according to the records of the *Unione Industriale*, the first silk-spinning workroom was established in Como. Today the Como silk-weaving and printing industry employs nearly 20,000 people, and Como produces some 85 percent of all the silk made in Italy (pages 67 and 92).

Silk Designers Gamble on Fashions

One of the city's best-known silk firms is the establishment of Antonio Ratti. Dr. Gregorutti arranged a visit to its offices in the mellow old lakeside *Villa Sucota* on Como's outskirts. Signor Bruno Gentili, the managing director, offered us cups of strong coffee and told us about the business.

"Silk has been grown and woven in Como since the 16th century," he said, "but the Ratti company has been in business only since 1945. Even so, we're an important firm. We employ about 75 people in the office and our mills have more than 600 laborers."

Surprisingly, Italian raw silk furnishes only about 20 percent of the Ratti supply. The balance is imported from the Orient.

"Frankly," Signor Gentili explained, "the quality of Japanese raw silk is higher. Centuries ago, the growing of silkworms was a big part of our economy. One of the *Sforza* rulers required that every farm family produce a certain number of cocoons annually.

"But tending silkworms is peasant labor, and there aren't many peasants around Como these days. We're successful, not because of cheap labor or readily available raw materials, but because of the quality of our finished product."

Ratti produces printed dress materials, necktie silks, and scarves. We entered a room

filled with samples of the current collection of dress fabrics, literally thousands of designs, each repeated in a broad range of colors.

"We weave and print several million yards of silk a year," said Signor Gentili. "And every year, you know, is a gamble. We produce our own designs, of course—about 35 new ones every day—and we have to start production a year ahead. Since our material is sold to many of the top fashion houses in the world, we have to decide this year what they're going to want next year. If our taste should ever go wrong, we'd be in trouble."

With Signor Gentili, we drove a few miles outside Como to one of the company's modern mills. The great airy rooms were filled with machines, but we were surprised at how few people seemed to be tending them.

"These are the most costly looms in the world," Signor Gentili told us, "but one girl can operate 16 machines. In our older plants, one girl can tend only four looms. The lower labor cost makes the new machines more economical."

Ratti's employees are well paid by Italian standards. The basic salary for a mill worker is about 100,000 lire (\$160) a month. The Italian Government requires an annual bonus of a month's salary, and Ratti adds another two months' pay as a bonus. As an extra incentive, the workers on the weaving machines get all the profit from production in excess of 90 percent of the capacity of their machines.

Family Inn Delights Its Guests

We made our headquarters, during our stay on Lake Como, only a few minutes' drive from the *Villa Sucota* in the ancient *Albergo Caramazza* in the little village of *Moltrasio*. The structure, Signor Rodolfo Caramazza assured us, was more than 400 years old, and had been in his family all that time.

"This is nice," he said, "but it is also a nuisance. Because the building is listed as a national treasure, I must get permission from the government to make even the slightest alteration. The red tape..." His eyebrows and his hands went up together.

I sympathize with Signor Caramazza, but I must admit that I personally wouldn't approve even the slightest alteration in his hotel. We spent nearly a month there, driving

Strength of the mountains in their faces, women of *Premana* wear a tan from summer sun. Village wives with their children care for cattle in high pastures during the summer; in winter the women assist husbands in their small factories by polishing the village's metal products.

out early each morning to visit points of interest around the lake, and it became a second home. His wife watches over the books and the buying, his two sisters supervise the twenty-odd rooms and the restaurant, and his mother, well over 80, seldom leaves the kitchen. And what a kitchen!

The Caramazza is officially listed as a third-class hotel, but the only thing third-class about it is the price. Our two double rooms with bath, plus breakfast and dinner, came to a little more than five dollars a day per person. The food was superb. Breakfast involved melon, ham and eggs, a great platter of rolls, and fresh sweet butter. Dinner started with soup, ranged through a choice of pasta, a fish course, a roast, fresh vegetables from the albergo's garden, and fruit and cheese. We dined beneath venerable trees on a terrace with a magnificent view of the lake (page 97). If I sound as if



Rugged ride has its reward. To reach summer retreats on "their Alp"—a nearby mountaintop—Premanese negotiate almost unbelievable switchbacks (left). Turns are impossible. When the jeep in foreground reaches the corner, the driver will back up the next section, as the vehicle beyond is doing. At road's end, a steep hike brings this family to their cottage (above). Shrine honors the Virgin Mary. Together for the weekend, men relate the news from Premana, and the women report on the cows and children—all to the tune of clicking needles.



ETCHING: (ARTIST) BY JOSEPH J. SCHENCKEL; ILLUSTRATION BY FRANC D'OR © N.C.S.

I were in love with the Albergo Caramazza, it's because I am. And I was not alone. The twins cried when we left.

Moltrasio itself is a sleepy little village, with more private villas than public accommodations. Northward on the shore of what Longfellow called "the loveliest of all lakes," lie the tourist-oriented resort towns of Tremezzo and Cadenabbia, and bustling Menaggio. Near the upper reaches of the lake are Dongo, Gravedona, and Sorico (map, pages 62-3). Today these last three towns are tourist centers, but until the beginning of the 15th century they formed the tiny Repubblica delle Tre Pievi. And it was the fleet of Gravedona, its capital city, which in 1178 inflicted

a crushing defeat upon the mighty German Emperor Frederick Barbarossa.

Barbarossa had climaxed his conquest of most of northern Italy by sacking Milan. He dispatched the major portion of his booty in a well-armed flotilla which was to land at the northern end of the lake and thence transfer the loot to pack trains for the journey over the mountains into Germany.

The people of Gravedona got news of the treasure-laden fleet, and, joined by boats from other lake-shore towns, intercepted it. The battle was bloody, but the men of the Tre Pievi knew their own waters better than the invader. They captured the entire flotilla.

The booty, history tells us, was beyond

price. Gold, works of art, precious stones, rich tapestries, and beautifully made suits of armor fell into the hands of the simple sailors of Gravedona, who experienced a prosperity they had never dreamed of. Frederick never forgave them.

When a peace treaty was being arranged between the Lombard League and the Emperor, Barbarossa is reported to have exploded:

“Pardon to everyone except the perfidious people of Gravedona!”

And in Dongo, only a few kilometers from Gravedona, another ruler met a much more personal tragedy. Benito Mussolini, attempting to flee to Switzerland in a German lorry, was captured in the piazza with his companion, Claretta Petacci. The next day they were shot in the little village of Mezzegra, near Tremezzo. A simple cross, bearing the name Claretta Petacci and the date April 28, 1945, marks the spot. There is no mention of Mussolini—only a scrawled “Duce” on a nearby stone wall.

Queen’s Legacy: a Road and a Crown

Como’s eastern shore is also dotted with resorts. Varenna, a favorite with tourists (page 94), is equally attractive to historians, for here in the sixth century lived Queen Theodolinda, once the possessor of the Iron Crown of Lombardy, certainly one of the most history-laden royal diadems in the world.

The beautiful queen, daughter of a King of Bavaria, was married to Flavius, King of the Lombards. But after only a year of marriage, Flavius died. The Lombards, devoted to their queen, offered to accept as king any prince she might marry. She chose Agilulf, Duke of Turin, and in a few years converted him to Christianity. The Pope, St. Gregory the Great, was delighted. He had always regarded Agilulf as a threat to the independence of the papacy. Now the Piedmontese was safely in the fold.

In gratitude, Gregory sent Theodolinda a circlet of iron brought by the Empress Helena from Jerusalem to Rome. According to tradition, it was wrought from a nail used at the Crucifixion.

The iron relic later was placed in a gold crown of Byzantine times and today rests in the cathedral at Monza, near Milan. Victor Emmanuel III wore it when he assumed the throne in 1900.

Theodolinda has left Lake Como another legacy which is more important than her crown. Built under her direction, the Strada Regina—the Queen’s Way—linked the villages along the western shore. Today’s fine highway follows much the same path and makes it possible to circle the entire lake in an easy day’s drive.

Lake Como, its shore dwellers like to say, is shaped like a man striding westward, his front foot in Como and the other in Lecco. Between the two legs is a promontory of great beauty, and at its tip is La Punta Spartivento—The Point That Divides the Wind.

Here lies Bellagio, a favorite retreat in the time of the Caesars, and a mecca for travelers today (pages 58-9). Pliny the Younger

Afloat by castle walls, the author’s twins, Donnali and Brian, drift in the warm waters of Lake Garda at Sirmione. The Scaligeri, lords of nearby Verona, built the crenelated battlements in the 13th century.

Begging for a swim, a youngster tugs at his mother’s skirt by Sirmione’s shore. Here at the tip of a peninsula, bathers dive amid rocks worn by the “fair lake, whose water quaffs the light of heaven. . . .” Thus the Roman poet Catullus, who lived at Sirmione in the first century B.C., sang of Garda.





ENTREPRENEURS BY JOSEPH A. SCHENKEL © NATIONAL GEOGRAPHIC SOCIETY



had several villas here, and wrote enthusiastically about the views. Emperor Maximilian I of Austria stopped by in 1496 for some hunting. Franz Liszt paid a lengthy visit in 1837, and here wrote his lyrical *Dante Fantasia*. And the French writer Stendhal, staying at the Villa Melzi, found the view the most beautiful in the world apart from the Bay of Naples, and not inferior to that.

Bellagio's principal attraction is the spectacular Villa Serbelloni, originally built in the 15th century and rebuilt a century later. In 1930 it was purchased by the American-born Princess Della Torre e Tasso, who, when she died in 1959, left the property to the Rockefeller Foundation.

Scholars and writers, invited by the Foundation, now come here to study and create. And after two thousand years the tradition of the Roman man of letters Pliny the Younger lives on above The Point That Divides the Wind.

There is another great villa on Como with a history as long and as colorful as that of the Villa Serbelloni. That is the Villa d'Este, on the lake shore at Cernobbio, just north of Como. Today it is one of Europe's great luxury hotels. Built by Cardinal Tolomeo Galio in the 16th century, it served as a residence three hundred years later for Queen Caroline, the eccentric wife of England's George IV. Its rooms are furnished in a style which would do credit to royalty, and if its prices are commensurate, so is its service. The hotel has its own golf course, a swimming pool floating in the lake, and beautifully tended grounds (pages 64-5).

Premana's Iron Ran Out, but Not Its Spirit

If Como invites the muse and delights the eye, there is a village in the mountains above it which does something I find more important: It warms the heart. Its name is Premana, and it is so old that no one really knows when it began.

Its people are metalworkers almost to a man, and their settlement here goes back at least to Roman times. Certainly they were working in iron in later centuries, shaping arms for the fighting men of Milan and Verona and hardware for the gondola makers of Venice. And then, more than a century ago, the iron mines which dotted their mountains ran out.

Another and less hardy people might have left their village and their mountains for an easier life in the cities below. But the people of Premana refused to let their village die. Their fathers and their grandfathers and their grandfathers' great-grandfathers had worked

"All-but-island," wrote Alfred Lord Tennyson of Sirmione. The moat of the Scaligeri castle cuts across the peninsula. Only pedestrians and a few private cars may cross the bridges; a sidewalk train carries visitors through the village to the Roman ruins and bathing beaches at distant land's end. The castle's fortified harbor today blooms with water lilies.







with metal in this mountain eyrie, and their skills had been passed from generation to generation. The skills were still there; only the metal was missing. The answer: Bring the metal to the skills.

It wasn't easy. The road up to Premana is narrow and twisted and treacherous even today. But these are mountainfolk, and they do not demand that life be easy. So, one way or another, they brought the metal. In the last century it came in wagons, drawn by straining mules or oxen. Now it comes by truck.

But iron was too heavy, and the cost of shipping the iron objects they had once wrought with loving care was prohibitive. After the war they turned to steel—highly tempered

steel, hard to work, but very valuable when properly shaped. They shaped scissors and surgical instruments and knives—and beautifully made ice axes, climbers' tools to be forged with infinite care because on them a man's life may depend. And they did so well that, far from dying, Premana is one of the few villages in Italy which have not lost population to the cities. Indeed, it has gained 300 people in the past ten years.

My first view of Premana was a combination of amazement and disappointment. Amazement at the beauty of its situation, clinging to a mountainside with neatly tended pastures stepping down the nearby slopes (pages 72-3). Disappointment, because I had



EDMUNDSON BY JOSEPH J. BOHENSCHIL © N.Y.C.

Gaiety explodes as Bardolino celebrates a bountiful grape harvest. Folk dancers, in traditional costume, swing to the tune of guitars in front of the town hall.

to be a good example. Antonio, lean and wiry at 69, has four sons and four daughters. Three of the daughters are married and living on their own floors in other houses; one is *promessa*—promised—and will leave soon. And, exactly as Dr. Gregorutti had told us, each of the sons had his own floor, and his own doorbell.

In the workshop below, the forge was glowing and anvils were ringing as Codega sons and some of the 25 employees hand-shaped heads for ice axes, cow bells a foot across for export to Switzerland, and miniature bells for souvenir key chains. Signor Codega handed me an ice ax and I hefted it. The balance was excellent.

"It takes a man more than a day to make one," he said, "and I or one of my sons inspect each one. They must be perfect. Here, feel the place where the wood joins the head."

I slid my hand up the shaft and onto the metal. Unbelieving, I tried it again. When I closed my eyes, I couldn't detect the jointure. Signor Codega beamed.

"This is handwork," he said. "No machine can do such a job."

Sindaco Remembers His GI Liberators

Someone spoke from behind me.

"Is it true you are Americans?"

Donna replied that we were.

"Then you are doubly welcome," said a smiling, middle-aged gentleman who introduced himself as the *sindaco*, or mayor, of Premana. "First, because you are the first Americans who have ever come to our village, so I welcome you on behalf of all of us. And more important to me, because the Americans liberated me from a Nazi prison camp. I saw General Patton's army enter Trier on March 18, 1945, and it was the happiest day of my life. So I welcome you for myself, Gianola Dionigi, and I offer you the hospitality of my village and my family."

We checked into the spotless Hotel La Peppa, then rejoined the mayor over a bottle of good wine to hear more about his village.

"We have about 1,900 people now," he calculated, "and ten years ago it was only 1,600. We could use even more workers if we had them. But we're producing them ourselves at a pretty good rate. Last year 65 children were born here.

been told it was far from the tourist track, and what I saw looked like a shining cluster of small apartment houses and hotels, each with four or five or six stories.

"Don't worry," said Dr. Gregorutti, "it's just as I told you. Those aren't apartments or hotels, they're private homes."

"How can people in a village like this be rich enough to put up homes of that size," I wondered.

"They aren't rich, but they're comfortable," laughed Gregorutti. "Father and mother occupy one floor; every married son has a floor of his own. The family metal shop is on the ground floor. These are family industries."

The family of Antonio Codega turned out



Sparks dance on the floor as molten iron pours into a mold at the Dongo foundry of Falck Iron and Steel. This company, one of Italy's largest makers of iron products, employs 10,000 people.

Blended in the harvest, a conglomeration of grape varieties tumbles from a vineyard truck. On the terraced slopes above Lake Garda grow Rossara, Molinara, Rondinella, and Negrara, the grapes that make Bardolino wine.

"We'll have work for all of them when they're old enough," the mayor continued. "And most of them will be making scissors. Ninety percent of our exports are scissors. They have become famous all over Europe."

Premana is run by a council of 15, elected every five years. The council chooses one of its number to serve as sindaco.

Mindful of Italy's strong Communist party, I asked Signor Dionigi if many Communist votes had been cast in the last election.

"There was one," said the mayor. "We think it was cast by an old woman who couldn't read the ballot."

And what did the Premanese do for recreation?

"We have a movie," replied the mayor, "every Sunday. And almost everyone has a television set. And then in May and September we have the weddings."

"You mean everyone gets married in those two months?" I asked.

"Almost everyone," Signor Dionigi replied. "It's traditional. You see, in the old days, everyone kept cows and made cheese. In May people took the cows into the upper Alps. A lot of people wanted to marry



before they went up there. And, while they were in those upper pastures, a lot more decided to get married when they came down in September."

"Do you have a newspaper?" I queried.

"Oh yes, a very good one. It's sent all over Italy to Premana families who have moved away."

"Daily or weekly?" I asked.

"Every three months," the mayor laughed. "This is a very quiet town and it takes a long time for enough to happen to fill a paper."

It *is* a quiet town. So quiet that there is no policeman, and no jail.

The mayor and his friends, who had been conversing in Italian, suddenly started speaking among themselves in the local dialect.

They conversed for two or three minutes before Donna interrupted them.

"I had better tell you that I understand what you are saying," she smiled.

Their faces showed astonishment, and disbelief.

"You were discussing whether you should take us up to Vegessa," she said. "You said the road was terrible, and after we got there the climb would be very difficult, and..."

"But this is impossible," the mayor exclaimed. "The signora speaks beautiful Italian, but even other Italians don't understand our dialect. How do you do it?"

