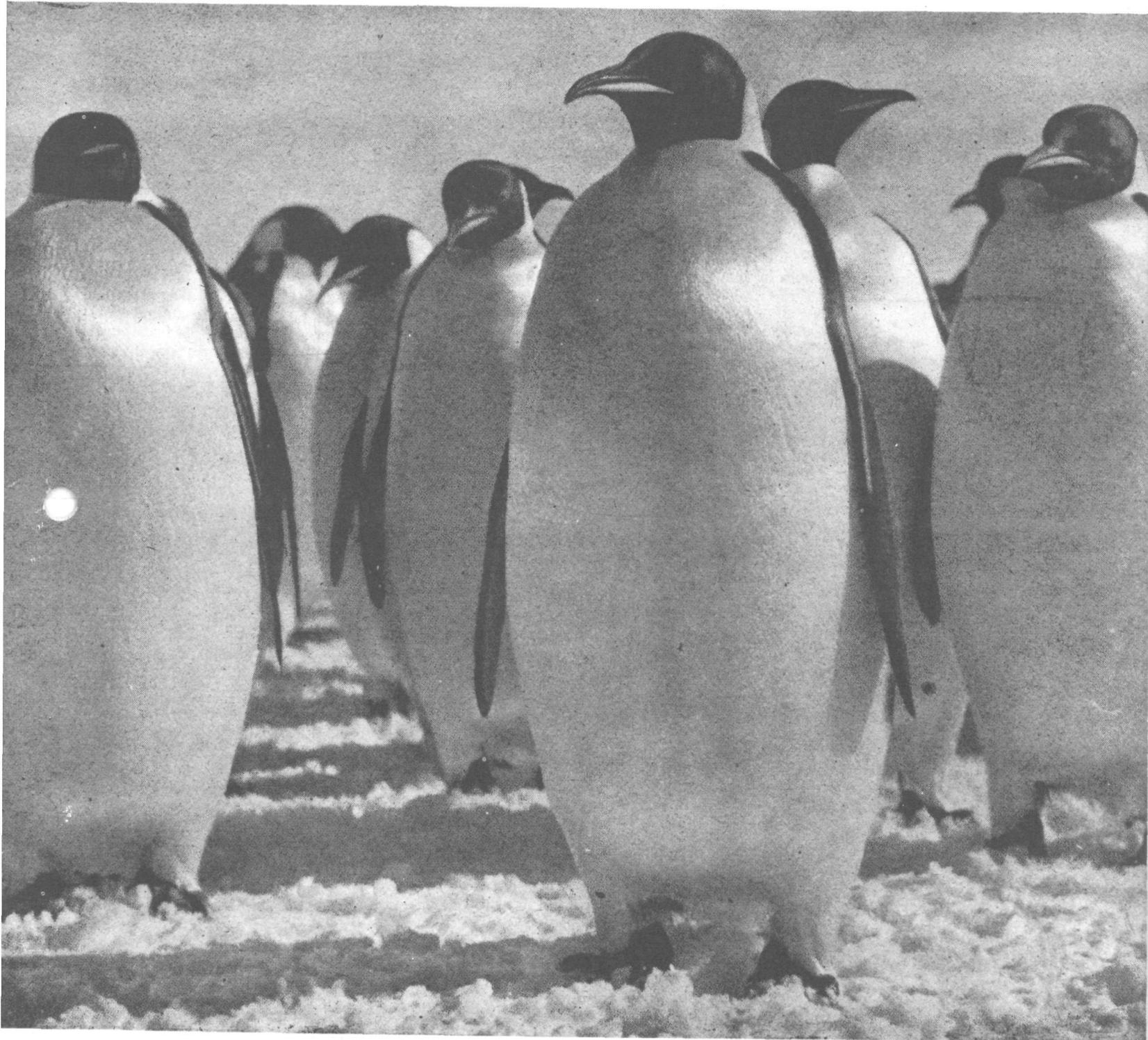


THE POLAR TIMES



U. S. NAVY OFFICIAL

Emperor penguins. They are about four feet tall, weigh ninety pounds. The average life span is probably thirty-five to forty years.

National Oceanic and Atmospheric Administration

The Polar Times

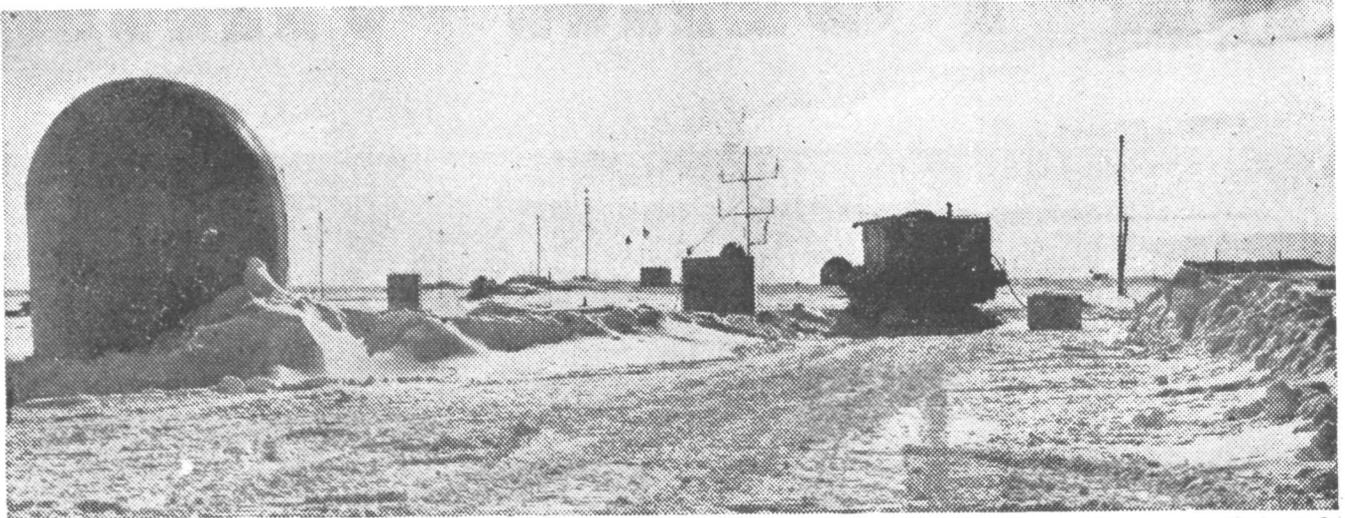
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The antenna and weather huts of the Amundsen-Scott South Pole Station stand out on the drifting snows of the Pole



An unsightly garbage dump lies on the shore of an inlet near McMurdo Station, a sign that civilization has come

The Polar Times

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DECEMBER 1967

City Life and City Problems Come to the Antarctic

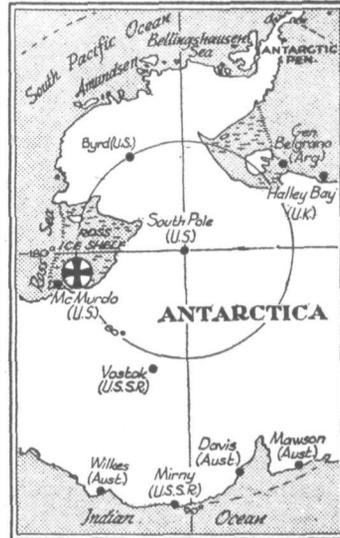
Booming McMurdo Has Steel Houses and Illicit Stills

By **ROBERT REINHOLD**
The New York Times

McMURDO STATION, Antarctica, Dec. 21—Urban sprawl—and urban problems—are beginning to reach Antarctica.

