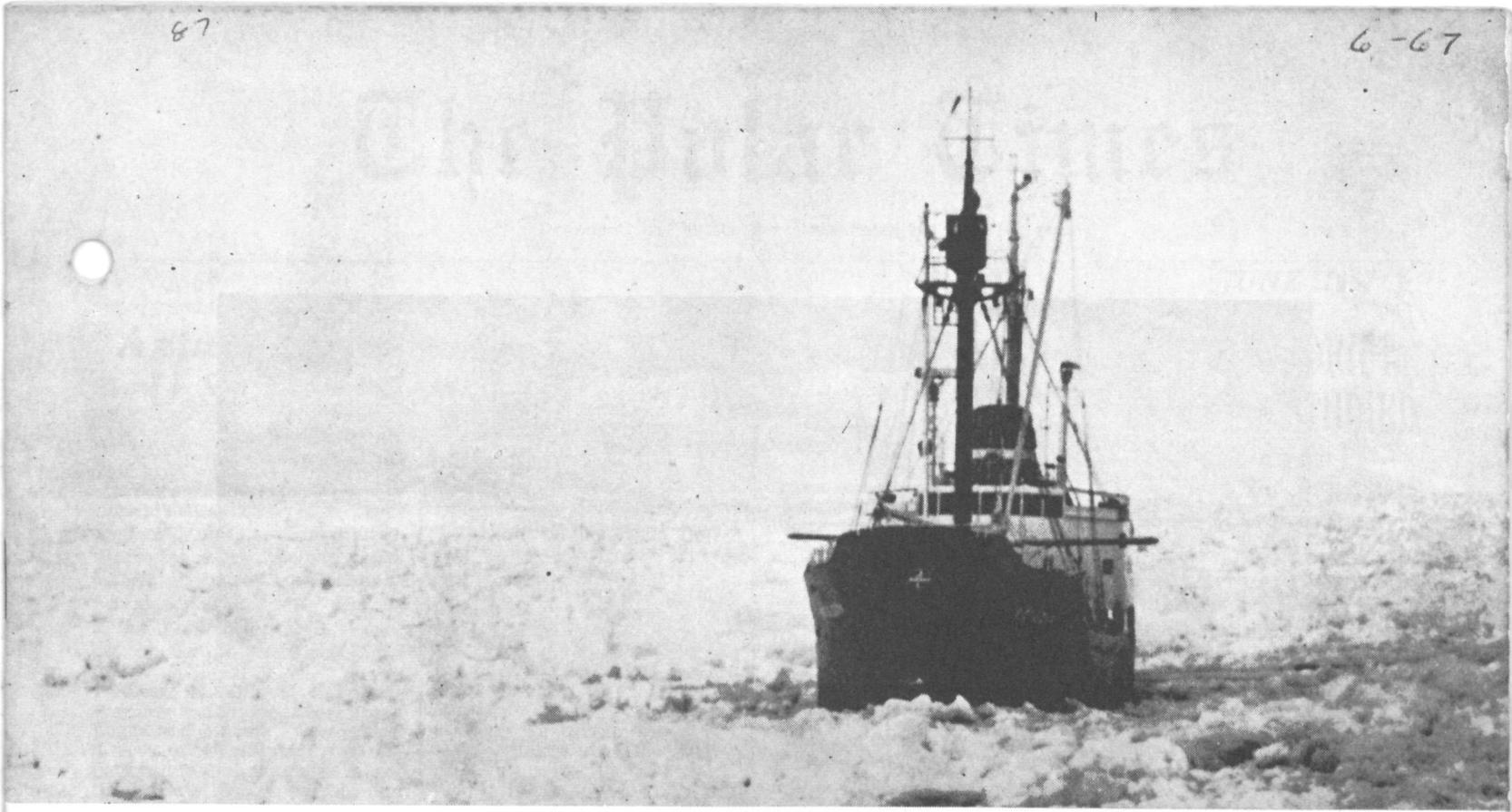


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# THE POLAR TIMES



# **National Oceanic and Atmospheric Administration**

## **The Polar Times**

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*(U.S. Navy Photo)*

*Aerial view southwestward from tip of Hut Point Peninsula. Mount Discovery is on horizon at right.*

**The Antarctic Scene:**

*Aerial view of part of the Admiralty Mountains near Hallett Station.*

*(U.S. Navy Photo)*



# The Polar Times

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No. 64

JUNE 1967

## Antarctic Studies Said to Aid U.S. Space Program Research

By **TILLMAN DURDIN**  
The New York Times

McMURDO STATION, Antarctica, Jan. 10 — The United States space program can profit extensively from American experience and scientific research in the Antarctic, four top leaders of the program said here today.

Robert R. Gilruth and Drs. Wernher von Braun, Ernst Stuhlinger and Maxine Faget ended a week of wide-ranging investigation into United States scientific efforts and supporting naval logistic activity in Antarctica.

As they headed back by air to the United States they had high praise for what American scientists and the Navy are doing in the Antarctic and foresaw close future cooperation between Antarctic operations and the United States space program.

Mr. Gilruth is director of the Manned Spacecraft Center at Houston and Dr. von Braun is director of the George C. Marshall Space Flight Center at Huntsville, Ala. Dr. Stuhlinger is director of the Research Projects Division at the Space Flight Center and Dr. Faget is assistant director of engineering and development at the Spacecraft Center.

In pursuit of their objective of seeing what can be learned in the Antarctic of benefit to

the space program, the experts visited every important United States installation and activity in the Antarctic.

They spent hours talking with personnel and studying equipment and procedures of Navy-supplied and Navy-administered research stations at the South Pole, in Byrd Land, the McMurdo area and the five valleys at the edge of the Trans-Antarctic Mountains.

Their interest in the Antarctic derived not only from the fact that much research of great importance for space flight goes on here but also from the circumstance that Americans carry on their work in the Antarctic under conditions of stress, isolation and extreme cold similar to those on the moon or in space.

As would be the case in space or on the moon, men in the Antarctic depend for their activities and survival on the perfect functioning of equipment, a logistics system and correct decisions in critical situations.

The visitors paid special attention to these aspects of Antarctic activity. They showed special interest in the strange, desolate dry valleys, and on their similarity to terrain that might be encountered when Americans land on the moon.

Mr. Gilruth emphasized that there were no plans to launch

## Soviet Explorers Visit U.S. Antarctic Station

WASHINGTON, March 8 (AP)—A party of 17 Soviet explorers dropped in at a remote American station in the Antarctic the other day—and there was “much socializing, and a James Bond film,” a radio message to the National Science Foundation reported Wednesday.

Outside, the thermometer registered 70 degrees below zero.

Word of the visit was received, the Foundation said, from the United States’ “Plateau Station”—600 miles from the South Pole and more than two miles above sea level—where the get-together occurred.

or land astronauts in the Antarctic but said some training for astronauts in the dry valleys might be considered. The experts said there was unlikely to be any testing of space equipment in the Antarctic.

The minute fungi and algae that constitute Antarctica’s plant life also claimed the visitors’ attention in the light of the possibility that such growths exist on other planets. They carefully studied devices being experimented with in the Antarctic for detecting living organisms.

“We were more interested in the techniques for conducting science than in the findings of science,” Mr. Gilruth said. “But of course these, such things for example as studies of solar flares and radiation, are of great importance to the space program.”

## LAND MASS DRIFT WILL BE STUDIED

U.S. Team Will Investigate Continental Link Theory

By **JOHN NOBLE WILFORD**  
The New York Times

Were Australia and Antarctica once part of the same continent?

Was the earth, millions of years ago, made up of only two or possibly one supercontinent?

An extensive attempt will be made this summer by American and Australian scientists to search for some answers to these questions involving the theory held by a number of geologists that the earth’s continents are constantly drifting though ever so slightly.

The study, to be conducted by the United States Coast and Geodetic Survey from the ship Oceanographer, will be made along the submerged continental slopes off Western and southern Australia. The survey will get under way after the ship leaves Penang, Malaysia, on Aug. 8 as part of its maiden round-the-world research cruise.

In announcing the project in Washington June 10 Dr. Robert S. Dietz, a geological oceanographer with the Department of Commerce’s Environmental Science Services Administration, said that the survey would seek to determine whether Australia was once joined with Antarctica and possibly India to form a single continent.

Those who espouse the con-



(U.S. Navy photo)

NASA officials and their NSF host in Antarctica. Left to right: Drs. Faget, Gilruth, and von Braun; Mr. Smith (NSF); and Dr. Stuhlinger.



(U.S. Navy photo)

Drs. von Braun and Gilruth visit one of the dry valleys of Victoria Land. At left is Mr. Smith.

tinental drift theory contend that the great land masses have been moving apart since the earth's early period. Some believe that there was once a single continent called Panagea (universal continent), while others think that there were two, referred to as Gondwana and Laurasia.

Gondwana is supposed to have consisted of what is now Australia, Antarctica, India, South America, Africa, Malagasy and various submerged fragments. Laurasia is supposed to have consisted of North America, Europe and most of Asia.

If this were true, according to Dr. Dietz, Antarctica's Wilkes Land Peninsula once fit into the southern coast of Australia.

Dr. Dietz, who will lead the team of American and Australian scientists, said that the ship would begin its survey off the Northwest Cape of Australia, continue south around the southwest tip of Australia and then across the southern length of the continent.

"There are several points off western Australia which are critical to the continental drift theory," said Dr. Dietz, a supporter of the theory. "One is Exmouth Rise, a submerged terrace which abuts the continental slope off Northwest Cape. Another is the Naturaliste Ridge, another deep underwater terrace off the southwest tip of Australia."

The Oceanographer is scheduled to investigate the ocean floor along the route to see how far the Australian continental shelf extends into the ocean and to determine if there are any similarities in geological structure between the shelf off Australia and the shelf off India and Antarctica.

This will be done by making echo soundings to survey the depths and angle of the offshore ocean floor and by taking continuous gravity and magnetic measurements.

The scientists will also set off explosions on the ocean floor and measure the seismic waves that they produce. In this way they hope to determine the

### The Polar Times

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.

## South Polar Station's Gravity Rises Slowly

Washington, April 15 (Special)—Is nothing sacred? Now even gravity isn't what it used to be. At the South Pole, it seems, gravity has gone up noticeably since 1957.

Noticeably isn't saying much, however. Gravity in January 1966, was just about a hundred-thousandth of 1 per cent (0.00001 per cent) greater at the South Pole station than it was in December, 1957, according to John C. Behrendt, of the United States Geological Survey.

The reasons, he says, are probably that the ice sheet, with the station on it, is moving downhill and to areas of higher gravity, and that the station itself, from which the measurements are made, is sinking into the ice. The closer an object gets to earth's core, the greater is the gravitational attraction on it.

The traveling ice sheet, Behrendt reported in Science, may actually have been moving as much as 165 feet a year. Sinking

structure of the crust immediately below the ocean floor.

Dr. Dietz said that the survey party would enlist the aid of a Navy navigation satellite to determine the ship's position within two-tenths of a mile at all times. This should enable the group, he said, "to make the most accurate survey ever made in this region."

The survey is scheduled to run about a month. The Oceanographer, which left Jacksonville, Fla., on March 31, is making a 37,000-mile eight-month voyage to its home base at Seattle.

### SIZE OF ANTARCTICA IMPRESSES A TEXAN

CANBERRA, Australia (AP)—Edward A. Clark, United States Ambassador to Australia and a Texan, has found a place he says "makes Texas seem quite small"—the icy and silent vastness of Antarctica.

Mr. Clark and several members of his embassy staff visited the polar continent during its half-year summer season. His first stop was McMurdo Sound, the main American base in the Antarctic.

"When we landed on skis on 10-foot thick ice at Williams Field," Mr. Clark said, "I thought we were being given a fabulous welcoming demonstration. I soon learned that most

alone could have produced the same apparent increase, but it would have required a drop of more than 9 feet since 1957, which is probably more than 100 times as much as actually took place.

More likely, the scientist believes, is that the station has shifted horizontally and is over an area where gravity, for a reason like the density of subsurface material, is greater.

Another possibility, he said, although an unlikely one, is a thinning of the ice sheet. Again, the amount necessary for such a gravity increase, about 16 inches a year, is "not supported by direct evidence."

Unfortunately, it is virtually impossible to pinpoint the station's position exactly, which make precision gravity measurements somewhat inaccurate at best. A remedy may be found in the future, when a now-proposed geodetic satellite system enables the superaccurate location of any transmitter on the ground.

of the demonstrators were more interested in mail, Christmas packages and other things than us. I soon located 17 Texans. I had a nice visit and a meal with them."

Mr. Clark then flew on to the South Pole, three hours and 800 miles from McMurdo Sound, and landed on ice 9,000 feet thick.

"It is paradoxical that the coldest place in the world could produce the warmest friendship and the most classic example of international understanding," the Ambassador said.

### Zoo Penguins Hatching Egg

PORTLAND, Ore. (AP).—After 10 years in the Portland Zoo, Annie the penguin has laid an egg.

She and her faithful mate, Albert, have been taking turns sitting on it.

Annie, Albert and 30 other rare Adelie penguins were captured in 1957 near McMurdo Sound in the Antarctic by Jack Marks, zoo director.

Marks says the egg should hatch in 34 to 35 days.

Sea lions, whales and some seals sleep under water and come to the surface only occasionally to breathe.

## Navy to Airlift 2 From Antarctic

AUCKLAND, N.Z., June (AP)—A U.S. Navy ski-equipped Hercules plane left for the Antarctic today to bring back two sick men.

The plane carried a ton of provisions, including fresh milk, oranges, eggs, apples and vegetables and 6000 pounds of mail for the U.S. McMurdo station and Scott Base.

It was bringing back CPO Ronald O. Hilton of Versailles, Ky., who has lung trouble, and Hospital Corpsman 1/C Leroy Goodrich of Scarborough, Maine, who suffered a gall bladder ailment and was being brought out as a precaution.

### 1903 Antarctic Boat Found

BUENOS AIRES (AP)—Argentine Navy men from the transport ship Bahia Aguirre have recovered a boat of an expedition of the French explorer, Jean Baptiste Etienne August Charcot (1867-1936), from Antarctic ice where it was buried for 64 years. The boat was abandoned in 1903 at Port Charcot, Booth Island, by the physician-explorer.

### COLDEST TEMPERATURE

The coldest temperature in the history of our planet was logged in the year 1958 at Sovietskaya, a Russian base about 700 miles from the South Pole. A temperature of 127 degrees below zero was recorded.

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# U.S. Crew Flies 1000 Miles To Map Vast Antarctic Area

By Peter Winterble  
Washington Post Staff Writer

April 13

From the seventh floor of the Hotel Cabo de Hornas in Punta Arenas, Chile, Palmer Land is only a thousand miles away.

Punta Arenas is pretty lively for a southern town, what with 77,000 people and a few nice hotels, restaurants and points of interest for tourists and visitors.

But Palmer Land is pretty grim. It's the part of Antarctica closest to Chile and it doesn't have any population, hotels or restaurants.

It also lacks good maps for use by the international scientists studying the Antarctic.

That's why William R. MacDonald, of Crownsville, Md., flew down there last fall with other members of the U.S. Geological Survey and a team of Navy flyers.

MacDonald, 42, is assistant chief of the Survey's international activities branch, and is the cartographer in charge of mapping huge sections of the 6 million-square-mile continent.

To do so, he directs liaison with the Navy and coordinates the flights of the two planes, a C-130 and a C-121J, that the Navy has available for photo-assignments.

Last October, McDonald and 16 others arrived in Punta Arenas in the C-121J—a specially-equipped military version of the Lockheed Constellation—and set up shop in the hotel.

They were charged with making aerial photos of nearly the entire section of Palmer Land, which required flying from the Chabunco airport outside Punta Arenas to the Antarctic and back on a single load of fuel, distances up to 4000 miles.

The daily routine went something like this: Load up the planes' cameras and collapsible inside fuel tanks, and wait for the weather report. If it was "go," the crew—three pilots, three navigators, two radiomen, two photographers, two engineers and a representative of the Chilean Air Force—would board the plane at about 2 a.m. and take off.



By Maragret Sandahl—The Washington Post

## William R. MacDonald, back from the Antarctic

Five hours later, they would reach Palmer Land, circle to get the proper bearings for the day's camera runs, and begin photographing. Three cameras made simultaneous pictures—two of the horizon and one of the barren land below. Then, after up to seven hours of photography, five or more hours back to Punta Arenas.

MacDonald gives great credit to the Navy for its "outstanding effort" in the operation. Six of eight tries resulted in thousands of successful, "mapping quality" photographs, he said.

But he also gives great credit to the Nimbus and ESSA weather satellites, which provided much of the weather information.

The satellites' pictures of Palmer Land, made every 90 minutes, were radioed to an interpretation station in Suitland, just outside Washington, and were then transmitted to

the Survey members in Punta Arenas through the Chilean Third Naval District.

## Russians Invite the French For Antarctic Expedition

MOSCOW, June 24 (Reuters)—Soviet scientists have invited French colleagues to take part in an expedition to study changes in the antarctic's ice cover, the Soviet press agency Tass reported.

The agency said that an understanding of the changes was important for weather forecasting.

Tass said the expedition was scheduled to start later this year and could make new measurements of the rate of motion of the Antarctic ice where Soviet glaciologists took measurements in 1963 and 1964.

This will be the 13th Soviet Antarctic expedition, the press agency said. It will operate between the intercontinental Soviet station Vostok and the Mirny Observatory.

## WEATHER BALLOONS IN ENDURANCE TEST

WASHINGTON, Jan. 28 (AP)—Special high-altitude balloons have been circling the globe for record periods up to more than six months in warm-up tests for a proposed new long-range, worldwide weather forecasting effort.

The proposed system envisions having thousands of balloons aloft simultaneously, a Government meteorologist reported.

He indicated that the so-called "superpressure" balloons have long since shattered the endurance records of conventional weather balloons, whose flight times are usually limited to two weeks.

The durable high-fliers are called GHOST balloons. The initials standing for Global Horizontal Sounding Technique. Several of them have made more than 17 circuits of the earth at constant-level altitudes up to 72,000 feet.

The 12 balloons still aloft are those remaining from 58 launched from Christchurch, New Zealand, and from McMurdo Sound, Antarctica, since last March, reported Vincent E. Lally of the United States National Center for Atmospheric Research, Boulder, Colo.

Describing the venture in the technical journal Science, he said the initial tests were designed to test the durability of the balloons and their capabilities for remaining at preselected levels.

## Nuclear Desalting Plant In Operation in Antarctic

WASHINGTON, Feb. 25 (UPI)—A nuclear-powered desalting plant has been put into operation at the United States naval base at McMurdo Sound, in the Antarctic, the Navy said yesterday.

The plant, which produces about 14,000 gallons of fresh water a day, serves 250 Navy men and scientists stationed at McMurdo during the winter and 1,250 in the summer.

It went into operation Jan. 16.

## Antarctic Hills Named For Berkeley Student

BERKELEY, Calif. (UPI)—A University of California student has a series of nunataks named after him. Nunatak is an Eskimo word for hill, or mountain, surrounded by a glacier.

The nunataks are located in Antarctica where Oliver C. Morse III, an electrical engineering graduate student, "wintered over" in 1960 as an engineer for the National Bureau of Standards.

## A SCIENCE MYSTERY

Science Digest—April, 1967

# Puzzle of Antarctica's desert valleys

Bleak, desolate, frigid, cluttered with 1,000-year-old seal mummies and eerie, wind-sculptured rock, they fringe McMurdo's shore, defying explanation

by William J. Perkinson

MAN's efforts to explore the moon and other planets together with what seems to be a world-wide fluctuation in climate have stirred new interest in one of the stranger areas of Antarctica, the ice-covered continent that surrounds the South Pole.