"Years ago I lived in the mountains on the Austrian side of the border," Donna explained. "I spoke the dialect there, and yours is

EDDIE/STONE (BELOW) AND ESTACHE/RE © N.S.S.



close enough that I can understand.”

The mayor and his friends were dumbfounded. The dining room of La Peppa was filled by now with villagers having a glass of wine or an espresso after the day's work, and the mayor shouted for everyone to come and hear an American who spoke the local tongue. Donna had to answer a lot of questions in dialect before we could get back to the matter of the trip to Vegessa. We arranged to rent two jeeps and went to bed.

I awakened to an unfamiliar sound. At first I thought it was a peal of bells, each with a different tone, ringing all over town. But the bells didn't stop. Suddenly I realized that I was in one of the last places in the world where you could be awakened by the sound of hammers on anvils.

There were times during that ride up the mountain when I wished Donna hadn't understood the dialect. If she hadn't, our hosts might have decided against taking us. And bouncing around narrow curves on rock-studded roads, I wasn't sure just how grateful I was for the invitation.

Jeep No Match for Premana Switchbacks

In a number of places the switchbacks were so sharp that the jeep couldn't make the turn (page 76). More sensible men would have sighed and turned back. Not the mountain men of Premana. They simply drove the jeep as near the edge of the cliff as it would go—and about two feet farther than I would have tried to make it go—then went into reverse and backed up to the next hairpin curve. Then, just as the back wheels started small rocks tumbling down the mountainside, they went forward to the next elbow and repeated the process. I hope you will understand *how* we did it. I will never understand *why*.

But perhaps I do. Because Vegessa is such an idyllic mountain Shangri-La that I might even be persuaded to do it again. Might, I said.

A stream of crystal-clear water tumbles down a steep mountainside into the valley,

Broad apron of fertility separates Lake Mezzola, center, from Lake Como. Once marshland through which the Adda River poured into Como, the Piano di Spagna—Plain of Spain—has been reclaimed for farmland. The name originated during Spanish rule of the area in the 18th and 19th centuries.





where there is a little restaurant and a cluster of wooden houses. Far above, where the stream begins, is another group of homes.

"If you'd like," said the mayor, "we'll stroll up and see the cheese making. It's at the top of this little hill."

I looked the thousand feet straight up the sheer "little hill" and gasped. "I'm afraid it'll be a little dangerous for Donna and the twins..." I began, but Brian and Donnali were too quick for me.

"Come on, Daddy," Brian shouted with the happy innocence of a 12-year-old. Then, before I could catch my breath to give him a little fatherly advice about contradicting his elders, he was off at a run up the mountain, Donnali bouncing after him.

Halfway up the trail is a grim reminder of

the fact that Italy's mountain people did not take kindly to Nazi domination. A simple cross marks the spot where five partisans were shot. And the newness of the 30 houses at the top underscores the message on a plaque which explains that the village was destroyed by the Nazis in 1944 for sheltering partisans.

Scaligeri Castle Once Sheltered Dante

We spent the night back at La Peppa, and in the morning the mayor and his friends gathered to see us off. The twins said goodbye to the children they had met playing soccer in the piazza. Just as we got into our car, Signor Codega gave me a key chain holding some of the tiny bells which his factory makes for souvenirs. They hang from my car keys today. And every time I hear the pleasant tinkle,



Proud husbandman, 85-year-old Pietro Bonetti still tills 8½ acres near Bardolino, growing grapes, olives, and corn. Signor Bonetti also owns three cows and sells the milk not used by his family; calves bring added income.

"Hurry-up bread" bakes on an open hearth. Signora Maria Bonatti removes *focaccia* from a grill placed over burning grapevine trimmings. The name of this unleavened bread has become a colloquialism for anything made quickly, although Signora Bonatti kneaded her dough of flour, milk, and olive oil for nearly an hour.



I remember the ringing anvils of Premana and the warmth of the people we met there.

We had spent too long on Como. Reluctantly, we drove east to Lake Garda. One look at Sirmione, however, and our regret was drowned in a flood of anticipation. Sirmione is at the tip of a long, narrow peninsula which thrusts from Garda's southern shore, and it is a traveler's dream. Its shores are lined with pebbled beaches and modest, sun-drenched hotels, and near the tip towers the great Rocca, the castle of the Scaligeri family, where Dante was once a guest (pages 79-81).

The streets around the moat which surrounds the castle are narrow, some roofed by arcades, all lined with souvenir shops and restaurants and ice-cream stands. A tiny train with open cars winds through from time to

time, carrying visitors from the city's massive gates to the Grottoes of Catullus at the tip of the peninsula. Between our hotel and the castle was an antique shop with half its wares within its tiny confines and the other half in a happy jumble on the sidewalk.

Almost every day we would stop to poke through the fascinating confusion, pricing copper cooking pots and Sicilian puppets, cracked majolica ware and carved candlesticks. The proprietor, an ancient Sicilian with magnificent handlebar mustachios, cheerfully answered our questions and invariably invited us to join him in an espresso. We talked about the history of Lake Garda, and about the vulnerability of his stock, some of which he left on the sidewalk when he locked his shutters for the night.







REPRODUCED BY JESSE J. SHERIDAN © N.Y.S.

Island magnificence rises from Lake Maggiore. Mists of evening (left) veil the terraced garden of Isola Bella, one of the Borromean Isles offshore from Stresa. The Counts of Borromeo transformed the once-bare rock in the 17th century, building a lavish palace and transporting soil from the mainland to construct exotic gardens. Guests watched theatricals in the garden amphitheater (above), decorated with cherubs and shells. In 1959, Prince Vitaliano Borromeo completed the Grand Hall of the palace (right), following original plans.





FATCCHIONE © NATIONAL GEOGRAPHIC SOCIETY

Printing silk by hand, men carefully place a screen to apply blue dye to a broad ribbon of scarves at Binda Gianni and Company, silk manufacturers in Como. In addition to silk, the Como region makes furniture and foundry products.

here. Now most of our visitors are from Germany, the Netherlands, and Denmark."

The director introduced us to Silvio Marzari, correspondent for the journal *L'Arena* of Verona. Young, eager, and handsome, Silvio appointed himself our guide.

"You like our Bardolino wine!" he exclaimed happily. "Come along, I'll show you how the grapes are grown."

We climbed into the car and drove over twisting dirt roads into the hills that towered over the town. In half an hour we arrived at the farm of Pietro Bonetti. Silvio led us into the kitchen of the little stucco cottage, and we found the Bonetti family finishing lunch.

Empty bowls which had held risotto were on the ancient wooden table, and a big piece of hard cheese sat beside a grater

"The angels will protect me," he shrugged, and apparently his trust was well founded.

The eastern shore of Lake Garda, sheltered by towering Mount Baldo, has Mediterranean flora. Olives, cypresses, and citrus thrive here, and winegrowing flourishes (pages 84-5). The red wine of Bardolino is one of Italy's best-known vintages, and we called on Signor Renato Gianfranceschi, director of the Bardolino Tourist Office, to talk about it.

"Wine is important to our economy," he said, "but tourism is our big industry. Lake Garda has always been popular with wealthy Europeans, but in the 1950's there was a big change. Ordinary people then began to come

at one end of the board. Pietro Bonetti rose from the table, dabbed at his mustache, and greeted Silvio as an old friend. Seated at the scrubbed table were Pietro's wife Rosi, their son Albino and his wife Alba, and the two grandchildren Pietro and Tiziano.

Pietro Bonetti is 85 (page 88), his wife, by her own statement, "a little younger." With his son, Pietro does all the work on the 8½ acres he has rented since 1904.

"We grow wine grapes, corn, and olives," he said. "In a good year we'll sell 200 *quintali* [44,100 pounds] of grapes and 15 of olives. We keep a few pigs and rabbits and chickens for our own use."

Rosettes of silk and satin, mementos of a lost trade, fill the Umbrella Museum in Gignese above Lake Maggiore. A century ago virtually the entire town made and repaired umbrellas and parasols. Today the craft has vanished from the village.

We finished our wine and walked out to inspect the vineyards, where son Albino proudly demonstrated the new method of planting vines.

"Fifteen years ago," he told us, "we trained the vines in an inverted L, and the grapes didn't get much sun. Then we turned to a Y shape, and both arms of the trellis got the light. Now we plant them in the shape of an inverted U with a flat top, like a soccer goal, and the clusters are exposed to the sun all day. It's made a lot of difference in our production."

We returned to find Brian and Donnali romping in the barnyard with young Pietro and Tiziano. Donnali had brought candy for the youngsters, and Tiziano was insisting on giving her a squawking chicken in return. We got over that hurdle and took a tour of the barnyard. Leading to the hayloft was an ancient handmade ladder, and hanging from one rung was a rabbit's foot. I pointed it out to Brian.

"I climbed up while you were out in the vineyard," he said. "And, Daddy, anyone who uses that ladder *needs* a rabbit's foot."

Literary Genius Seized as a Spy

Some 20 miles north of Bardolino lies the enchanting village of Malcesine. Today it is a pleasant resort, but from the 15th through the 18th centuries, when Venice ruled the area, it was the most formidable fortress on that powerful republic's northern borders.

The ruins of the ancient fortifications at-



ESTABLISHED BY NATIONAL GEOGRAPHIC SOCIETY

tract tourists today, and they did the same in the 18th century. For when Johann Wolfgang von Goethe came here in 1786, on his first visit to Italy, he was arrested for sketching the crumbling towers. His attempts to explain that he was interested only in the beauty of the scene didn't fool the local officials for a minute. With his heavy German accent, he was obviously a spy!

So Germany's great literary genius was detained by the local magistrate. Apparently he had no proper identification papers. Ultimately, he was identified and released.

It is perhaps as well that the incident occurred *after* Goethe had noted his first



impressions of the lake area. Reaching Torbole, a charming little harbor a few miles north of Malcesine, he had written: "I have finally arrived here, here where I should have been long ago; many of the hard places in my life would have been made easier."

Our own lives, I think, might have been made easier if we could have stayed on Lake Garda—at Limone, with its citrus groves, or on the tent-strewn Gardone Riviera, which stretches north of Salò on the western shore, or in Desenzano, where peat bogs yielded traces of primitive man nearly a century ago. But summer would not linger, and our time was running out. West we drove, over Italy's excellent *autostrada*, to Lake Maggiore.

"I call the Lago Maggiore district the Eden of Italy," wrote John Ruskin a century ago, crediting it with the "purest air, richest earth, loveliest wave, and the same noble race that founded the architecture of Italy at Como."

Generations of travelers have agreed with the distinguished Englishman. The elder Alexandre Dumas called Maggiore "the land beloved of the gods." Then as now, Maggiore was particularly popular with the English and French, since it lay across the Simplon Pass and was easily accessible. Today Maggiore is a haven for campers. Whole families arrive with tents and inflatable boats, and spend their holidays in the open at a minimum cost.

On the Cannero Riviera, on the northwest shore of the lake near the Swiss border, thousands of brightly colored tents line the public beaches. Bikinis and shorts are the uniforms of the day. Children seem to outnumber the pebbles on the beach. Refreshment pavilions feature rock-and-roll music, and the stillness of the nights on the shores of Como is replaced by noisy gaiety that lasts until the early hours.

Barren Rock Becomes a Garden Isle

To me, the greatest beauty of Maggiore lies in its islands. Seen from our Perla Nera—Black Pearl—hotel in Stresa, the Isola Bella and the Isola dei Pescatori rose from the cerulean waters like precious gems.

Isola Bella is man's triumph over nature. Until the 17th century it was a barren rock, inhabited by a few fishermen. Then Count

Carlo III Borromeo decided to turn it into a garden spot, dedicated to his wife Isabella. He called it Isola Isabella (pages 90-91).

It was Carlo Borromeo's dream to turn his island into a replica of a ship, with gardens terraced to resemble prow and superstructure, and a palace screened by the greenery. He died in 1652 before it was completed, but his son Vitaliano finished the principal portion of the work. Dozens of landscape architects and generations of workmen have labored in the intervening centuries to make Isola Bella what it is today: one of the world's most beautiful gardens.

Man Cannot Live by Flowers Alone

We visited the island first on a summer Sunday, and it seemed that half of northern Italy had the same idea. In the gardens, groups wandered happily, their voices raised in Italian folk songs. Things were quieter in the castle itself, but even there groups of children raced down the marble corridors, oblivious to the admonitions of the guards.

The castle is filled with fascinating works of art—paintings, statuary, tapestries—but we were far more interested in the gardens. Ignoring the importunities of a series of uniformed cicerones who offered their services at what they insisted was a very reasonable price, we wandered half the morning over the 10 terraces, marveling at their intricate design and the remarkable collection of trees and flowering plants from all over the world.

On a single terrace we found trees from Nepal, New Zealand, Argentina, China, Chile, Mexico, and Japan. On another was a pool with giant water lilies—*Nelumbium speciosum*—standing four feet tall with pink blossoms nearly a foot across. And then, from behind a low wall on another level, Donnalì called excitedly.

"Come, look—tomatoes!"

"Can't be," I told Donna. "But let's go look."

To our surprise we found a gnarled gardener on his knees in a tiny plot of perfectly tended soil, surrounded by rows of lettuce, onions, and, indeed, tomatoes.

"No, this garden wasn't in the original plan," he answered Donna's question, "but

Huddled against a mountainside, Varenna clings to the shore. Boats tie up only a step from colorful homes. On balconies garnished with vines and flowers, residents sip wine in the soft air of evening and watch the silent spectacle of sunset across the lake. "Sweet vision! Do not fade away," wrote Henry Wadsworth Longfellow of Como's glory, "Linger, until my heart shall take into itself the summer day."



Gathering at sunset for a moonlight sail, boats from Bardolino await the starting gun. Skippers will cruise to San Vigilio Point near the city of Garda and back across the lake called a “precious spectacle” by the German poet Goethe.

Chicken in disguise brings smiles of anticipation to the author and his family. Baked in clay molded in the form of a duck, the chicken arrives as the main course of their dinner on the terrace of the Albergo Caramazza at Moltrasio. Lodgings, food, and the congeniality of the hosts made this hotel a favorite of the Shors.

those of us who live here have to eat. Most people don't get up here to look, and to be honest, this is the best soil on the island.”

Isola dei Pescatori—the Isle of Fishermen—only a stone's throw from Isola Bella, was made for artists. Dominated by the watchtower steeple of its ancient church, blackened stone houses crowd narrow winding streets. We stepped ashore from our motor launch, looking for fishermen. We were, it became apparent, about 10 years too late.

The streets around the harbor are lined with souvenir stalls, offering bright scarves, handmade straw hats, and gaudy rayon dresses. I asked the proprietor of one establishment where I could find a fisherman.

“You're talking to one,” he said. “At least, I used to be one. But now that so many tourists are coming, I can make more in six months from this little shop than I used to make in a year of fishing. And the hours are much better. Today, everyone is either selling souvenirs or in the restaurant business.”

An hour's walk around the island confirmed his view. What space wasn't occupied by souvenir shops was taken up by restaurants. And while there were half a dozen fishing boats in the tiny harbor, only a couple appeared to be operational.

We chose the Hotel Italia for our lunch, and were surprised when the attractive proprietress addressed us in flawless English. Anna Tarella, we found, was English. Married to Giuseppe Tarella, whose family has owned the hotel for more than a hundred years, she has lived on the island since 1957.

“There have been a lot of changes in that time,” she said. “When I



first came, most of the women went down to the lake shore to do their washing. Now they not only have piped water in the houses, but a lot of them have automatic washing machines. From rocks to pushbuttons in one jump."

We paid a very modest check and walked to the 14th-century Church of St. Victor. Tradition has it that Isola dei Pescatori has had a church since the fifth century, and that it was an early center of Christian worship in the area. Inside, an aging islander pointed out the treasures of the church. He was particularly proud of two 14th-century wooden busts of the Apostle brothers St. Peter and St. Andrew.

"In a few years," he said, with a note of regret, "they may be the only fishermen left on the Island of Fishermen."

In Gignese, a mountain village high above Maggiore, we came upon one of the most remarkable museums in Italy. Once the people

of Gignese and its neighboring villages were famous throughout Europe as umbrella makers and menders, and today the Museo dell'Ombrello e del Parasole pays honor to their skills (page 93).

Traditional Skill Now Only a Memory

Giuseppina Viotto, a pleasant woman of middle years, welcomed us to the museum. No one makes umbrellas in Gignese today, she reported sadly, but a century ago almost every family was engaged in the trade. Umbrellas were made in the homes all winter. In the spring the fathers and sons would take to the road, selling them all over Europe.

"The truth is," she added, "that today you can't even get an umbrella repaired here."

You can, however, learn a lot about umbrellas. There are some here with handles of mother-of-pearl, ivory, bone, horn, silver, or

FISHWOMEN (ISLAND) AND BRANCHING BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH J. SCHERSCHL © N.G.S.