McMurdo Station, the spreading installation that serves as the United States' chief research site and staging ground for inland stations and expeditions, is shedding its frontier-town atmosphere as permanent buildings and the comforts of civilization appear everywhere.

Built 10 years ago for use by American scientists during the International Geophysical Year, McMurdo was not expected to last more than a year, or two. But the scientists never left, and the station grew helter-skelter over the years as temporary huts and wooden shacks were thrown up where and when they were needed. The situation became so bad



The New York Times Dec. 22, 1967

that McMurdo began to undergo a kind of urban renewal. The streets are still unpaved, but 10 new sturdy steel buildings will have been erected by the end of this Antarctic summer, next March. Up to 30 more are planned in the next decade.

McMurdo Station covers a gentle hill on a peninsula of

Junk Mars the Icy Landscape —Urban Renewal Begun

Ross Island, a small bleak volcanic island that rises above the Antarctic ice at the outer edge of the Ross Ice Shelf.

It is today a bustling town whose population during the summer reaches a thousand or more men. They include several hundred civilian scientists and technicians who study marine life, atmospheric physics, the movement of glaciers and other aspects of geology. Most of the other summer residents are Navy personnel, although there are also members of all the other armed forces stationed in the Antarctic.

The town boasts three bars (and several clandestine stills where sailors produce liquor from canned fruit), three movie theaters, a bus line, a nuclear power plant, a gymnasium, a small hospital and a saltwater distillation system that will soon provide running water for

every building.

But it also shows the scars that civilization almost inevitably inflicts on the landscape. A smoking garbage dump and junkyard litter the shore of a once picturesque little inlet just below the restored wooden hut in which Robert Falcon Scott, the British explorer, wintered in 1902 before setting out on the first deep penetration of the continent.

Power lines from the nuclear power plant deface the stark, windswept and lifeless hills that so awed and impressed the first explorers more than 50 years ago.

"Back in 1956 nobody really ever dreamed we'd be here on a more or less permanent basis," said a spokesman for the Navy, which provides logistic and construction support for the scientific effort mounted by the National Science Foundation. "Consequently we came and threw up buildings to last a few years at the most."

"We've begun a McMurdo redevelopment program to make the station completely permanent. It's very complicated because we've got very little land left to build on."

Like every growing town, McMurdo is undergoing a construction boom. Navy Seabees work around the clock to take advantage of a sun that never sets on Antarctica from October to March.

The major construction project this year is a two-story building, to be the largest structure in Antarctica. It will house the 200 or so Navy personnel who each year spend the bleak, dark winter at McMurdo. They maintain the station and support the 35 scientists who winter over at various stations on the continent.

The building will contain a laundry, reading rooms and lounges, post exchange, barber-shop and facilities to feed 1,000 men. Another new building to be constructed soon will house many of the scientists, most of whom now live in old huts and in corners of their laboratories.

Other construction plans call for new office and warehouse buildings, a communications

Events in Exploration Cited at Polar Center

Washington Star

Sept. 9

Eight significant events in the last 12 years have to a large extent rounded out exploration of the earth's last frontier—the poles.

Dr. Albert P. Crary of the National Science Foundation outlined the eight events here yesterday at a meeting marking the establishment of a "Center for Polar Archives" in the National Archives building on Pennsylvania Avenue. Crary for several years served as chief scientist of the U.S. Antarctic research program.

"The period from 1955 to 1967 marked the aerial conquest of the Antarctic continent," Crary

said. "The continent has now to a large extent been explored.

Discussing exploration of the south polar regions since 1955, Crary listed these eight events:

1. The voyage of the Navy icebreaker *Atika* to the southern ice in 1955.
2. The "fly-in" of four military aircraft from New Zealand to McMurdo Sound—a distance of 2,200 miles—in December 1955.
3. Military aircraft flights of 1955-56 over the geographic South Pole and other inaccessible points in Antarctica.
4. The pioneering landing of the airplane "Que Sera Sera" at the South Pole in October 1966 and its subsequent jet-assisted

takeoff—"the first contact with the pole in 44 years since the ill-fated expedition of (Robert Falcon) Scott," Crary said.

5. The opening of Byrd Station, 800 miles from the McMurdo base, which was accomplished "by the last of the giant surface trains" of tractor-drawn sleds.

6. The start in 1957 of a series of over-snow traverses, which will culminate in 1969.

7. The permanent occupation of the south polar station, beginning in 1956-57.

8. The signing of the Antarctic treaty by 12 nations in December 1959.

"Historically the consequences of the treaty may far outstrip the other events I have mentioned," Crary said.

The Polar Archives Center has been designated as the official repository for records created by government agencies engaged in both Arctic and Antarctic activities and for gifts of private papers.

building, a combined fire station and telephone exchange and a recreation facility.

Although McMurdo is surrounded by millions of tons of ice, water supply is a major problem. Pipes carrying water must be heated to prevent freezing, especially during the winter, when temperatures sometimes sink to 50 degrees below zero.

"Ultimately," said an engineer, "the whole town will be like any other city—running water in every building that needs it."

The Antarctic science effort itself is undergoing a major change.

"The survey era is over," a biologist said. "We no longer get the explorer type—the people who came down for the sheer adventure. If a scientist has to spend the night in the field, it's a traumatic experience."

Scientists board helicopters in the morning to reach remote field sites and are picked up in the evening.

"It's like taking the subway to work," one remarked.

8 Men on 1,200-Mile Trek Of Exploration in Antarctic

CHRISTCHURCH, New Zealand, Dec. 4 (Reuters) — Eight men were on their way across the Antarctic Monday on a 1,200-mile expedition into one of the last unexplored regions of the world.

In about two months a United States ski-plane is expected to pick up the six scientists and two engineers, a spokesman for the American Operation Deepfreeze said here today.

The expedition left an American Antarctic base Friday with ice tractors to complete the third leg of a four-year 5,000-mile exploration of Queen Maud Land, begun in 1964. Five of the scientists are American and the sixth is Norwegian.

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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.

Polar Explorers Drop 'Mush' for Helicopters

The Washington Post

Sept. 9

A dog sled is just about as good as a helicopter for gathering information in Antarctica, but it sure isn't as comfortable, a Polar explorer said here yesterday.