The area is called the McMurdo Oasis. It consists of several thousand square miles of dry valleys, so called because they are made of

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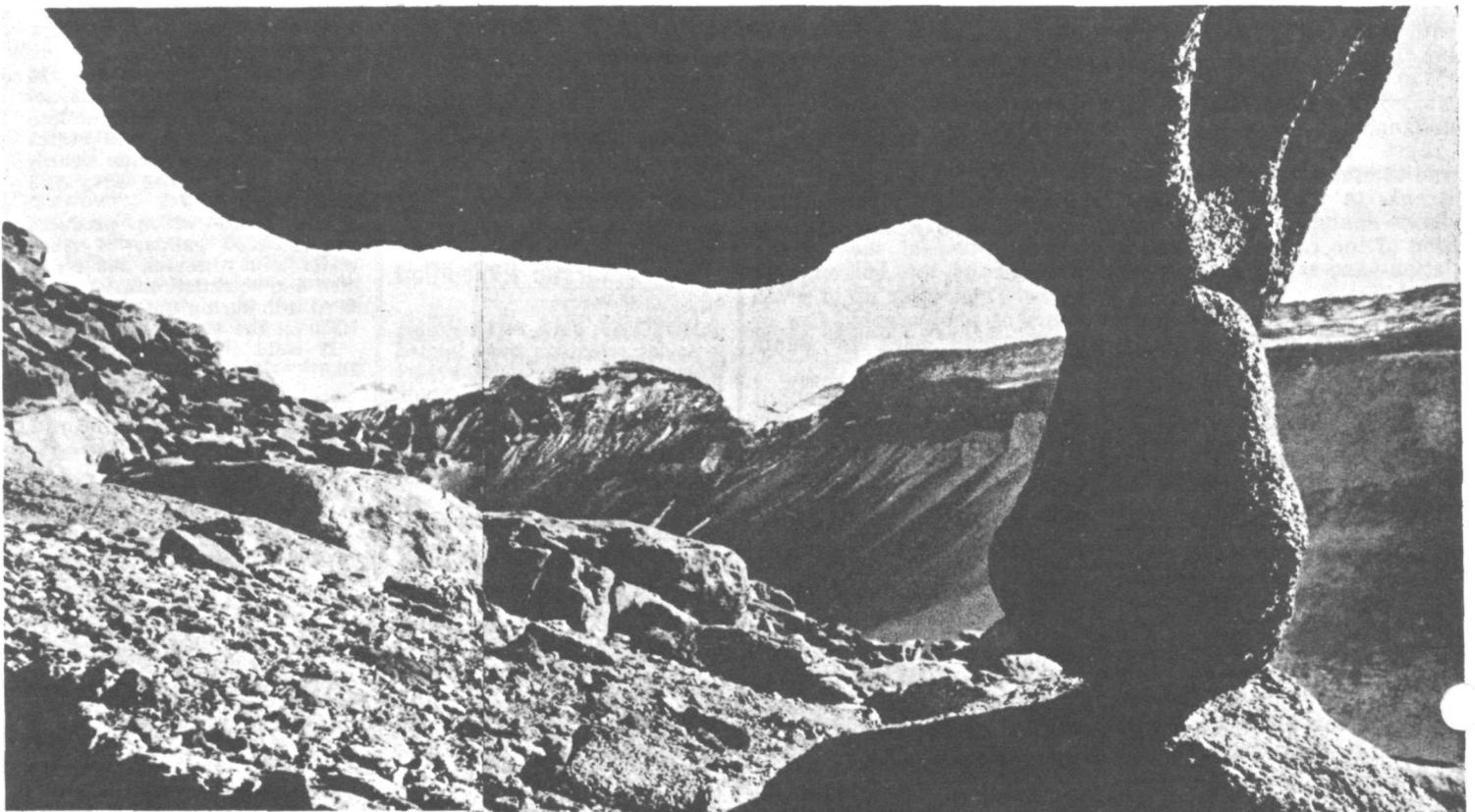
Over a period of thousands of years, these eerily beautiful sculptures have been carved by wind-blown sand and ice crystals out of naked rocks scattered about the Antarctic dry valleys. Snow almost never reaches the ground there because hot air rising from the exposed surface evaporates it before it can ever touch the earth.

bare rocks that remain free of snow during both the summer and winter.

Still more curious, many of the isolated valleys contain lakes that are covered with 6-to-12 feet of ice during all but the summer months.

Yet scientists who have measured the temperatures of the water at the bottom of some of those 100-to-200-foot-deep-lakes say the bottom water is as warm as 72° F.

Those measurements mean that in the austral, or Southern Hemisphere summer, when the ice atop



some of the glacier-fed lakes melts completely, the difference between the temperature of the air above the lakes and the temperature of the water at the bottom may be as much as 80 to 100 degrees.

In winter, when temperatures in the dry valleys are estimated to drop well below minus 70 degrees, the difference in temperature between the air above the ice-covered lakes and the bottom waters is estimated to be as much as 150 to 200 degrees.

Just why these "oases" of dry-bare rock exist within the desert of snow and ice that covers almost all of Antarctica is still a mystery.

Glaciologists, seismologists, geologists and meteorologists all have their own preferred versions or combinations of explanations as to how the dry valleys came to be and why they remain dry and snow-free to this day.

Those valleys will be more and more in the news because:

1.—The National Aeronautics And Space Administration hopes to establish bases in either the Taylor or Wright dry valleys for: (a) testing equipment that could be used to detect any form of biological life on the moon and Mars, and (b) bases that could be used to test, under actual conditions of cold and darkness, moon drills—like those developed by the Martin Company and Westinghouse plants in Mary-

land. Those drills would enable geologists to take samples of the material inside the moon.

2.—The growing belief of a number of Antarctic experts that the United States will soon need another "main" supply depot in Antarctica either to replace or supplement the main U. S. Navy base now located at McMurdo Station on the southernmost tip of Ross Island.

One proposed site for such a base is at Marble Point, a snow-free, bare rock area within a few miles of both the Taylor and Wright dry valleys. The valleys are some 60 to 70 miles from McMurdo Station.

The Taylor Glacier which hangs, or flows, above the Taylor dry valley is at least 35 miles long and from 2 to 10 miles wide, according to experts at the United States Geological Survey. (U.S.G.S.).

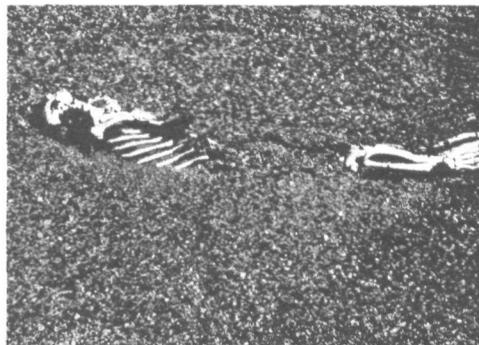
It flows from the 8,000 foot high plateau of Victoria Land, in what is called New Zealand's Ross Sea Dependency, down to within 20 miles of the Ross Sea Ice Shelf.

There the glacier suddenly and abruptly ends. The dry valley containing the mysterious lakes with warm, bottom water continues below the glacier, gradually widening until its snow-free rocks meet the Ross Sea Ice Shelf.

The mountains to one side of the glacier and its dry valley are marked by peaks some 3,000 to 6,000 feet high. These mountains are called the Kukri Hills, because ear-



Scientist, above, examines a recently discovered seal corpse. Below, 1,000-year-old skeleton of seal that also erred in wandering from sea to frozen bed of valley.



ly British explorers thought the shape of the hills resembled the Kukri, or a Gurka sword.

The hills to the south of the Taylor Glacier and its dry valleys are the northern foothills of what is called the Asgard Range which has peaks up to 6,500 and 7,500 feet.

There are two curious things about the Wright dry valley:

1.—The valley, about 30 miles long and up to 10 miles in width, lies between two glaciers, the upper Wright Glacier and the lower Wright Glacier. The lower Wright Glacier extends from about 12 miles from the western end of the dry valley until it merges into another larger glacier that flows into the Ross Ice Shelf.

2.—The Wright Dry Valley contains what is thought to be one of the few rivers, if not the only river, known in Antarctica.

It is called the Onyx River, because of its color. In summer melt water from the upper Wright Glacier flows freely—if briefly—through the riverbed, New Zealand experts say.

Volcanic activity of the past and present may have had something to do with the creation of the dry val-



Limnologist above makes radio contact with the McMurdo Station, main U.S. outpost in Antarctica, a move vital to every field scientist. Glaciers (below) on valley slope maintain a constant position because they ablate at the same rate that they are fed.



leys of the McMurdo Oasis, according to two groups of scientists.

Glaciologists say that sometime—about 150 million to 200 million years ago—beds of unusually strong and hard rock were uplifted or laid down at what is considered the heads of the dry valleys.

Then, for some still unknown reason, when Antarctica became covered with ice, that hard rock formed dams which prevented the glaciers from flowing freely down the valleys.

The part of the glacier that did flow over the hard rock was thus much thinner than the part of the glacier dammed up behind the rock.

In time the thinner glacier was "starved" of its parent ice and gradually evaporated due to the katabatic, or down slope winds, that roar through the valleys of Antarc-

tica at speeds over 100 mph.

Once the glacier evaporated, the bare rocks became so warm in summer that it was impossible for snow to accumulate in quantity. Similarly, the theory goes, strong winter winds sweep the areas free of snow during the Antarctic night.

That is the outline of the conventional—if unsatisfactory—explanation of the dry valleys.

Seismologists, particularly those of New Zealand, are not too sure the glaciologists' answer is the complete or even the right one.

The seismologists note that the McMurdo Oasis contains 13,000-foot-high Mount Erebus, Antarctica's famous active volcano. A new one, Mt. Melbourne, has just been found.

They also say that studies by scientists of several nations—includ-

ing Russia, New Zealand and the United States—have indicated that the earth around Scott Base, at Pram Point on Ross Island, has the highest heat flux of any other spot that has been measured in the world.

That means, the New Zealanders explain, that the temperature of the earth under the base increases more greatly with depth.

Some scientists suspect that a high-heat flux beneath the dry valleys may be the reason why the glaciers suddenly end and the dry valleys begin. Seismologists are also not quite willing to accept the explanation geochemists offer: That the warmth of the water is due to the heavy salt content of the bottom water and to the fact that there is very little, if any, mixing of the lake water by vertical convection or by circulating currents.

## Antarctic Observation Ship Fuji Returns

April 20

Japan's Antarctic observation ship Fuji, carrying members of the eighth Antarctic observation team returned to Harumi Pier in Tokyo Port Wednesday morning, winding up its 104-day voyage.

The icebreaker, which left Tokyo Port on December 1 last year, arrived back shortly after 9 a.m.

Some 500 family members of the observation team had a happy reunion as soon as the ship arrived.

During its polar expedition, Fuji succeeded in breaking through thick layers of ice and docking alongside the Showa Base.

In a press conference on the ship, Capt. Matsuura said it was very difficult to break the ice, because there was a mammoth iceberg near the base stopping the flow of ice to the outer sea. Despite such thick ice, the Fuji used only 70 per cent of its ice-breaking power, he said.

## Antarctic Project

June 24

CANBERRA (AP) — Plans have been announced for four Australians to spend 14 months on the floating Amery Ice Shelf in the Antarctic, 300 miles from the nearest settlement. Purposes of the expedition are to find out what happens there in winter and to drill holes to the bottom of the 1,000-foot-thick ice island.

# New Zealand team to spend winter in Antarctica valley

By Reuters

Scott Base, Antarctica

New Zealand plans to open a scientific station in the dry-valley region of Antarctica.

So far as is known, no one has ever yet spent a winter in the dry-valley region.

It is about 50 miles west of Scott Base and is a stark contrast to the Antarctic.

Only the summer appearance of the valleys is known.

There is no covering of ice or snow, glaciers hang part way down the steep 6,000 foot sides, sand dunes rise to heights of up to 100 feet, rivers flow, and there are lakes with thickly frozen surfaces.

Some experts say the full history of the Antarctic continent, and its relationship to the rest of the earth, could be understood from a study of this region.

No one knows exactly what happens in the valleys during the winter.

## Summer groups work

In the short summer months, when scientists of many nationalities examine the geology and physics of the area, the only life in the valleys is microscopic, collecting round the shores of the lakes and in streams from the snouts of the glaciers.

Since New Zealand's Antarctic research started 10 years ago, parties from the Victoria University in Well-

ington have worked in the valleys each summer.

There was a full range of work for geologists and physicists who were interested in the excessive salt content of the lakes and the abnormally high temperature of the water — as much as 77 degrees F. beneath the ice covering.

One year ago the United States, New Zealand, and Japan planned to share a year-round station in the dry-valley region. The plan was dropped, and now New Zealand intends to build its own station.

## Six men to remain

It is planned to move two huts into the Wright Valley near Lake Vanda.

Both prefabricated huts will be taken to an already selected site and a party of some six men will live in them next winter.

Continuous upper atmosphere sciences will be studied during the winter as well as full meteorological and glaciological programs.

In summer more extensive outdoor sciences will be carried out with the station as a base for field parties.

The base and its environment will be a strictly scientific area. To minimize interference to scientific recording equipment no large generators will be installed.

All equipment will be operated by batteries, recharged by wind-powered generators, with small motor generators as a stand-by.

## POLAR EXPLORER TELLS OF HAZARDS

### U.S. Antarctic Team Scaled Highest Peak on Continent

WASHINGTON—The Americans who conquered Antarctica's highest mountains slept until noon, dined on filet mignon, and got around by motor toboggan.

On the other hand, the expedition members had to endure 35-below-zero temperatures, survive a storm that blew down most of their tents, and struggle for two weeks to climb one peak.

Nicholas Clinch, leader of the recent American Antarctic Mountaineering Expedition, related some of the pleasures and hazards of polar mountain climbing in a report to the National Geographic Society, which, with the American Alpine Club, sponsored the expedition.

The 10-man expedition made the first ascents of six peaks in the Sentinel Range in western Antarctica. The group climbed the Vinson Massif, 16,860 feet, the highest point on the continent; Mount Tyree, 16,220 feet, the second highest peak; Mounts Shinn and Gardner, more than 15,006 feet high; and Mounts Ostenson and Long Gables, more than 13,000 feet high.

All the members of the expedition climbed Vinson, Shinn, and Gardner; various teams reached the other summits. In all, the men spent 40 days in the hostile Antarctic environment.

The expedition first set up a base camp near Vinson, and established another camp higher up the mountain. A terrific storm raged for two days, flattening all tents in base camp.

"I thought at the time, 'How many days are we going to have of this?'" Mr. Clinch said. "But actually, the storm was a good thing for us, because we had been lax in guying the tents. From then on we were more cautious. But we never got another storm as bad."

Mr. Clinch estimated that the temperature had dropped as low as 35 degrees below zero on the trip. He is not sure, because shortly after the thermometer hit 26 below, the wind smashed it against a tent pole.

On Christmas day, after the expedition had already climbed Vinson and Shinn, everyone gathered in a large tent at base camp and had a steak dinner, part of the 120 pounds of filet mignon they carried.

The sun never set during the Antarctic summer. "We got into the distressing habit of sleep-

## South Pole Cold Held Slowing Hair Growth

MOSCOW (UPI) — It is so cold at the South Pole that explorers find the growth of their hair and fingernails slowing down, Russian doctors said.

The doctors said experience on 12 expeditions showed that explorers also suffered from insomnia, headaches and shortness of breath.

ing until noon or 2 o'clock, climbing for eight hours, then having dinner at 10," Mr. Clinch recalled.

Besides climbing, the expedition made an extensive collection of rocks as part of its program of geological and paleontological research. The samples are being examined for fossils of ancient sea life.

"A big psychological factor was the knowledge that the United States Navy was standing by," Mr. Clinch said. "Otherwise it would be an almost insane project—climbing 400 miles from anything. The only other living things we saw were a few lichens on a very few rocks.

"Our isolation was brought home to us the first night out. We were trying to reach McMurdo, and our first radio contact was Pole Station. Imagine, our first human contact was with the South Pole!"

### Mountain Climber Honored

WASHINGTON, March 31 (AP)—Nicholas Clinch, a Los Angeles lawyer who led the successful climbing expedition up the Antarctic's highest mountains, the Sentinel Range, was honored Friday by the National Geographic Society. Chief Justice Earl Warren presented Mr. Clinch with the John Oliver la Gorce Medal honoring the society's late president and editor of National Geographic for 52 years.

### Coast Guard Icebreaker Credited in Two Rescues

WASHINGTON, Feb. 10 (AP)—A Coast Guard icebreaker that can break through ice 10 feet thick was credited today with helping rescue two Danish ships in Antarctica recently.

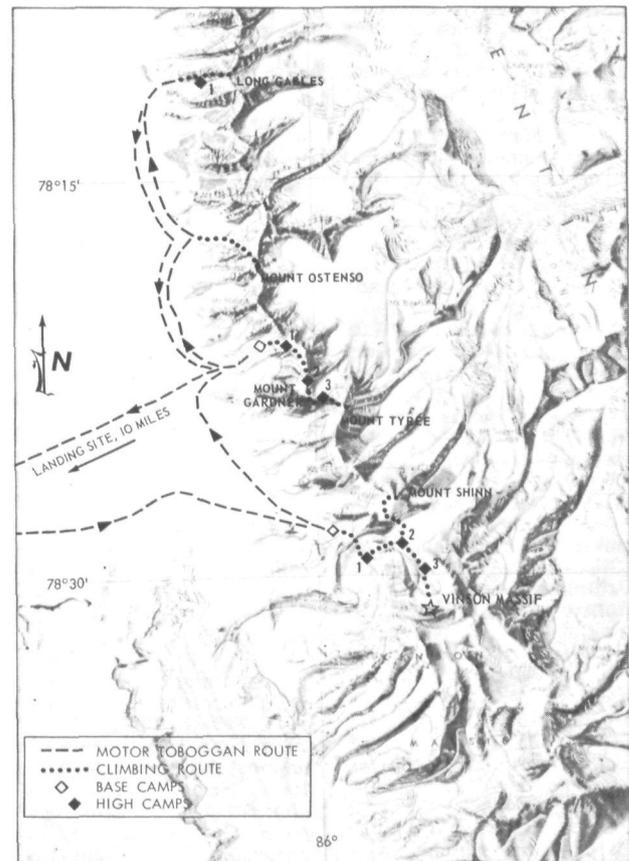
Coast Guard headquarters told about it today, identifying the icebreaker as the 279-foot-long Eastwind, based at Boston. The Danish ships, caught in heavy ice floes nearly 40 miles off the Budd coast of Antarctica, were the Neela Dan and the Thala Dan.

The Neela Dan had been stuck for nearly a month and the Thala Dan for 14 days. The Eastwind escorted the Thala Dan to Wilkes Station, an Australian Antarctic base, and escorted the Neela Dan into open water.



(Photo courtesy National Geographic Society)

The flags of the 12 Antarctic Treaty nations fly at the summit of Vinson Massif.



Route and camp locations of American Antarctic Mountaineering Expedition portrayed on a portion of U.S. Geological Survey 1:250,000 Reconnaissance Series map "Vinson Massif" (compiled 1961).

### Icy Trip for RAF

London, March 30 (AP)—An 8-man Royal Air Force expedition will fly 900 miles inside the Arctic Circle this spring and summer to explore uncharted regions of Ellesmere Island.

### Jersey Scientist to Aid Soviet

PERTH, Australia, Jan. 23 (AP)—An American scientist, Dr. Edlen E. MacNamara of Pittstown, N. J., will join a Soviet expedition leaving Australia this week to study the rocks and soil of Antarctica.

# L. V. BERKNER DIES; RESEARCH LEADER

Science Academy Treasurer  
Collapses at Meeting

The New York Times

WASHINGTON, June 4—Dr. Lloyd Viel Berkner, a science research administrator, died today of a heart attack in George Washington University Hospital. He was 62 years old and lived in Fort Lauderdale, Fla. Dr. Berkner had collapsed yesterday at a meeting of the council of the National Academy of Sciences, of which he was treasurer.

## Retired but Active

Dr. Berkner, because of a heart ailment, retired in 1965 as president of the Graduate Research Center of the Southwest in Dallas, but until recently was chairman of the board of trustees and continued to take part in the activities of scientific organizations.

Dr. Berkner was once described as a man who had done everything a modern boy would like to do. As a young man he took part in a polar expedition, established a radio relay record with a homemade radio set and went to sea as a radioman on ships running to Central and South America.

He devoted his life to assaults on challenging frontiers, and he helped to shape scores of Government policies. More than any other man, he is credited with being the father of the International Geophysical Year, which he suggested in 1950 in a conversation with other scientists.

From this conversation grew the I.G.Y. of 1957-58. Dr. Berkner's administrative skills and his ability to make scientific problems dramatic and meaningful to legislators and Government officials were important factors in the success of the American part of the program.

He was skillful at countering the arguments of those who doubted the value of international exchanges of data, and he impressed many persons with the importance of such by-products of the I.G.Y. as the 12-nation treaty on Antarctica.

A strapping 6 feet 2 inches, Dr. Berkner weighed 200 pounds. He was a big man concerned with big ideas and big things. He was equally at home in discussing solar-terrestrial relationships, the possibility of life on Mars and a new concept of evolution. He was also adept in introducing new accounting systems and improvements in business administration.



Blackstone

Dr. Lloyd Viel Berkner

A forceful speaker, he seemed to talk "in capital letters" and "had the vigor of six oxen," an associate said yesterday.

"Man's technology," Dr. Berkner liked to point out, "is his means of multiplying his productivity: the quality and setting of his technology determine the ultimate limit of wealth of his society."

Dr. Berkner became president of the Graduate Research Center in 1960. Before that, from 1951 to 1960, he was president of Associated Universities, Inc. an organization formed by nine eastern universities to administer the Brookhaven National Laboratory at Upton, L. I., for the Atomic Energy Commission.

While he headed Associated Universities, the world's most powerful accelerator was built at Brookhaven, and a giant radio telescope was constructed at Green Bank, W. Va.

The adventures of Dr. Berkner began in Perth, N. D., and in Sleepy Eye, Minn., where he grew up and developed a youthful interest in radio. He was born Feb. 1, 1905.