Fiery blossoms light the night above Isola Comacina, Lake Como's only island, in celebration of Midsummer Night, the eve of St. John's Day, June 24. Time exposure records the wanderings of candles set afloat on waters crimsoned by fireworks.

porcelain. One, which belonged to a chief constable of Turin, has an eight-inch dagger concealed in the shaft. One of the oldest, dated 1753, belonged to a doge of Venice and is made, appropriately, of fine Venetian silk.

Framed on one wall is a letter to the secretary of the museum. It is from 10 Downing Street, London, and it is dated 8 November, 1938. It reads:

Dear Sir:

I am writing on behalf of the Prime Minister to express regret that because of very many similar requests he is unable to do what you ask.

Yours truly,
E. M. Watson

I expect that the Prime Minister—his name was Neville Chamberlain and he was not long back from Munich—was so sick of requests for his famous umbrella, which had become a symbol of the appeasement of Adolf Hitler, that he didn't want to see the word even in his correspondence.

We explored the many villages on the shores of Lake Maggiore, marveled at the colossal 17th-century statue of San Carlo Borromeo which dominates the southwestern coast, and studied the history of that cardinal who exhibited such remarkable Christian charity during 16th-century famine and plague, and such fanatical vindictiveness when he was persecuting Protestants. As we left the lake, I gave the twins a little quiz on Maggiore's past.

"What," I asked, "is the most famous event in the history of Lake Maggiore?"

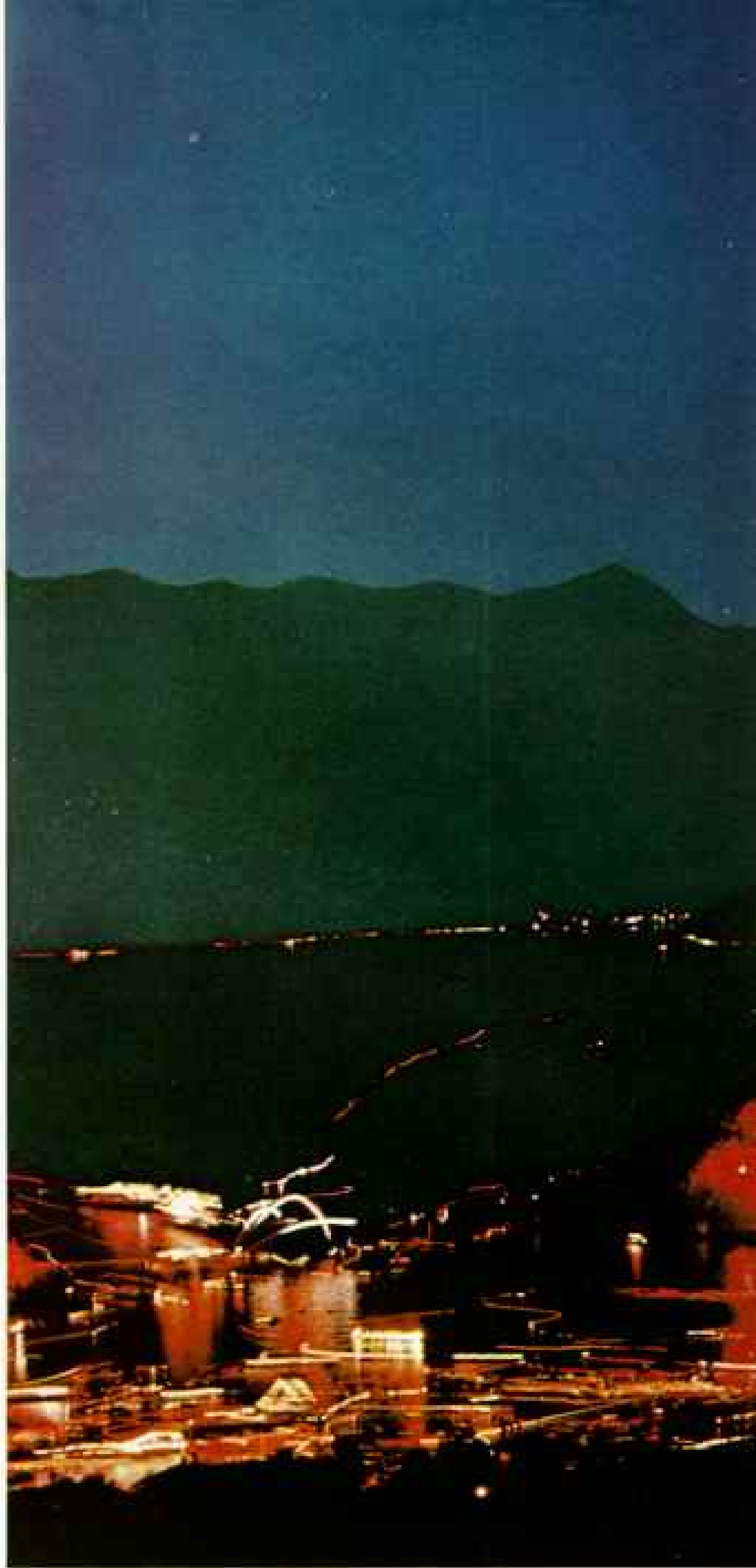
Brian had an immediate answer.

"On June 30, 1961," he announced, "Mr. Kenneth MacLeish set a world record for diving. He went down 728 feet."

He was right, too. Mr. MacLeish, now a National Geographic Senior Assistant Editor, set the record with a Swiss companion,

Hannes Keller. And I should have known that a short course in Italian history could not compete with the *Guinness Book of World Records* for the attention of a 12-year-old boy.

We drove back to Moltrasio for a farewell dinner at the Caramazza. English, French, Dutch, and Swedish guests whom we had met earlier came to say goodbye. Signora Caramazza offered the specialty of her kitchen, a chicken baked in clay (preceding page).





EXTACROME BY S. SANPIETRO © W.A.S.

"And it is not a factory chicken," she insisted. "This is a scratching chicken."

I didn't understand. She explained that a "factory chicken" was one grown by mass-production methods, kept constantly indoors and never allowed to scratch for itself.

"They have no flavor," she said. "This scratching chicken grew up in my own backyard. It scratched the earth for its food. It tastes like the good Lord wanted chickens to taste."

Perhaps that explains the charm of the Italian lakes. So many tourist spots are like factory chickens—made to order, depending for their growth on modern devices and a careful calculation of maximum profit.

Not so Como, Garda, and Maggiore. Their charm is in the blue water and the towering mountains, in the warm Italian sun and the warm Italian spirit. And their flavor, I think, is what the good Lord wanted it to be.

THE END



FOREST FIRE:



EXPERIENCED BY TED BARNES. TRIPLED BY BOB LITTLEFIELD. © N.G.S.

WIND-WHIPPED FLAMES, roaring like a squadron of jets, ravage 100-foot trees on a mountaintop fire line in Willamette National Forest, Oregon. Firebrands the size of pie plates shoot hundreds of feet into the air. Courageous woodsman, chain-sawing a burning snag, joins in a valiant but futile effort to halt the holocaust.

The Devil's Picnic

By STUART E. JONES and JAY JOHNSTON

National Geographic Staff



WE STOOD with the gray-haired ranger on a high ridge in Oregon overlooking a thousand square miles of forest. The night before, my *GEOGRAPHIC* colleague Jay Johnston and I had watched a particularly violent thunderstorm of the type that plagued the Northwest in the bad summer of 1967: a storm full of crackling lightning and rolling thunder—but no rain.

Now, miles away, we could see a dozen plumes marking new fires that lightning had set—igniting vegetation on the tinder-dry forest floor. Soon, if this summer's melancholy script was followed, these small fires would merge into big ones.

"Well," said the ranger, "I see the devil went on a picnic again last night."

Jay and I had come to the Northwest to write about forest fires and the ultramodern

methods by which the U.S. Forest Service seeks to control them. Virtually all parts of the United States suffer from fires each year. We chose the Northwest for our survey because it contains some of the Nation's major timber resources and has a long history of disastrous blazes. Soon we found ourselves not merely discussing fire control with experts, but actually feeling the heat and dodging the burning debris as we watched flames destroy great trees in Oregon, Washington, Idaho, and Montana (map, opposite).*

We began our on-the-spot coverage on—of all things—a ski lift. Jay and I, with photographers Bates Littlehales and Ted Mahieu, soared up the slope of Hoodoo Butte in the Cascade Range of west-central Oregon. Be-

*See "Our Green Treasury, the National Forests," by Nathaniel T. Kenney, *GEOGRAPHIC*, September, 1956.



Doom appears imminent for frame buildings at the Hoodoo Ski Bowl near Santiam Pass in Oregon. Leaping from tree to tree, flames race along the lower slopes of Hoodoo Butte. Chain-saw crews and bulldozer operators frantically fell pines ringing the main lodge and these smaller structures. Their Herculean work saved the resort for the hordes of skiers who flock here each winter. Oregon's fiercest fire in the summer of 1967, the Big Lake Airstrip blaze, as it was called, destroyed 7,700 acres of magnificent timber—ponderosa pine, alpine fir, Engelmann's spruce, western red cedar, and western white pine.

Worst fire season in recent history saw Northwest forests plagued by more than 5,000 blazes last summer. Fortunately, fire fighters confined 94 percent of the fires to ten acres or less, employing the most modern techniques—smoke-jumping, aerial chemical drops, helicopter supply flights. But some fires raged out of control for days (map, below). The largest, Sundance in Idaho, swept 55,910 acres and defied an army of 2,000. Extreme fire danger in four states—Oregon, Washington, Idaho, and Montana—caused partial or complete closing of many national forests.



EXTRACT FROM PAUL YEAGER, MAP BY GEOGRAPHIC ART DIVISION © N.E.C.

low us, and just beyond the edges of the clearing where steel towers supported the cableway, fire swept with savage fury through magnificent stands of Douglas fir, hemlock, alpine fir, and lodgepole pine.

Exploding Trees Hurl Fiery Darts

As we glided upward, our eyes began to smart. Smoke obscured the crowns of the forest giants, masked the sun, and turned the sapphire sky a cheerless gray. We could hear the popping and crackling of burning underbrush and the odd whistling sound, like Paul Bunyan's teakettle, of fire consuming billions of pine needles.

Occasionally the intense heat caused a pine to explode with a report like the crack of a rifle. Needles and bark flew through the air like flaming darts. Ted Mahieu frantically

brushed a smoldering ember from his hair.

The holocaust we were watching was threatening 1,665,979-acre Willamette National Forest, more than twice as big as Rhode Island and producer of more timber than any other national forest (pages 100-101). The Hoodoo Ski Bowl chair lift was designed for skiers and sightseers—giving them splendid views of Mount Washington, Mount Jefferson, and other peaks. But right now the chairs were carrying fire fighters—and us—to the burning summit of Hoodoo, a 5,702-foot mountain near Santiam Pass.

It was our baptism in fire fighting, and the midpoint of a long, dry season that saw a fierce epidemic of fires. In the Northwest alone more than 150,000 acres of federal timber land, plus another 91,000 in state and private hands, would be destroyed.



NATURE STRIKES HER MATCHES: *The sky blazes in fury, the earth trembles. Torrential rains spared timber from fiery death when these lightning bolts stabbed Snoqualmie National Forest in Washington's Cascades. But two weeks later a "dry" storm touched off dozens of fires. A ranger-station lookout made this 15-second time exposure from Timberwolf Mountain. Pole holds weather instruments.*



But at the same time it was an ideal opportunity to study new techniques. Men must still attack forest blazes with shovels and axes, earth and water, but science is making their job easier and quicker with a host of new tools, some of them surprising. Among those we were to see:

- **Air power.** Pilots and observers in light aircraft, supplementing men in lookout towers, spot fires early. Airborne infrared scanners provide instant maps of burning areas. Planes drop chemical retardants and parachuting shock troops; others speed crack fire-fighting crews thousands of miles to scenes of crisis. Helicopters place men and tools in

spots formerly denied even to pack mules.

- **High-speed communication.** Compact radio networks, including walkie-talkies, link fire-control commanders with crews miles away.

- **Mechanization.** In minutes, bulldozers do jobs that once meant many man-hours of labor with shovels and mattocks. Chain saws replace axes. Four-wheel-drive vehicles conquer all but the roughest terrain.

Using such advanced techniques, federal and state agencies in the past quarter century have cut the Nation's annual fire loss—in federal, state, and privately owned forests—from 30 million acres to less than five million.

One day soon computers will join the battle.

Fed data on fuel characteristics, winds, humidity, and the like, these machines will tell fire-fighting commanders when and where to deploy forces.

Now an army of some 20,000 was unlimbering every weapon in its arsenal to subdue the enemy in the four northwestern states. And we were soon to learn that even with the best of equipment, fire fighters must sometimes lose battles—and lives—before they win the war.

At the top of the butte we hopped off the chair lift and walked into a scene of organized chaos. A brisk southwest wind was blowing, and sheets of flame engulfed the tall trees while 20 fire fighters worked



Motorized muscleman of the line, a bulldozer operator carves a 12-foot-wide firebreak near Hoodoo Butte with the blade of his ponderous yellow "Cat." Employed in normal times by logging companies to cut truck roads, the cat skimmers, as they are called, risk their lives to combat fires. Roaring up and down sheer slopes, they must be ever alert for burned-through snags that crash to earth without warning.

Ankle-deep in duff, eyes watering from acrid smoke, a 25-man crew widens a line in an attempt to halt advancing flames of last summer's Cotter Bar fire in Nezperce National Forest, Idaho.





FIGHTING FIRE, like waging war, demands a battle plan. While part of the army mops up in the burned area, the main forces of men and equipment carve 8- to 20-foot-wide fire lines. When the legions join lines in the path of the fire—over the crest of the mountain—they will contain the flames.

Smokejumpers parachute to fight spot fires in inaccessible areas.

Helicopter dumps water on snags in the burned area and spot fires outside the lines.

Fighters quench smoldering spots with water from a creek.

Shovelers smother persistent wisps of flame with dirt and ashes.

Illustration by [unreadable]

perilously close to them. The men, in fire-resistant orange shirts and hard hats of gleaming aluminum or plastic, feverishly shoveled earth onto burning brush.

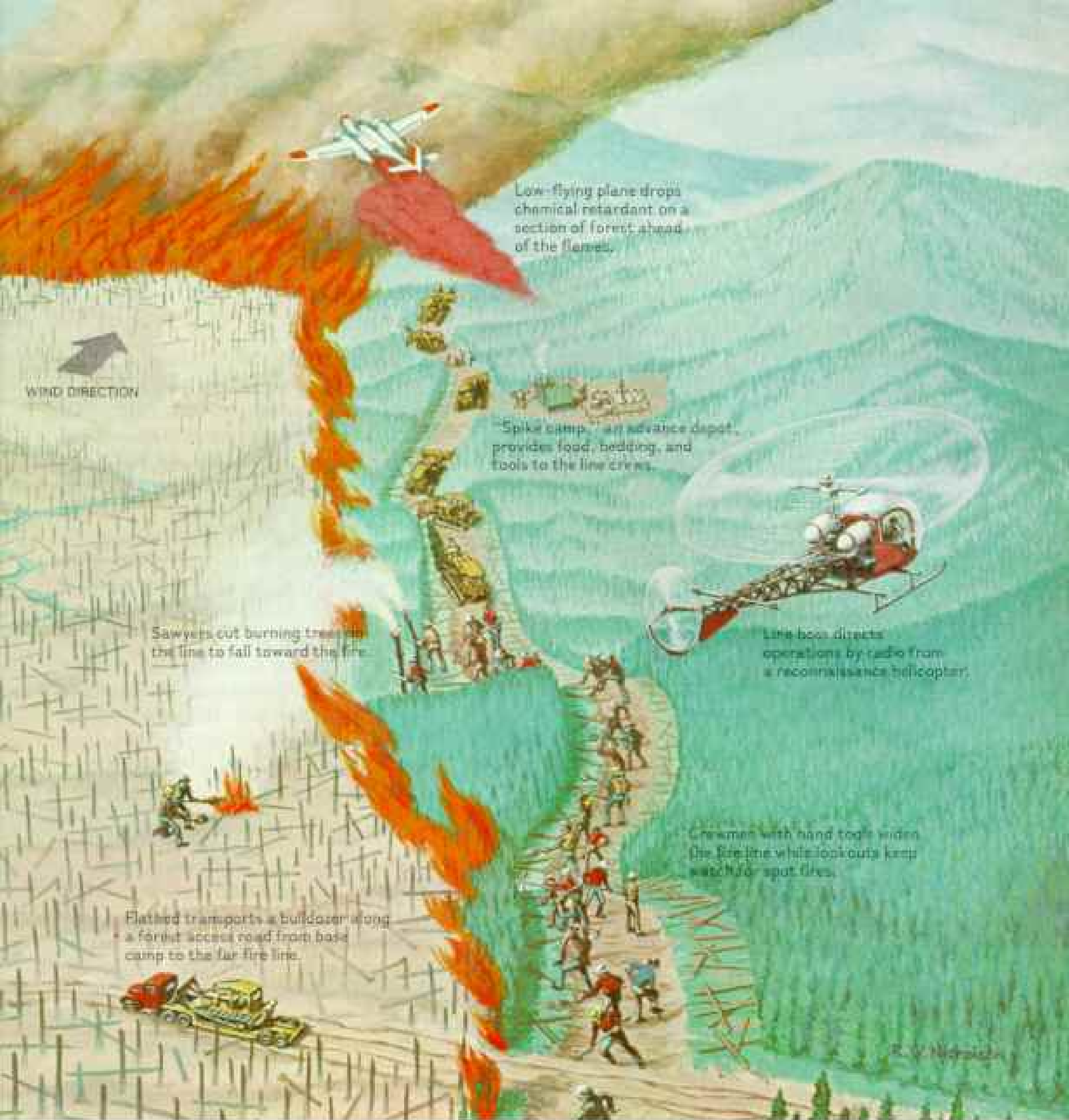
Hours earlier, a bulldozer had scraped out a fire line—a 12-foot-wide swath a few inches deep (preceding page). In theory, with the strip cleared to bare earth, the fire's advance would halt. But the rising wind blew flames and sparks across the strip onto tinder-dry undergrowth, and here the men hurled smothering shovelfuls of earth to cool the fire and keep it on the ground.