F. Alton Wade said the helicopter and other modern conveniences make a big difference in comfort and the time expeditions consume.

He told a conference on U.S. Polar Explorations at the National Archives that the conveniences make modern scientists soft, and Wade should know. He went to Antarctica in 1934 and again last year.

"It still takes a special breed of men to work in polar regions," he said.

In 1934, Wade recalled, it took him more than a year to reach the area he was to ex-

plore. During a three-month voyage to the South Pole, he was dog handler, cook, seaman and sled builder. After 20 days of travel by dog sled, his party reached Mt. McKinley and Wade, a geologist at Texas Technological College, was so happy to see a rock again that he kissed it.

Last year, it took him only five days to reach the exploration area by plane and helicopter. But poor flying weather restricted explorations to 4½ days, compared to the 25 days spent mushing through the snow with dog teams 33 years ago.

The conference marked the opening at the Archives of a Center for Polar Research, where records of U.S. explorations will be stored.

Team of Ten to Chart Antarctica for U.S.

WASHINGTON, Oct. 23

A ten-man team of U.S. Geological Survey engineers and cartographers leaves Tuesday for Antarctica to determine which part of the world's most remote continent is land and which part is ice.

They will then produce by next February the raw materials—reconnaissance photos, data on ice shifting—for the first maps of desolate sections of Marie Byrd Land.

The survey is part of the National Science Foundation's U.S. Antarctic Research Program. This segment has a tentative budget of \$1.4 million.

William R. MacDonald, of Crownsville, Md., will head the mission for a month and will then pass the reins to J. N. Standifer of Fairfax.

The two leaders plan to photograph and survey 401,000 square miles of the continent's western sector, weather permitting. One one million of Antarctica's six million square miles have been mapped previously.

Photos will be made from Navy aircraft at an altitude of 15,000 feet, MacDonald said.

At the same time, four of the party's engineers will be surveying 52 sets of poles that were imbedded in the polar ice cap four years ago to measure ice shifting.

Rough sketch maps showing the shape of the terrain will be made in Washington. After further surveys, final maps will be drawn.

"Our major purpose in this expedition—and in ignoring the ice—is to support other sciences," MacDonald explained. "We simply want to be able to tell them where the ground is and what kind it is."

It will be summer in the southern hemisphere when the team arrives. MacDonald, who is returning to the area for the seventh time, expects temperatures from "about 40 below to 10 above."

The groups will live in wood-framed huts. Blankets will serve as walls. They will boil snow for water. Their great luxury will be a once-monthly ham radio call to their families.

Their workday will run 18 hours, partly because of the great flying time required to reach the desired areas and

also because workdays may be few and far between. Last year's crew "only finished at one site out of five because of bad weather," MacDonald reported.

Scientists From Ohio State Study Fallout of Meteorites

COLUMBUS, Ohio, (Science Service) — When astronauts bring back samples of dust from the moon for analysis, scientists expect to have trouble separating the real lunar material from space dust that fell on the moon in the form of micrometeorites. An Ohio State University study of long-term fallout in Antarctica may help.

Ohio State scientists are taking samples of Antarctic ice and snow and melting them down, measuring the rate of fallout deposited there over the years. Preliminary analysis show that the fallout contains the same proportion of nickel as large meteorites, which indicates that it comes from outer space, rather than from the earth's atmosphere. This means that the Antarctic fallout is the same stuff as the space dust that is probably present on the moon's surface.

Antarctic Penguins Polluted

VANCOUVER, B.C. (Canadian Press)—Pollution has reached such a global scale even Antarctic penguins and Arctic snowy owls carry pesticides on their bodies, William Baily of the British Columbia Health Department says.

American Polar Society

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Antarctic Post Buckling Under Tons of Snow

U.S. Pushes to Build New Station at Pole Within Two Years

By **ROBERT REINHOLD**

The New York Times

SOUTH POLE STATION, Antarctica, Dec. 26 — The South Pole Station, built as a temporary research base on the geographical pole in 1957, is collapsing under tons of snow and ice.

Although it was constructed above the surface, the station has since been covered over completely by shifting snow. Today it lies under 4 to 12 feet and its makeshift wooden buildings are in imminent danger of being crushed.

The United States Navy, in cooperation with the National Science Foundation, is rushing through plans to build a new station within two years. Until then, Navy Seabees are here to shore up the bending walls and ceilings.

The Amundsen-Scott South Pole Station, to use the full official title, was named after the first two men to reach the pole, Roald Amundsen, a Norwegian, and Robert Falcon Scott, a Briton.

The two men participated in a tragic race to the pole in 1912. Scott reached the pole after a journey over jagged mountains and mammoth glaciers only to find that Amundsen had been there a month before. On the way back Scott and his party perished.

Today, the pole is reached in three hours in the relative comfort of a ski-equipped Navy Hercules aircraft. Built like a boxcar on skis, the Hercules is the workhorse of the Antarctic.

From the carpeted cockpit of the plane, Scott's 922-mile trek can be followed with the eye.

First, there is the featureless expanse of the Ross Shelf Ice, a floating table of ice the size of Texas and in some places more than 1,000 feet thick.

Then comes the Beardmore Glacier, which weaves like a snake through the Queen Alexandra Range. One hundred miles long and 30 miles wide at its mouth, the Beardmore rises sharply to the 9,000-foot Polar Plateau, a flat, glistening expanse where Scott's party encountered fierce storms.

Finally, the aircraft slides to a halt on the snow, only 100 feet from the station. Outside, the sun shines brightly and the



The New York Times (by Robert Reinhold)

Scientists relax in the station's library, equipped with stereo, chess and cold sodas

temperature hovers around 17 degrees below zero—"hot and dusty" weather to the local residents, who often venture out coatless on such "mild" days.

The entrance to the station, hardly visible from the surface except for antenna, weather huts and fuel bladders, is through a tunnel in the ice. Once inside, there is little evidence that this is the "awful place" that Scott found when he arrived here 56 years ago after losing the race to the pole.

As many as 45 Americans and one Russian exchange scientist live and work in a small, well-heated cluster of buildings connected by ice tunnels that are propped up by large timbers. Twenty-one persons will spend the long, dark winter here.

They enjoy a fair number of the comforts of home—stereo sets, movies every night, enough food and supplies to last three or four years and a lounge (named "Club 90" after the latitude) that serves as combination church, bar, music room and pool hall.

Lieut. (j. g.) John Hedley, a civil engineer, is in charge of the Navy men who provide logistic support for the National Science Foundation's re-

search program in meteorology, upper atmosphere physics and other fields.

"Perhaps they put me here because they feel the station is going to fall down any minute," he said recently.

The station's scientific director is Harold L. Coleman Jr., a meteorologist with the United States Weather Bureau.