At 17, with a homemade set, he established an American Radio Relay League speed and distance record over a circuit from Connecticut to Hawaii. After brief schooling in New York to get a radio operator's license, he went to sea as a radioman.

In 1923 he went back to school at the University of Minnesota, earning a B. A. degree in electrical engineering.

Then, at 23, he joined Rear Adm. Richard E. Byrd's expedition to Antarctica.

The expedition over, Mr. Berkner worked first for the National Bureau of Standards in Washington as an engineer studying the propagation of radio waves. In 1933, he was

# AIR COMMANDER IN ALASKA KILLED

Gen. Birchard and Pilot Die  
When Plane Flips in Lake

ANCHORAGE, Alaska, June 4 (UPI)—Lieut. Gen. Glen R. Birchard, Commander in Chief of the Alaskan Command, and his pilot were drowned yesterday when their plane overturned while taking off from Upper Ugashik Lake near here.

Two other passengers, Maj. Gen. Joseph A. Cunningham, commander of the 22nd Air Force Military Airlift Command, and Edward A. Bellringer, a civilian attached to the Alaskan Command Personnel Division, were able to swim to shore.

The bodies of General Birchard, 53 years old, and Maj. Norman C. Miller of the 21st Operation Squadron at Elmendorf Air Force Base, Alaska, were found late yesterday afternoon floating in the lake.

Major Miller was piloting the U-6A aircraft when it capsized

appointed physicist at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

During World War II, when he served as a naval officer and rose to the rank of captain, his scientific and organizing skills played an important role in national defense.

After the war Dr. Berkner returned to the Carnegie Institution to head a section on exploratory geophysics of the atmosphere. But Secretary of State Dean Acheson called on him in 1949 to organize the first military assistance program under the North Atlantic Treaty.

From 1958 to 1962 Dr. Berkner was chairman of the Space Science Board of the National Academy of Sciences, which advised the Government on the national program of space research. For his service he received the Distinguished Public Service Medal of the National Aeronautics and Space Administration.

He also had received the Legion of Merit, a special Congressional gold medal and many other awards.

Dr. Berkner never took time to earn a Ph.D., but he had a number of honorary doctorates.

Survivors include his widow, the former Lillian Fulks; two daughters, Mrs. Charles H. Booth and Mrs. James C. Ashley; his parents, Mr. and Mrs. Henry Frank Berkner, and two brothers.

A funeral service is scheduled for Wednesday at 10 A.M. in the Fort Myer (Va.) Chapel, with burial in Arlington National Cemetery.

in the lake. The four men had been on a fishing trip to Upper Ugashik Lake, and emergency aircraft were sent out to search for them when their plane was overdue.

General Birchard, made his headquarters at the Elmendorf base. He is survived by his widow, Virginia, and two sons. Major Miller is survived by his widow and two daughters, aged 11 and two.

## Survivors Treated

ANCHORAGE, Alaska, June 4 (AP)—Two survivors of an aircraft accident that killed the Commander in Chief of the Alaskan Command were under treatment today for shock and minor injuries at the Elmendorf Air Force Base hospital.

A helicopter from the base sighted the two on the shore of Upper Ugashik Lake yesterday. High winds prevented a landing, and the two men were hoisted aboard by means of a basket and a winch.

# NEW SCIENCE WING TO HONOR EXPLORER

May 22

The science wing of the new \$4.2-million science and engineering building, now under construction on the campus of the State University of New York Maritime College, Fort Schuyler, the Bronx, will be named Ross G. Marvin Hall.

Adm. George M. Wauchope, retired, the chairman of the school's council, said last week that the building was being named in honor of the 1902 graduate of the New York Nautical School, the former designation of the college, who accompanied Cmdr. Robert E. Peary on his famous "dash to the Pole" expedition of 1908-9.

Mr. Marvin, Admiral Wauchope recalled, was the only casualty of the expedition, dying in the Arctic Ocean off Cape Columbia in April, 1909, at the age of 29.

The science-engineering building is expected to be completed this fall. The four-story science wing will house nuclear, advanced physics, computer, research, physics, chemistry and meteorology laboratories, classrooms and meteorology and oceanography study rooms, as well as conference rooms and faculty offices.

May 10

**Capt. John King Davis, 83,** an Antarctic explorer who in 1916 rescued another British explorer, Sir Ernest Shackleton, marooned just 97 miles from the South Pole, made seven expeditions to the South Pole—the first as chief officer of a ship no bigger than a river barge, discovered Queen Mary Land and the Davis Sea in 1911; in Melbourne, Australia.

## DR. JAMES L. DYSON, GEOLOGY PROFESSOR

The New York Times

EASTON, Pa., March 4—Dr. James L. Dyson, Markle Professor of Geology and head of the department at Lafayette College, died today of cancer at Roswell Park Memorial Institute in Buffalo. His age was 54.

Dr. Dyson was the author of "The World of Ice," a book about glaciers published by Alfred A. Knopf, which won the 1962 Phi Beta Kappa science award as an outstanding contribution to the literature of science.

He was graduated from Lafayette in 1933 and received a Ph.D. degree from Cornell in 1938.

Dr. Dyson taught geology at Cornell University from 1935 to 1938 and at Colgate University from 1938 to 1941. He was associate professor of geology at Hofstra College in 1946-47 and joined Lafayette as head of the department in 1947.

He was a former president of the Pennsylvania Academy of Science and chairman of the advisory selection committee on Fulbright Awards for geology.

Surviving are his widow, the former Lolita G. Brown; two daughters, Dolores and Deborah, and his parents, Mr. and Mrs. Herbert P. Dyson.

## LEONARD SEPPALA, DOGSLED RUN HERO

SEATTLE, Jan. 28 (AP) — Leonard Seppala, hero of a dramatic dogsled race against death in Alaska's sub-Arctic wastes 42 years ago, died today. He was 89 years old.

In the first weeks of 1925, Mr. Seppala and other dogsled drivers saved Nome, Alaska from an epidemic by rushing diphtheria serum the 650 frozen miles from Nenana.

His leg was the most hazardous because it included risking the dangerous ice of Norton Sound, an arm of the Bering Sea. But early in February, his team trotted along the beach and into Nome.

Mr. Seppala, born in Skjaer-voy, Norway, also was renowned as one of the great dogsled racers of his time. He entered the world's first dog-team race in Alaska in 1908 and once estimated he had driven dogs nearly a quarter of a million miles before retiring in the 1940's. He won the All-Alaska Sweepstakes for three consecutive years from 1915 to 1917.

He is survived by his wife of more than 50 years. She first watched him race when she was queen of the 1915 All-Alaska sweepstakes. Their only child, Sigrid, was Miss Fairbanks in 1937.



WILLIAM BRIESEMEISTER

## W. A. BRIESEMEISTER, A CARTOGRAPHER, 72

HASTINGS - ON - HUDSON, N.Y., May 10—William A. Briesemeister, a cartographer of the American Geographical Society, Broadway and 156th Street, New York, from 1913 until his retirement four years ago, died yesterday in his home at 124 High Street. He was 72 years old.

He supervised the preparation of many famous maps including the "Millionth" map of South America. He was noted for his maps of Antarctica, used by the Admiral Byrd expedition force. "Briesemeister Peak" in the Antarctic was named for him by explorer Finn Ronne.

At the close of World War II, Mr. Briesemeister worked on maps to be used at the peace conferences for the Colonel House Commission.

## Byrd Expedition Aide Dies in Stillwater

May 10  
STILLWATER (UPI) — Glenn Henry Brant, a member of Adm. Richard E. Byrd's expedition to the South Pole in 1934-35, died in a Stillwater hospital Wednesday. He was 61.

Bryant was a long-time member of the Oklahoma State University faculty. From 1949 to 1965 he was head of the Electrical Technology Department and for the past two years has served as supervisor of the Technical Institute Extension program.

He was an honorary member of the Explorers Club of New York City and was a World War I Army veteran.

He created the Briesemeister Elliptical Equal-Area projection, permitting land areas to be shown on a flat map in their true relative size.

For 15 years, he was active in Hastings Boy Scouts activities, serving as a scoutmaster for six years and helping the scouts develop their summer camp.

He was active in the Senior Citizens group of Hastings and was an honorary life member of the Stuyvesant Yacht Club of New York City.

Surviving are the widow; three sons, Arthur of Los Alamos, N.M., William C. of Babylon, L.I., and Robert of Seattle, Wash.; one brother, Fred C. of New Rochelle; one sister, Mrs. Fred G. (Marie) Bradshaw of the Bronx; seven grandchildren and one great-grandchild.

## Alf Olaussen, Ship Chandler, Operated a Whaling Fleet

Alf Olaussen, a former ship chandler at 11 State Street, died March 2 at the Silver Lake (S. I.) Nursing Home. He was 72 years old and lived at 100 Signal Hill Road in Grymes Hill, S. I.

Mr. Olaussen was born in Norway. Before coming to the United States in 1939 he operated a whaling fleet in Antarctic waters. He served during World War I as a merchant marine captain, and his ship was twice torpedoed by German submarines.

## THOR SOLBERG, 73, 1935 OCEAN FLIER

Airport Owner, Decorated  
by Norway's King, Dead

BRANCHBURG, N.J., Feb. 27—Thor Solberg, who in 1935 piloted the first northern-route flight to Europe, died yesterday in Somerset Hospital at Somerville. He was 73 years old and lived here.

Mr. Solberg came to New York from Norway in 1928. For seven years he operated a picture frame factory in Brooklyn to finance the realization of his dream—a flight from New York to Norway. On Aug. 25, 1932, he and his radio man, Carl Petersen, took off from New York, but wrecked their sesquiplane in a forced landing at Harbor Grace, Nfld.

Three years later, with Paul Oscanyan as radio operator, Mr. Solberg flew from Floyd Bennett Field in a single-engine, open cockpit Loening amphibian Air Yacht biplane. They traced the North Atlantic route via Labrador, Greenland, Iceland and the Faeroe Islands.

On Aug. 16, a month after take-off, the Solberg plane landed safely at Bergen in Norway, where the pilot was greeted by five of his brothers and three sisters. King Haakon gave Mr. Solberg the St. Oleg Medal, and hailed him for establishing a potential route for commercial air travel. Data collected on the flight were used by the Allies to plot flights of military aircraft during World War II.

Mr. Solberg was the operator of the Solberg-Hunterdon Airport, a 1,000-acre commercial airport near Whitehouse, N.J. That port has recently been considered as the site for a fourth New York metropolitan jetport.

Since World War II, Mr. Solberg had served in the Scandinavian countries as distributor for the Cessna Aircraft Company and as representative of United Aircraft International in Norway. He was owner of Jarlsberg Airport at Tonsberg, the only privately owned air facility in Norway.

Mr. Solberg was born in Flooro, Norway. He took flying lessons in Germany shortly after World War I, and completed his flight training after coming to the United States. The six-foot, 200-pound aviator, a life member of the Explorers Club, piloted a Cessna 310 to Norway last summer by way of Maine and Iceland.

Surviving are his widow, the former Lorraine Sturdevant; a son, Thor Jr.; two daughters, Miss Suzanne K. and Miss Lorraine P. Solberg; six brothers and three sisters.

# These Rough Notes And Our Dead Bodies

SCOTT OF THE ANTARCTIC. By Reginald Pound. Illustrated. 326 pp. New York: Coward-McCann. \$5.95.

By EVELYN STEFANSSON NEF

"A LAND may be said to be discovered the first time a white European, preferably an Englishman, sets foot on it. If he is accredited by the Royal Geographical Society, so much the better." The late Vilhjalmur Stefansson made that remark as he told of having delivered a lecture at the R.G.S. in London, back in the twenties, where, unexpectedly, he received an icy reception from an audience that had previously always been friendly.

Later a friend explained that the coolness was because he had "made the mistake" of praising John Rae, an explorer who adopted Eskimo methods of Arctic travel that enabled him to journey with greater ease than his predecessors. There was a strong feeling against Rae at the Society, he said, based on the feeling that "of course, anyone can do it if he is willing to go native"—but that was something no English gentleman cared to do.

In 1900, in much the same atmosphere at the Royal Geographical Society, Robert Falcon Scott, with no previous polar experience, was chosen by Sir Clements Markham to lead the National Antarctic Expedition. Markham, a former Navy man with boundless knowledge, energy and prejudice, selected Scott because he too was a dedicated Navy man and he liked his looks. Handsome, intelligent and able, Scott set out to become a polar explorer, learning, along with his men, from their mistakes. They made up in endurance and pluck what they lacked in technique. The Discovery expedition (1900-1904) was a success and Scott returned home a hero.

In 1910, married now and father of a baby son, Scott returned to the Antarctic with a distinguished sci-

MRS. NEF was married to the late Vilhjalmur Stefansson, well-known Arctic explorer.

entific staff and an ambitious program. He led a party of five over the icy terrain to the South Pole, manhauling their sledges after the dogs and ponies failed, only to discover that the Norwegian, Roald Amundsen, had preceded them. The heart-breaking story of their agonizing return journey is familiar history. All died from a combination of lack of food and fuel, scurvy, terrible luck with the weather and the shock of finding that they were not first at the pole.

IN comparison, Roald Amundsen, traveling light and fast by a route 60 miles shorter than the British, made a brilliant journey, remarkable for its uneventfulness. He took numerous dogs, which he systematically killed to provide fresh food for the remaining dogs and men. Scott was incapable of killing dogs for food, although strangely enough, as the present Director of the Royal Geographical Society, Laurence P. Kirwan, has pointed out, the British didn't mind killing and eating their ponies.

Amundsen left home announcing that he would try for the North Pole. En route, news that Peary had achieved it made him secretly change plans and head instead for the South Pole. Any pole with its attendant fame and glory was what he wanted. Scott's men had higher goals. They were dedicated first to the gathering of new knowledge, the long-planned pole journey was secondary. The difference in attitudes is perfectly symbolized by the 35 pounds of geological specimens still on their sledge when the search party found it.

Ill, hungry and cold, manhauling their sled, they never abandoned the heavy stones which would identify the rocks of Antarctica, at that time as little known as the moon was to us before Lunik and the moon shots. When they knew they were to die, they also knew that the knowledge they had gathered would not, and they still believed what they had done worthwhile. Their faith is confirmed by the innumerable red quarto

volumes of the scientific results of the expedition that are still consulted. There were no scientific results of Amundsen's expedition.

Scott's diaries are literary documents of worth. The British biographer Reginald Pound, author of "Scott of the Antarctic," permits the explorer to speak for himself, to tell a story more dramatic and moving than any novelist could invent. "Had we lived," Scott wrote, "I should have had a tale to tell of the hardihood, endurance and courage of my companions which would have stirred the heart of every Englishman. These rough notes and our dead bodies must tell the tale." The last entry of all, written with near-frozen fingers, was "For God's sake look after our people." When the world learned what had happened there was a tremendous response to that final plea. Care was taken of the families of the lost men, with enough over to found the Scott Polar Research Institute, which continues its polar work in the same high-minded tradition as its namesake.

MR. POUND, with access to much new material for the first time, has done well with it. In this fine biography he wisely gives us the unfavorable as well as the favorable facts, permitting Scott, whose stature and record are secure, to emerge as a more human and appealing figure.

How changed exploration is since Scott's day! Our new explorers, no less brave, screened by psychologists, are conditioned to obey instructions of the scientific team back at headquarters. Now the team, not the explorer, makes life and death decisions. In our space capsules, explorers no longer retain even that last privilege of making a good death. It is strangely comforting to be reminded of a time when men more often knowingly took great risks for ideals larger than themselves. Perhaps the single most important result of Scott's last fatal expedition was that Robert Scott, by providing a shining example, taught several generations of young Britons how to die with nobility and grace.

THE NEW YORK TIMES BOOK REVIEW

## Soviet Geologist Calls Maps Wrong on Antarctica Coast

MOSCOW, Reuters—Modern maps of the Antarctic continent are wrong and the coast-

line they show does not correspond with the true boundary of the continent, according to a Soviet geologist.

In some places the true boundary is 150 miles south of the boundary shown on maps, Prof. Nikolai Grushinsky wrote

in the magazine *Zemlya Vselennaya* (Earth and Universe).

In a report on his article, Tass, the official Soviet press agency, said Professor Grushinsky had arrived at his conclusions on the basis of studies in geodesy (earth measurement

on a large scale), seismology and gravimetry.

The professor also said that a definite equilibrium had been reached between Antarctica and its environment and that the continent had thus stopped sinking.

## CONQUEST OF THE LAST FRONTIER

By L. H. Neatby. Ohio University Press, Athens, Ohio; Longmans Canada, Don Mills, 1966. xvi, 426 pages, bibliog., maps. \$10.00.

Reviewed by W. L. Morton

This lucid narrative and well made book is an account of the attempts to reach the North Pole, complete the exploration of the Arctic basin, and traverse the North West Passage. The expeditions traced date from that of Elisha Kane in 1853-55 to those of Stefansson completed in 1917. Working from the published narratives of the explorers, assisted by biographies and other Polar literature, Dr Neatby has made an immensely readable book of a distinct phase of Arctic exploration. The phase was that of the transition from exploration by ship to that by sledge, exploration aided by the increasing use of scientific method and technology on the eve of the supersession of all surface travel by the airplane and the submarine. It is central to the book's theme that an east to west passage from the Atlantic to the Pacific, almost made in reverse order by McClure, was at last made possible by the use of the

## THE BEAVER / 56

internal combustion engine. Even more fundamental is how the book illustrates that the conquest of the Arctic has depended either upon adaptation to Arctic conditions, Eskimo-fashion, by living on the country and moving by sledge, or upon a far higher technology than that available before 1917.

Mr Neatby not only gives unity, and by unity ready comprehension to, his theme, he also restores to memory many names at least half forgotten while those of earlier explorers, who may not have done much more for exploration, remain in legend or in lower latitudes than those of the High Arctic. The quest for the Passage, culminating in the tremendous drama of the search for Franklin, is embedded in literature and even folk memory. Not so the names of those who undertook the tracing of the mazes of Polar ice and land, and made the attempt, partly scientific, but really as competitive and pointless as the present space race, to follow "The American Route" between Greenland and Ellesmere Land to the Pole. Even the once resounding name of Robert E. Peary seems archaic to one who remembers his name in the papers.

This success is owing not only to the author's skill in narration, but perhaps even more to the imaginative care and insight with which he has revived the characters of the men of whom he writes. Kane, Greely, Peary, are outstanding examples of biographical recreation, and even minor figures are given remarkable substance; few are mere names. The fewness of the dramatis personae, the intensity of the Arctic experience explains much of this, but Mr Neatby has made the most of the opportunities offered.

One defect does stand out. The Peary-Cook controversy is admirably handled, and also the tragic ending of the Greely expedition. The bitterness surrounding Stefansson's Canadian expedition is not touched on. No doubt this was because the book was written before Stefansson's death. But the lack should be repaired in a second edition.

There is a general map, and useful regional maps, of the Canadian Arctic. The two illustrations are good, but too few.

*Professor Morton, whose work in the field of Canadian history is well known, is Master of Champlain College and professor of history at Trent University in Peterborough.*



**RUSSIA.** Seven multicolored stamps feature Bering Straits area, and show map and scenery of Alaska and Eastern Russia, plus birds, seals and landscapes.



**GREENLAND.** Single stamp honors "Royal Wedding"



**FRENCH ANTARCTIC TERRITORY.** Multicolored stamp marks "First Rocket Firing, Sondes 1967".....

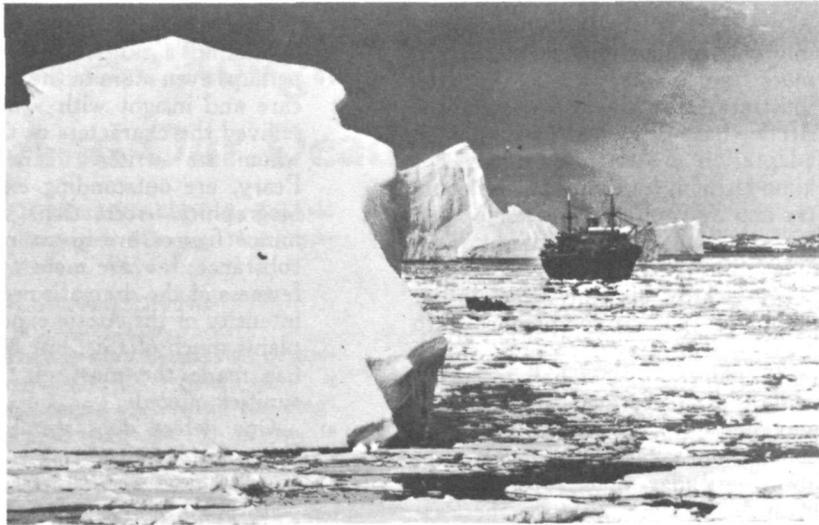


**FRENCH ANTARCTIC TERRITORY.** Two multicolored stamps, airmail and postage, show new Power Station and Whale.



## Chile Publicizes Shackleton Rescue

Rescue of the Shackleton Expedition is the subject of a set of two recently released by Chile. The 20 centavos for regular postage presents a map section of the Antarctic; the 40c the view of a ship against a background of high walls of ice. On both is the portrait of Pilot Pardo.