They labored in vain. The fire was "crowning" or "topping out"—leaping from treetop

to treetop. Burning brands blew across the line faster than the men could extinguish them.

Crew boss Ward Monroe of the Forest Service, red-eyed and unshaven, looked worried. "What's happened to that retardant drop we called for?" he asked. "We need it!"

No sooner had he spoken than we heard the drone of a single-engine airplane, saw it flash overhead, and then heard the full-throated roar of a much larger craft. A converted B-17 Flying Fortress, following the spotter plane, swooped in. From its open bomb bay—now holding four 500-gallon tanks instead of explosives—gushed a red cloud of chemical retardant, blossoming out



Low-flying plane drops chemical retardant on a section of forest ahead of the flames.

WIND DIRECTION

"Spike camp," an advance depot, provides food, bedding, and tools to the line crews.

Sawyers cut burning trees in the line to fall toward the fire.

Line boss directs operations by radio from a reconnaissance helicopter.

Crewmen with hand tools widen the fire line while lookouts keep watch for spot fires.

Flatbed transports a bulldozer along a forest access road from base camp to the far fire line.

like an exotic flower in the B-17's slipstream.

What the bomber dropped was a paintlike mixture of ammonium sulphate (a common fertilizer) and water, with a red dye added for visibility. Clinging to trees and undergrowth, it remains wet for hours, slowing or halting any flame that may reach it. Globbs of the slurry spattered around us.

Ward Monroe took stock again.

"Not quite on target," he said. "I wish he had hit it square."

We sensed that Monroe, who patrols and directs repair of the trails of Willamette in normal days, felt a keen personal loss as each wooded acre succumbed to the flames. Now

he decided it was time to leave Hoodoo's summit.

A spot fire broke out on the north slope beneath the chair lift, which had kept running all the while, its empty chairs gliding sedately on a ride to nowhere. Bulldozer operator Bill Paetsch yelled and ran to his machine. Burning needles had ignited the seat cushion. Bill hastily beat out the flames.

Ski Trail Becomes an Escape Route

Ward Monroe yelled to his crew: "We're going to evacuate while there's still a trail open! Follow me! We'll have to run for it!"

A signpost atop the butte pointed to three



Water away! With pinpoint accuracy, the pilot-bombardier of a helicopter douses a spot fire touched off by the big Trapper Peak blaze in northern Idaho. Moments earlier he had hovered over a lofty lake, lowered the drum, and filled it with 250 gallons of water. The month-long Trapper Peak fire, fought by 2,000 men, burned 16,600 acres. PHOTOGRAPH BY TED BARKER © R.E.A.

ski runs: Devil's Dive, Mambo Alley, and Giant Jawbone. We half ran, half slid down snowless Devil's Dive. The bulldozer clanked along behind us. Looking back, we could see Hoodoo's crest wearing a gray shroud patterned with streaks of flame.

At fire-control headquarters in the ski lodge at the foot of the butte, Fire Boss Gale Ontko told us the Big Lake Air-strip blaze, which included Hoodoo Butte, now covered 4,500 acres. He had 550 men fighting it, and flames roaring through the valley between Hoodoo and neighboring Hayrick Butte threatened the ski lodge itself. Bulldozers and chain saws toppled trees near some outlying buildings (pages 102-3).

Hot, Dry Summer Brings Disaster

But in the lodge kitchen, and in another under canvas outside, cooks calmly prepared dinner for the fire-fighting army: steak, potatoes, string beans, carrots. Heightening the resemblance to a military operation, there were also Spam sandwiches.

In a jeep we jounced up a dusty, steep six-mile road to the Forest Service's wooden lookout tower atop nearby Cache Mountain, in Deschutes National Forest. From its wind-swept platform we watched the fire moving closer. A twin-engine Douglas Invader whistled in behind a spotter plane and dropped retardant near Four O'Clock Lake. To the south, spot fires were popping out on the lower slopes of Mount Washington.

Next day, back at Willamette National Forest headquarters in Eugene, Oregon, Jay and I learned that the lookout tower had narrowly escaped the flames. (If it had been destroyed, it probably would not have been rebuilt; finding aerial reconnaissance better for fire detection, the Forest Service and state forestry departments are reducing the

Commandos of the fire-fighting forces, smokejumpers parachute to the Big Lake Airstrip blaze. Spotter in the DC-3 (below) points out the preferred upwind landing site. Wire-mesh mask on the helmet protects the jumper's eyes if he lands in a tree. Trained at the famed Smokejumper Center in Missoula, Montana, the fighters function as advance attackers.



PHOTOGRAPH (ABOVE) BY DAVID L. ARNOLD;
REPRODUCTION BY BATES LITTLEHALLS © N.E.S.

number of manned towers.) Still later, we heard that the Big Lake Airstrip fire had at last been controlled—but only after devastating 7,700 acres.

The time was late August. People of the Northwest hopefully awaited the rains that would end one of the most disastrous summers in the region's history. Clouds of smoke billowed over some of the Nation's most spectacular scenery, and the smell of burning wood was strong.

National and state forests were closed to camping, hunting, fishing, hiking, and logging. Travel, for the most part, was restricted to main highways through the woodlands. Older inhabitants uneasily recalled the great Tillamook Burn of 1933, when fire swept





EXTACOLOR (REVISED) BY JAMES W. HUGHES

Veteran of wartime bombing raids, a Douglas Invader spews chemical retardant on a small fire in Ochoco National Forest, Oregon. Dyed red for visibility, the slurry quenches flames and soaks trees and undergrowth in the path of the fire. The 25-year-old plane

267,000 acres along the Oregon coast, destroying more than 13 billion board feet of timber and raining debris on ships 500 miles at sea.

Fire in 1967 had a powerful ally: severe drought. Thanks to the Northwest's rich water resources and elaborate irrigation systems, farm crops did not suffer unduly. But people and forests did. Portland, which usually enjoys pleasantly cool summers, experienced 71 consecutive rainless days while sweltering in temperatures ranging up to 105° F.

Remarkably enough, considering the thousands of men committed to the hard, dangerous job of suppressing the fires, only three lives were lost during the season. But by the

time the last blaze was under control, the cost in timber was reckoned in many millions of dollars. With the forests closed, some mills shut down, and loggers, truckers, and other workers faced lean days.

Incalculable damage was done to watersheds, wildlife habitats, and recreational and scenic areas. Fishing lodges and dude ranches suffered from canceled reservations. The fiercest fires destroyed even the organic matter in the topsoil, and left the land prey to erosion. Ashy debris rolled down the steep slopes into streams and lakes, polluting the haunts of the Northwest's famous steelhead trout and salmon.



U.S. FOREST SERVICE, BIDDACHOWE BY JAMES C. VINCENT © W.A.S.

holds 1,000 gallons of the fluid and usually unloads it in two spraying runs. Small spotter planes frequently lead tankers to their targets.

Nature, of course, in its own good time will repair the ruin visited in a single summer upon an environment that had been hundreds of years in the making. But the process of healing and regrowth is slow, and scars of the destruction Jay and I saw in Oregon's Cascades, Idaho's Bitterroot Range, and elsewhere will remain for generations.

Flames Driven by 60-mile Winds

At Willamette headquarters, we heard that a stubborn fire in northern Idaho had advanced into Kaniksu National Forest. Jay got there in time to see the largest and deadliest of the Northwest blazes. Born of lightning,



Temporarily up a tree—a 120-foot ponderosa pine—a smokejumper will rappel down a line he carries for such emergencies.

it was only a 1,000-acre fire on the flank of 6,375-foot Sundance Mountain until the afternoon of September 1. Then, fanned by winds up to 60 miles an hour, flames roared across 50,000 acres in less than 12 hours. In one 30-minute period the fire advanced four miles.

By Labor Day, September 4, the Sundance fire stretched roughly 25 miles in length, and had a perimeter of 90 miles.

"We've got 2,000 men on the lines," Rolland Saylor, of the Forest Service, told Jay, "and we've built 21 miles of fire line. Yet you couldn't call the fire contained, and it certainly isn't controlled."

Man power on the Sundance blaze included





Army and National Guard units, state forest workers, employees of the Soil Conservation Service, U. S. Forest Service "hotshot crews" from California, and youths from Job Corps camps. The Bureau of Land Management had flown in Eskimos from Alaska, and veteran Indian fire fighters arrived from Arizona and New Mexico. There were student volunteers, striking copper miners from Montana, and recruits from the skid rows of Seattle and Spokane.

Young Lookout Survives an Inferno

Meanwhile, from 6,270-foot Trapper Peak, about 30 miles north of Sundance Mountain, fire was sweeping an area of 16,600 acres. Forest Service officials were holding their breath for fear the winds would merge the two great fires into a single colossal blaze. Toiling on the Trapper Peak lines were 2,000 men.

Sundance had already claimed two lives. When the high winds whipped the fire out of control, a Forest Service sector boss and a bulldozer operator found themselves trapped in a blazing ring. Bodies of the men, suffocated, were found under the machine.

Death came uncomfortably close to 18-year-old Forest Service lookout Randy Langston, who was on the tower atop 7,264-foot Roman Nose when the Sundance blaze mushroomed. It was his first summer on the job, and he had spent it keeping his eyes on a 360-degree sweep of lordly forests and emerald lakes high in the Selkirk Mountains. He reported daily by radio to Gene Napier, a fire-control officer at Kaniksu headquarters in Sandpoint. Every two weeks he received supplies by pack mule.

That Friday afternoon Randy noted rising winds and saw smoke and ashes blow past the tower. Soon, after making calculations with map and alidade—an instrument for determining direction

Like Roman candles, evergreens explode as flames sweep upward through dry needles in Willamette National Forest. Fire fighters do not attempt the impossible; they know that a grove "topping out" cannot be saved. Man with a hand torch will start backfires in an effort to make the blaze burn in upon itself and thereby spare other threatened trees.



FLAMEBITE (BELOW) BY ARTIST LITTLEBLEN; INSIDEBITE BY DOTTI L. ARNOLD © R.23



—he reported, “The fire is about six miles away.”

Napier immediately ordered Randy to pack his light personal gear and a portable radio and start hiking down the mountain. A truck was dispatched to meet Randy on a jeep trail a few miles from the tower. He never reached it.

“About a mile and a half down,” Randy said later, “I saw the first flames. I called Gene on the radio. He asked if I thought I could make Pothole Lake, a few miles from the base of Roman Nose.

“I told him no, I didn’t think so, so he told me to go back to the mountaintop and get out on a big rockslide near the tower. I climbed the tower and carried down some of my heavier gear and dragged it out on the rocks. The flames were so close to the tower that I couldn’t stay there any longer.

“The rock shelf had an overhang, and I wedged back under it as far as I could. Flames began roaring over it. I saw blazing branches as long as my arm fly past the overhang and down into the forests around the Roman Nose Lakes. They set a couple of dozen spot fires.”

Every 15 minutes Napier called Randy on the radio. About midnight he looked up and back over the rock overhang and reported to Napier that the whole east side of the mountain had burned. Miraculously, the tower still stood on its concrete base. Next morning a helicopter plucked Randy, unharmed, from the summit of Roman Nose.

The Sundance fire shattered the usual tranquillity of Sandpoint, a

Flames gnaw at the heart of a majestic 150-foot western white pine in Idaho’s Selkirk Mountains. A sector boss on the Sundance fire makes a cautious inspection. Minutes later, he posted signs warning that the giant would soon crash.

Ravenous red tide devours tinder-dry underbrush in Nezperce National Forest. Shovel in hand, radio on hip, a shouting crew boss orders his men to smother the ground fire before it ignites the trees.

lumbering town of 5,000 beside Pend Oreille Lake. On Labor Day weekend, Jay Johnston found it in turmoil. Fort Lewis, Washington, had sent 375 Army troops in 55 trucks, six ambulances, and five mobile kitchens to camp at the fairgrounds. Military police wrestled with giant traffic snarls.

Alaska Eskimos Lend a Hand

Tables were at a premium in Connie's Cafe. A sign behind the counter advertised "Motorcycle Races, Rain or Shine." Scrawled blackly across it was "Canceled Due to Fire."

By 5 p.m. Monday the Sundance fighters had hacked a line all around the fire except for four miles on the eastern side. Near Hellroaring Creek five 24-man crews of short, dark fire fighters labored to close that gap—sawing, chopping, digging, shoveling. They strongly resembled American Indians, but they were not. They were Eskimos from

Chevak, a tiny riverside fishing village near the Bering Sea (below).

A dozen such crews had flown from Alaska to help fight the fires. For most of the Eskimos, it was their first trip "outside," their first look at horses and cows.

Frank Ulroan, the Chevak crew leader, spoke good English.

"The first question everyone asks us," he said, "is 'How do you like it here in the Lower Forty-Eight?' We tell them, 'It's too hot.'"

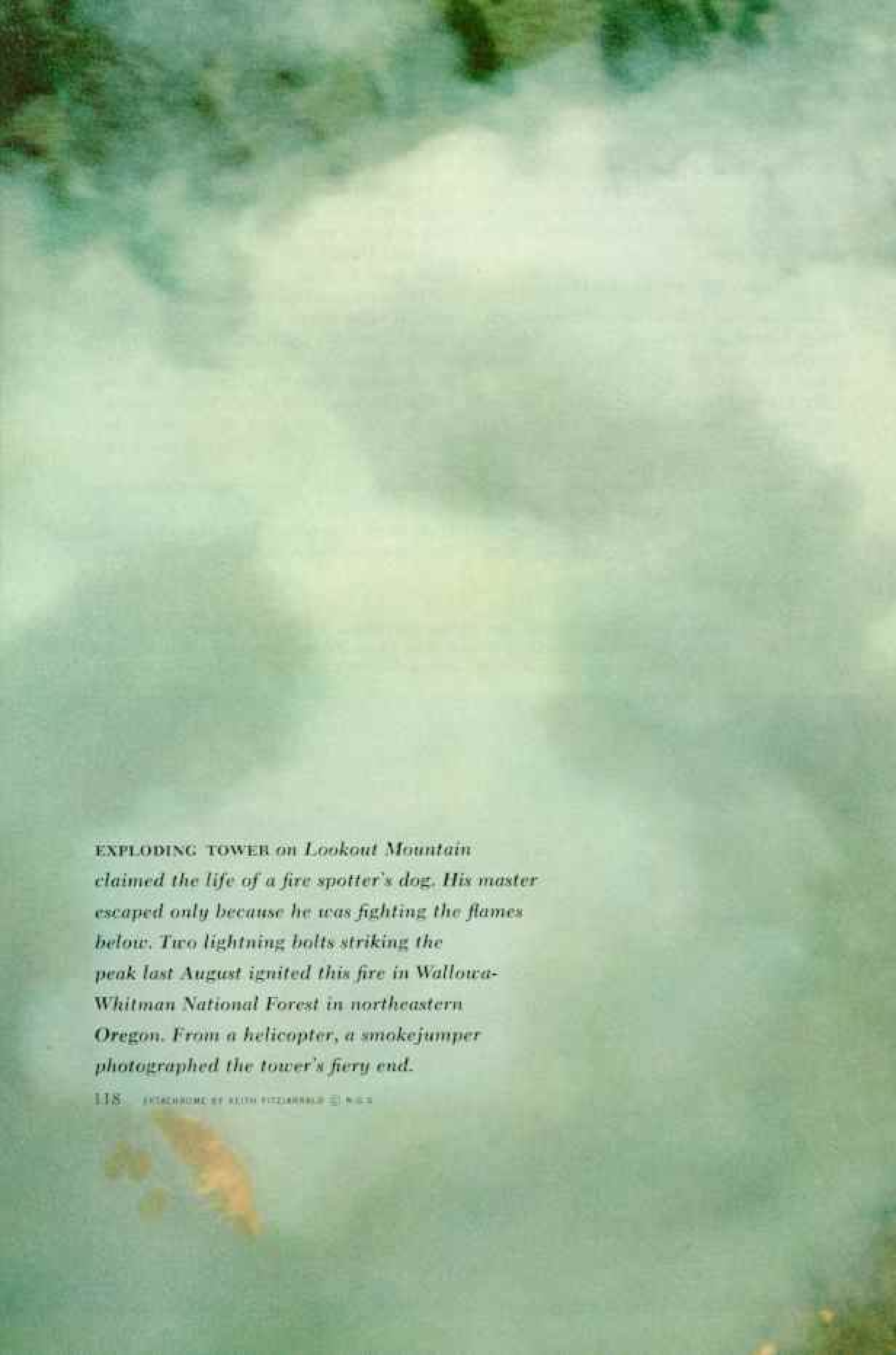
"You know what really fascinates these men?" asked Brian Weatherford, their non-Eskimo liaison officer. "Ants. They never saw any in Alaska, and every free moment they have they go out in the fields and watch ants at work."