"This spot is so dry," he said, "that it's like the Sahara. You wake up with a headache, and dried out nose. Some people adjust to it and some don't."

Despite all the ice, the South Pole lies in the middle of a desert. There is seldom much wind and only three inches of snow in a year. The snow that does fall, of course, never melts.

The burying of the station has been caused not by new snow but by drifting. Snow tends to accumulate against any object, such as a building, that rises above the surface.

The station has another problem. The ice on which it was built is moving at the rate of about 150 feet a year. In 10 years, the site has shifted more than 1,000 feet.

To counter this problem, the new station will be built five years "upstream" from the pole so that it will gradually "float"

into the proper position.

Actually, no one is really positive where the pole is. The old pole, which nobody believes is the true one any more, is still marked by a brightly striped barber pole with a globe on top.

The United States Geological Survey contends that the real pole is about 1,000 feet away from the station and has placed an American flag on the spot.

However, the United States Coast and Geodetic Survey has different ideas and has staked its claim, with an inconspicuous marker, at still another spot.

No one here argues about it.

Navy Plane Lands In Antarctica

Reuters

CHRISTCHURCH, New Zealand, Nov. 2—Crew members at the U.S. Navy South Pole Station had their first visitors in eight months yesterday when a Navy Hercules flew in to deliver provisions, mail and three replacements.

Twenty-two men spent the winter at the Pole, where it is now spring.

Ice Core Formed in 8000 B.C. Brought Up by Team

By ROBERT REINHOLD
The New York Times

BYRD STATION, Antarctica, Dec. 16—A team of Army engineers brought up from deep within the Antarctic ice cap today a clear, glistening sample of ice formed in 8000 B.C.

Toiling day and night in a frigid, dimly lit ice tunnel, the team is trying by February to drill through the bottom of the 7,000 or more feet of ice beneath this cavernous underground research station in the heart of western Antarctica.

If successful, they will possess a continuous record of the earth's climate and atmospheric history over 30,000 or 40,000 years—neatly preserved and available for ready reference in small cores of ice.

Analysis of these samples and the air trapped in them is expected to shed important light on many important questions on the history of Antarctica and the rest of the world.

For example, it is expected to give clues to the causes of ice ages, the movement of ice sheets, the rate of accumulation of snow and dust from outer space and changes in the earth's climate, temperature and weather over the centuries.

It would be the first time the massive, weighty mantle of ice that clamps down on the Antarctic continent has ever been penetrated to the bottom. No one is certain exactly how thick it is or what will be found beneath—perhaps frozen rubble and rocks, gasses or a pool of water under immense pressure.

Drilling at an average rate of 100 feet a day, the eight-man team has removed 3,450 feet of ice cores, about half the anticipated depth, corresponding to approximately 10,000 years of accumulation. The men hope to break through before the onset of the Antarctic winter in mid-February.

Ice from these depths has been under such heavy pressure that air bubbles within it literally explode when the ice is melted.

"This is ice from 1776," a member of the station's staff said as he dropped a chunk into a glass of bourbon whisky, which began to pop like a bowl of Rice Krispies. "You should hear the 10,000-year-old stuff—it almost explodes in the glass."

More than 90 per cent of the world's ice lies above and around Antarctica. Were it to melt, it has been said, the sea level throughout the world would rise by 200 feet—enough to cover the Statue of Liberty to her nose and completely

inundate New York City.

The ice cap also has a great impact on the world's weather. For these and other reasons, glaciologists have long studied the Antarctic ice as an index of events elsewhere on the globe.

Because the snow that falls here never melts, each year's precipitation, combined with the air present at the time, piles up in compacted layers that are pressed further down by each succeeding year's fall. The problem in studying these layers has been to develop a drill capable of penetrating deep into extremely cold, tightly packed ice.

The Army drill was devised by the United States Army's Cold Regions Research and Engineering Laboratory in Hanover, N.H. It was perfected at Camp Century, Greenland, where the 4,500-foot ice cap was penetrated in July, 1966.

In 1957, the engineers attempted to drill through the ice at Byrd Station with a conventional oil rig. The project reached to 1,000 feet, only about one-seventh of the way down.

The new device, unlike a conventional oil rig, has no solid stem to turn the cutting tool, or bit. Rather, the motor and bit are suspended together on a flexible cable that is lowered down the opening in the ice. The bit is designed to bring up a continuous core of ice.

Clad in oil-stained red parkas and fur hoods, the engineers work in minus-17 degree temperatures as they methodically lift the drill every three or four hours to remove a core of ice 15 feet long and 4 inches in diameter.

Each sample is carefully marked and logged, placed in a plastic bag and stored away in neat rows of black tubes until ready for shipment to the laboratory in New Hampshire.

The drilling, supported by a grant from the National Science Foundation, is directed by Herbert Ueda, a mechanical engineer. Preliminary chemical and physical analysis of the ice is made by Anthony J. Gow, a New Zealand-born geologist who has spent nine seasons on the ice.

As the core emerges, Mr. Gow makes a number of quick tests. For example, he checks the density of the ice as a gauge of the pressures that have been exerted on it. He inspects for separations between the layers, which would indicate periods of thaw (only one in 10,000 years has been detected).

He also studies the crystal

Lost Seal Solves Mystery

Washington.

THE dead body of a lost crab-eater seal pup has solved one mystery involving its ancestors for over 1,000 years.

Two scientists exploring a valley of southern Victoria land in Antarctica discovered a recently dead carcass of a seal, some 20 miles from the sea and 1,500 feet above sea level. As its tracks indicated, the young seal had evidently lost its way along the jagged rocks of the valley and starved to death, since its

structure to get an idea of the direction of forces working on the ice. Like metal crystals, ice crystals tend to align along lines of force.

Finally, he melts small samples and measures the dissolved solids, such as sea salts. Preliminary results show that there is practically no salt in the ice, indicating that this area has always been far removed from the sea.

Back in New Hampshire, the cores will be subjected to sophisticated dating, temperature, chemical, pressure, structure and other types of analysis.

For example, temperature changes from one period of history to another can be traced by measuring the ratio of different isotopes, of atomic varieties, of oxygen in the trapped air bubbles.

The laboratory will preserve the cores and make samples of them available to glaciologists elsewhere.

Perhaps equally important knowledge will be gained from the fate of the hole once the drilling is over. Structural changes in the hole over the years will be watched to learn how the ice sheet moves deep below the surface.

The team, all civilian employees of the Army, has run into one major problem. The drill has not been descending in a straight line and the hole is 10 degrees off the vertical. If this trend cannot be corrected, the angle will increase to 30 degrees by the time the project is completed.

usually thick blubber or fat was almost entirely used up and its stomach and intestines were empty.

Skeletons or mummified bodies of over 100 seals have been found over the past 60 years by scientists with the United States Antarctic Research Program. They have been found as far inland as 35 miles and 6,000 feet above sea level, with no indication of how they got there.