(Photo: E. A. McDonald)

*Cruise ship Lapataia anchored in Arthur Harbor.*

## Antarctic Tourism in 1967

EDWIN A. McDONALD\*  
*Captain, USN (Ret.)*  
*Alpine Geophysical Associates, Inc.*

ANTARCTIC JOURNAL

It is probable that the old-time antarctic explorers seldom gave much thought to the prospect of tourist trips to Antarctica. After all, their exploratory voyages were usually far from luxurious, so it was fairly difficult for them to envision anyone being willing to pay good money to be removed from the blessings of civilization just to see antarctic scenery. Yet, within the past two years, three well-advertised travel expeditions have taken tourists to the Antarctic Peninsula area, and three other tours were made in 1958 and 1959—the Argentine-organized cruises of *Les Eclaireurs* and *Yapeyu*, respectively, which touched at the stations on Melchior and Deception Islands and at installations in other localities.

A great deal of curiosity and comment has been generated by reports of antarctic tourism. Reactions have been reported in the press to range from favorable interest to apprehensive hostility, based on equally varied predictions that sightseers would pose no particular problem or that they might irreparably damage the scientific usefulness of the sites they visited. A description of this year's January and February tours, which the writer was in an excellent position to observe, may serve to place the subject in better perspective.

As with the 1966 tour, the two 1967 tours began at New York's Kennedy International Airport. There, on January 10, most of the first group of 48 tourists boarded a jet for Buenos Aires. On January 26, most of the 46 members of the second group started their trip in a similar fashion. (In both cases, some tour members proceeded to Buenos Aires by different means.) Included in the two groups were a dozen South Americans, three Japanese, three Germans, two Swiss, two Mexicans, two Britons, and a Scot. Surprisingly, there was a

preponderance of single women. Most of the men and women were influential in their professions: some had made their mark as inventors or as executives of large enterprises, and many were members of the medical professions. (When, on one of the trips, a passenger fell out of a top bunk and broke a bone, the services of seven doctors, including a world-famous bone specialist, were available.) Some boasted of relatives who had been or were serving at antarctic stations. Some were amateur radio operators who had talked to men stationed in Antarctica. What the tourists had in common—and where they differed from other people—was in having an interest in Antarctica and the wherewithal to finance a trip there.

After a brief stay in Buenos Aires, the tourists flew in smaller planes to one of the world's southernmost points of civilization, Ushuaia, Argentina, at the midpoint of the Beagle Channel, which cuts across Tierra del Fuego archipelago. After a night's rest at a newly constructed and government-financed hotel and an automobile tour of the main island, they boarded the 300-foot *Lapataia*, an Argentine Navy twin-screw transport, for the two-week voyage to the Antarctic Peninsula and off-lying islands.

When *Lapataia* poked her bow into the fearsome Drake Passage, the tourists got their first surprise. In spite of expectations, all four trips across the 500-mile-wide passage were as quiet as a millpond cruise, thus making the many bottles of seasickness pills seem somewhat superfluous. Later in the itinerary, however, rough weather did prevent visiting some places. On the second trip, for instance, the winds were so strong at Deception Island that *Lapataia* had to emulate a merry-go-round within the flooded crater that forms the harbor, making 374 full circles before the winds at last abated enough for the anchor to hold. Near the end of the second voyage, fierce 60-knot winds forced an unscheduled layover at an unoccupied Argentine sta-

\* Captain McDonald was employed as lecturer and consultant for the 1967 antarctic tours organized by Lindblad, Inc., a New York City travel agency.

tion, Teniente Cámara, on Half Moon Island, a rocky islet between Livingston and Greenwich Islands in the South Shetlands.

For the 12 women and 9 men (the writer included) who suddenly found themselves stranded on Half Moon Island on the 14th and 15th of February, there was little warning that such a happening was in the cards. One minute the boat was attempting to push its bow up on the beach, and the next the boat was being pushed sideways by charging waves that carried it high up on the beach, a position which it occupies today. Waves continually broke over the boat. Passengers who were on board scrambled ashore as best they could to join others already there.

Stores within the huts proved a blessing for the wet and hungry tourists—sufficient blankets, coal, spirits, and food being discovered to change the experience from one of serious consequence to one of only slight inconvenience. While the wind raged outside, the tourists were able to huddle in chairs and in the bunks of one of the huts. There were no lasting ill effects, only wet feet, a few colds, and one case of slightly frozen toes. "Now I have something to tell my grandchildren," boasted an elderly woman, and others declared the experience to be the high point of the whole cruise. Shortly afterwards, the group took up a collection to present a bronze plaque (bearing the names of those stranded) to the Argentine Navy for installation at Teniente Cámara.

The tourists reacted with enthusiasm to the visits to the U.S., Argentine, and British scientific stations, and especially to the observation of the animal and plant life in some of the most beautiful surroundings in the world. With as many as half a dozen cameras apiece, they put their memories on film. Clearly, the visitors deemed the experience one that they will cherish always.

## Command of Naval Support Force is Transferred

Ceremonies at McMurdo Station on February 25 marked the transfer of command of the U.S. Naval Support Force, Antarctica, from Rear Admiral Fred E. Bakutis to Rear Admiral J. Lloyd Abbot, Jr., the fifth commander in the organization's 12-year history. The ceremony coincided with the closing of the summer support season and the beginning of the austral winter. When the two admirals departed Antarctica that day, they left behind about 200 Navy and scientific personnel who will remain there until next austral summer.

Admiral Bakutis, who has been appointed Commander, Fleet Air Alameda, at the U.S. Naval Air Station, Alameda, California, held his antarctic command since April 27, 1965. His tour was highlighted by the construction of Plateau Station and Byrd Station's VLF substation, major redevelopment of McMurdo Station, extensive photomapping of Antarctica, the beginning of a new Palmer Station, and the first landing in Antarctica of a pure-jet transport.

Most of the tourists were exceptionally good hikers and ardent conservationists who were so fond of bird life that they habitually carried high-powered telescopes and binoculars to aid their identification of birds. This is a significant point in view of the suggestions made in some newspaper articles that the antarctic tourist casually tosses beer cans and wastepaper from one rookery to another. Actually, the tourists I observed did nothing of the sort. When told that they were suspected to be trampers of lichen beds and befoulers of penguin rookeries, they immediately took notice. They appeared to understand thoroughly the value of maintaining Antarctica as a great natural laboratory, which is, today, very similar to much of the rest of the world ages ago. Certainly, all of the rules and regulations on this matter which the tour staff prescribed were scrupulously obeyed.

In my opinion, the antarctic tourist will pose no significant problems to the future of antarctic science, particularly if he is given competent and common-sense guidance as to what he can see and do. Indeed, through his influence, he can lend a great deal of support and assistance to antarctic science and conservation. It seems reasonably safe to predict that hotels, airports, and other services usually associated with tourism are not just around the corner for Antarctica. At our present stage of technical advance, nature and weather make expansion of antarctic tour enterprises an extreme financial risk. Antarctic insurance rates are very high. But shipborne tours, in which the ship herself provides the necessary antarctic accommodations, have now been proved feasible for those who are willing to pay quite a bit of money for the privilege of seeing today what only explorers were able to see yesterday.



(U.S. Navy photo)  
Rear Admiral Bakutis congratulates Rear Admiral Abbot after change of command ceremonies at McMurdo Station. Behind them is the Byrd memorial.

# THE URGENCY OF PROTECTING LIFE ON AND AROUND THE GREAT SOUTHERLY CONTINENT

by Robert Cushman Murphy

**B**eyond doubt, the Antarctic is the only facet of our world in which man has not yet lived long enough to have had an overwhelming effect upon the native ecosystem. Everywhere else he has transformed primordial conditions to such an extent that we have only a vague idea of what they once were. Man, throughout his latter cultural history, has shown that he is the sole insatiable predator because, unlike all other animals, he takes his prey mostly from motives other than those of personal survival. Places in which we can observe and experiment in a primitive climax grow scarcer year by year, or day by day, but in Antarctica they remain thus far at our service.

The water and land enclosed within the Antarctic Circle are unique in several ways. Their relationships with both higher and lower belts of latitude are different from those of corresponding areas around the northern end of the earth's axis. Southward from the North Pole and Arctic Ocean, for example, there is a relatively rapid climatic transition from polar to subarctic, to cold-temperate, to warm-temperate. In the Southern Hemisphere, however, we have to forget the equivalent positions of the two polar circles and to recognize that the antarctic environment is actually three times larger than the arctic environment.

The continental climate of high latitudes in the Northern Hemisphere assures mild summers and a

rich diversity of plant and animal life. Antarctica, on the contrary, has a broad belt of oceanic climate surrounding the lofty and frozen interior. Instead of being closely rimmed by land masses such as Eurasia and North America it is by far the most isolated part of the world. The narrowest gap that separates it from other continents south of the Equator is the 700-mile reach across Drake Passage, from the Antarctic Peninsula to Cape Horn.

That Antarctica is by far the most insulated area on earth is equally meaningful. It is meteorologically buffered from all other land by a wide and permanently cold ocean and an overlying ring of circling winds. It has been well said that Antarctica has "trapped" its own cold—which is fortunate for air-breathing life everywhere else.

Site of a present-day ice age more stupendous than the northern Pleistocene glaciation, Antarctica thus far shows no sign of a coming interglacial stage. The twin factors of isolation and insulation seem to forestall that. Melting of the load of antarctic ice, which is 90 per cent of all the ice in the world, would raise the ocean level by at least 200 feet. But most glaciologists believe that the six or more million cubic miles of antarctic ice are not lessening, despite the recent worldwide trend toward climatic amelioration. Warming, indeed, may only supply more moisture from the north to swell the scanty antarctic precipita-

tion and thus add to the ice cap. Russian glaciologists have found reasons for concluding that antarctic stored ice may be growing at a net rate of nearly 300 cubic miles a year. This possible, though not yet proven, gain would result even though immeasurable quantities of ice are carried outward from the glacial coasts in tabular icebergs, some of which are as big as the state of Connecticut. The principal effect of such transport is to maintain *status quo* by keeping the isolating and insulating ocean as cold as possible.

The respective differences between plant and animal life in the Arctic and the Antarctic are due, therefore, to the continental controls in the north and the isolation, insulation, and peripheral oceanic climate of the southern realm. In Antarctica we find no widely varied flora and fauna such as fill the lands around the North Pole. A hundred or more kinds of flowering plants thrive to the north of the Arctic Circle, whereas there are only two small and obscure species south of the Antarctic Circle. In spring the Arctic rings with birdsong. The land birds of Greenland include eagles, falcons, owls, ptarmigan, larks, wheatears, fieldfares, pipits, wagtails, redpolls, buntings, and ravens. The arctic mammals number lemmings, hares, ermines, foxes, wolves, bears, caribou, and musk-oxen. These—not to mention a counterpart of the Eskimo—are all missing from the south. The distinctions show us,

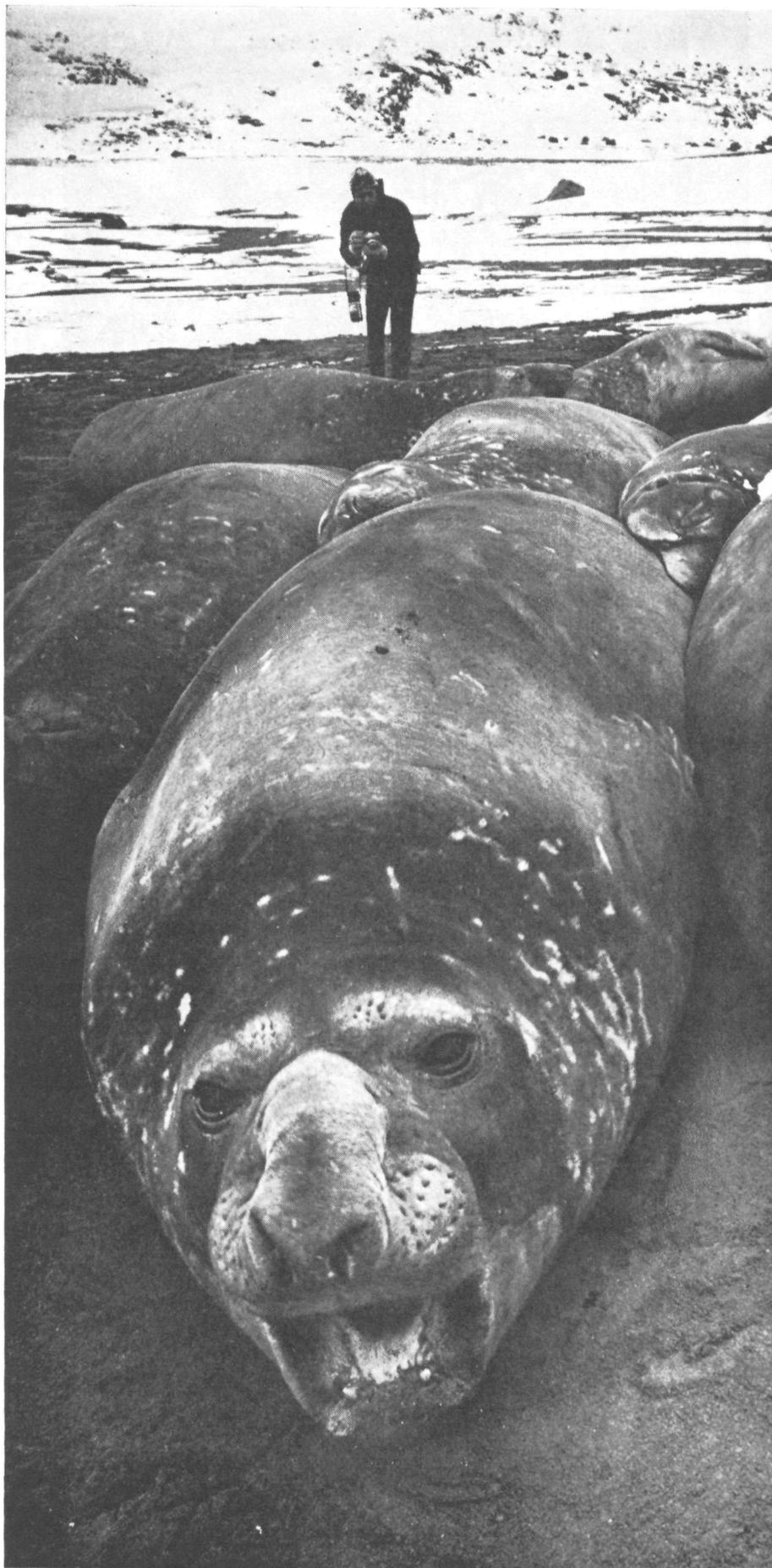
as was long ago pointed out by Charles Darwin, that the periodic extreme temperatures of polar winter are less inimical to life than the unrelieved chill of antarctic, and even subantarctic, summer.

**F**or food resources, the Antarctic claims the richest of all ocean waters, and despite the harsh climatic threshold, it has produced also a spectacular assemblage of life above sea level. Virtually all this life, however, subsists upon a food chain that extends from the sea. For higher animals, such as birds and mammals, there is no equivalent of the arctic food chains that stem from terrestrial vegetation. Antarctic life is manifest in enormous numbers of individual organisms, rather than in a wide range of kinds. The penguins, the hordes of flying sea-fowl, the seals of the drifting and the fast ice, the primitive yet highly specialized arthropods, the extraordinary invertebrates of pools that remain frozen except for a few days in each year, the lichens, mosses, and other cryptogamic plants—all are there to be investigated by the methods of many scientific disciplines.

We need all these life forms for ecological, behavioristic, physiological, sociological, medical, and many other reasons. We need them likewise for esthetic and humanistic ends. Since the Antarctic is the only fragment of the world that still seems unsuited to what we euphemistically call "development," let us keep it as we found it.

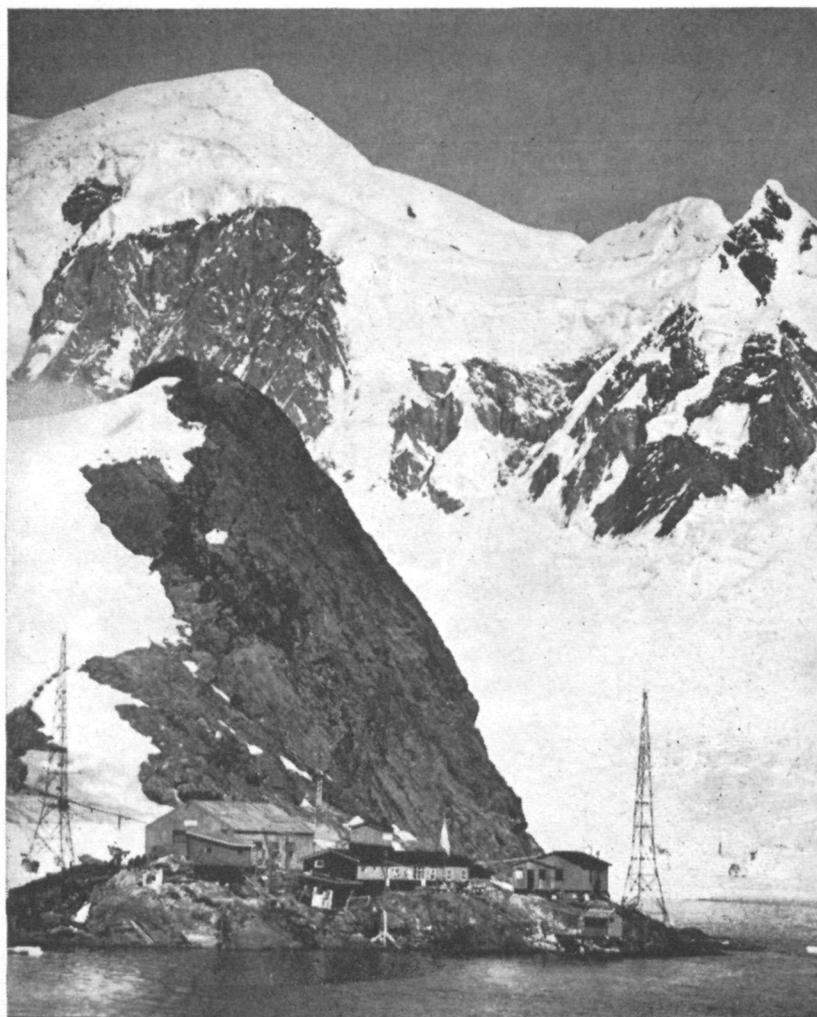
Nobody any longer doubts the importance of national parks, even though New Zealand is probably the only nation that has dedicated an adequate proportion of its territory toward such use. The Antarctic should properly be regarded as an international park, a concept that would harmonize with agreements already concluded among the countries that began joint exploration and research during the International Geophysical Year.

In 1964 twelve nations, which had earlier signed the Antarctic Treaty and subscribed to co-operative endeavor, ratified a list of "Agreed Measures for the Conserva-





*The rapacity of skuas, which feed on penguin eggs and young or infirm penguins, has aroused some enmity among human visitors and workers in the Antarctic. But the much maligned skuas are indigenous elements of the native coastal ecosystem, unlike the man photographing the ponderous itinerant elephant seals or the increasingly numerous research stations along the Antarctic coasts and in the interior. Below, an Argentine research station huddles at an edge of the Antarctic Peninsula.*



tion of Antarctic Fauna and Flora." This was an important step, even though the field was limited to land and water beyond 60° south latitude. This means that it does not cover the many islands to the north, along the Antarctic Convergence. Even more regrettable, it excludes whaling operations, which have long been the most shamefully shortsighted of overexploitations. More than 46,000 whales, a toll four or five times greater than the ocean population can safely endure, have been slaughtered in the Antarctic within a single season. Also, seals on high-seas ice receive no present protection under the "Agreed Measures." One seal, the crabeater, appears right now to be running the risk of a commercial threat. A list of specially protected species has, however, been drawn up, as well as a list of specially protected areas. But the official designation of these areas has been put off for further consideration. The document recognizes that protection of the limited vegetation, and of the great bulk of small animal organisms, can be achieved only through preservation of the habitat.

These slow-moving international intentions are commendable, as we all realize. But the representatives of the United States in Antarctica should on no account wait for their implementation. By precept and action it is up to us to make sure that the spirit of conservation prevails, most of all on the periphery of the continent, which harbors life for a hundred miles back from the sea.

This means that the pumping out of ships' bilges in coastal waters, and the ill-considered use of explosives, are no more tolerable in the Antarctic than elsewhere. It means that all resources are to be used only for truly cultural purposes. It means that life is never to be sacrificed for sport or "trophies." It means that colonies of penguins and other seabirds are never to be regarded as centers of amusement. We know too well that penguin populations decline if frequently and carelessly visited by groups of human beings, and especially if they are stampeded by helicopters. Even in the course of carefully controlled investigation of Adélie Penguins

it has been learned that a bird seized and held briefly for banding may reveal the traumatic effect for a week thereafter, perhaps discontinuing the behavior appropriate for its reproductive stage, or failing to seek food in the sea at the normal time.