Only two ridges removed from Hellroaring Creek, where the Eskimos toiled, lay the Pack River watershed. Two days earlier the Sundance fire had raced through this area of

Strong arms of an Eskimo fire fighter hurl dirt on charred woodland to prevent a flare-up of the Sundance blaze. Flown in by jet, 12 Eskimo crews from Alaska helped battle the Northwest fires. In Idaho many of them saw their first horses, cows, and ants.

PHOTOGRAPH BY DAVID L. ARNOLD, NATIONAL GEOGRAPHIC STAFF © 1982





EXPLODING TOWER on *Lookout Mountain* claimed the life of a fire spotter's dog. His master escaped only because he was fighting the flames below. Two lightning bolts striking the peak last August ignited this fire in *Wallowa-Whitman National Forest* in northeastern Oregon. From a helicopter, a smokejumper photographed the tower's fiery end.



majestic trees and immense ferns. People who had visited the scene told Jay the devastation was incredible, so he went to see for himself (pages 124-5).

"Everything I had heard was understatement," Jay reported. "As our jeep wound down into the Pack River Valley, I looked out on the nearest thing to total ruin I have ever seen. On both sides of the narrow stream, as far as I could see through the smoke, there was only gray-black death."

Here the blaze had burned so fiercely that it created a rare phenomenon—the combination of intense heat and winds called a fire storm. Awesome winds, generated within the storm's micro-climate, snapped the trunks of 30-inch trees. Tall cedars were uprooted and piled one atop the other like jackstraws (painting, pages 122-3).

Indians Rank as Fire-fighting Elite

On several of the fire lines, Jay and I encountered crews of sturdy, bronzed men laboring swiftly and efficiently with shovels, saws, and axes. Each group wore distinctive tribal designs on their hard hats. Among the most highly respected of fire fighters, these were Indians of the western United States.

Their insignia identified them as representatives of the Jemez, Zia, Santo Domingo, Taos, and Zuni pueblos in New Mexico and of the Hopi, Navajo, and Papago reservations in Arizona. There were also Sioux from South Dakota, Flathead from Montana, Nez Percé from Idaho, and others.

What makes the Indians—especially those from the Southwest—such superb fire fighters? Veteran foresters cite a combination of factors: They are physically and mentally conditioned for rigorous outdoor work; they know how to fight fires without water because they come





DETAIL ABOVE LABELED BY TED MARTELL; EXPLORE (BELOW) AND EDGEWORK BY PAUL BEAVER © N.A.S.



Breakfast at dawn brings respite from a long night's battle. Open-air kitchen at the Hoodoo Ski Bowl feeds a Mexican-American crew from the Snake River Valley.

Second helping of steak revitalizes a begrimed fire fighter. Crews generally spend 10 to 12 hours on the line, but at crucial times they may labor for 18 hours at a stretch. Such grueling work demands good food and plenty of it. Where possible, mobile kitchens prepare the meals, but crews far from base camp often must subsist on canned rations flown in by helicopter.

Rare moment of rest finds a fighter stretched out on his paper sleeping bag. The new type of bedding offers advantages: It is lightweight, waterproof, and cheap enough to be expendable. But it provides little warmth against chill nights in the forests.

from arid country; confident in their own teamwork and hereditary knowledge of forest ways, they do not panic in tight spots.

Subject to call anywhere in the West, the Indians must be prepared to fly fast and light. Urgent evening calls to New Mexico and Arizona have landed Indians in Wyoming and Montana before daylight. A call to Albuquerque at 5 p.m. can bring crews to a fire in California by midnight.

During the 1967 fire crisis, the airports and small airstrips scattered throughout the Northwest were busy around the clock. Air power has become a mighty weapon in the war against forest fires.

122 Besides dropping retardant, planes fly

parachuting smokejumpers to fires that cannot be reached in any other way, transport fire-fighting crews, map fires with special infrared and electronic equipment, and haul all manner of tools and supplies.

Smokejumpers' Rule: "Hit Hard and Fast"

Helicopters can reach otherwise inaccessible places. Several times we saw them hover over steep slopes and lower tools on lines to crews, and, once, hoist an injured man for a quick trip to a hospital. Helicopters also drop retardant, and some are equipped to lower huge buckets to lakes or streams, haul up as much as 900 gallons of water, and swiftly fly it to hot spots (page 110).



Perhaps the busiest airport of all was the one at Missoula, Montana, site of the Forest Service's northern regional headquarters, its Smokejumper Center, and its Northern Forest Fire Laboratory.

A large array of aircraft crowded the hangar area, and none of them bore the sleek look of modern jets. Besides dozens of light planes, they included heavy and medium bombers of World War II vintage.

Except during fire season, these larger craft stand idle, maintained for emergency use only. The smaller planes usually perform such jobs as crop-dusting and charter flights. Now all were being used in retardant-dropping and other fire-fighting missions.

PAINTING BY NATIONAL GEOGRAPHIC STAFF ARTIST WILLIAM H. BURRIS © 1983



Near a hangar, young Dave Robinson was slashing bags open and pouring retardant into a hopper to be mixed with water. The resulting slurry would be loaded into the planes and rushed to the front (pages 112-13).

A knee injury had prevented Dave from going on the flights that had been dispatched daily from Missoula for the previous two weeks. A college student in the winter, Dave had graduated from the smokejumpers school the year before and had made many fire jumps.

To qualify for smokejumpers school, an applicant must be less than 28 years old, in top physical condition, and have had at least a year's experience fighting forest fires. From as many as 500 applicants a year—mostly teachers and college students—only about 80 are selected. Nearly all complete the four-week course in parachute jumping and fire fighting, which teaches the behavior of large blazes and the tactical and logistical problems of fire control.

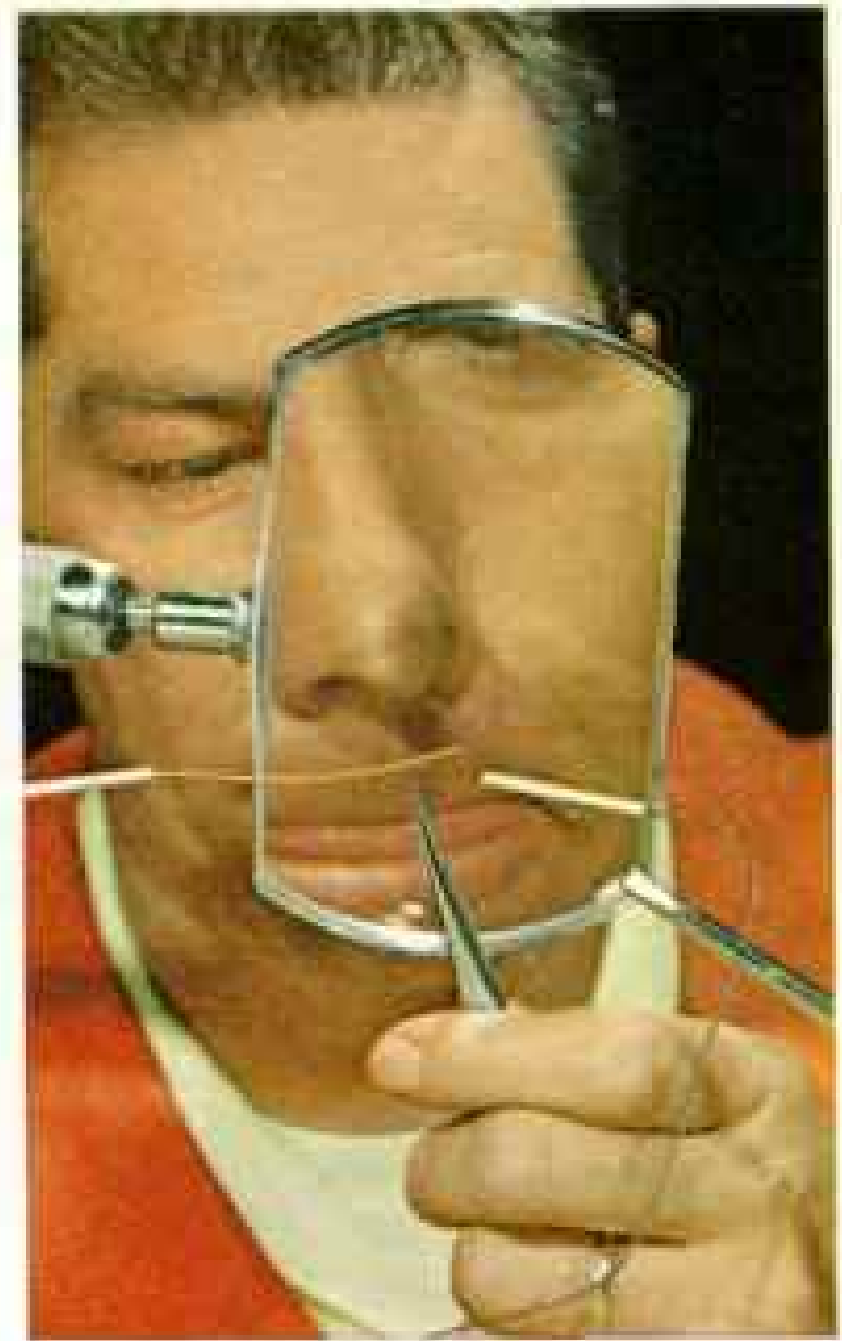
The course requires seven parachute jumps. In these, Dave said, the men follow the cardinal rule of smokejumping: "Always land as close to the target as safety permits, and hit the fire hard and fast."

Since smokejumpers often land in trees, with a force equal to that of a 10-foot free fall, they wear tough nylon jump suits and wire-mesh face masks attached to plastic helmets (page 111). Each jumper's outfit includes a nylon line, coiled in a leg pocket, by which he can lower himself from a tree like a mountain climber rappelling down a cliff face (page 113).

Once on the ground, jumpers must collect and shoulder 40-pound packs of equipment, which are dropped separately. Besides fire-fighting tools, each pack contains a sleeping bag and enough food to sustain a man for two days.

Tornado-like fire whirl, its funnel-shaped vortex of flame spinning at 300 miles an hour, uproots centuries-old cedars. An artist's recreation depicts the fearsome fire storm that pulled in air to feed its fury as the Sundance conflagration swept across Idaho's narrow Pack River last September. So intense was the heat that it split granite boulders in its path. Scientists estimate that at its peak the cataclysmic fire front released energy equivalent to that of a 20-kiloton bomb exploding every two minutes. One such bomb leveled Hiroshima. And, like Hiroshima, the Pack River region cooled to a scene of awesome devastation (page 125).

Threading a pine needle into a thermocouple, a technologist records the surface temperature of the needle up to the instant of ignition. The U. S. Forest Service's Northern Forest Fire Laboratory in Missoula, Montana, conducts this study.



Wired for science, a bed of ponderosa pine needles blazes in a six-story combustion chamber at the Missoula laboratory. Recorded and filmed data on how fires spread will help scientists devise better ways of controlling future conflagrations.

Gray-black death shrouds the once-idyllic Pack River watershed. Only charred snags stand where 150-foot cedars and hemlocks raised a green canopy above slopes lush with ferns, wild flowers, and shrubs. Researchers from the fire laboratory measure shredded tree trunks to determine the strength of the fire-spawned winds that toppled them.

Working beside Dave Robinson was Leonard Krout, assistant project superintendent at the school. Grounded because he had passed the maximum jumping age of 40, Krout estimated that he had made 200 parachute descents. At the moment, he said, crews drawn from the 190 men based at Missoula were continually being dispatched to fire areas.

"Our fellows are primarily shock troops," he explained. "They fly out in DC-3's, which hold as many as 16 men and their equipment, or in smaller twin-engine aircraft.

"Sometimes," he added, "we even use that old crate over there. Do you recognize it?"

Leonard pointed to a boxy object that resembled a corrugated-iron garage with a wing and three engines. Amazingly, it was a Ford trimotor plane, an aeronautical sensation back in the early 1930's. Smokejumpers esteem this relic because it lumbers along at less than 100 miles an hour and permits easy

exit from a door placed well below the wing.

Next door to the smokejumpers school at Missoula stands the Northern Forest Fire Laboratory. Here laboratory chief Arthur P. Brackebusch and a corps of scientists busy themselves with forest-fire problems. Fuels such as pine needles, moss, and grass are studied to learn their flammability characteristics. In two large wind tunnels and a six-story combustion chamber, the researchers conduct burning experiments under controlled environmental conditions.

Throughout the mountains around Missoula the laboratory's mobile stations and radar units record different types of lightning strikes. Experiments also continue in the seeding of clouds with silver iodide crystals during lightning storms in the hope of preventing fire-setting discharges.

One of the Forest Service's most promising new tools is Fire Scan, the infrared detection

SMOKEJUMPERS (BELOW) BY PAUL BECKER, DETACHMENTS (TOP LEFT) AND FISHCATCHERS BY DAVID TILGNER © R.S.I.





Bone-weary fighter, half-blinded by smoke, silently prays for the rain so desperately

device developed by the Missoula laboratory, which I mentioned earlier. Taken aloft in a swift aircraft, this heat-sensing instrument reacts to even the smallest blaze in a forest and provides instant thermal maps of endangered areas.

In a Fire Scan plane flying as high as 15,000 feet above the ground, an image covering up to 250,000 acres appears on a cathode-ray tube like the screen of a television set. Fire shows up in varying degrees of intensity against a background of cooler vegetation and terrain.

The image on the cathode-ray tube is recorded on Polaroid film. Prints dropped in plastic capsules to fire-control officers provide up-to-the-minute intelligence on

the enemy's movements and capabilities.

Fire Scan makes maps accurately by day or night or through dense smoke. It cannot penetrate clouds, however; the minute water droplets blank out the infrared signal.

Looking beyond Fire Scan, researchers at Missoula and other Forest Service laboratories foresee the day when similar devices, riding satellites far out in space, may bring man to a long-sought goal—detection of all forest fires at the very moment of birth.

Finale: the View From Headquarters

Back in Washington, D. C., Jay and I discussed the 1967 fires, and the outlook for future summers, with officials of the Department of Agriculture's Forest Service. Among



SCENERY FROM BY NATIONAL GEOGRAPHIC PHOTOGRAPHER DAVID LITTLEFIELD © N.G.S.

needed. September storms finally ended the Northwest's nightmare summer of fire.

them was Malcolm Hardy, Director of the Cooperative Forest Fire Prevention Program, the symbol of which is Smokey Bear.

From Mr. Hardy we learned that fire in the forest isn't always bad; it can be a boon as well as a bane.

"When conditions are just right," he said, "skilled foresters use fire to prepare sites for seeding or planting, to reduce hazardous accumulations of fuel, to curb diseases that afflict trees, and to improve conditions for wildlife and livestock.

"But fire must be controlled by man. Unleashed, it changes from docile servant to berserk destroyer.

"The fires of 1967 in the Northwest show what lightning can do when conditions are

critical. For the Nation as a whole, however, nine out of ten forest fires result from somebody's carelessness, ignorance, bad luck, or malicious disregard for the rights of others.

"A disturbingly large number—more than one in four—are set intentionally," Mr. Hardy continued. "Not far below incendiarism in the statistics is debris burning.

"Thus, while people are the principal cause of the wildfire problem, people are also the only hope of its solution."

Through its prevention program the Forest Service strives constantly to remind Americans that fighting forest fires is a dirty, dangerous, and difficult business, sometimes exciting, but always expensive—in dollars, lives, and resources.

THE END

AN ERA ENDS
FOR THE "YANKEE" ISLES

The Bonins and Iwo Jima Go Back to Japan

By PAUL SAMPSON

National Geographic Staff

Photographs by JOE MUNROE

THE PATRIARCH OF CHICHI JIMA, largest of the Bonin Islands, gazed out over a cobalt-blue Pacific and warmed to his favorite subject.