Some bodies have been preserved for 1,200 years in this cold, windy land where virtually no bacteria and few predators exist. Even though the mystery of how the seals died so far away from home is now solved, scientists are still not sure why or how these gregarious, fast-moving creatures would become so lost.

POLAR LAB STUDIES PATTERNS OF SLEEP

Researchers in a behavioral science laboratory 35 feet beneath the surface of the ice at the geographical South Pole are studying the sleep and dream patterns of secluded naval and scientific personnel Science Service reports.

Now in the second year of a three-year study, the sleep-pattern investigation is expected to provide data in planning for human factors in future terrestrial and extraterrestrial explorations, and in predicting impending breakdowns of men under stress.

It had previously been observed that Antarctic explorers as well as scientists and others based on the continent suffered from insomnia—termed "big eye" by people in the Antarctic.

The studies, conducted by Dr. Jay T. Shurley and Dr. Chester M. Pierce of the Oklahoma Medical Research Foundation, will try to determine whether months of isolation will cause a change in an individual's psychological makeup.

Antarctica Was Warmer Long Ago

Discovery of lake sediments and other deposits formed in relatively warm conditions less than 300 miles from the South Pole indicate that Antarctic summers were 13 to 18 degrees warmer 120,000 years ago than they are today.

TOURISTS DRAWN TO THE ANTARCTIC

Two Shiploads to Join Busy Scientists at U.S. Station

By ROBERT REINHOLD

The New York Times

Nov. 27

Antarctica, long the preserve of rugged explorers and research scientists, is bracing for its first wave of tourism.

Two shiploads of 20 tourists each are expected to dock at McMurdo Sound, site of the main American research station, early next year, much to the dismay and disdain of some crusty Antarctic researchers and explorers.

The visitors, who are paying as much as \$8,000 each for their tour, will be welcomed at the station, but they will receive no official assistance or attention as long as the wildlife and experimental programs are not disturbed.

The sight of female tourists may come as a welcome change of scenery to the hundreds of scientists and Navy men stationed on the continent, some of whom have spent up to 12 months on the barren icescape.

About 150 American scientists have journeyed to Antarctica's far-flung bases this year to get on with the serious business of science during the 10th year of intense research on the continent.

As participants in 60 research projects supported by \$7.7-million from the National Science Foundation, they are mapping the last unexplored region of Antarctica, drilling through thousands of feet of the ice cap to find out what lies beneath, and conducting wide-ranging experiments in biology, geology, meteorology, oceanography, physics and many other fields.

The projects began in earnest only last month, with the arrival of the relative warmth of spring in Antarctica, where the seasons are the reverse of those in the Northern Hemisphere.

The summer population of McMurdo Station will swell to nearly 1,000 in December with the arrival of United States Navy ships and planes that are part of Operation Deep Freeze.

Deep Freeze is the code name for the logistic support effort of the Navy, which operates, supplies and provides transportation to the research



The MAGGA DAN in the Antarctic ice.



The New York Times Nov. 27, 1967

THE RESEARCH BASES of U.S. scientists mapping Antarctica, shown by stars.

stations for the National Science Foundation.

In the past, tourists have occasionally visited parts of the Antarctic peninsula, the relatively accessible tongue of land that stretches north toward the southern tip of South America. None, however, has crossed the Antarctic Circle to the mainland.

Under international treaty, no passport or visa is required to travel throughout Antarctica. But since there are no accommodations or vehicles for them, the tourists will be restricted to an area within walking distance of their ship.

The tour, or "expedition" as the organizer calls it, is run by Lindblad Travel of Manhattan. The owner of the agency, Lars-Eric Lindblad, will be the leader, assisted by Capt. Edwin A. McDonald, a retired naval officer who has made six Arctic and seven Antarctic expedi-

tions.

The brochure promises the visitors a look at scientific stations, the penguin rookeries, where "we will see and photograph every type of penguin," and the rich marine life that surrounds the continent.

Mr. Lindblad said the tour was rugged and not designed for those "only interested in a good time."

An observer who has undergone many Antarctic seasons was more cynical: "It's for the man who has run out of continents to collect."

Three principal research endeavors are being undertaken this summer.

At Byrd Station, a cavernous base built almost completely underground, Army Engineers are attempting to drill a hole through the ice, which is believed to be from 7,000 to 8,000 feet thick at this station 400 miles from the coast.

If successful, this project is expected to shed important light on many of Antarctica's greatest secrets—the nature of the material beneath the ice pack, its movement over thousands of years, the history of Antarctica and other continents and the rate of accumulation of snow.

Ten scientists and engineers from a variety of universities and Government agencies will attempt to map 1,200 miles of Queen Maud Land, a wind-swept plateau on the African side of the continent. It is one of the last unexplored regions of Antarctica.

At Marie Byrd Land, a multifaceted survey is being conducted along the coast to sample the forms of life and to study the geology and magnetic field of the area. The results are expected to clarify the theory that Antarctica was one part of a giant supercontinent that

included Africa and South America.

According to the treaty governing Antarctica, freedom of travel between the bases of different countries is guaranteed. There is, in fact, considerable cooperation among the 10 nations, including the Soviet Union.

Reuters

WELLINGTON, New Zealand,—Tourists from ten countries—mostly American—will be put ashore on the great international continent of Antarctica early next year from the cruise ship Magga Dan on the first of two scheduled trips to the frozen south.

Some women are scheduled to make the sea journey from New Zealand to what is regarded as the world's last stronghold of men.

The tourists will fly from San Francisco to New Zealand where they will join the Magga Dan, scheduled to leave Lyttelton on the first trip Jan. 8. They will be due back Feb. 4.

The Magga Dan, owned by J. Lauritzen Lines of Copenhagen, is a refrigerated cargo vessel with accommodation for 34 passengers. She was built for navigation through ice.

CHANCE OF ICE AGE SEEN IN POLLUTION

CLEVELAND (Science Service)—Air pollution is changing the weather and could bring on another ice age if atmospheric conditions are right, according to Dr. James P. Lodge, a chemist at the National Center for Atmospheric Research in Boulder, Colo.

More likely, according to Dr. Lodge, we will just have "a substantial number of years without any summer" in cities across the northern United States.

"But, we really don't know enough about the dynamics of the atmosphere to be certain," he added. "I think it's safe to say that whatever may come, it's going to be distinctly less comfortable."

Dr. Lodge was chairman of a session on long-lived air pollutants at the meeting here of the Air Pollution Control Association.

An ominous sign, he pointed out, is that "the glaciers of the Pacific Northwest have stopped shrinking. They have shown no measurable net changes in three or four years."

GEOLOGISTS SPEND A COOL CHRISTMAS

Wyoming Team Celebrates
in Remote Antarctic Camp

By ROBERT REINHOLD

The New York Times

LAKE VIDA, Victorialand, Antarctica, Dec. 25 — Four geologists from Wyoming spent a bleak, cold Christmas today at this remote, wind-swept tent camp on the shores of a frozen lake in the Trans-Antarctic Mountains.