No one would want to deny workers at an antarctic station the privilege of watching penguins, but regulations should leave no doubt that the opportunity is a privilege, subject to necessary restrictions. Now that Antarctica seems inevitably destined to become an austral summer tourist realm, the point needs more stressing than ever before.

In short, a penguin colony cannot be a circus—not if it is to remain a penguin colony. Intentional damage, such as vandalism, is less to be feared than harm from well-intentioned trespass. Those who have spent patient weeks recording the seasonal cycle of breeding animals know this, to their sorrow. The same devoted researchers know likewise the murderous havoc that can and does result from heedless maneuvering of aircraft. At the Antarctic Symposium held at Buenos Aires in November, 1959, it was “conceded that each season the resupply operations in support of Antarctic scientific bases bring with them into the Antarctic a number of persons, members of ships’ companies and others, who possess a minimum of interest in the natural life and its conservation and who, if not supervised and controlled, have made and will continue to cause serious damage to the flora and fauna.”

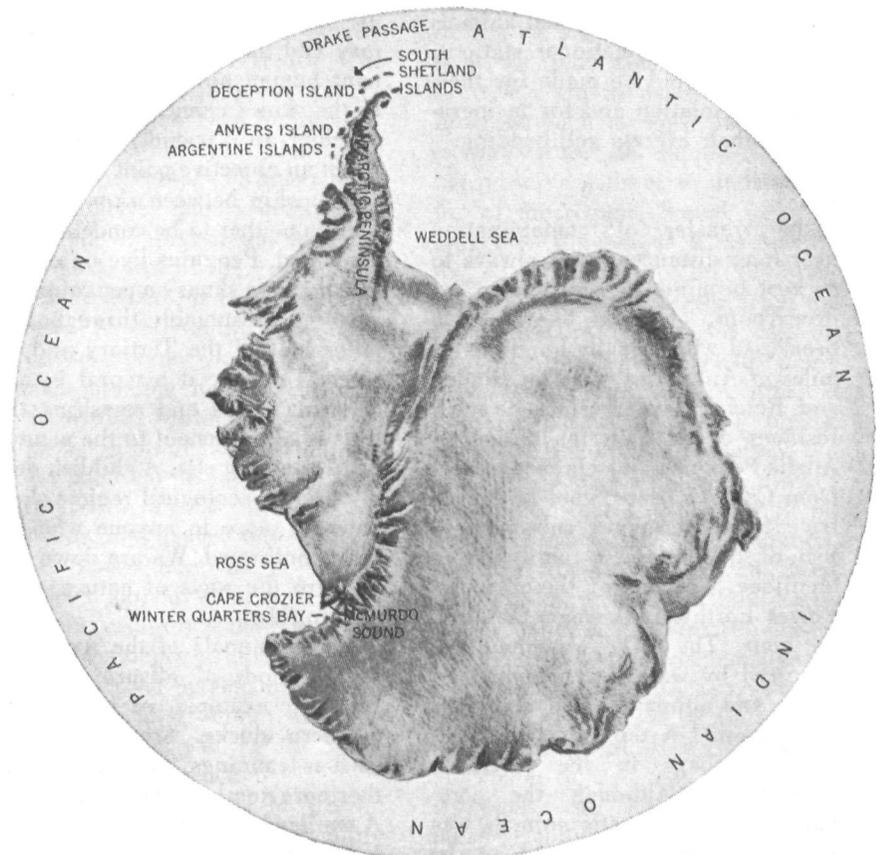
And the time is past, except in emergencies, when we are entitled to rely upon antarctic resources for a significant proportion of station or shipboard food. Marine invertebrates and fish are perhaps an exception, but eggs and seals are not. Nobody need now complain because three hundred tons of seals were killed and cached as food for the

sledge dogs of a former expedition. But today there are too many of us, coming too often, to warrant such a sacrifice. Let me quote from the minutes of the fourth meeting of the Special Committee on Antarctic Research, assembled at Cambridge in 1960. “In recent years the deprivations of expeditions upon this traditional food source have become alarmingly heavy, and are now continued without respite from year to year. For example, near several stations the stocks of Weddell seals have been so disturbed that breeding rates have been affected and scientific research rendered difficult. Animals are killed without regard to age or sex, and even animals marked in the course of scientific studies have been taken. Without biological research it is impossible to assess the permissible annual crop which the various seal colonies would stand, but it is certain that this figure is being seriously exceeded in many areas.”

We now have better use for the seals and, fortunately, decreasing need of the dogs. Dogs seem to me to pose one of the few threats of lasting contamination in the Antarctic.

Rats, established for the better part of two centuries at some of the low-antarctic islands, are incapable of surviving in a feral state on the continent. Dogs, however, constitute a danger worthy of international consideration. There are rumors aplenty that parties from at least two co-operating countries have allowed their dogs to run free, with resulting butchery of penguins. No native antarctic animals are instinctively wary of terrestrial enemies. How could they be when they have never known them?

It is not absurdly unlikely that dogs might become acclimated in Antarctica and take on the role of arctic wolves. In February, 1958, the Japanese were forced to abandon fifteen Karafoto huskies when heavy ice prevented the relief vessel *Soya* from approaching their station, and a blizzard made recovery of the animals by helicopter out of the question. In the following spring, two of these dogs were found alive, and the information was headlined in Tokyo newspapers. The expedition leader radioed that when



the advance party landed, "Taro" and "Jiro" bounded forward, wagging their tails. It was assumed that the thirteen lost dogs had fallen into crevasses, had been rafted out to sea on ice, or had been devoured by the surviving huskies.

When Sir Vivian Fuchs came aboard U.S.S. *Glacier* off Marguerite Bay, in March, 1960, he told me that he had lost one of his sledge dogs near the base of the Antarctic Peninsula. Sixty days later the truant turned up again at the ship not simply in good condition but fat, after journeying 150 miles across the ice. Dogs and wolves are of the same genus. Huskies and wolves are as close in habitus as in heritage. It is horrifying and not wholly chimerical to picture wild dogs surviving, breeding and multiplying on a winter diet of Emperor Penguins and a summer diet of Adélies—for as long as the birds lasted!

And what of other domestic or laboratory animals? The importation of poultry into Antarctica was stopped in July, 1966, but guinea pigs and mice are still called for. Such creatures could not become feral, but they might introduce parasites and viruses to infect the indigenous fauna. If experimental animals are necessary at national stations, provision should be made for their hermetic isolation and for incineration of their excreta and bedding.

**T**he transfer of contamination over long distances needs always to be kept in mind. No chlorinated hydrocarbons, so far as known, have been used within many hundreds of miles of Antarctica, yet Drs. Sladen and Reichel have recently detected residues of DDT in the tissues of Adelie Penguins and a crabeater seal from Cape Crozier. Other biologists have found the same substance in fish of the antarctic family Nototheniidae. Not one of these species ranges northward beyond the pack ice zone. The DDT was doubtless acquired by way of a marine food chain, and ultimately from creatures that ingested it thousands of miles away, perhaps in the Northern Hemisphere. Although the compound in the antarctic animals was in concentrations believed to be



insignificant, the circumstances should still serve as a warning.

Few persons are free from prejudice, and prejudices spring as freely from altruistic motives as from any other. An example in Antarctica is the enmity that the skua arouses in the tender breasts of men who come in the ships and planes. Skuas devour penguin eggs. They miss no opportunity to steal, swallow whole, or tear to bits young penguins at any stage of growth. They hang around, ghoulishly, every adult penguin that shows signs of being ready to depart this life, and at the favorable moment they are quick to hasten its demise. (I may add that the presence of indignant human observers usually adds to the skua's chances of doing such mischief to "friendly" creatures.) From an objective point of view, this relationship between skua and penguin is neither to be condemned nor condoned. Penguins live on euphausiid shrimps; skuas on penguins. So it has been, presumably, throughout the latter half of the Tertiary and ever since. To make it a moral issue by clubbing skuas and smashing their eggs is of no benefit to the penguins or to anything else. A childish desire to upset an ecological regime should have no place in anyone who is to head southward. We are down there to learn the ways of nature, not to reform them.

Many animals of the Arctic rear large broods of offspring. This is true, for example, of some of the northern ducks. Among mammals such as lemmings, the litters may furthermore number several in a season. A similar high rate of fertility is unknown in the Antarctic, where the

fauna may be said to exist on a marginal basis of stability. Two additional influences tend to assure a low reproductive rate, namely, the uniquely severe summer environment, and the fact that all the air-breathing vertebrates take their exclusively animal food directly or indirectly from the sea.

Heavy snowfall, extreme frost, storms, or winds that merely close leads and clog coastal waters with tight pack are always likely to make prey inaccessible and thus, in the case of birds, block the feeding of the young. Scientific literature teems with instances of how heavily the hazards of weather are weighted against the egg and nestling stages of antarctic birds. Data from the life histories of Emperor Penguin and Snow Petrel suggest that an unsuccessful annual breeding cycle may be statistically more "normal" than one in which a single chick per pair of adults is reared to fledging and departure. At the Argentine Islands, off the western coast of the Antarctic Peninsula, Roberts found the mortality of Wilson's Petrel chicks to be about 65 per cent. The well-advertised carcasses of ancient, desiccated, chiefly immature seals at localities far inland show in like manner how tardy departure, or premature freezing and closure of sea ice, can lead to aimless scattering, starvation, and death.

Other factors limiting exuberant multiplication include both disease and predators. The polar environment is regarded as singularly healthful, and yet we know that *Aspergillus*, a mold responsible for respiratory infections in birds, is liable to arrive with man's invasion.

if it is not already there. Maladies grouped under the pathological term "ornithosis" sometimes take a heavy toll of bird life. Nor are the seals free from unpredictable holocausts. A report by Laws and Taylor describes mass deaths of crabeater seals during the season of the year that should be devoted to pupping. The mortality in a localized population of about 3,000 animals was estimated to be 85 per cent. The proximate cause was a highly contagious virus infection. It was limited in the area of its ravages and also extraordinarily host-specific. Weddell seals in the same vicinity, but dependent upon dissimilar food, remained healthy. The sickness of the crabeaters was probably induced by shortage of krill (euphausiids), but going back to prior causes, the mortality was of climatic origin.

**M**ature antarctic animals are less prone to catastrophic destruction than are eggs and young. The limited data we have on longevity and viability indicate that most of the birds and mammals, once past their vulnerable infancy, enjoy a notably favorable life expectancy. No more convincing support for this opinion need be sought than the findings of Roberts in a west Antarctic colony of Wilson's Petrels. This author ringed nearly all the birds of 23 mated and nesting pairs. At the next breeding season, a year later, he recovered most of his marked petrels, linked with the identical mates and occupying the identical burrows of the previous year. In other words, there was no evidence of adult mortality among pelagic birds that, between reproductive periods, migrate far into middle latitudes of the Northern Hemisphere.

In such relative safety of adult antarctic animals we find an explanation of the very large numbers that some of their populations attain. Despite physical risks, predation by skuas, Giant Fulmars, leopard seals, killer whales, etc., de-

spite proportional scarcity of reproductive sites vis-a-vis the vast extent of watery pasturage, we encounter in Antarctica some of the most abundant of all species of birds, as well as seal populations estimated to number six million or more individuals of at least one of the six kinds. Why then, it would be fair to ask, has conservation of the antarctic fauna suddenly become a matter of growing concern?

The answer is that in a long-isolated realm of tenuous balance, where broods are small (rarely more than a single annual replacement) and the dangers of immaturity extravagant, man, the new interloper, is the straw that can break the camel's back. We have seen the signs already in the over-exploitation of Weddell seals in the neighborhoods of some stations. Around the periphery of the Antarctic, we have the appalling history of fur seal destruction—all but total—which is only now beginning to mend because of the half century of protection at South Georgia.

In the same outer oceanic ring of islands we note with foreboding that, although whales continue to decrease, the improved techniques of slaughter almost manage to maintain the scale of total return. The former, drastic wiping-out of the humpback has now been followed by similar extirpation of the blue whale stock. The percentage of blue whales in the Antarctic catch is today only a twentieth of what it was in 1930. The finback, last of the unprotected whalebone whales, is in turn paying the costs. There is nothing to follow except the sperm whale, which is once again being harried throughout the world's warmer oceans.

Man has himself become the center of a potential demographic crisis in Antarctica. Proliferation of his occupancy and travel must be accepted. There may be a modest withdrawal during some years, but it appears certain that the remainder of the twentieth century will be mostly years of expansion in his numbers, and that pursuit of scientific information will be the main reason for his presence.

An establishment like McMurdo, the home of a thousand or more human beings in the austral summer

and of a couple of hundred in winter, fairly bursts with conservation problems, of which the disposal of sewage, garbage, and other waste is only the first. There is no subsoil seepage, no rapid bacterial decomposition, such as come to our aid in the more familiar world. Each season the biologists find that they must go farther afield for their ecological studies. Even the bottom of Winter Quarters Bay is losing the semblance of a "natural area."

With a dozen nations engaged in antarctic research, overcollecting of organisms and unwitting repetition of studies that call for collecting require weighing. Penguins, as preserved specimens or as captives for zoological parks, are much sought after by different groups at even single national bases. Fewer examples, especially of killed birds, might be made to serve the purposes of several or many workers. Sladen, Penney, Prévost, and others have recently conducted penguin investigations of great significance with negligible sacrifice of life and minimum disturbance of the colonies.

**T**he task of perpetuating antarctic life calls for long vision no less than for immediate control measures. We are in need of scientific forecasts such as only patient and cautious study can supply. We cannot preserve without an understanding of the regime. Sound foresight may then prevent us from making the slight overdrafts on resources that differ only in degree from the gross overdrafts that we can already see. For whether we use many times too much or only a little too much of things we cannot create, the result will still be depletion. We are already wise enough to discard the fallacy that a species is in no danger because it is still common. We need always to recall and heed the brilliant maxim of Paul-Emile Victor, made at the Antarctic Symposium of 1960 in Paris, namely that Antarctica represents a system of immense capital, yet of only small annual increment. If we fail to acknowledge this, we may find that the ecosystem can be wrecked even more speedily than those of the temperate regions.

## WINTER CLIMBERS SCALE M'KINLEY

### Ascent by Three Alaskans Is First in Off Season

TALKEETNA, Alaska, Feb. 1 (AP)—An eight-man international team has begun the first attempted winter ascent of 20,320-foot Mount McKinley, a bush pilot, Don Sheldon, said today after a radio message from the climbers.

Mr. Sheldon said the party had advanced about 4½ miles up the west buttress toward the summit since he flew the men and nearly a ton of equipment to the 8,250-foot-high base camp early this week.

The shuttle flights in Mr. Sheldon's single-engine plane were made from this village 80 miles north of Anchorage after a day's delay caused by high winds.

TALKEETNA, Alaska, March 8 (AP)—Three Anchorage climbers reported today that they reached the top of 20,320-foot Mount McKinley a week ago. It was the first time the mountain, highest in North America, had been scaled in winter.

An Air Force plane dropped a radio to the climbers at about the 14,000-foot level of the mountain. They sent this message:

"Pass the word along that we made the summit on the first of March at 7 P.M."

The final assault team was composed of Art Davidson, 22 years old, Dave Johnston, 25, and Ray Genet, 35.

They were part of an eight-man team that set out a month ago on the expedition. One of the original members of the party, French-born Jacques Batkin, 36, of Anchorage, was killed on the second day of the climb.

Two other members of the party—Gregg Blomberg, 25, of Denver, and John Edwards, 35, of Cleveland—were at the team's base camp at the 8,200-foot level. An Army helicopter landed there today, but the men declined evacuation.

Later in the day, however, the Air Force Rescue Coordination Center in Anchorage said that the five climbers had been picked up by Army helicopters and were being flown to Talkeetna.

The two other members—Dr. George Wichman, 39, and Shiro Nishimae, 31, both of Anchorage—were last reported at about the 10,000-foot level.

#### Two-Headed Giant

Mount McKinley has been described as a two-headed giant, with a maximum reach in its south peak of 20,320 feet, and a secondary north peak that is



Bradford Washburn

**CLIMBING MOUNT MCKINLEY:** An eight-man international team is now making the first attempt in winter to climb Alaska's 20,320-foot Mount McKinley—the highest point in North America.

### Climber on Mt. McKinley Killed in Fall in Crevasse

TALKEETNA, Alaska, Feb. 6 (AP)—Jacques Batkin, 36 years old of Anchorage, was killed Jan. 31 when he fell in a crevasse on Mount McKinley. He was one of eight men making the first winter ascent of the 20,320-foot peak.

Mr. Batkin was carrying a pack weighing 60 to 70 pounds from the base camp at about 7,500 feet to a second camp at about 8,100 feet. Men at the camp said they saw him suddenly disappear, and the party

more than 19,000 feet up.

In 1910, two climbers reached the top of the north peak and in 1913 the south peak was reached. In 1932, a party of climbers conquered both peaks.

One of the most recent summer ascents of the south peak took place in July, 1961, by a six-man Italian team.

Summer temperatures drop to more than 20 degrees below zero, while in the winter temperatures of 100 below and lower have been recorded.

found a small hole where he dropped through crusted snow into a narrow crack in the glacier.

Mr. Batkin's pack remained on the snow, jammed in the hole, but the shoulder straps had snapped. He dropped about 50 feet, hitting a ledge on the way down.

Dr. George Wichman of Anchorage, another member of the party, said Mr. Batkin died of head injuries.

#### Peak Is Climbed and Named

GLENALLEN, Alaska, April 28 (AP)—The highest unclimbed, unnamed peak in Alaska's Wrangell Range on the Yukon border was conquered yesterday by six members of a joint American-Japanese climbing party. The 14,400-foot mountain was named Mount Kobe in honor of the sister-city tie between Kobe, Japan, and Seattle.

#### One Dead in Alaska Air Crash

KODIAK, Alaska, Feb. 8 (UPI)—A Coast Guard plane with eight men aboard crashed today on St. Paul Island, about 600 miles west of here. The Coast Guard said one man was killed and seven injured. No names were available.

## Three Climbers Tell Of Six-Day Ordeal On Mount McKinley

FAIRBANKS, Alaska, March 9 (AP)—The three climbers who conquered Mount McKinley for the first time in winter told of their experiences today as Army helicopters brought back two companions who had been unaccounted for since Sunday.

Ray Genet, a 35-year-old Anchorage painting contractor, said the three men had been pinned down for six days by winds of more than 100 miles an hour and temperatures of 72 degrees below zero after reaching the 20,320-foot peak.

He, Dave Johnston, 24, of Gladstone, N. J., and Art Davidson, 22, of Fort Morgan, Colo., left a camp at the 17,000-foot level in the morning of March 1 and reached the summit by 7 o'clock that night.

"We all stopped just before we got to the top," Mr. Johnston said. "We put our arms around each other and ran up. Then we stood there, like a football huddle, and slapped each other on the back."

The exhilaration of reaching the top of North America's highest peak quickly turned into the most harrowing experience of the climb.

"We had to go down over fairly steep ice with many crevasses," Mr. Davidson said, "and we followed the crampon marks we'd left on the way up."

Then winds hit with terrific force. "It was a fantastic wind, driving snow and embedding it in every vein of the rocks," Mr. Genet said. "It was another world."

TALKEETNA, Alaska, March 9 (AP)—Two climbers unaccounted for since Sunday were found today in an ice shelter on Mount McKinley and evacuated by Army helicopters.

The airlift completed a venture in which men conquered North America's loftiest peak for the first time in winter.

The two climbers who were rescued today were the last of a seven-man expedition to be brought down from the mountain.

The five others, including the three who fought their way to the 20,320-foot summit at 7 P.M. on March 1, were evacuated yesterday.

An Alaskan Air Command spokesman said Dr. George Wichman, 39 years old, and Shiro Nishimae, 31, both of Anchorage, were found in the ice igloo by two searchers flown in by helicopter this morning.

The other members of the expedition were resting here today. They are Ray Genet, 35, Art Davidson, 22, and David Johnston, 24, all of Anchorage; and Gregg Blomberg, 25, of Denver, Colo., and John Edwards, 35, of Cleveland, Ohio.

## Underground Nuclear Test Set at Aleutian Site

### Series of Explosions Planned at Amchitka Island

By LAWRENCE E. DAVIES  
The New York Times

FAIRBANKS, Alaska, May 28—The Defense Department is proceeding with plans to set off a series of deep underground nuclear tests within the next two or three years at Amchitka Island, in the Aleutian chain.

Alaska conservationists are uneasy but resigned. Much of their leadership has become convinced that the test program is important to national security and that the greatest precautions will be taken to protect the sea otter, the Canada goose, ducks and other inhabitants of the wildlife refuge in the islands.