"I'll tell you one thing," said Uncle Charlie Washington. "We're thankful for what the United States has done. I can't express it—the way they treated us, the kindness. They gave everybody a show to earn a livin'."

We stood on a height overlooking the harbor of this island, some five miles by three, rising in gentle peaks 600 miles south of Tokyo (map, page 137). The brush-tangled hills were honeycombed with tunnels, caves, and crumbling gun emplacements—relics of Japanese last-ditch determination in World War II.

Uncle Charlie, a wiry little fisherman with a handlebar mustache, spoke with special fervor. After 23 years of American control, his home islands were reverting to Japan.

I marveled silently at Uncle Charlie. Now 87, he was born on Chichi—a Japanese island—yet he breezed along in fluent, colloquial English salted with traces of Massachusetts. He spoke of the "cam" water, and of the "com-mahnder" of the U.S. Navy base below. His weathered sailor's face bore no hint of the Orient; in his dungarees and faded work shirt he would have looked at home on a dock in New Bedford (page 135).

Semitropical Chichi Jima, the only one of the Bonins now

Lush Eden to early seafarers, the Pacific island of Chichi Jima still shelters descendants of New Englanders who first settled the Bonins in the 1830's and 40's. During World War II, Japanese fortified Futami Bay, including the distant village of Omura; they also beached the torpedoed freighter *Hinko Maru* as a barrier against a feared United States landing attempt. For 23 years the U.S. Navy has administered Chichi and its sister islands; now they revert to Japan.





inhabited, has been an outpost of New England for nearly 140 years. Many of the 202 islanders, legally Japanese citizens, trace their ancestry to Yankee sailors. Nathaniel Savory, of Essex County, Massachusetts, arrived with the first settlers in 1830 and founded a dynasty that still produces island leaders. Uncle Charlie is the son of a Negro cabin boy who jumped an American whaling ship here in 1843.

Photographer Joe Munroe and I were the first journalists permitted by the United States Navy to study the Bonins intensively since World War II. We found a happy handful of people with a whole group of islands to themselves. Their goats scrambled freely over the hills; they fished off the islets in outriggers.

Before the war, nearly 6,400 Japanese colonists had dominated the Bonins, but Japanese and "Yankees" alike were evacuated at the height of the Pacific campaign. The United States allowed the descendants of the original settlers—135 in all—to return in 1946. Joe and I soon saw that two decades of American rule had reinforced the islanders' original heritage. We attended a meeting of the island council, whose five elected members represent the Savorys, Gilleys, Robinsons, Webbs, and other Chichi families. It reminded us of any small-town council in the States.

Return of Japanese Stirs Hope and Fear

Yet we also saw a happy union of East and West in our weeks of wandering on Chichi Jima. Where else, I mused, could Kayu Yashiro marry George Washington and settle down in a frame bungalow built by the United States Navy and fitted with a Japanese bath?

The Yankees who grew up on Chichi before the war attended Japanese schools, but learned English in their homes. "I had to speak English to my father or he would beat me," recalled Nat Savory, a great-grandson of the original Nathaniel.

Nat's features, like those of most middle-aged and older people on Chichi, strongly suggest Western origin. The younger inhabitants reflect increasing intermarriage with Japanese. Some of the girls are classic Eurasian beauties; many of the boys look Japanese. The shy island children wear clothes ordered from mail-order catalogues and listen to American country-and-western records.

Nineteen-year-old Irene Savory summed it up poignantly: "We are children of two worlds."

In the twilight of Western ascendancy, I found Chichi Jima awaiting the return of the Japanese with an uneasy mixture of hope and apprehension.

The Japanese claim to the Bonins goes back to 1593, when, they say, Ogasawara Sadayori, a warrior prince, landed on the chain. Subsequent expeditions confirmed that the islands were *munin* or *bunin*, "empty of men"—hence the name "Bonin."



Trained by the Navy, 24-year-old Jimpei Komata mans an air hammer on a public-works project. His face reflects English, Polynesian, and Japanese ancestry.



Western features of Jesse Webb recall his English grandfather, who came from Surrey in 1847. Jesse, a cousin of Jimpei, has long worked for the Navy as a painter.

Great-granddaughter of a Yankee, Lulu Savory Ashcraft married a U. S. sailor from Chichi's 30-man Navy base and, with their two young daughters, will go with him to his next post. Her forebear, Nathaniel Savory of Massachusetts, arrived in 1830 and led the little colony for 44 years.



APRACHONS (RIGHT) AND RESEARCHER © N.A.S.

At the American school run by the Navy, 14-year-old Ruth Savory masters eighth-grade work. Last year, two dozen Chichi youngsters attended high school and college on Guam.



Descendant of a Portuguese seaman, Episcopal rector Isaac Gonzales cultivates Chinese cabbage. He also teaches island children Japanese to prepare them for the return to Japan's sovereignty.

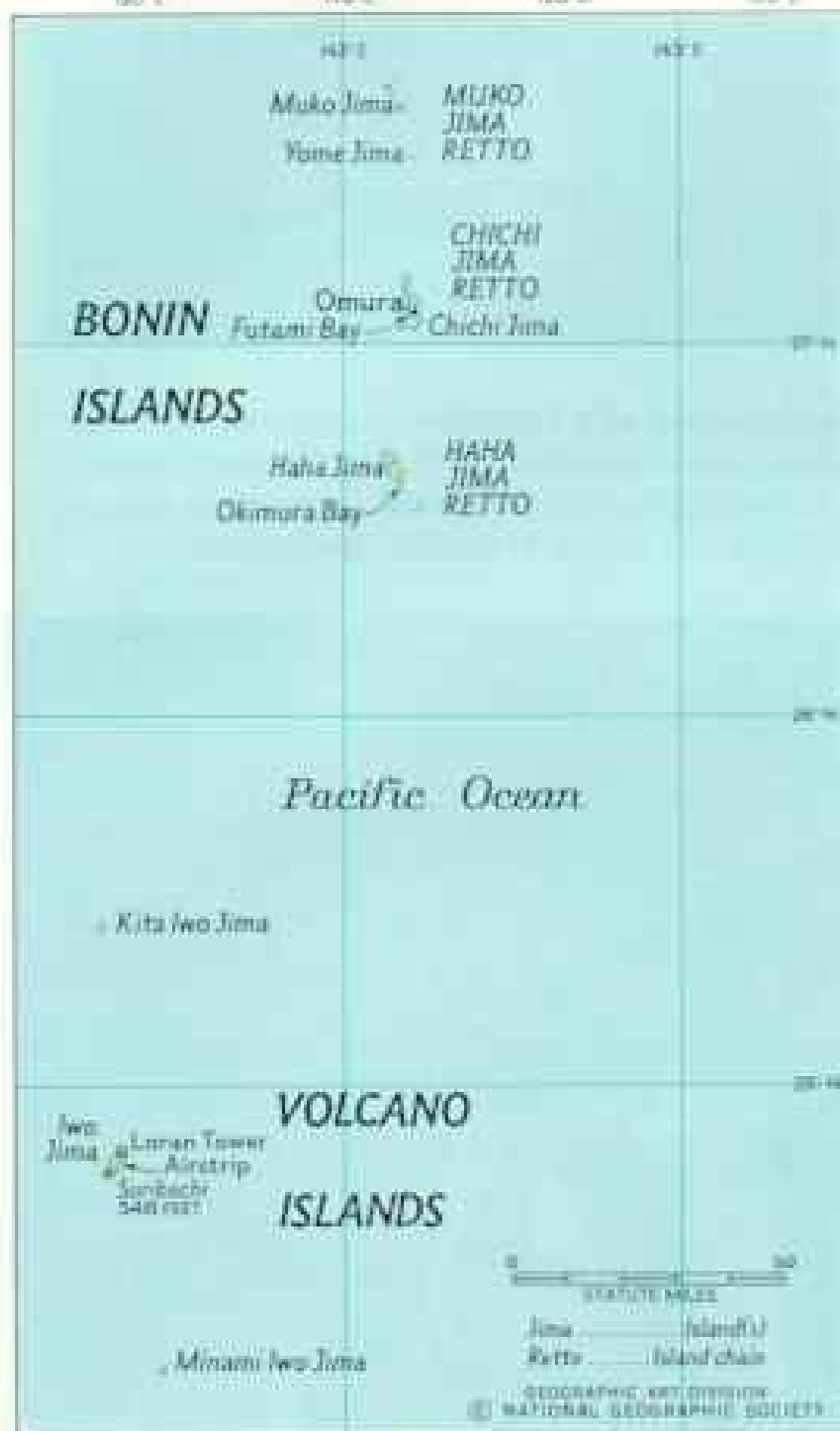




Chichi Jima was still uninhabited when Nathaniel Savory and a mixed band of about 30 colonists—British, Genoese, Danish, and Hawaiian—arrived from Hawaii in 1830 to establish a new home and life. In the years that followed, drunken whaling crews and pirates often drove the settlers from their homes to refuge in hill caves. Savory, a natural leader, was elected chief magistrate, and helped to impose order at last on the rough-and-ready island.

Japan formally annexed the Bonins in 1876, two years after Savory's death. Japanese colonists trickled in. Within ten years all the Western settlers had become naturalized Japanese. They clung to their separate

Land ladder to Tokyo Bay, the Bonin and Volcano Islands, plus Marcus Island and the coral atoll of Parece Vela, total only 40 square miles. They were *bonin*, or empty of men, until five Westerners and 25 Hawaiians settled on fertile Chichi Jima in 1830. Impressed by its strategic location, American Commodore Matthew Perry spent his own money to buy land in 1853 from Nathaniel Savory for use as a coaling station, but his plan died. Japan annexed the Bonins in 1876 and began colonization; she later added the other islands. In World War II, Chichi, Iwo, and Marcus served as Japanese bases.



Siren song of the sea holds fisherman Willie Savory as it did his forefathers—sailors, seal hunters, and whalers. Off Chichi's harbor he harpoons the hard-fighting wahoo with the spear resting between forked sticks on the red outrigger of his canoe. Dropping a bright fish-shaped lure, Mr. Savory will watch for wahoo, or giant mackerel, through a glass-bottom "look box." Closer to shore, he hunts sea turtles.

identity, however, and banded together in a village called Yankeetown.

I wondered how the islanders had fared during World War II, and asked Nat Savory. "The Japanese were good people," he told me, "but when the war started, they changed."

Some of the Yankees were drafted into the Japanese Army; others were forced to work on island fortifications. Their Western faces aroused hostility.

"I remember," said Jerry Savory, another great-grandson of Nathaniel, "a Japanese officer telling me, 'Jerry, your ancestors' country is finished.' This hurt me very much."

When Pacific combat forced the evacuation of the colonists to Japan in 1944, nearly

7,000 persons left the Bonins and Iwo Jima, in the Volcano Islands, 170 miles away. At that time the Japanese feared an American attack on either Chichi or Iwo and heavily fortified both islands. Iwo Jima, because of its strategic importance as the best available air base between the Mariana Islands and Tokyo, was the actual target. After it was taken, the Bonins were bombed almost daily, but never invaded. U. S. Marines occupied Chichi Jima in December, 1945.

Then the United States assumed jurisdiction over the Bonin and Volcano Islands. The Navy administered them, although Japan retained "residual sovereignty." Following long negotiations, Japan expected to resume

Stiff as a board, a frozen wahoo rides the shoulder of Willie's brother, Moses Savory. He carries it from a freezer in the fishing cooperative. An old fish tally marks the wall. The Navy provided the freezers and shipped fish without charge to Guam, but set a quota because of limited space. Now, under Japan, Chichi Jima's fishermen must make new marketing arrangements.



ADAPTED BY JOE BURRIS © U.S.A.



control of both island groups in the spring or early summer of 1968.

On the eve of that much-discussed event, Uncle Charlie Washington said, "I can't say anything against the Japs. They treated us O.K. Of course I was born under the round ball, the rising sun."

Yet we found that many of Chichi's older people were worried. "To tell you the God's truth," one of them told me, "I wish they never would come back. We're content. The Navy has always treated us good. What more could we want?"

Young islanders, however, hope that the Japanese will liven up Chichi Jima. They anticipate, perhaps too optimistically, instant resort hotels, tourists, new stores, and new faces to spice the quiet routine.

"The Japanese will be more active and progressive," 20-year-old Diana Washington declared. But she added, wistfully, "I guess there won't be as much running around barefoot and picking oranges in the hills."

Terror Follows Boredom on Chichi Bird

Joe and I saw many barefoot girls but few oranges on Chichi Jima. For a time I feared we would not even see Chichi. Getting there was half the trouble.

At the time of our trip, two main routes spanned the blue Pacific from Guam to Chichi Jima. For years three valiant old Navy Grumman HU-16D's, amphibious planes collectively dubbed the "Chichi Bird," flew there on an irregular schedule. The flight, one passenger told me, meant "five hours of boredom and ten seconds of sheer terror." (The moments of terror came when the Bird skimmed

mountaintops, twin engines sputtering, and plummeted into the tiny harbor.)

A typhoon had grounded the Chichi Bird, so Joe and I took the alternative. We boarded the USS *San Joaquin County*, a Landing Ship, Tank, that shuttled back and forth from Guam to Chichi to Japan. The LST brought supplies to the islanders and the 30-man Navy facility, and carried the island's fish catch to Guam. The cargo on our trip was typically varied: 10,000 pounds of rice, a drill press, 125 cases of beer, a portable water cooler, 1,088 pounds of bread, a reflector antenna, 2,300 pounds of plywood, a pinball machine.

For five long days the flat-bottomed LST wallowed from trough to trough. Finally, we sailed into the sheltered harbor called Futami Ko—a remnant of a volcanic crater—at Chichi Jima. Rolling ceased; spirits soared.

The dull orange sun was disappearing into the Pacific behind us. A petty officer came on deck, pointed to the golden afterglow on the green mountains, and said, "I'll always remember the Bonins. These people are good, real good. The natives and the Navy here are just like a big family."

Joe and I joined the family. Though the only telephones on Chichi were the Navy's eight rural-style crank sets, word of mouth transmits news at teletype speed. No one seemed surprised to see two strangers strolling the oiled dirt road that serves as main street of Omura, Chichi's sole village.

Soon after I arrived on Chichi, I was stopped on the main street by a gray-haired man. "My name is Willie Savory," he said. "I work just now as a painter for the Navy, but I'm a fisherman" (pages 132-3).



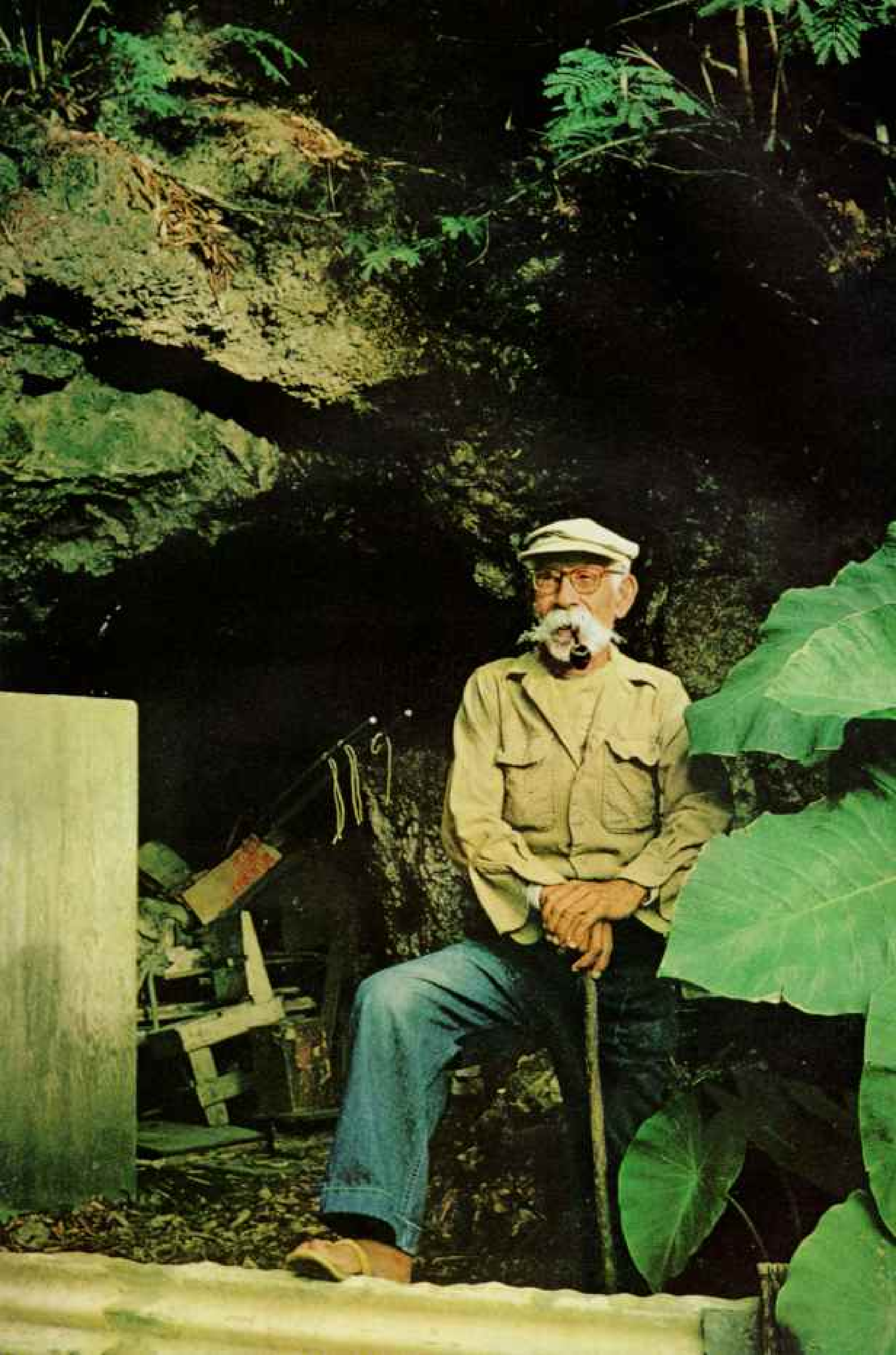
Scourges of paradise: Giant African snails, brought from Japan only 30 years ago, ravage gardens. When the five-inch mollusks climb high, islanders say, a typhoon approaches.