It was work as usual for the scientists. The only concession to the day was a Christmas dinner, which differed little from dinner on any other day here in Victoria Valley except for a pineapple ring on top of the ham steaks.

The temperature reached 37 degrees, but a bitter wind rattled the old Army tent where the men ate. Designed to allow plenty of balmy tropical breezes, the tent also allows icy Antarctic blasts off the nearby glaciers.

A red candle was burned more in jest than in the Christmas spirit, which had difficulty finding its way to this scientific outpost about 90 miles from McMurdo Station.

The camp was set up early in November by Prof. Scott B. Smithson and three students from the University of Wyoming. Two of the students normally live in an even more remote camp eight miles away.

It was not a white Christmas, for this camp lies in one of Antarctica's three dry valleys, which are almost completely free of ice and snow. The camp stands on sand surrounded by red and yellowish mountains covered with rubble strewn by glaciers of previous ages.

For reasons that are still not understood, most of the glaciers that once filled these valleys receded and melted away thousands of years ago. In their path they left bare, jagged peaks and breathtaking gorges somewhat reminiscent of the Grand Canyon. Receding glaciers still lie draped between the peaks like giant tongues lapping the valley walls. Incongruously, however, the walls of ice end abruptly in graceful sand dunes.

Victoria Valley, like the other dry valleys, is really a desert. The snowfall is so slight it is nearly immeasurable. The land is more barren and life-

less than any of the hot deserts of the world.

For thousands of years, furious winds blowing off the glaciers have sand-blasted the boulders on the valley floor, giving an eerie aura to the landscape.

Geologists have long been attracted to this area because, unlike the rest of Antarctica, its rock formations are not covered by an impenetrable ice cap.

According to a widely accepted theory, the continents of the Southern Hemisphere were once connected in a super continent that broke up like parts of a jigsaw puzzle into Africa, Australia, South America and Antarctica. Antarctica, geologists believe, may hold the key to putting the continents back together. This is the setting in which the Wyoming party found itself early last November.

Compared with that first week, the spare Christmas celebration was luxurious, everything, it seemed, went wrong at the start. Placed in the valley by a United States Navy helicopter, the scientists were promised a prefabricated hut and the rest of their equipment on the next day.

Their hopes were smashed with the hut, which had to be dropped on the ice by the helicopter during a windstorm. The weather worsened. The four waited with little equipment in a small icy tent. The temperature plunged to 10 degrees below zero. The wind howled and everything froze. To get water, the men had to chop ice from the lake and melt it. Water became so precious that the frozen remains of previous meals were left preserved on the unwashed plates. Bottles of whisky froze and burst. Steaks had to be cut with a hacksaw.

"We managed to pick the windiest spot within a 100 miles," Professor Smithson told this correspondent, who has been stranded here by bad weather for five days.

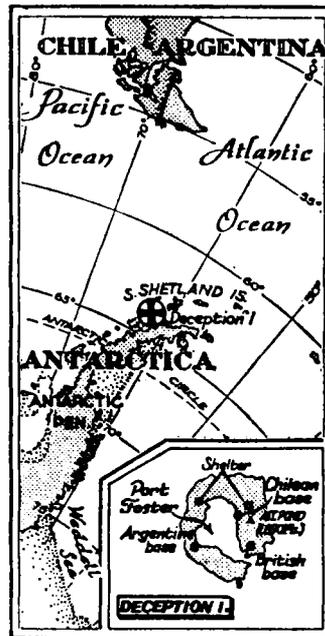
"By the third day," the professor continued, "everytime our stove made a rattling noise we'd all dash out thinking it was the helicopter with our equipment."

When the helicopter finally came, it brought not a warm hut, but the drafty tent now being used as a combination kitchen, laboratory and lounge. The only recreation is a ham radio set to reach friends at home.

Professor Smithson spent Christmas Eve on the radio and managed to wake up a stay-at-home member of the team in Laramie, Wyo., at 3 o'clock in the morning.

The other members of the team are David Toogood, Philip

Great Volcanic Cloud Obscures Antarctic Isle



The New York Times Dec. 7, 1967

The New York Times

SANTIAGO, Chile, Dec. 6 — Antarctica's Deception Island, from which Chilean, Argentine and British research teams have been evacuated following volcanic eruptions and earthquakes, was invisible throughout the day.

Reports from Chilean planes flying over the island, just off the Antarctic Peninsula, said that a great mushroom cloud blotted out the island.

Rocks were still flying and dense smoke was seen emerging from what has presumably now become the summit of a submerged volcano active for the first time in at least a hundred years.

Deception Island is believed to be the crater rim of a submerged volcano enclosing a virtually landlocked bay 10 miles in diameter. The water in the harbor has frequently been agitated in the past as if by underwater eruptions.

Fikkan and Robert Stevenson.

They have all become philosophical about their hardships.

"The only place Antarctica really looks good," Professor Smithson said, "is from the sleeping bag."

Polar bears have built-in sunglasses to prevent snow blindness. A special lid protects the bears' eyes from the arctic glare.

52 Flee Antarctic Volcanic Eruption

Dec. 7

SANTIAGO, Chile (AP) — Argentine navy helicopters lifted 1 Argentine researchers from the Antarctic island of Deception Tuesday night amid bubbling, boiling seas from the eruption of an old volcano.

The 14 Argentines were the last of 52 persons to be evacuated from the island after the volcano exploded unexpectedly from the depths of an ancient lake and speewed ashes and rock at three scientific bases manned by Argentines, Chileans and British. The bases were used for weather and oceanographic studies.

Earlier a Chilean helicopter took off 30 Chilean and eight British scientists and military men. No volcanic eruption had been reported for more than 120 years on the eight-mile-long island 600 miles below the southern tip of South America.

Hillary Returns To Antarctica

WELLINGTON, New Zealand, Oct. 18 (AP)—Sir Edmund Hillary, conqueror of Mt. Everest and leader of a transantarctic expedition, returned to the Antarctic today with a seven-man party.

He left Christchurch by air on his way to Cape Hallett where his party hopes to climb the 700-foot peak of Mt. Herschel.

Hillary said the area contained some magnificent mountains which had not yet been attempted by climbers. His party hoped to climb some unnamed peaks as well as carrying out a geological and survey program.

Hillary Sets Up Advance Camp

Oct. 28

Wellington, New Zealand (AP)—Sir Edmund Hillary, who conquered Mount Everest, said today he had established an advance camp 3,400 feet up Mount Herschel, in the Cape Hallett area of Antarctica.

This mountain has never been climbed.

In a radio message Hillary said snow conditions were bad, but he added the expedition was working well above the advance camp examining routes in preparation for a dual assault on the mountain.