Geological explorations still under way will determine whether the plans for Amchitka are to be carried out, but a contract of nearly \$13-million for the drilling of five holes was let several months ago to Parco, Inc., a subsidiary of the Parker Drilling Company of Tulsa, Okla.

Amchitka was the site of the test blast of an 80-kiloton nuclear charge 2,400 feet below the surface of the ground on Oct. 30, 1965.

That explosion, called Operation Long Shot, was designed to yield data to enable scientists to distinguish between an earthquake and an underground blast. Since many quakes occur in the Aleutians, as well as the Soviet Union, ways were sought to identify Soviet nuclear explosions among recorded earthquakes.

The further tests now envisioned will be of far greater magnitude than set off in 1965. Some of the shock holes will be drilled to a 6,000-foot depth and will be 90 inches in diameter, compared with the 32-inch width of the first Amchitka hole. Exploratory holes will be narrower and shallower.

"The first drilling rig is being set up," said a spokesman for the Atomic Energy Commission, "but the first blast is a long way off. A decision has been made to use Amchitka, however, unless unforeseen geologic conditions become apparent."

Earlier suggestions that an Alaska testing ground might be chosen near the headwaters of the Utukok River east of Point Lay on the Arctic slope drew sharp protests from the Alaska Conservation Society.

Dr. Frederick C. Dean of the University of Alaska, who is the immediate past president of the society, declared the proposed site was in the main calving ground of the western herd of the Brooks Range caribou, on



The New York Times May 29, 1967

### Defense Department plans nuclear blast at Amchitka.

which Eskimos depend for food.

Henry Vermillion of the A.E.C.'s Nevada operations office at Las Vegas said in a telephone interview that there was no plan to drill on the Arctic slope this year.

"We expect to send a party up next month to see the lay of the land and do some reconnaissance, but our position is that we don't plan anything if Amchitka pans out all right."

For a while, Alaska conservationists, especially members of the Audubon Society, were upset by a report that the Air Force was interested in Agattu, another Aleutian island, for a nuclear detonation experiment. Agattu is the nesting area of many birds and is considered important, especially for the re-establishment of the Aleutian Canada goose.

Despite assertions of conservationists that they had confirmed the Agattu report, a Defense Department source insisted that this island never had been considered for nuclear testing.

About 80 persons will be at work this summer on the Amchitka project. The force will be at a peak of 650 during a possible two-year construction phase, according to a qualified source, who said the project's total cost might exceed \$66-million. He said that "if history tells us anything, we can expect that the project will go on for more than three years."

This source related that scientists were still puzzled by some aspects of Operation Long Shot. They were unable to explain, he said, an error of 25 kilometers in the location of the blast when measured seismically.

Underwater shots using conventional explosives are to be fired this summer. One experiment is to involve 20 small shots 600 to 800 feet below the surface and five to 10 tons in size. Some will be up to 600 miles off the coast. A second experiment will be an underwater detonation 1,000 to 4,000 tons in magnitude about 32 miles southwest of Amchitka.

### Conservationists Uneasy, but Resigned to Program

Amchitka is some 1,500 miles southwest of Fairbanks.

Walter Kirkness, State Commissioner of Fish and Game, received a letter last month from Dr. S. J. Lukasik, director for nuclear test detection of a Defense Department agency, asking his advice for "minimizing possible damage to marine life and interference with fishing activity" from the deep-water detonations.

Mr. Kirkness said in a telephone interview at Juneau that the explosions, postponed from last summer, probably would take place in August.

"From the work we have done," he added, "I would say there is no danger to wildlife. There will be practically no disturbance on the surface of the water."

The commissioner said that in the Amchitka underground test in 1965, "we ran a number of experiments, with other agencies, to determine effects on the fishery and animals. There was no damage to Dolly Varden trout eggs, even very close to the blast's epicenter, and no damage of any kind, as far as I know, except to a couple of sea birds."

Miss Celia Hunter of Fairbanks, executive secretary of the Alaska Conservation Society, said a major point that the society had tried to make was this: "The Fish and Wildlife Service has limited funds and if its people have to be spared to monitor at Amchitka, we want the A.E.C. to provide funds to make up for it."

Dan Swift of the University of Alaska, vice president of the society, commented: "I am not happy about Amchitka's being used as a test site but I recognize national needs and I think present opinion views it as preferable to an Arctic site."

### Alaskans Aid Russian at Sea

ANCHORAGE, Alaska, Feb. 11 (AP)—Three Alaskans made a perilous six-hour trip through the Bering Sea today in a 25-foot open boat to aid an injured Russian seaman. The Russian, identified as Vechvslav Mihailovich, a crewman aboard the mothership Nahodka, operating with a Soviet fishing fleet in Bristol Bay, was hurt when a cable snapped and struck him in the stomach. Three men from the Air Force aircraft control and warning station at Cold Bay went to the Nahodka in a 25-foot outboard boat and took the injured man back to Cold Bay.

## U.S. AND JAPANESE TO SIGN FISHING PACT

WASHINGTON, April 29 (AP)—The United States and Japan will sign an agreement May 10 in Tokyo that will keep Japanese fishermen outside the 12-mile zone around the continental United States, including Alaska, until Dec. 31, 1968.

An announcement that an agreement had been reached was made here by Ambassador Donald L. Mackernan, special assistant for fisheries to Secretary of State Dean Rusk.

Under the new pact, Japanese fishing will be permitted in certain selected areas in the eastern Aleutian Island chain inside the 12-mile zone for six months of each year.

The timing is arranged to avoid conflicts with American fishermen and their crab pots and other gear that have been damaged or destroyed in the past by Japanese and Soviet trawlers.

Mr. Mackernan said that the Japanese had agreed not to fish inside the fishing zone along the Pacific Coast. In the Bering Sea, the Japanese will have limited fishing rights from the west end of Unimak Island westward along the Aleutians.

From Long. 165 degrees W., the Japanese will be permitted to fish for six months. The Japanese will refrain when American fishing is at its seasonal peak.

It was agreed that there would be no Japanese fishing for salmon east of Long. 175 degrees W.

### CLEAR, ALASKA G. E. Develops a Fluid for Tracking Station

The New York Times

The wintry blasts and sub-zero temperatures at this remote Ballistic Missile Early Warning Systems (B.M.E.W.S.) station are not expected to be able to freeze a giant radar tracking antenna into immobility.

The antenna—an 84-foot-diameter parabolic disk weighs 210,000 pounds and rests on a 9-foot-diameter hydrostatic bearing. These two parts "float" on 300 gallons of a thin film of special silicone lubricant developed by the General Electric Company. Known as SF85-50 fluid, it was chosen by engineers of the Goodyear Aerospace Corporation because of its relatively constant temperature, which reduces friction with maximum efficiency.

It also provides a uniform viscosity that results in an even film over wide temperature ranges. The B.M.E.W.S. equipment is capable of detecting and tracking objects at ranges in the thousands of miles.

# 800 B.C. Artifact Find in Alaska Aids Theory of 2-Continent Link

**Leader of a Brown U. Team Says That Similar Pottery Was Unearthed in Asia**

By JOHN H. FENTON  
The New York Times

BRISTOL, R. I., Jan. 5—Artifacts reliably dated at 800 B.C. have been unearthed by Brown University anthropologists on the banks of the Kobuk River, 50 miles north of the Arctic Circle, in Alaska.

Composed chiefly of bits of flint in the shape of crude weapons and tools, the artifacts add support to theories of commercial and cultural links between the North American continent and Asia before the dawn of recorded history.

Douglas D. Anderson, who led the Brown expedition to Alaska, said similar pottery had been uncovered in various Neolithic Age sites throughout Asia, including Japan. The Japanese diggings, he said, were attributed to a report by Kamakichi Kishinouye in an article for an agricultural journal of the Imperial University at Tokyo, in 1911.

Mr. Anderson is assistant curator of Brown's Haffenreffer Museum of Anthropology in this Mount Hope Bay village. He displayed other artifacts, dated at 8,000 years, which he said were still under study.

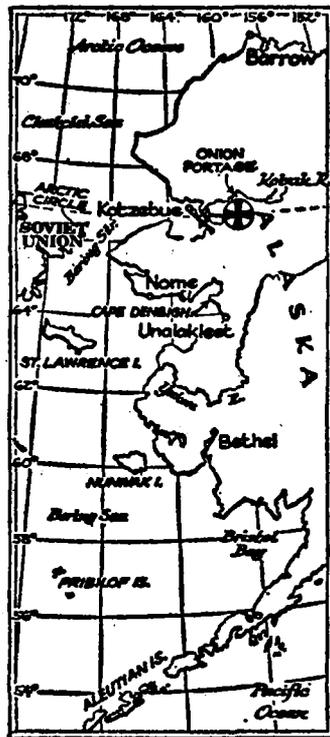
But Mr. Anderson said the other day that he was certain the artifacts dated from 800 B.C. indicated definite community patterns that appear to have survived in the Arctic over 2,700 years. These artifacts were discovered last summer.

Mr. Anderson is carrying on the work of Dr. J. Louis Giddings of Brown, who was fatally injured in an automobile accident two years ago. Mr. Anderson, a graduate student working on a doctoral degree in anthropology, is a former student of Dr. Giddings.

The theory that the North American mainland was joined to Asia in the area now covered by the Bering Sea has long been under discussion. The Giddings and Anderson diggings add weight to this theory.

Mrs. Giddings, the widow of Dr. Giddings, is curator of the museum that was given to Brown by the Haffenreffer family of Rhode Island. It is situated about half an hour's drive south from the Brown main campus in Providence, R. I.

Mrs. Giddings said that her husband discovered the first Alaskan artifacts in 1948 at Camp Denbigh, a bight on the Seward Peninsula. She said he had been motivated by an



The New York Times Jan. 7, 1967  
Cross marks discovery site

Eskimo legend that a dwarf once lived in the area.

"Obsidian flakes found at the site lent credence to the theory they had been fashioned by a dwarf," said Mrs. Giddings.

The tiny artifacts, tested by the radio carbon-dating laboratory of the University of Pennsylvania, placed their age at 5,000 years.

Carbon dating is done by determining the ratio of radioactive carbon 14 to other forms of carbon in the artifacts. There is a fixed ratio of these substances in the atmosphere and, hence, in the once-living material, used to make the artifacts.

Since the death of the living material, the radioactive carbon has decayed at a steady, known rate. The percentage that is left indicates the approximate age of artifact.

The 800 B. C. artifacts unearthed last summer at Onion Portage, a narrow bend in the Kobuk River, have been identified as arrowheads, adzes used for fashioning boat frames and sleds, and parts of special tools for working with caribou antlers.

Onion Portage, which takes its name from wild onions found growing nearby, is situated in an elevated clearing of woodland on the river bank. It was first explored in 1962 by Dr. Giddings as a result of surveys in the area.

During last summer's diggings, Mr. Anderson and his team uncovered a kazigi, or

# A 'GOLDEN FLEECE' SOUGHT IN ARCTIC

**Scientists Gather Wool of Musk Ox Worth \$50 a Pound**

FAIRBANKS, Alaska, Jan. 7 (UPI) — There is a "golden fleece" in the Arctic that is waiting to be gathered. But the argonauts who seek this treasure are not Greeks; they are scientific cowboys.

The fleece they want comes from the musk ox. It is called "qiviut," and it is worth about \$50 a pound.

Qiviut is the fine, soft underwool of these Ice Age throwbacks who haunt the barren lands along the Arctic Sea in North America, Greenland, Scandinavia and Siberia. It is light gray-brown in color, can take any type of dye, can be bleached and has a diameter less than that of cashmere and a staple length two to three times that of cashmere.

A full-grown musk ox sheds from three to six pounds of this wool annually. But the musk ox is as wild as the tundra it inhabits. Consequently, the problem is to domesticate the beasts so they can be herded and bred economically.

And that is what the University of Alaska is attempting to do.

The project involves more than mere wool gathering. If the university is successful in

men's house. Nearby was evidence of a cluster of tents where women of the community were supposed to have lived.

Among the artifacts discovered within the area covered by the kazigi was a potsherd, buried in the remains of a hearth. Mr. Anderson said this was the only potsherd ever found in Alaska at the 800 B. C. level. He said its discovery indicated trade with Siberians, since it was pottery of a type "certainly not invented by Eskimos."

Onion Portage is one of the two most ancient sites discovered so far in the Arctic. The other is in the Aleutian Islands, which lie west of the Seward Peninsula. Until recently, it had been believed that man had not inhabited those northern regions for more than 2,000 years.

Dr. Giddings' excavations at Camp Denbigh were dated at 5,000 years. The cape is about 150 miles southwest of Onion Portage.

"What appears to be evident," Mr. Anderson said, "is a culture that extended across the top of North America to Greenland, where the first men were believed to have lived 2,000 years ago."

all stages of the program, a new industry will have been developed to aid the hard-pressed natives of the North, the Eskimo and Indian villagers who find themselves unable to cope economically with the demands that encroaching civilization has made of them.

The first stage of the project has been completed. This involved a 10-year study in which a herd of musk ox underwent physiological research on John Teal's farm in Vermont. Mr. Teal is supervisor of the project, which is being helped financially by the Kellogg Foundation.

The second phase, involving selective breeding, is now in progress. The school has 32 head of musk ox penned on a 142-acre grazing site adjacent to the campus at the college near Fairbanks.

Mr. Teal and his herders hope to increase the herd to 100 head. At the same time they are attempting to develop an animal that will be more docile and produce more wool than the wild musk ox.

The third stage involves distribution of the animals to the villages. Upon request, a dozen oxen will be lent to a community after village herdsmen have undertaken at least a year of training on the college farm. At the same time, graduate students will be sent to the village to teach the natives how to spin and weave qiviut.

The borrowed breeding stock will be replaced in kind with calves. This method was used to establish Alaska's flourishing reindeer industry. The oxen will not be used as a source of food, however.

Musk ox require little care. They feed on tundra grasses and sedges and have been observed pawing through four feet of snow to reach food. At the school the animals are weighed each afternoon. Cows average 475 pounds and bulls 625 pounds.

For the breeding program, two bulls were selected for size and temperament. Each was given a harem of six cows and each group was put into special pens. Previously, the bulls and cows had been kept apart.

Terry Hall, herd manager, said that when the bulls acquired their harems they became belligerent. In fact, Mr. Hall and his assistant, Larry Rubin, had to take to trucks to herd the beasts.

"One bull outside the pens managed to open a gate and get in with one of the harems," Mr. Hall said. "He defeated the original harem bull and took over the cows. When we finally got him out of the pen, he became docile again."

Mr. Hall explained that the college herd had been captured on Nunivak Island in the Bering Sea in 1964 and 1965. They were the offspring of a 33-head herd taken to the island from Greenland in 1963 by University of Alaska personnel. Today, 650 musk ox live on Nunivak.

# Panel to Study Economic Development of Arctic Area

By LAWRENCE E. DAVIES

The New York Times

ANCHORAGE, May 31—The development of Alaska's vast mineralized Arctic areas, where Eskimo villages represent some of the nation's deepest pockets of poverty, is about to be put under scrutiny by a blue ribbon commission.

Walter J. Hickel, the first Republican Governor in Alaska's more than eight years of statehood, today named a 10-member team to help translate into action the top priority subject in his legislative program early this year.

Economic development was his foremost objective for this 49th state of 273,000 persons, of whom 53,000 are Eskimos, Indians and Aleuts. A central feature of the program is transportation.

Mr. Hickel envisioned as essential to the state's economic future the penetration of the isolated northwest interior and the rugged Brooks Range with hundreds of miles of new railroad. In these mountains lie what mining experts believe to be some of the world's important reserves of copper, nickel, lead, platinum, antimony and other minerals, awaiting the needs of the United States.

Governor Hickel, whose view is a controversial one, envisions Arctic areas dotted with newly constructed mining towns inhabited by hitherto unemployed but intelligent Eskimos drawn from present primitive, unsanitary, disease-breeding surroundings.

The task given his newly appointed commission on Northern Operations of Rail Transportation and Highways (NORTH), the Governor said, is to "find methods for economic development in the Arctic." These include the most efficient ways of moving great quantities of mineral products to smelters, refineries and markets.

The Republican-controlled Legislature allocated \$750,000 to Governor Hickel, with no strings attached, for use by the commission. Its members from outside the state are:

Everett Hutchinson, Under Secretary of the Federal Department of Transportation; Russell G. Smith of San Francisco, head of the Asiatic Development Commission and a re-

retired vice president of the Bank of America; Donald L. Smith, vice president for transportation of the Missouri Pacific Railroad; Samuel F. Pryor, retired vice president of Pan American World Airways, and William P. Lear of Wichita,



The New York Times June 1, 1967  
Present Alaska railroad is indicated by solid line. Dotted lines show routes of proposed extensions.

Kan., who recently sold his Lear Jet Aircraft Corporation to the Gates Rubber Company for a publicly announced price of \$28-million.

Alaskans on the commission are C. W. Snedden, publisher of The Fairbanks News Miner; John Coghill, a Nenana merchant; Albert C. Swalling of Anchorage, head of the Swalling Construction Company; John E. Manley, general manager of the federally owned Alaska railroad, and Jack H. White, an Anchorage real estate and insurance broker. The Governor and Secretary of State Keith H. Miller are ex officio members.

Working independently on Alaska's economic situation is the Federal Field Committee for Development Planning, whose chairman, Joseph H. Fitzgerald, went to work two years ago by appointment of President Johnson.

Mr. Fitzgerald and his economist, Dr. Douglas Jones, former professor of economics at the Air Force Academy, emphasized in an interview here that basic resource development in Alaska must be in response to the needs of the whole country, not merely of Alaska.

"It was slowed for a long time by the existence of stockpiles, which gave the impression that we had a surplus of everything," Mr. Fitzgerald said. "Now there is increasing shortage of everything but iron, and there is a great step-up all over Alaska by companies seeking more oil and minerals."

Mr. Fitzgerald referred to estimates that the present 420-mile railroad from Seward on the Gulf of Alaska north to Fairbanks, the interior "metropolis" of 20,000, could be extended 405 miles to Barrow in the northwest for \$160 million.

"As I see it, the Federal Government, in exploring whether to finance a railroad,

should look on it from the standpoint of sound investment—an ability to recapture the capital cost," he said. "Can it be done? The Canadians have pushed a whole series of railroad expansions and we are told they have experienced more rapid development than had been expected."

Dr. Jones said it was erroneous to suppose that "just because railroads were dominant in the mid-1800's they are not appropriate 100 years later [as economic developers]."

"The old Corps of Engineers idea of a highway to Nome—advanced during World War II—is not applicable here," he said. "It was to connect two towns. In this case we are talking of access, of opening up areas. The railroad route here would not follow a straight line from Fairbanks to Nome. It would follow the heaviest mineralized areas."

The first stage of the proposed railroad extension would run from Dunbar, near Fairbanks, northwest 405 miles to Barrow. Not on most maps, Barrow is the site of a shaft sunk by Kennecott Copper Corporation. It lies 14 miles north of the Eskimo villages of Kobuk and Shungnak, which are on the Kobuk River 150 air miles east of Kotzebue and 40 miles north of the Arctic Circle. The Kennecott shaft is about completed. It is down 1,075 feet, where it was flooded, leading to the punting of 3,000 gallons of water a minute during the last two months.

But Charles T. Penney, the Kennecott project manager based at Fairbanks, voiced optimism for the future. He said Mr. Fitzgerald was not far off in suggesting that Kennecott eventually might have three or four mines in the region, with Eskimo communities of 5,000 to 7,000 each.

"We have made no decision on the size of our operation," Mr. Penney said. "We are trying to determine costs. A railroad would encourage exploration through a combination of government and private industry. And we prefer Eskimo workers to any we can hire in Fairbanks."

He declared that "the weak and the dumb die off," leaving highly intelligent and willing Eskimos "who can do everything you give them to do."

"One advantage," he said, "in using Eskimo labor is that this is their home and they're happy to see the first snowflakes fall, whereas somebody from South Carolina would want to head for home immediately."

Mr. Fitzgerald estimated that 70 to 80 per cent of the natives in the Brooks Range and northern region had never been employed. They hunt seal, do a little fishing and live in vil-

lages "that make a place like Harlem look like a vacation resort."

Hardly a half century ago, he noted, they were involved in a stone age culture. The modern world now is being thrust upon them.

Mr. Hickel has many critics in and out of government who look on his railroad plan as visionary. He buoyantly predicted the start of building "in five years or less."

Feasibility studies, he said, already are under way, with the results to be turned over to the Federal Department of Transportation in October.

## TOURISM IS REVIVING ESKIMO-INDIAN ART

WASHINGTON — Alaska's Eskimos and Indians are enjoying a cultural boom because of tourism, according to the National Geographic Society.

Some anthropologists feel that tourism is an unfortunate basis for the revival of aboriginal traditions. However, the economic incentive has helped Eskimos and Indians to develop an understanding of their past and a sense of self-identity.