Leafy ginkokai grows in impenetrable walls; the Japanese planted the Central American shrub to camouflage gun positions. Now children at play blow its seeds through peashooters.



EDDICHRODES © NATIONAL GEOGRAPHIC SOCIETY

Grand old man of Chichi Jima, 87-year-old Uncle Charlie Washington reminisces about his youth. His father, a Negro cabin boy from Bermuda, deserted a vessel here in 1843; his mother was a daughter of Nathaniel Savory. During the days of sail, Charlie shipped aboard whalers and sealers that called at Alaska and San Francisco. Through it all, he recalls, "I never had hard times, you know."





Clearly, Willie's deeply lined, tanned face said man of the sea, and his boyish, tooth-filled grin bespoke one of the warmest hearts on the island. We became good friends.

The dark-blue waters around the Bonins teem with fish—wahoo up to 100 pounds, mackerel, tuna, rock cod, and many varieties of small reef fish. Schools of sardines scud through shallow waters like dark clouds. The islands supported a major fishery and two Japanese whaling stations before the war.

Chichi fishermen regularly cross the open sea to the now-uninhabited isles of Muko Jima, 40 miles away, and Haha Jima, 25 miles, when fishing promises to be better there. Willie described one visit to Muko:

"I told the guys, 'I say it's going to blow. We gotta go back.' But they didn't listen to me. So, O.K., next day it started to blow. We had enough chow for that day. But after that

we had none, so we had to go out and chase wild goats. We ate barbecued goats for five days. And we dug down into an old well to get water."

Jerry Savory explained that the quota for each fisherman was 800 pounds a month; they could easily catch much more, but space was limited on Guam-bound Navy ships.

Navy Leaves a Mark on Island Life

"Even if a man gets only 500 or 600 pounds of fish a month, and is not lazy and comes to the Navy and works," Jerry said, "he can earn at least \$200 a month. We live better than the medium-class people in Japan."

Like many other islanders, Jerry was worried about the Bonins' economy, if and when the Navy pulled out. About 60 men and women regularly worked for the Navy, earning a total of \$7,300 a month. Some weeks later I



Bound for a breeding place of storms, a Navy weather balloon, released from its green shroud, will sail up to 100,000 feet in this typhoon belt. Instruments will relay atmospheric data to electronic gear in the fiberglass dome. The U. S. is turning over to Japan the weather station on Chichi.

Grim reminder of combat, a Japanese coast-defense gun still points seaward from Chichi. During World War II, Japanese troops dug dozens of gun emplacements in the hillsides, improved the harbor to accommodate warships, and stored supplies for their airbase at Iwo Jima, 170 miles to the south. In 1944 nearly 7,000 civilians were evacuated to Japan from the Bonins and the Volcanoes. After the 1945 surrender, the U. S. Navy permitted 155 Chichi islanders of Western descent to return.



ALLIANCE/REUTERS © NATIONAL GEOGRAPHIC SOCIETY

learned that the base would, indeed, be closed, but that Japan would continue to operate the weather station.

The islanders lived in houses the Navy helped them build. The Navy treated their illnesses, educated their children, and provided bingo games and movies.

Under the Navy, the Yankees became even more American. Close friendships developed between the islanders and Navy families, which included 13 wives and 16 children when I visited Chichi. They fished together, played softball, and exchanged Sunday visits.

"These people are as nice as any I've met," said Chief Boatswain's Mate Robert McClure, who had spent the day helping a fisherman repair his outboard motor. "If you do them a favor, they repay it right away. I give them cake, because they do so little baking here. As soon as I get home, there's a boy with a bag

of tomatoes or some other gift at my door."

Though the Navy families on Chichi lived far from home—"Amer-ee-ka Jima," as they called it—their modest frame bungalows had all the comforts of suburbia, including barbecue grills. Standard stateside brands filled the commissary shelves. The movie theater consisted of an outdoor screen and folding chairs. Attendance was almost compulsive.

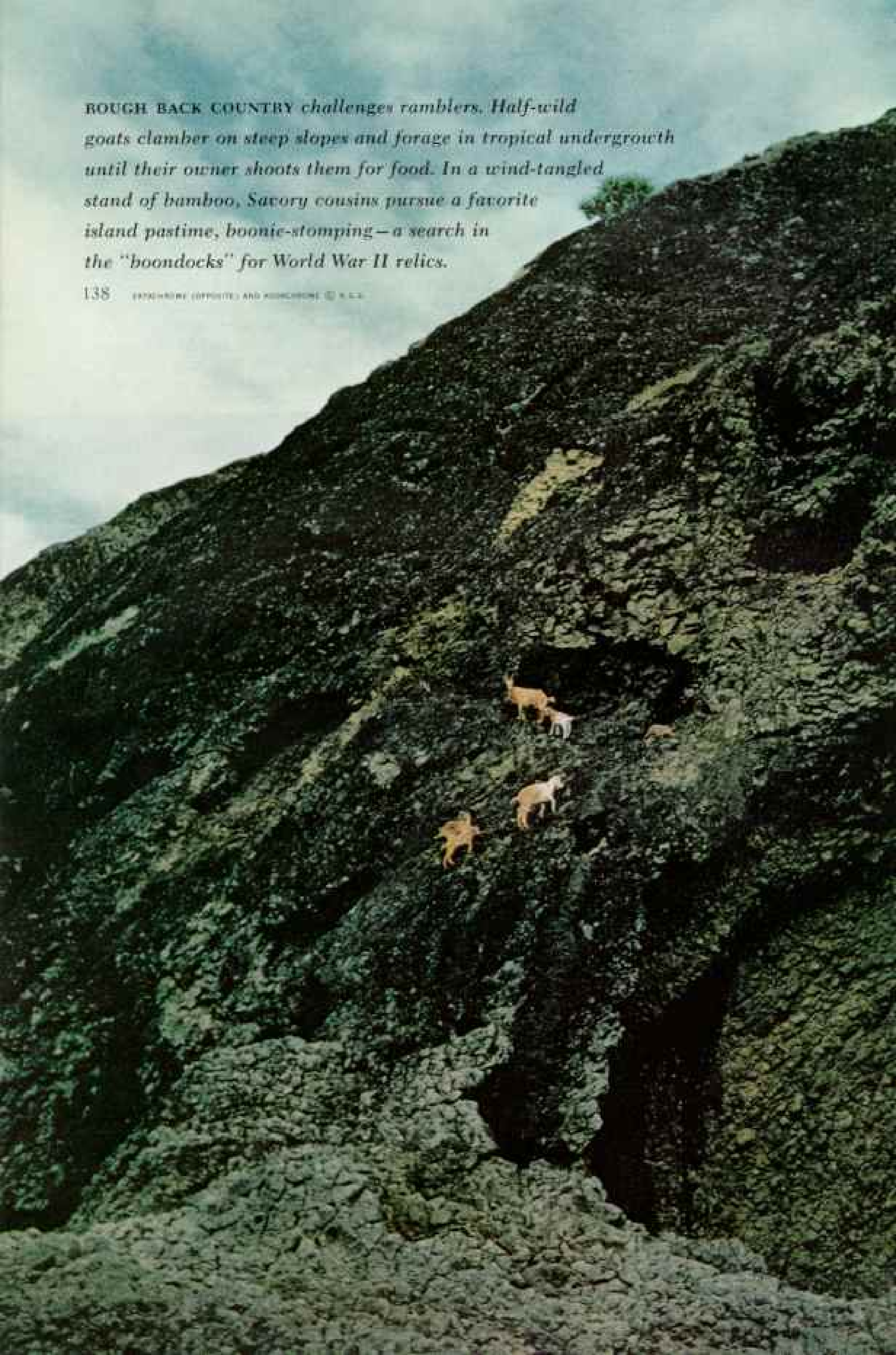
"You should see us on a cold, rainy night, bundled up in raincoats and boots and watching 'The Benny Goodman Story' for the fifth time," said the wife of a Navy yeoman.

Chichi Jima occupies a strategic spot in the Pacific, and the small base was designed to support the U. S. fleet. Municipal services, however, soon rivaled naval duties.

"I have been a civil engineer, cashier, accountant, foreman, and government adviser," said Lt. Comdr. Dale W. Johnson, officer in

ROUGH BACK COUNTRY challenges ramblers. Half-wild goats clamber on steep slopes and forage in tropical undergrowth until their owner shoots them for food. In a wind-tangled stand of bamboo, Savory cousins pursue a favorite island pastime, boonie-stomping – a search in the “boondocks” for World War II relics.

138 ESTABLISHED OPPORTIES AND ADVENTURES © N. C. C.







charge of the base. A doctor, a corpsman, and a nurse took care of the islanders' medical needs.

Lt. Wayne F. Crossman, the medical officer, told me one startling fact: At least half the adult islanders suffer from symptoms of peptic ulcers.

"I don't have the facilities to make tests to show if they are, in fact, ulcers," he told me in the island's gleaming dispensary. "In periods of stress the symptoms increase—say when fishing is bad, or in the typhoon season. I suspect it comes from living in a closed society, where everyone knows everyone else very well. Nervousness and tension would be natural products."

Though the islanders may indeed suffer from a sophisticated malady, they hold to simple beliefs. Even petite Anna Washington Stettenbenz, the native-born island nurse, admits to a few superstitions.

"Babies born on a falling tide will have a short life," she said. "All the old people keep track of this, and they know it's true. The first thing my father did when I was born was to go out and check the tide. Fortunately, it was rising."

Children Face a Language Problem

Uncle Rodrick Webb, an island leader, summed up two major worries on Chichi Jima about the Japanese return: education and property.

"I have a child in third grade," he said. "She has learned only English. If they start teaching only in Japanese, she'll have to go back to kindergarten.

"Most of our houses are not built on our own property. They were put where they are because of the water lines and electricity the Navy installed. We are worried about what we will have to do when the Japanese come back. Move the houses?"

Some of the houses occupy land owned by former Japanese farmers. Before the war, rich soil, a mild



D-Day on Iwo Jima: Marines hit the beach on February 19, 1945. Struggling through volcanic ash, they isolate 548-foot Mount Suribachi, only high ground on the eight-square-mile island. Some 21,000 Japanese defenders, concealed in caves, blockhouses, and pillboxes, fought on for a month. The death toll: 6,821 Americans and all but 1,083 Japanese.

Up goes the flag: Americans take Suribachi on February 23, a moment immortalized by Associated Press photographer Joe Rosenthal. For the next 23 years the Stars and Stripes flew from the height day and night. Now a copper reproduction of the flag honors the campaign in which, in Adm. Chester W. Nimitz's words, "uncommon valor was a common virtue."

Rusty wreckage of battle, a remnant of a Japanese tracked vehicle appears on an Iwo beach; the restless sea constantly exposes and buries such debris. Plans call for the U. S. to continue operating loran (long-range navigation) stations on Iwo and Marcus Islands.



PHOTOGRAPHS BY JOE ROSENTHAL, ABOVE; AND U. S. MARINE CORPS, OPPOSITE P. 141. MONROE BY JOE MONROE © N. G. S.



climate, and adequate rainfall made the Bonin Islands a huge natural greenhouse. Papayas, pineapples, bananas, and oranges grew plump and juicy in the warm sun. Ornamental, medicinal, and spice plants fetched good prices in Japan. Sugar cane was important, particularly on neighboring Haha Jima.

Today, on Chichi and Haha, you see only scattered patches of sugar cane still pushing through undergrowth. Vegetable farms have shrunk to backyard gardens.

Unhappily, farming in the Bonins has fallen victim to the giant African snail (*Achatina fulica*), the Oriental fruit fly, and an appallingly prolific scrub tree called ginkokai.

Wherever it goes, the giant snail devastates plants. Five inches long and equipped with thousands of rasping teeth, the brown-and-white pest has a king-size appetite (page 134). I saw snails crawling all over the island; whenever I stepped off a road, dry shells crackled underfoot.

Promoters introduced the snails, native to east Africa, into Japan and later the Bonins as a food and a "cure" for everything from tuberculosis to kidney trouble. The Japanese took snails to many Pacific islands as protein for their soldiers. But even as a last-resort food, the snails were unpopular.

The giant snails, islanders say, do serve one useful purpose. The natives are convinced the snails forecast typhoons.

"That's right," Uncle Charlie told me. "If you see these snails crawling up high, you got something comin'. That's no dream. They know it before the weather hits."

New World Tree Overgrows the Bonins

Islanders fence their gardens with corrugated iron to keep out the snails. But fences don't stop the Oriental fruit fly, a pest that apparently came to Chichi Jima in wartime shipments of fruit.

The fast-growing ginkokai (*Leucaena glauca*), with its feathery leaves and long green seed pods, is rather attractive, taken one at a time; en masse, it is an ecological nightmare. Originally from Central America and the West Indies, it grows into a nearly impenetrable jungle. The Japanese brought ginkokai to Pacific islands to camouflage gun positions. It has overgrown the Bonins.

Shortly before our visit to Chichi ended, Joe and I went to a party at Nat Savory's little yellow-painted teahouse. We wanted to see Jerry Savory's Japanese basket dance.

Jerry, the picture of dignity when sitting as a council member, unbends at parties.

Roy Gilley accompanied him, tapping a table and a dish with a stick and singing in a nasal monotone. Jerry put a blue kerchief on his head and stepped out the simple, rhythmic folk dance as he pretended to catch fish in a rice field and put them in a basket.

Then Roy whipped out his harmonica and ran through his repertoire, ranging from a Japanese chanty to "Auld Lang Syne." Jerry, who longs to become a United States citizen, delivered his favorite "Stars and Stripes Forever" speech, an eye-misting display of unashamed flag-waving. He wound up by belting out "Carolina Moon."

Ghost Towns Guard Lonely Haha

The next morning Joe and I embarked on a trip to Haha Jima, wrapped in haze on the southern horizon 25 miles away. Before the 1944 evacuation, 2,050 Japanese colonists had lived on Haha, which means "mother," compared with the 4,300 who lived on Chichi, or "father." Only fishermen and Japanese graves visitation teams called at Haha for a long time after the war. The last residents had left nearly 24 years before we made the trip in a Navy air-rescue boat.

Haha still lay deep in its long slumber as we poked into placid Okimura harbor. A school of fish rippled the water; two wild geese glided near shore. No other sign of life—only eerie silence. The narrow beach ended abruptly at a solid wall of ginkokai and brush. Behind slept the ghost town of Okimura, once the largest settlement on Haha.

Jeff Gilley, Roy's younger brother, unsheathed a machete and hacked a path through the tangle. Sunlight filtering through the green leaves cast bizarre shadow patterns.

We reached the shells of two brick warehouses. Wartime bombings and time had obliterated every other structure in Okimura, except for a concrete communications building on the hill overlooking the harbor. No trace remained of the broad road that once led from the beach.

Pushing up past a rusted Japanese Army truck and a field gun with barrel missing, we found a hillside cemetery choking in dense growth. Plastic flowers, left months before, brightened many graves.

Back at the beach, we heard a faint buzzing: a reconnaissance plane. A Navy officer with us said the Japanese had been given



STYLING BY JOE MURRAY © NATIONAL GEOGRAPHIC SOCIETY

"I would go back to the Bonins tomorrow," a 65-year-old native of Haha Jima tells her granddaughter. Now living in Tokyo, Mrs. Ito Takahashi recalls leaving her farm and tobacco shop in 1944 with a few possessions, including the pincushion she holds. Wall poster shows a Bonin breadfruit tree and speaks of love for her birthplace. With the Bonins reverting to Japan, she and hundreds of others hope for an early return to their island homes.

permission to photograph the island to plan for its future development. With this reminder that Haha Jima would surely reawaken, we slipped out of Okimura harbor.