U.S. Plans A-Powered Icebreaker

WASHINGTON, July 12 (UPI)

The U.S. Coast Guard is considering following the Soviet lead in building a huge nuclear-powered icebreaker capable of penetrating deep into the polar region.

A preliminary design for an icebreaker which could be driven by an atomic powerplant is already on the drawing boards, Adm. W. J. Smith, the Coast Guard commandant, recently told Congress.

Smith and other Coast Guard officials described their preliminary studies before the House Appropriations Committee. Their testimony was released today.

The largest and most powerful icebreaker in the world currently is the Lenin, a nuclear-powered vessel built by the Soviet Union in 1957.

The 440-foot vessel all but dwarfs the conventionally powered 310-foot Glacier, the largest U.S. icebreaker. Built in 1955, The Glacier has a tonnage of 8,300 compared to the 16,000 tons of the Lenin.

One of the advantages of the nuclear-powered Lenin, Smith said, was that it could run for two years without refueling.

Antarctic Peak Scaled

SCOTT BASE, Antarctica, Oct. 31 (Reuters)—Members of an expedition led by Sir Edmund Hillary twice scaled Antarctica's previously unclimbed Mount Herschel, he was reported here Tuesday. Sir Edmund reported by radio that two of the nine-man team reached the summit of the rugged 11,475-foot peak Friday. A second two-man assault team climbed the mountain Saturday.

G.I.'s Found Safe in Alaska

FAIRBANKS, Alaska, Nov. 15 (AP)—Two soldiers from Virginia, missing nearly four days on a caribou hunting trip, were found safe Wednesday. Spec. 4

Antarctic Doctor Hurt Flown to New Zealand

The New York Times

CHRISTCHURCH, New Zealand, Dec. 6—A British physician, seriously injured in a fall from an ice cliff near an Antarctic research station, arrived in New Zealand today on what was called the longest rescue mission ever undertaken over Antarctica's icy wastes.

A United States Navy plane covered 5,600 miles, roughly the distance between New York and Cairo, to rescue the injured man from Halley Bay, a British research outpost on the Atlantic side of the continent.

The man, Dr. John Brotherhood of London, 27 years old, was physician to the 37 Britons at the station. He was injured on Dec. 2 in a blinding snowstorm, during which he fell over a 30-foot ice cliff.

Suffering from spine damage and broken facial bones, Dr. Brotherhood survived the 30-hour storm with a companion until found by a rescue party.

ANTARCTICA YIELDS MUCH MARINE LIFE

In contrast to the barrenness of the Antarctic continent, the adjacent waters, during the summer, may well be the world's richest area of marine life, according to a University of Miami professor. One reason for this abundance of life may be the water's low temperature, which enables it to hold more dissolved oxygen and carbon dioxide than seas to the north, Science Service says.

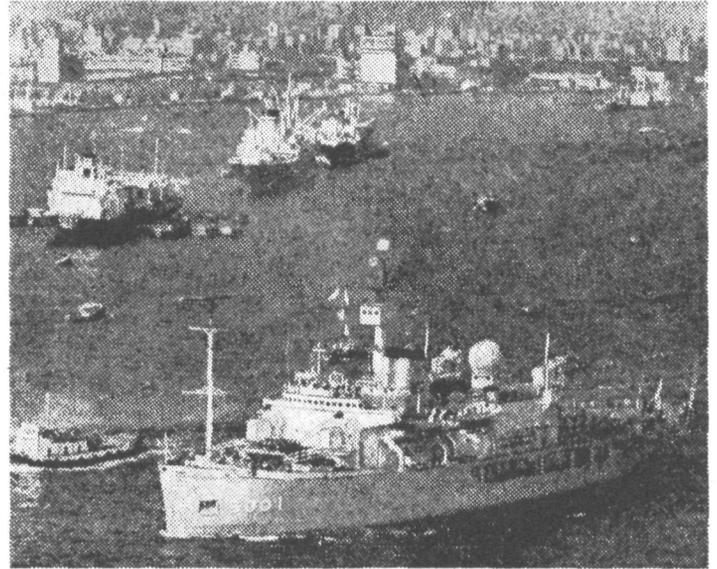
Scuba divers at McMurdo Sound have penetrated through 16 feet of ice to collect samples of microalgae and protozoa living in the frigid waters. An analysis of these algae leads Dr. John S. Bunt to estimate that the annual primary production of the Antarctic waters may exceed 30 million tons of organic carbon.

Dr. Bunt's study into the location and productivity of these algae may also provide new information on the grazing habits of seals and whales.

James E. Blevins, 21 years old, of Damascus, and Spec. 4 Larry R. Bryant, 20 of Fairfax, were reported in good condition in the hospital at Fort Wainwright, where they are stationed.

Russia made its claim to Alaska on the basis of voyages by Vitus Bering in 1728 and 1741.

Observation Team Leaves For Antarctic



Japan's observation ship Fuji is seen leaving Tokyo Port for Antarctica (Photo taken from Mainichi helicopter Swan.)

Nov. 25

Japan's ninth Antarctic observation team left Tokyo Saturday afternoon for the Antarctic aboard the icebreaker Fuji.

A ceremony marking its departure was held at Harumi Pier. Those present included Education Minister Toshihiro Kennoki and Kaneshichi Masuda, Director of the Defense Agency.

The 7,760-ton icebreaker carried a 40-member observation party headed by Masayoshi Murayama, a crew of 182 under the command of Captain Toshiharu Honda, and four newsmen.

Of the 40-member observation party, 28 will winter on the continent.

The Fuji is scheduled to arrive at Showa Base on Ongul Island around January 1, 1968, via Fremantle, Australia, where an American scientist, Martin Phillip Sponholz, will join the expedition.

The Fuji will return to Japan around April 12, 1968, after leaving behind the 28-member wintering team and taking aboard the eighth wintering observation team which has spent one year on the continent.

POLAR EXPEDITION TO MEET RUSSIANS

ALERT, Northwest Territory, Dec. 21 (Canadian Press)—A four-man scientific expedition will meet a Soviet research team 50 miles south of the North Pole early in the New Year.

The four men, now making preparations at Resolute Bay on Cornwallis Island, will meet the Russians on P-15, a floating ice island used for scientific and defense observation south of the Pole, "just to shake hands."

David Humphreys, an Australian master mariner heading the group, said the scientific part of the expedition hopes to determine Arctic Ocean floor depths and the contour of the ocean floor. The expedition will leave Ward Hunt Island,

east of this community 2,200 miles northeast of Edmonton, later this month for the 840-mile round trip.

The team will take seismic measurements by drilling through the ice caps using small explosives. The returning sound waves from the ocean floor will be recorded on tape for future analysis, Mr. Humphreys said.

He said that there was a long-held belief that the earth is concave at the North Pole and that the expedition would attempt to prove the theory with gravity measurements.

Missing: One Penguin Egg

PORTLAND, Ore. (AP)—The Portland zoo has lost a penguin egg. Zoo Director Jack Marks said the green egg, about three times as big as a chicken egg, could have been stolen or the penguins might have eaten it.