A nonprofit corporation called Alaska Indian Arts, for example, employs Indians to carve masks and totem poles, make canoes, dance costumes and moccasins. It also sponsors the Chilkat dancers, formed in 1957, to revive Indian skills and customs.

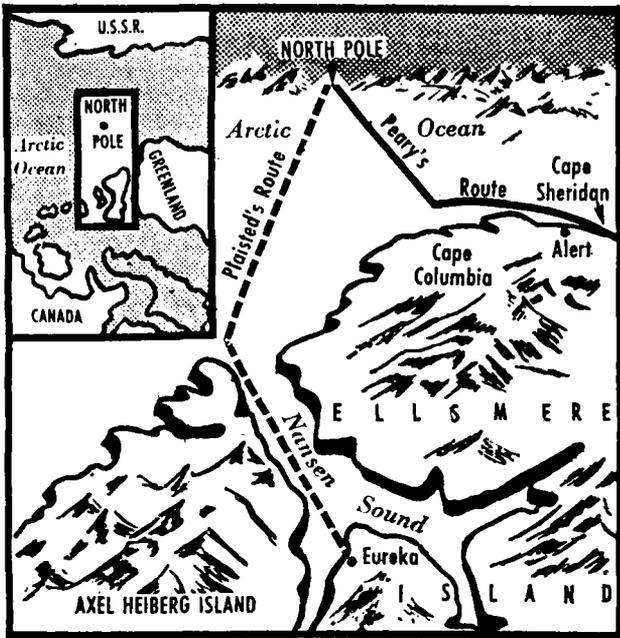
The Chilkats were long one of the most warlike of the Tlingit Indian tribes, and the Tlingits always have been renowned for valor.

"Russians suffered a military defeat at the hands of Tlingits in 1805, when warriors wiped out the foreign colony founded near Yakutat," writes W. E. Garrett, a National Geographic editor.

A Tlingit Indian told Mr. Garrett:

"Missionaries and early Government officials tried to destroy our culture. I got many a whipping for speaking Tlingit on the school grounds. Our people lost their initiative. We had no leadership. We were not allowed to be responsible for our own lives. Now the Bureau of Indian Affairs people are encouraging us to save our language and revive our handicrafts."

Point Barrow, Alaska, is the northernmost town in the United States since the admission of that state into the Union.



The Washington Post

Feb. 12, 1967

**NORTHBOUND**—The planned route of Ralph Plaisted's party this spring and the route of Adm. Peary in 1909.

## 8-MAN TEAM BEGINS TRIP TO NORTH POLE

MONTREAL, March 28 (AP)—An eight-man expedition set out over the Arctic ice cap by motorized sled today in an attempt to reach the North Pole for the first time over the ice since 1909.

Radio reports from the party's leader, Ralph S. Plaisted, said the group left its base camp at Eureka on Ellesmere Island in Canada's Northwest Territories.

The expedition was traveling over the ice of Nansen Sound, with the temperature 20 degrees below zero and in a 30 miles-an-hour wind. When it traverses the 162-mile sound, the group plans to clear a strip of ice so an aircraft can bring in supplies from Eureka.

Mr. Plaisted, a 39-year-old insurance man from St. Paul, plans to reach the pole by mid-April. Adm. Robert E. Peary's expedition reached the pole on April 6, 1909.

Mr. Plaisted and a scientific crew hope to pinpoint for the first time the geographic pole's exact location. They will gather other scientific data and install a radar-signaling device to guide United States nuclear submarines. At least two submarines, the Nautilus and the Skate, have crossed the polar region under the ice.

Eureka is 2,530 miles north of Montreal and about 625 miles south of the pole. The party expects to travel about 800 miles because the route will not be in a straight line.

CEDAR RAPIDS, Iowa, April 27 (AP)—An expedition of Canadians and Americans, which had hoped to be the first to

reach the North Pole over the ice in half a century, will turn back Sunday about 530 miles from its goal.

The group's communications center here reported tonight that the expedition, headed by a St. Paul, Minn., businessman, Ralph S. Plaisted, had decided to give up the trip.

Spokesmen here said the time for which the reconnaissance plane was hired was running out and the men on the expedition were anxious to return to their businesses.

EDMONTON, Alberta, May 11—Ten bearded men reached here by an Air Force plane last night after an unsuccessful attempt to reach the North Pole by sled.

"We were beaten this time," said their leader, Ralph Plaisted, a St. Paul, Minn., insurance man. "But next year we will reach the Pole."

The men left Eureka, on Ellesmere Island, on March 28. Eureka is about 624 miles from the Pole and 2,000 miles north-east of here.

"The ice started breaking up about a month before it should have," Mr. Plaisted said. "We were airlifted off the floating ice May 5 after traveling about 265 miles from our base camp at Eureka."

### MUKTUK DELIGHT HALIFAX (AP)

—With exotic items to offer, Canada will send a team to a world cooking competition next year in Frankfurt, Germany. Among the Canadian specialties are buffalo meat, Arctic char—fish—seal meat and muktuk, the skin of the white whale.

# Origin of Alaska Quake Traced Over 950 Years by a Scientist

By WALTER SULLIVAN

The New York Times

WASHINGTON, April 19—For at least 950 years before the great Alaskan earthquake of 1964, the coastline of that region was gradually warped downward, it was reported here today. Then, on Good Friday of that year, the deep rocks fractured and the coastline leaped from the released tension.

The scientist who presented this reconstruction of the catastrophe, which took 114 lives and devastated a number of Alaskan towns, said the fact that many centuries had been needed to set the stage for such an event should be reassuring to those who feared a recurrence.

The report was made by Dr. George Plafker of the United States Geological Survey at the annual meeting of the American Geophysical Union, being held at the Sheraton-Park Hotel. The finding was based on an analysis of tree stumps and other fragments of material that had been buried as the sea gradually overrode the coastline.

Each stump was dated by analysts of its radioactive carbon content, providing a timetable of the sea's incursion. This showed that the coast near Anchorage subsided steadily from 950 years ago until the present. In fact, the process may have begun as much as 1,360 years ago, Dr. Plafker reported.

He was one of several speakers who presented evidence purporting to show that such quakes occur because rock beneath the ocean floor is pressing in under the continental margins. Over the centuries, he said, this pressure pushed the coastline in by at least 65 feet and warped it downwards some 15 feet.

The rupture occurred along an east-west fault 500 miles long sloping at an angle of 15 degrees from the ocean floor to a deep zone under the Aleutian Islands and south-central Alaska.

Such a concept of oceanic rock flowing towards and under the continents, and island arcs such as the Aleutians, conforms to a central theme of the conference—the assessment of recent evidence that a layer of rock is pouring out of the mid-ocean ridges and flowing across the ocean floor at rates as high as four inches a year.

This rock has to go somewhere when it reaches the coastline and some believe that it pushes down under the continents, much as soup that is being heated in a pot rises over the burner, flows out across the surface, and sinks near the

edges to be heated some more.

The Rev. William Stauder of St. Louis University presented analyses of five earthquakes along island arcs. Three occurred near Rat Island in the Aleutians from 1962 to 1966, each being followed by numerous subsidiary quakes. The others were in Alaska proper and the Kurile Islands of the Soviet Union.

All, he found, conformed to this concept of oceanic material pushing under the arcs, whose frequent quakes and volcanic activity seem to mark battlegrounds between continental and oceanic structures.

However, the evidence was not all in favor of ocean floor spreading. It was pointed out that if a thin layer of rock was flowing over deeper material, there should be earthquakes all along the route—that is, all over the ocean floors.

Actually the quakes are largely limited to the mid-ocean ridges and oceanic margins, such as the island arcs.

Dr. Harry H. Hess of Princeton University argued that the flowing rock must reach very deep to account for the absence of widespread tremors.

The meeting, which began Monday, will end tomorrow with discussions of sediment distribution across the ocean basins.

Part of the debate centers on whether or not the sediments are consistent with the new rock-flow theory.

### Rocket Grenade Tests Start

WASHINGTON, April 10 (AP)—The National Aeronautics and Space Administration started a month-long series of rocket-grenade atmospheric sounding experiments today at its Point Barrow, Alaska, launching site. The project involves launching of two-stage Nike-Cajun sounding rockets to altitudes of about 100 miles. The grenades, carried as payloads in the rocket, are detonated to provide audio measurements of atmospheric densities.

### Polar Bear Protection Urged

MOSCOW, March 28 (Reuters)—A Soviet biologist has warned that polar bears may become extinct unless states with territory in the Arctic take measures to protect them, it was reported Tuesday. The biologist, Savva Uspensky, wrote in the monthly journal Priroda (Nature) that there were now only 10,000 to 20,000 of the bears in the Arctic, and they were seriously threatened by the introduction of modern hunting methods.

# Tribal Self-Rule Is Closer in Canada

By JAY WALZ

The New York Times

OTTAWA, March 4—The Canadian Government committed itself this week to sweeping changes aimed at giving wider freedom of decision to the country's more than 250,000 Indians and Eskimos.

When the steps under way are completed, the Indians on reserves, numbering about 215,000, will be able to make their own decisions on local matters.

In the Northwest Territories, embracing one-third of the country's land, self-government for the 25,000 Indians and Eskimos and white settlers will become a steadily growing reality.

Large numbers of the Indians remain skeptical, but others take hope that the Government, 100 years after the founding of the Canadian confederation, will surely back up its promises with deeds.

Proposed amendments to the outdated Indian Act were announced by Arthur Laing, Minister of Indian Affairs and Northern Development, this week.

During the week Mr. Laing also appointed the first Northwest Territories Commissioner who will govern the Canadian north "from the North."

The first duty of Stuart N. Hodgson, the appointee, will be to move the headquarters of his territorial government from Ottawa to Yellowknife, 2,000 miles away on the shores of Great Slave Lake.

Mr. Hodgson's appointment to be Commissioner of the Northwest Territories marked the beginning of a new era in government administration of the vast northern country. Previously the Commissioner and his staff have resided in Ottawa, making visits to the people they govern.

## RESEARCH ON NORTH PRESSED IN CANADA

SASKATOON, Sask. (Canadian Press)—The Institute for Northern Studies at the University of Saskatchewan is acting as a lure for faculty and other scientists, focusing their attention on the north.

Established in 1960, the institute aims at promoting, encouraging and engaging in research on the northern regions and to train specialists for work in the north. North to the institute is the northern part of the western provinces, the Northwest Territories and the Yukon.

The institute achieves these ends by interesting scientists and post-graduate students in the north, lending financial sup-

## Yellowknife the Capital Of North Canada Region

The New York Times

OTTAWA, Jan. 21—Canada acquired her 12th provincial capital this week. Yellowknife, a gold-mining town on Great Slave Lake, was named the "first city" of the vast, potentially wealthy Northwest Territories.

Canada's largest political unit, the territories cover 1.25 million square miles, sweeping from the 60th parallel to the North Pole, but have a population of only 23,000, half of them Eskimos and Indians.

In the cold darkness of a subarctic winter, more than 500 Yellowknife residents packed the Elks Hall Wednesday to hear of the step toward self-government from Arthur Laing, Minister of Northern Affairs. The region has been run from Ottawa.

Many communities, among them Fort Smith, Inuvik and Hay River, vied for the honor. The difficulty was selecting a location from which a third of the country's land mass could be administered. A commission found last October that Yellowknife was the best site.

In changing this, Mr. Laing's department followed the recommendation of a commission of advisers seeking ways of giving the territory more self-government. The selection of Yellowknife, a gold-mining town of 3,000, also followed the proposal of this commission.

About \$5 million will be spent by the federal Government in establishing the territorial capital in Yellowknife. Accommo-

port to their northern studies, helping them get into and out of the north, and providing special courses for professionals in the north.

The institute is developing ideas that may result in a north-oriented degree course in subjects including anthropology, geography, biology, geology and some medical studies. The course would be aimed specifically at government employees working or planning to work in the north.

It would involve about 400 hours of instruction in about 20 subjects, including two months of field work, probably at a research and training center to be established by the institute at Rankin Inlet, 900 miles north-east of Saskatoon.

dations for about 75 employees are to be ready by "freeze-in" next October.

The Commissioner carries out his duties with the support of a 12-member legislative council, which has always held its mid-winter meetings in Ottawa. The last such meeting here will take place next week.

One problem in extending self-government to the Far North is its inability to pay its own way. Few of its rich mineral resources have been developed. For the foreseeable future the north must rely on the bounty of the economically advanced south.

## RESCUED PAIR TELL OF 3 DAYS IN YUKON

JUNEAU, Alaska, June 18 (AP)—An Alaska educator and his 9-year-old daughter, whose light plane ran out of gas over the Yukon wilds Wednesday, were close to safety on their own when rescue came last night.

Robert L. Thomas, 43, and his daughter, Nancy, endured pain, hordes of mosquitoes and the exhaustion of hiking through swamps, brush, over downed trees and around a myriad of lakes before they were sighted.

Mr. Thomas, director of administrative services of the Alaska Department of Education, and his daughter were on the last leg of a flight from Oregon to Juneau when their newly purchased Aeronca sedan ran out of gas. Mr. Thomas said that the plane flipped over on its back. He and his daugh-

## Trapped Beluga Whales Feared Dead in Arctic

EDMONTON, Alberta, Jan. 30 (Canadian Press)—An Arctic blizzard apparently has taken the lives of the three beluga whales that remained alive in a hole in the ice 1,200 miles north of here.

P. J. Benson, Edmonton coordinator of a save-the-whales campaign conducted by the Inuvik Lions Club in the Northwest Territories, said a blizzard and 40-below-zero temperatures had covered the hole through which the whales had been breathing.

"There was only one man working on the hole," he said. "He just couldn't keep it open by himself."

The three were all that survived a herd of 17 trapped in Eskimo Lake. The freeze prevented the herd from swimming 50 miles into the Beaufort Sea en route to wintering grounds in the Pacific Ocean.

ter were both thrown against the dual controls and their teeth "sliced through our lower lips," he said. He said that they patched themselves up with the plane's first-aid kit. With an auxiliary radio receiver Mr. Thomas got a fix "within a mile of their location, but efforts to radio for help were futile.

After staying with the plane for a day and a half, Mr. Thomas and his daughter set out for the road to Atlin 13 miles away, taking with them about 50 pounds of survival gear, including food, matches and "space blankets." The blankets are silver on one side and red on the other for reflection and signaling. They used the blanket to attract the attention of the search plane that spotted them Saturday after the two had hiked for nearly 30 hours.

Mr. Thomas said he was distressed over the death of three Coast Guardmen who were killed in a plane crash during the search.

## Geologist Says Icy Winters Are Starting Severe Cycle

EAST LANSING, Mich. (UPI)—The rugged winter of 1966-1967 was only the start of a whole cycle of icy winters that will hit the earth during the remainder of the 20th century, according to a geologist here.

Dr. Maynard Miller of Michigan State University said the sun was entering a "cooling off" period in which solar explosions, commonly called "sun spots," die down. This process started in the 1950's.

With less energy being discharged into the earth's atmosphere, the envelope of gases surrounding the earth starts to cool off "and the cooling, when it starts, comes rapidly," Dr. Miller said.

"The really severe winters would be with us by the 1970's," he said.

## Frostbite Help

NEW YORK (UPI)—In case of frostbite, don't rub the frozen area with snow and don't massage or rub it. In fact, don't touch.

Instead, medical authorities advise, begin rapid rewarming as soon as possible. A hot bath is excellent, but avoid scalding. Hot wet towels will help, applied gently and changed frequently. Hot liquids will help raise body temperature.

If warmth and hot water are not available, place the person in a sleeping bag or cover him with coats or blankets, advises "Today's Health," publication of the American Medical Association (AMA).

Antarctica's Weddell seals search for food as deep as 1,500 feet below the surface.

## 30 LATE ICEBERGS FOUND OFF CANADA

### Patrol Extends Work After Unexpected Development

June 17

This year's International Ice Patrol season will be held open indefinitely because of the discovery yesterday of a large batch of late-season icebergs in the North Atlantic.

On Thursday the service had informed ship masters that the patrol's 1967 season would end at 8:48 P.M. tomorrow.

Yesterday, Comdr. John E. Murray, the patrol's commanding officer here, said he had to countermand that order and "stay open indefinitely" because of the discovery of 30 medium and large icebergs in a position where they might drift south into the shipping lanes.

The icebergs were found, he said, in an area between longitudes 47 to 52 degrees west and latitudes 48 to 49 degrees north, an area 30 miles wide and 150 miles long east of St. John's, Nfld.

The icebergs, Commander Murray said, caught the patrol's aerial observers completely off guard.

He theorized that they must have drifted south well beyond the eastern edge of the Labrador Current, that cold stream of ocean water off the Labrador and Newfoundland coasts that carries these menaces to navigation south and into the Atlantic shipping lanes.

He explained that the patrol searched only to the eastern limits of the Labrador Current and not beyond that line. "They must have drifted down well out to sea and then turned west before they were spotted," he explained.

Unexpected or undetected incursion of icebergs into the patrol's search area, Commander Murray said, was one of the hazards of the patrol's work, although a relatively rare one.

The medium icebergs rise from 60 to 100 feet above the water, while the large ones are up to 150 feet high, he said.

Up to nine-tenth of the mass of an iceberg is usually submerged.

Commander Murray said that the ice season was a heavy one this year with 410 icebergs spotted and plotted by the end of last month. During a normal season, which usually lasts for about three months, an average of 377 are found.

So far this season, the heaviest iceberg concentration, he said, was found along that 100 miles of Newfoundland coast between Cape St. Francis and Cape Race.

## Trapped Beluga Whales Feared Dead in Arctic

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## SCIENTISTS DISCUSS WORLD WITHOUT ICE

WASHINGTON (AP)—Scientists long have speculated about what would happen to coastlines and low-lying areas if the world's icecaps and glaciers should melt.

Hydrologists of the United States Geological Survey, who have studied the problem, think they have come up with some answers.

Dr. Raymond L. Nace said that most estimates placed the sea level rise from such a happening at between 200 and 250 feet.

This would mean, according to James T. Lee, a cartographer, that new seaports would appear on the map, including Rochester, N. Y., Jackson, Miss., Little Rock, Ark., and Columbia S. C.

However he said, a rise of 250 feet in the ocean level would inundate about 267,300 square miles of 22 Atlantic and Gulf coastal states. Nobody says it is going to happen, but Mr. Lee theorizes that Delaware, Florida and Louisiana would be virtually inundated.

"Completely inundated would be such major cities as Houston, Corpus Christi and Galveston, Tex.; New Orleans, La.; Miami and Tampa, Fla.; Mobile, Ala.; Norfolk and Richmond, Va., and Jersey City, N. J.," he said.

"Large portions of many cities would be under water, including Boston, Mass.; New York City; Philadelphia, Pa.; Newark, N. J.; Baltimore, Md.; Washington, D. C., and Montgomery, Ala."

## COMPUTER MAY AID COAST GUARD JOB

### Ice Patrol Sees Speedier Processing of Data

May 28

The Coast Guard's annual vigil over ice dangerous to shipping in the North Atlantic promises to become an easier task in the future, according to the commanding officer of the service's International Ice Patrol.

Cmdr. John F. Murray, in an interview at patrol headquarters at Governors Island, said the service was studying the feasibility of applying computer techniques to the laborious and now manually performed task of processing data on winds, currents and water temperatures in a continuing effort to forecast ice drift and ice melting rates.

Information on these factors comes into patrol headquarters regularly from ice observation flights, made by a Coast Guard aircraft based at Argentina, Nfld., and from ships at sea.

"With the eventual aid of a computer," Commander Murray said, "We will be able to process more data much more quickly than we are able to do now and will be in a better position to predict more accurately ice behavior in the Grand Banks area off Newfoundland."

The patrol's activities are controlled here for the first time since the patrol was established by the Coast Guard in 1914 in response to international demands for an ice observation service. Establishment was prompted by the sinking of the British liner Titanic two years earlier after she struck an iceberg on her maiden voyage from Liverpool to New York. More than 1,500 persons were lost in the disaster.

The patrol for the last three seasons, Commander Murray said, was based at Argentina and prior to that headquarters were at Woods Hole, Mass.

The heart of the headquarters is staffed by five officers and enlisted men. The operations room has a large wall map, on which is plotted the most recent information on icebergs south of Labrador as well as the daily positions of vessels in the area.

The ice data on this chart are forwarded daily to the Navy Oceanographic Office in Washington for daily dissemination to the maritime industry, and to Argentina for distribution by radio facsimile via the Coast Guard radio station NIK to ships at sea equipped with facsimile receiving gear.

## COAST GUARD PLANS TO 'BOMB' ICEBERGS

WASHINGTON, Feb. 25 (AP) — For the second year the Coast Guard plans to paint iceberg in the North Atlantic by "bombing."

The brilliant coloring will be applied this spring by the Lockheed HC130B Hercules aircraft, dropping a sort of chemical paint bomb from low altitudes.

The Coast Guard used to tag icebergs, to study their direction and drifting speed, by firing colored materials from patrol vessels by bow and arrow.