On a bright, breezy morning Joe and I said goodbye to our Yankee friends and boarded the Chichi Bird. It lumbered into the air, bound for a more famous island also scheduled for reversion to Japan. Its name, somber in memory: Iwo Jima.

An hour later, Iwo poked out of the haze—a flat little island shaped like South America, but ending in a bump. The bump was historic Mount Suribachi. We circled closer and I saw the Stars and Stripes snapping in the breeze

atop the volcanic cone. White surf washed the black beaches. Time slid backward for me to the bloody battle for Iwo Jima.

February 19, 1945, was D-Day for 30,000 Marines who hit that beach of gritty volcanic ash. The narrow strip looks scarcely big enough to hold such a horde, to say nothing of the tanks, bulldozers, trucks, artillery, gasoline drums, and tons of supplies.

Just four days after the landing, 40 Marines crawled warily up the north face of Suribachi. They overwhelmed a small Japanese force in a brief, fierce fight, and planted the American flag on the 548-foot height. Later in the day, six Marines replaced the banner with a larger

flag, and Joe Rosenthal of the Associated Press recorded the scene in one of the most famous war photographs ever made (page 141).

Only after 26 days of slaughter was Iwo Jima secured. We suffered 26,038 casualties, including 6,821 killed. The 21,000 Japanese fought to the end, yielding only 1,083 prisoners.

"Among the Americans who served on Iwo Jima uncommon valor was a common virtue." These simple, moving words of Adm. Chester W. Nimitz leap from a plaque under the United States flag that flew night and day atop Mount Suribachi. Just before the reversion agreement was signed, the flag was replaced with a copper reproduction, thus preserving the symbol of heroism—and simplifying its maintenance.

"In this constant breeze a flag is tattered in three weeks," said Maj. Paul Gerber, commander of the U. S. airbase on Iwo.

We stood on Suribachi, overlooking the entire island. Once 50,000 U. S. and Japanese troops had swarmed over it, now only 78 Americans were there—40 at the Air Force base and another 38 Coast Guard men. The ten civilian employees included no Japanese.

Ironically, the airbase had no planes, and the Coast Guard station had no boat. The Air Force maintained the 9,800-foot runway as an emergency landing field. The Coast Guard beamed loran (long-range navigation) signals from a 1,350-foot tower.

Ghosts of War Linger in Dark Caves

Major Gerber drove me from Suribachi down to the beach where the landing took place. It rises in a series of broad flat terraces. I sank up to my ankles; black sand filled my shoes. Every step took effort.

"Imagine crawling over this stuff in a field pack with your clothes soaking wet and shells bursting all around you," said the major.

It was easy to imagine. I felt even closer to the war two days later when Joe and I pushed our way through a tangle of dripping wet ginkokai to a typical Japanese cave. The entrance was scarcely bigger than a rabbit hole. We slid in feet first, dislodging a small avalanche of dirt and stones.

Dust of the old burrow started me coughing. The air was stifling. Littering the low passages lay the debris of war. I saw rifle ammunition, live hand grenades, land mines, small artillery shells, rusty helmets, long-dry canteens. Joe beamed his flashlight up a side passage, and two dusty brown skulls stared

back. We had seen enough. I clambered out into a rain that suddenly seemed refreshing.

The heat in Iwo's caves comes from volcanic activity. Before the war, residents mined steaming sulphur pits. Like the Bonin Islanders, they raised sugar cane and vegetables, and did a little fishing. The 1,200 Japanese on Iwo and Kita Iwo Jima, a small island to the north, were evacuated in 1944.

Prewar Residents Dream of Return

Shortly after the war, former residents of the Bonins and Iwo formed the Ogasawara Association to work for repatriation. In Tokyo I found members jubilant over the news of the islands' reversion to Japan.

"It is like a dream," said Mrs. Ito Takahashi. "I was born on Haha Jima, and I never have forgotten to keep wishing to return. Life on the island is much better. The cold weather here is very hard on me."

We sat in Mrs. Takahashi's little house in a damp industrial district near Tokyo Harbor (preceding page). The 65-year-old widow once ran a small shop on Haha, selling tobacco, saki, and light meals.

"I still have property on Haha Jima, and I'd like my sons to develop it," she said. "I'd like to have a little shop there again."

Almost all the former colonists I talked with in Japan were eager to return to the Bonins. Even when I described the dense growth that obliterated the farmland, especially on Haha, they talked of sending at least a vanguard of returnees back by autumn of 1968.

Imaichi Okuyama, of Chichi Jima, now on the staff of the Ogasawara Association, realizes that the Japanese Government will have to provide aid to develop the islands, particularly to promote tourism, now just a dream. His tiny, cluttered office is battered by Tokyo street sounds. As we talked, traffic hissed in the rain, horns blared, sirens wailed occasionally. But Mr. Okuyama's eyes sparkled. He was in the Bonins, blessed by the bright sun and fruitful sea.

"I think fishing and agriculture will be rebuilt first," he explained. "But I have a dream for the future. I hope we can use the special features of this subtropical land to make it a paradise for the Japanese people."

I hope so, too. And I hope it will also become a paradise for Uncle Charlie Washington, Willie Savory, and all the other good people I came to know on that remarkable little outpost of America in the far Pacific.



**The Fourth of July
is a good day to take pictures.**

So is the Fifth of July.



You don't really have to wait for a national holiday to take good pictures. Not when there are good pictures all around you. Every day. Which is a good reason to keep Kodak film around. Because that's the film everything comes out best on. Any day.

Remember the Day...in Pictures



This is New York

We mean it.

The air in this bottle could have come from New York on any muggy morning.

But it didn't come from New York. It came from a complex rig at the Esso Research Center, where they can, now simulate the atmosphere of any city in the world.

The apparatus that does the simulating is a surrealist array of pipes, vessels, lights and meters. A big transparent drum swelters under artificial light. A car on a test bed spews exhaust into the drum. Simulated solar radiation does its worst. And, at the end of it all, a collection

of plants quivers in a miniature gas chamber.

The metering system is so precise, it can detect and identify airborne molecules down to five parts per billion. Thus, the air we breathe is being scrutinized as it has never been scrutinized before.

The smog problem is the first order of business.

What causes it? What does the sun do to the hundreds of chemical compounds in the air? What turns leaves brown?



in August

What irritates your eyes? And finally, the big question. Since nature itself contaminates the air — what exactly is healthy air?

The answers to these questions will affect us all.

In the next few years, more and more laws will surely be passed to control air pollution.

These may comfort our souls. Do's and don'ts usually do. But no regulation can be any better than the knowledge on which it is based. Jersey's affiliate, Esso Research, is

determined to help supply such knowledge.

There is much to be found out. But the air pollution problem will be solved. A recent finding supports our optimism.

Air pollution from cars reached its zenith in 1967. It has been getting less and less ever since. This news may not rate three cheers. But it may justify two. One from you. And one from us.

Meanwhile the work goes on.

**Standard Oil Company
(New Jersey)**





Ceylon

THE FRIENDLY ISLAND

The enchanting tapestry of this emerald isle is woven of many strands. Your eye travels from verdant hills to lofty mountain peaks... modern roads take you to ancient Buddhist shrines... dazzling pageants amaze you... vast velvety beaches beckon for swimming, sailing and snorkeling. You can watch the mining and processing of precious stones and strike attractive bargains for sapphires, rubies, topazes, tourmalines and other glittering gems. Wildlife is abundant, anglers don't have to tell fish stories and golfers have a field day.

The Ceylonese are a gentle, soft-spoken, cultured people, proud of their 2,000-year-old civilization and happy to show their visitors around. Prices were always reasonable and now currency devaluation makes your dollar buy 20% more.

See your Travel Agent
CEYLON TOURIST INFORMATION OFFICE
 48 East 43rd St., New York, N.Y. 10017



BOOKS . . .

published by and
 available only from the
 National Geographic Society

009	THIS ENGLAND	\$11.95
007	WATER, PREY, and GAME BIRDS with record album	11.95
006	SONG AND GARDEN BIRDS with record album	11.95
051	Above two bird books ordered together	19.95
016	GREAT ADVENTURES	7.95
018	MEN, SHIPS, and the SEA	9.85
003	AMERICA'S HISTORYLANDS Landmarks of Liberty	9.95
004	AMERICA'S WONDERLANDS New Enlarged Edition	9.95
005	Above two books in combined boxed edition	18.90
020	WILD ANIMALS of North America	7.75
014	MAN'S BEST FRIEND Revised "Book of Dogs"	9.85

The above is a partial listing. Write to the Society for a free catalog of all publications. United Kingdom members may obtain the Society's publications from its office at 11 Stanhope Gate, Mayfair, London, W. 1.

Order from Department 60

NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D.C. 20036

"The memberships I have sent have all given the greatest pleasure to those who have received them—and I have received many wonderful comments long afterward."

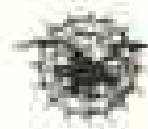
Give the gift that transcends the commonplace—membership in the National Geographic Society. Use order form on the third page of this magazine.



The Chicago Picasso or your own art gallery

Your **USF&G** agent
can insure them both

Whether you need insurance for a dramatic work of art, or for your business, home or family, your USF&G agent can insure virtually everything you value. You'll find him in the Yellow Pages. Consult him with confidence, as you would your doctor or lawyer.



THE USF&G COMPANIES, Baltimore, Md. 21203. United States Fidelity & Guaranty Co., Fidelity & Guaranty Life Insurance Co., Fidelity & Guaranty Insurance Underwriters, Inc., Baltimore, Md. 21203 • Fidelity Insurance Co. of Canada, Toronto
CASUALTY • FIRE • MARINE • MULTI-LINE • LIFE • GROUP INSURANCE • FIDELITY • SURETY BONDS

Get your tickets now for our 3000 mile Spectacular.

"The Canadian" is a luxurious three-day rail cruise on the Banff-Lake Louise Route across the Canadian landscape. And what a landscape. Rivers, the Canadian Rockies, waterfalls, starry skies and sunsets. Our Scenic-Dome gives you an up-high picture window view of the whole scene. While you relax along the way, you'll enjoy continental service, including gourmet dining, snacks, nice people, nice times. It's comfortable going all the way. Streamlined, de luxe coaches feature reclining chairs with full-length leg rests. Roomettes and bedrooms, too. All accommodations reserved. Call your travel agent or Canadian Pacific.

Canadian Pacific

Trains / Trucks / Ships / Planes / Hotels / Telecommunications
WORLD'S MOST COMPLETE TRANSPORTATION SYSTEM





CLOCKS BY *Ridgeway*

Think of the many places in your home that could welcome a clock like this—think of the warmth it would add—the serenity its golden chimes would bring. Gracious guardian of each golden hour, a Ridgeway clock is at once fine furniture and a family friend. Let us show you the many sizes and styles to choose from.

Send 25c today for a complete catalog ... the "Story of Clocks" ... other literature. Write Ridgeway/Division of Crowley Furniture Co., Inc., Dept. NG, Ridgeway, Virginia.

Sale!

Regular List \$49.95

20 X 50

\$24⁹⁷

S-A-V-E



Dealers Wanted

Tremendous power brings objects 27 times closer ... 3 times the power of ordinary binoculars. Achromatic. Wide 50 mm (2" across) front lens assures greater illumination, sharper & brighter images. 27 mm. 7" high. "Coated lens" Streamlined, sure, rubber frames make these binoculars easy to hold and focus.

30 DAY FREE TRIAL

If not satisfied return for refund! Made in Japan. Sturdy, plush lined case & straps included. Add \$1.25 postage, handling, C.O.D.'s require \$2 deposit. **ORDER TODAY.**

UNITED BINOCULAR CO.
8043 S. Western, Dept. HS-1398, Chicago, Ill. 60620

Display Sales Room Open 8:30-4:00 Monday thru Friday

Take it easy WITH AN EscalIFT



Ride up and down stairs on a safe, economical Dover EscalIFT. Designed for safety and dependability by a major manufacturer of commercial elevators. Can be installed on any straight or curved stairway; seat folds out of way when not in use. A wonderful convenience for the aged and handicapped. Thousands in use around the world. Write for catalogs on the EscalIFT and HomeLIFT residence elevator. Dover Corporation, Elevator Div., Dept. R-56, P. O. Box 2177, Memphis, Tenn.—38102

DOVER EscalIFT

CHANGE OF ADDRESS?

ATTACH YOUR NATIONAL GEOGRAPHIC LABEL HERE, print new address below, clip and mail to National Geographic Society, Washington, D.C. 20036. (Have a question about your magazine? Attach label to this form, and clip to your letter.)

NAME _____

NEW ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

Lost? Tired? Hungry?



© Mobil Oil Corporation

You wander from hotel to motel. "Filled."
You want to eat. "We're not serving any-
more tonight."

You need directions. "Don't know."

What a swell vacation.

But there's still hope. If you'd only spend a
mere \$2.50* on a Mobil Travel Guide.

Then you wouldn't have to worry about get-
ting stranded in a strange town. You'd have a
whole list of hotels and motels.

You'd know if a place is ••••••••••, or
••••••. How much it costs. Whether or not
there's a laundry, baby-sitter, free parking.

You'd know when the restaurants close.
What their specialties are. And how much
you'll pay for a meal fit for a king.

In each of the 7 Regional Editions of the
Mobil Travel Guide there are also easy-to-
read road maps. (To make getting lost a lot
harder.)

And discount coupons to many tourist

spots. (To make sightseeing a lot easier.) In
fact, if you use these discounts, the book
more than pays for itself.

You can buy a Travel Guide at most Mobil
Stations. You'll find that this one little book
can help save the rest of your vacation from
turning into a disaster.

Maybe now you'll listen when people tell
you that books are the salvation of mankind.

Mobil Travel Guide, P.O. Box 6025, Chicago, Ill. 60660			E
Name _____			
Street _____			
City _____		State _____	Zip _____
Please send the regional editions checked. I enclose a check for \$2.50 for each, plus 50¢ for postage and handling.			
<input type="checkbox"/> Conn., Maine, Mass., N. Hampshire, N.Y., Rhode Island, Vermont.			
<input type="checkbox"/> Del., D.C., Md., N. Jersey, N.C., S.C., Va., W. Va., Pa.			
<input type="checkbox"/> Illinois, Indiana, Mich., Ohio, Wis.			
<input type="checkbox"/> Idaho, Iowa, Minn., Mont., Neb., N. Dak., Ore., S. Dak., Wash., Wyo.			
<input type="checkbox"/> Alabama, Florida, Georgia, Kan., Ky., La., Miss., Tenn., Tex.			
<input type="checkbox"/> Ark., Colorado, Kansas, Louisiana, Missouri, N. Mexico, Okla., Texas.			
<input type="checkbox"/> Arizona, California, Nevada, Utah.			

*Suggested retail price.

Travelers Aid

(The Everywhere Check)



FIRST NATIONAL CITY BANK, NEW YORK. MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Usually you think of Travelers Aid as a place to go for help when traveling. Well, First National City Travelers Checks offer you help, too, by protecting your cash from loss or theft.

First National City Travelers Checks are just like cash. Only better. When cash is lost or stolen, it's gone forever. When our checks are lost or stolen, you can get your money back fast. We've built a worldwide

network of over 25,000 banking offices where you can get on-the-spot refunds.

Acceptability? "The Everywhere Checks" are issued and backed by the leader in worldwide banking. So, they're known and welcomed in more than a *million* places around the globe.

**First National City
Travelers Checks**

They cost only one cent per dollar, and they're sold by banks everywhere. We'd call that *travelers aid*. Wouldn't you?

The one-family airline.



If you're now expecting us to tell you what a big, happy family we all are at Delta, forget it.

You're not interested. And we know it.

We know that the only family you care to hear about is the one that beats you into the bathroom every morning.

And until the time comes for you and your family to fly

somewhere together—to visit relatives, say, or to put a little pleasure in your next business trip—you've got no time for us.

If you do call Delta, the last thing you'll want to hear about is how great we are with families, and how many deliriously happy trips we've flown in the past.

You'll be looking for proof—not promises. And it's not

very likely that we'll be getting more than one chance to do the proving.

You'll expect us to be able to put you all on a flight that's going where you want to *when* you want to. You'll expect us to be prepared in case somebody in your family is more interested in a warm bottle than a sizzling steak. And you'll expect to get the whole trip at family-plan discount fares that you can afford.

And you'll be right to expect all those things.

Well, our job, as the one-family airline, is to make your family as important to us as it is to you.

That may sound like a pretty hard promise for the nation's fifth-largest airline to keep. But it's worth the extra effort.

The way we look at it, one satisfied family is worth four or five satisfied individuals any day of the week.



The one family that matters is yours.

We're watching your weight.

A good breakfast is an essential part of any weight control program. Scale down and get back into things, with the Kellogg's® Special K® Breakfast. Only 240 calories, 99% fat-free. Delicious.