Last year the Coast Guard tried the color-bomb technique. It worked so well the method will be used on a large scale in the ice patrol program this spring.

The Coast Guard said yesterday that two of its Hercules aircraft had also been equipped with new radiometric iceberg detectors that pick up electromagnetic impulses radiating from icebergs and distinguish the ice forms from the surrounding water. Crews thus no longer need to track icebergs visually.

Coast Guard reconnaissance aircraft from Argentina, Nfld., patrol more than 33,000 square miles of the North Atlantic and the glaciers of Western Greenland and the Canadian Arctic that develop some 7,500 large icebergs each year.

## A PILOT IS RESCUED FROM GREENLAND ICE

WASHINGTON, March 1 (UPI)—A civilian pilot was rescued today from a desolate icecap in Greenland where he was forced to land a private plane two days ago when he encountered a polar storm.

The Air Carrier Service, employer of the pilot, George W. Grossoehme of Rockville, Md., a Washington suburb, reported it was notified he was picked up at about 10:15 A.M. by a ski-equipped Hercules C-130 that landed near his plane.

Mr. Grossoehme asked his rescuers to notify his family and his company that he was "okay and in good spirits," a spokesman for the concern said.

Mr. Grossoehme was being flown to the United States air base at Sondrestrom, Greenland, for a medical checkup. The twin-engine private plane he was flying by an Atlantic-European route to Manila was reported not seriously damaged.

A World War II pilot in the Pacific, Mr. Grossoehme was in frequent contact with rescue crews by radio in his downed plane. In addition to arctic survival gear he carried, he was dropped additional supplies Monday night by an Air Force helicopter.

# Alaska Tags and Tattoos Polar Bears for Study

By LAWRENCE E. DAVIES

The New York Times

ANCHORAGE, June 4 — Alaska has taken a giant stride this year in polar bear research on the ice floes north of Point Barrow.

In a 43-hour period a team from the State Game Division immobilized 31 bears, using an airplane, a helicopter, a dart gun, a net and scales. The animals were then tagged and left to continue their wanderings over the vast polar region.

This is the first time, according to James W. Brooks, director of the game division, that so many of the white bears have been marked in his organization's quest for answers to a number of questions.

Scientists, frequently worried about possibly diminishing numbers of polar bears, want to know whether there are distinct bear populations in Alaska, Norway, Canada and the Soviet Union. Determining this would influence each country's way of managing its bear "resources" to prevent "overharvesting."

Jack Lentfer, a game division biologist, led the spring expeditions first to the Bering Strait at the southern edge of the Chukchi Sea, then to Point Barrow.

He said the seal-eating polar bears above Point Barrow did not seem so large as those in the Chukchi Sea, which dine on the same fare.

"We're going to learn more about the bear's reproduction capabilities—its rate of reproduction and the number of years between breeding—as a result of this research," he said.

Mr. Brooks, in a telephone interview from Juneau, said that plans were being made to tag 100 polar bears next year.

Once several hundred have been marked, the number "recovered" in ensuing seasons, either through kills by hunters or through sighting and identification by tagging teams, "will give us an indication of the intensity of the harvest," he said.

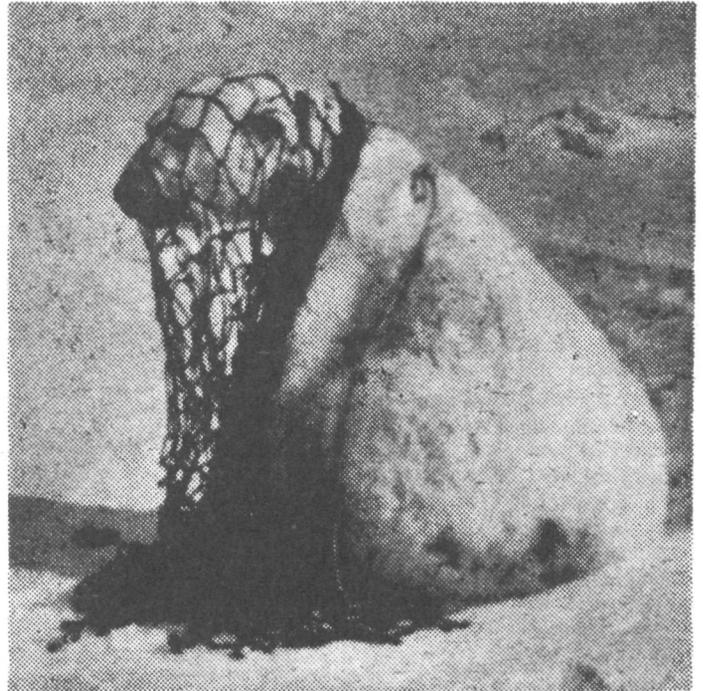
Should 30 or 40 marked bears be back a year after 200 or 300 have been tagged, it would indicate "intense exploitation" of the polar bear population off the Alaskan coast, Mr. Brooks said.

If only one or two returned annually it would show a low intensity of harvest. It would support the view, moreover, that there was an interchange of bear populations over the polar regions.

Mr. Lentfer said that he had immobilized the polar bears, one by one, by shooting them in the rump with a syringe gun while tracking them in a helicopter.

"Bad ice conditions in the Bering Strait, where the heaviest harvest takes place, sent us to Point Barrow," Mr. Lentfer said. "We used both a helicopter and an airplane, for safety reasons, and ranged 10 to 60 miles above Point Barrow.

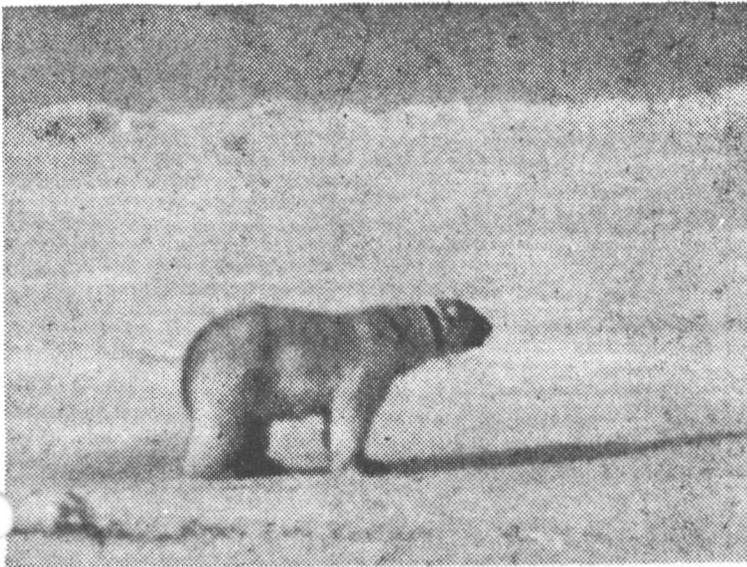
"Once we located fresh tracks we followed them till we found a bear. Once shot—we used a new drug with the trade name Sernylan — the bear would become immobile in 15 or 20 minutes. We would try, meanwhile, to keep him on the ice, out of open water.



Still befuddled with drugs, a bear that woke before the tagging team had completed its job wears net headdress.

"When he lay on the ice we put a numbered tag in each ear — one of stainless steel, the other of nylon—and attached a nylon collar, in a combination of colors, around

the neck of each adult bear. We also tattooed the bears in the upper lip, the groin and under the right leg. Each bear is therefore permanently identified."



Wearing an identification collar, bear stands numbly watching the departure of the helicopter team that tagged him.

# Soviet to Open Its Arctic Route

## Plans to Let Ships of All Nations Use Siberian Seaway

By **RAYMOND H. ANDERSON**  
The New York Times

MOSCOW, March 28 — The Soviet Union is preparing to open its Northern Sea Route, linking Europe and Asia along the north coast of Siberia, to vessels of all foreign countries, the head of the Soviet Union's swiftly growing merchant fleet said today.

The sea route, plowed 2,500 miles through the Arctic Ocean by icebreakers, is kept open 150 days a year. It significantly shortens shipping between northern Europe and the Far East.

The distance from the Soviet port of Archangel, in north European Russia, and Vladivostok on the Pacific Ocean, is about 6,500 miles via the Northern Sea Route.

By comparison, the distance between the two ports via the Suez Canal is 15,000 miles.

The announcement that the Soviet Union would open the Arctic route to all nations was made at a news conference by Viktor G. Bakayev, Minister of the Merchant Marine.

At an informal interview after the conference, Mr. Bakayev elaborated on his remarks. He said foreign vessels would be permitted to refuel and use facilities of the isolated ports scattered along the Arctic route.

An aide broke into the conversation to remark, "The route will not be free of charge, of course."

The Minister indicated that a formal announcement would be made soon. He did not say when the Arctic route would be opened to foreign shipping.

The route is defined by the Soviet Union as an internal shipping link, since parts are within the country's 12-mile territorial limit and all of it depends on the use of the Soviet icebreakers and shore facilities.

In 1965, the United States Coast Guard icebreaker North Wind abandoned an attempt to navigate the Arctic route when it was challenged by Soviet warships and military aircraft.

The navigation season on the northern route has been lengthened in the last seven years by



The new york times March 29, 1967  
Northern Sea Route (heavy line) to the Far East is shorter than southern route (broken line) through Suez.

## A-power in the Arctic

By Reuters

Moscow

Work has begun on the world's first Arctic nuclear power station, sited on the remote Chikchi Peninsula. It is designed to supply energy for gold, mercury, and lead mines and the cities of northern Siberia.

The newspaper Sovetskaya Rossiya, quoted by the Soviet news agency Tass, said workmen, hampered by strong winds, blizzards, permanently frozen soil, and temperatures plunging to 60 degrees below zero, were excavating a huge pit for the foundations of the station.

the use of icebreakers, including the nuclear-powered Lenin. Before the introduction of the Lenin in 1960, the season lasted 90 to 100 days. Now it has been extended to 140 to 150 days.

Soviet use of the route has risen in recent years in pace with economic development of the Arctic coastal territory and exploration of coal, oil, tin, gold and diamond resources.

Japanese vessels are now using part of the route, the Merchant Marine Minister said.

At the news conference he outlined a continuing rapid expansion of the Soviet merchant marine. The fleet has grown from 735 vessels of 3.3 million deadweight tons in 1958 to 1,300 vessels of 9.4 million tons last year.

The fleet will be expanded to a tonnage of 13.1 million by 1970, the minister said. About 60 per cent of the vessels in the fleet's expansion will continue to be ordered from shipyards abroad, he added.

## Sea Search Is Abandoned; 6 Russians Declared Lost

JUNEAU, Alaska, Jan. 2 (AP)—Six of 85 seamen who abandoned ship when a Russian refrigerator vessel sank in the Bering Sea Saturday were officially declared lost today, and a widespread search was called off.

The commander of a Soviet fishing fleet operating north of the Aleutian Islands said 79 men were rescued after the 239-foot "Refrigerator 10" went down 35 miles north of Unimak Island.

The Coast Guard, which had joined Soviet ships in the search, said details of the incident had not been learned because of language difficulties.

The Soviet fleet has resumed fishing operations, a Coast Guard spokesman reported.

# JAPAN SEEKS USE OF ARCTIC ROUTE

## Begins Talks With Moscow on Sea Lane to Europe

By **ROBERT TRUMBULL**

The New York Times

TOKYO, June 12 — Japan and the Soviet Union are discussing use by Japanese vessels of the Northern Sea Route, which links Europe and Asia along the north coast of Siberia.

The Arctic shipping lane would enable Japanese vessels to reach London in 22 days, instead of the 35 days required on the Suez Canal route, according to calculations here.

Japanese shipping circles have been worried by recent events in the Middle East and are looking for alternate routes.

The Soviet Union announced in March that it was opening the Arctic route, which it regards as an internal shipping link, to international shipping. Moscow said that a fee would be charged for the use of the route and that foreign vessels would be permitted to refuel and use the facilities of isolated ports along the route.

The use of the route by Japanese vessels is one of the subjects being discussed at a meeting of the Joint Soviet-Japan Economic Committee, which began in Moscow today. The committee is composed of Soviet and Japanese officials concerned with trade and economic matters.

In Tokyo, a leading shipping company, Mitsui Oskwa Shosen Kaisha, confirmed that it had asked the Soviet Union for permission to put observation teams aboard Soviet freighters on the northern run to study technical problems.

A spokesman for the Japanese line said that Soviet maritime officials had indicated a willingness to provide technical information, pilots and icebreakers for foreign vessels using the route.

Japanese shipping sources reported that the Soviet Union has opened an office in Murmansk to handle the interests of foreign carriers seeking to use the route.

According to the information here, the route would be freely navigable with safety only in July, August and September.

The Moscow economic meeting is to discuss measures looking toward an increase in Japanese-Soviet trade, from the current figure of \$514-million a year to at least \$1-billion annually. Commercial exchanges with the Soviet Union constitute less than 3 per cent of Japan's trade.

## SOVIET FISHING SHIP SEIZED OFF ALASKA

JUNEAU, Alaska, March 2 (UPI)—The Coast Guard reported today that the cutter Storis had seized a Russian fishing vessel, a stern-type trawler, for violating United States territorial waters.

A spokesman for 17th District Coast Guard headquarters here said the Soviet vessel, the SRTM 8-413, was found a mile south of Mitrofan Island on the south side of the Alaska peninsula west of Kodiak Island.

He said the Storis put a crew aboard the 178-foot trawler to escort her to Sand Point in the Shumagin Islands, a fishing community and site of a king crab cannery. There the crew of the vessel will be arraigned before a United States Commissioner, he said. Coast Guard headquarters here had no details as to the number in the crew of the Russian ship.

This was believed to be the first instance in which the Coast Guard has arrested a Soviet fishing ship for violating American waters. A few years ago, the state of Alaska—under the direction of then Gov. William A. Egan—arrested the captain and crew of a Japanese fishing vessel for fishing in an area barred to Japan under her North Pacific fishing treaty with the United States.

Russian and United States negotiators recently completed talks in regard to the United States claim to waters 12 miles offshore.

ANCHORAGE, March 3 (UPI)—The United States Government decided today to prosecute the master of a Russian fishing vessel seized by the Coast Guard for violating United States territorial waters off Alaska.

Coast Guard headquarters at

## Soviet Weather Satellites Being Lofted From Arctic

MOSCOW, June 1 (AP)—Soviet scientists at a remote Arctic base are launching single-stage rockets into the upper layer of the atmosphere as part of an international study of weather conditions, the Russian press agency Tass said today.

The base is on Hells Island on the shore of the Barents Sea. It is part of the group of Arctic islands known as Franz Josef Land.

Rockets are launched every Wednesday to study temperatures, air pressure and speed and direction of wind.

Similar studies are being conducted with rockets launched at the same time from France, Japan, Australia, India and the United States.

## Arctic Cruise

MOSCOW (AP)—The Soviet ship Tataria will take 200 tourists on a three-week Arctic cruise in the summer, calling at Archangelsk, Dudinka, Igarka and Dixon Island and viewing icebergs and ice hummocks, the Tass news agency reports. It said icebreakers will go to the rescue if needed.

Washington reported there was no other record of a United States seizure of a Soviet vessel.

Richard McVeigh, United States Attorney, said the Coast Guard cutter Storis chased the 178-foot trawler SRTM 8-413 for an hour yesterday before boarding her.

"The trawler pulled up its gear and attempted to flee," he said.

## SOVIET SEA CAPTAIN FOUND GUILTY BY U.S.

ANCHORAGE, Alaska, March 6 (UPI)—The skipper of a Russian fishing vessel was found guilty today and was fined \$5,000 for violating United States territorial waters off the Alaska coast.

Nikolai G. Zernov, captain of a 178-foot trawler, appeared in Federal District Court here with his court-appointed attorney and entered a plea of "no contest" before Judge James A. Von Der Heydt. At his arraignment, the Russian captain had denied any violation of American law.

On the basis of Coast Guard evidence, the judge found Captain Zernov guilty of fishing one mile off the coast in the Shumagin Islands.

Judge Von Der Heydt told Captain Zernov he had two weeks to pay the fine and was to return to his vessel as soon as possible. He was then flown to Kodiak, where arrangements were to be made for his return to the ship.

The case represented the first time the United States has seized a Russian ship and prosecuted a Soviet captain for violation of United States waters.

## U.S. Receives Check to Pay Fine for a Russian Skipper

ANCHORAGE, Alaska, March 20 (UPI)—A \$5,000 check to pay a fine levied against the skipper of the first Russian ship for violating United States territorial waters arrived today to meet the deadline imposed by a Federal court.

Nikolai G. Zernov, master of a trawler operating with a Soviet fishing fleet, was fined

## 2D SOVIET TRAWLER SEIZED OFF ALASKA

JUNEAU, Alaska, March 22 (AP)—The Coast Guard reported tonight that the cutter Storis had seized a 178-foot Russian fishing vessel for violating the United States 12-mile exclusive fisheries zone off the Alaska Peninsula.

The Coast Guard said that the Storis had placed a prize crew aboard the Soviet ship—the SRTM 8-457—and was preparing to tow or escort it to Kodiak.

It was the second time this month that the Coast Guard had seized a Russian fishing vessel for violation of United States rights.

The Soviet ship seized today was taken south of the Shumagin Islands, 100 miles southwest of the earlier seizure.

ANCHORAGE, Alaska, March 26 (AP)—The captain of a Soviet fishing boat, Leonid Kushchenko, who was convicted yesterday of having violated United States fishing waters, spent the night in jail when he was unable to pay his \$10,000 fine.

The 29-year-old captain, a tall, slim, bushy haired native of Vladivostok, seemed to fear that the worst was yet to come.

At his appearance before Judge James von der Heydt in United States District Court, Captain Kushchenko said through an interpreter:

"I ask you to consider that the Soviet Government respects the sovereignty of the United States Government and that I will be severely punished for my violation."

ANCHORAGE, March 27 (AP)—A Russian trawler captain convicted of violating United States fishing waters was released from jail here today after the Soviet Government had paid his \$10,000 fine.

Leonid M. Kushchenko, 29 years old of Vladivostok, spent two days in the Alaska State Jail after he was found guilty in United States District Court Saturday and was unable to pay the fine.

A cashier's check for \$10,000,

March 6 when he was found guilty of fishing a mile off the Alaska coast.

Two hours later, the Coast Guard had Captain Zernov in a plane on the first leg of a trip to rejoin his ship, thus leaving payment of the fine a matter of honor.

The check, drawn on the Riggs National Bank, Washington, D. C., was sent by registered mail addressed to United States Attorney Richard McVeigh, who prosecuted the case.

drawn on the National Bank of Alaska, was deposited with the court clerk shortly before noon. The Soviet Embassy in Washington had arranged for the check.

United States Marshal George Bayer went to Mr. Kushchenko's cell and then realized he did not know how to tell the tall, handsome Russian that he was free.

Mr. Bayer then got a Russian dictionary and pointed to the word to "free." Mr. Kushchenko's face lit up, he jumped gleefully into the air and then ran from the cell.

ANCHORAGE, March 28 (AP)—The punishment a Russian trawler captain faces from his Government will include repayment of a \$10,000 United States fine and loss of his master's license for a year.

Uri V. Chemokhud, third secretary of the Soviet Embassy in Washington, disclosed before his departure what action would be taken against Leonid M. Kushchenko, 29 years old, of Vladivostok.

Mr. Chemokhud said Mr. Kushchenko would have to pay back the full amount of the fine "over a period of time" and have his captain's license lifted for up to a year when he returns to Russia.

## ESKIMO FOUND ALIVE BURIED IN THE SNOW

MOSCOW (AP)—A Soviet newspaper has described the experiences of a sick woman who, crossing the frozen Siberian north, had been buried alive by snow, lost for two weeks and finally saved.

Sovetskaya Rossiya said that Eptune Pupta, a fisherman, and his wife, Valentina, left their fishing outpost at Agapa, above the Arctic Circle in Siberia, with Mrs. Pupta suffering from an undisclosed illness.

They set out by dogsled for a hospital in Baykalovo, 150 miles away, where their 8-year old son, Sasha, is at a boarding school.

The couple, of the Nyenyets, a Soviet Eskimo group, were caught in a snowstorm and lost their way. The exhausted dogs stopped and eventually died. The couple had no food.

Mr. Pupta searched for food but found only a wooden tower, which he used to make a fire for his wife and boil snow for drinking water.

Then he left his wife to search for help, on the same day the couple had been reported missing.

Mr. Pupta found help, but the rescuers could not find his wife.

Severe Arctic storms kept rescue planes grounded for a while. The search continued for two weeks while temperatures fell to 50 degrees below zero.

The newspaper did not say how the woman had been found, but said she had been discovered buried in the snow, exhausted and far gone from hunger, thirst and cold.



*(U.S. Navy Photo)*

*Support helicopter arrives at scientists' camp in McKelvey Valley, December 1966.*

**The Antarctic Scene:**

*USCGC Glacier tows HMNZS Endeavour into Winter Quarters Bay, December 1966.*

*(U.S. Navy Photo)*