South African Scope—June/July 1967

OUT IN THE COLD



Living up to its name, the Emperor penguin is haughtily disdainful of the attentions of man.

IN MAN'S QUEST FOR KNOWLEDGE he has overcome many barriers and crossed many frontiers. The Polar regions are among the last of these on earth, and the icy wastes have been slow to yield their secrets. Antarctica was the last uncharted continent, and although Amundsen and Scott raced to the Pole at the turn of the century, she has only in the last decade started to relax her grip. Twelve countries are at present probing her secrets, and South Africa is one of them.

Since 1962 the Republic has maintained a base in Queen Maud Land and yearly edges further south. Once a year the polar vessel "R.S.A." brings a relief team, but just in case she fails to get through there are enough stores at the base to last three years. The annual trip, although by now a routine one to Captain K. T. McNish, is no light matter. The hundreds of tons of supplies are very necessary to the welfare of the base and a two-year enforced stay in the ice could do strange things to the men.

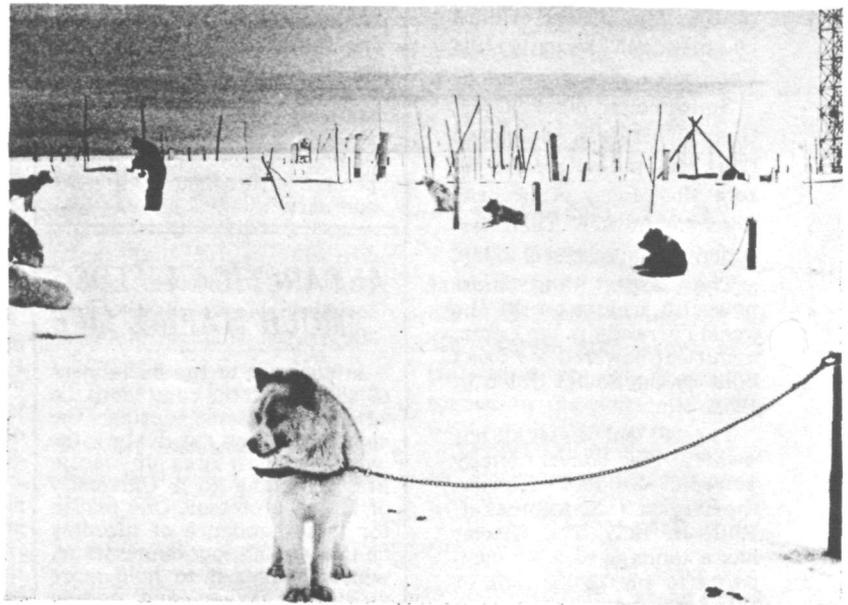
This year the ship had a narrow escape when a huge ice-shelf, where she had been preparing to off-load, peeled off the frozen cliff and crashed into the bay. About 40 times the size of the 1,573-ton vessel, the falling giant just nudged the "R.S.A." as the ship scuttled out into the bay; it could easily have capsized or smothered her.

South Africa's southerly position places her strategically for assaults on the white continent. The sixteen team members are all specialists, each one contributing to the growing fund of knowledge about Antarctica. Central data pools make this information available to any country.

The South African base is also extremely well situated for studying the ionosphere, as it lies on the edge of the South Atlantic radiation anomaly, where particles from space penetrate much lower into the ionosphere.

Research continues throughout the year. Meteorologists have one of the most arduous tasks. They take regular outdoor readings, even in the most frightening blizzards. When the weather is really bad, two men go out together as visibility may be limited to a few feet.

Among the fields of study are geology, geophysics (incorporating the ionosphere and magnetic fields) physiology



The dogs are chained well apart to prevent fighting.



Supplies ready for the mile-long haul to the base.



A cigarette warms the inner man as the "R.S.A." seeks a way through the "cake frosting" towards Antarctica.



Members of the expedition try out the ice in their first experience of the "white continent."

and biology. As integral part of the team are the specialist diesel mechanics, the radio operators and the doctor. A study will be made this year by Mr. Hans Loots, a physiologist, of the effects on the men of the rigorous living conditions.

This year, for the first time, a foreign base—the Belgian station at Roi Baudouin—was visited by the "R.S.A." and the sledge party from the ship was presented with 13 huskies—a token of the international cooperation that exists.

What does one do in the Antarctic when not working? Often the men are confined to the base for long stretches when blizzards rage, and boredom is a problem. The library and films are soon exhausted and for variety the films are projected without sound, or backwards. Dr. J. Schoonees, who has just returned with Sanae Seven, reports what he calls the "Big Eye." A man will go into a trance and later snap out of it as though nothing has happened.

So much time is spent indoors, that living and working

quarters must be practical and comfortable. Built in 1962 by the Department of Public Works, the base looks rather bleak on the surface—all that is visible are the dog-lines and scattered poles, aerals and vehicles. The buildings lie 30 feet below the ice, the result of an annual accumulation of about five feet of snow. Ice passages link the buildings and also serve as refrigerators.

This year the "R.S.A." took with her an official from the Department's Fire Prevention Section to examine and report on the fire hazard aspects of buildings and equipment.

Cold and wind are the two things which stick in the memory, according to men who have just spent a year at Sanae. In a world where two blowlamps are needed to get an engine started—one to warm the manifold, carburetor and gas pump, and the other to keep the first blowlamp from freezing up—and where crevasses can spell disaster, South Africans are doing their share in adding to the knowledge of this world we live in.

Group Airs Theory on Continents

Reuters

SYDNEY, Australia — An American oceanographic research vessel has discovered evidence to support a theory that Australia once linked India to the Antarctic and New Zealand was joined to Tasmania.

The vessel is the 3800-ton Oceanographer, the latest and best-equipped of a fleet of 15

vessels operated by the United States Department of Commerce, which called at Sydney on a world scientific cruise.

It has made continuous weather observations and studied such phenomenon as the sea-water ocean bed, variations in gravity, marine life, and ocean temperatures at various depths.

Off the Australian coast, from Perth to Sydney, the Oceanographer mapped the Australian continental shelf.

The chief scientist of the expedition, 53-year-old Robert Dietz, of the Environmental Science Service Administration, Institute for Oceanography, Miami, said he was convinced that about 150 million years ago there were just two

super continents.

They were:

- "Laurasia," combining North America, Europe and Asia; and

- "Gondwana," combining South America, Africa, Madagascar, Antarctica, Australasia and India.

In support of his theory, Dietz said the continental shelf mapped at 1000 fathoms gave Australia an outline which fitted neatly on to Antarctica, while the west coast of Australia fitted on to India.

Minor differences could be accounted for by erosion.

In Dietz's opinion, the world started as a solid mass. Then, about 150 million years ago, it became hot enough to be a viscous solid rather than a true solid.

The super continents floated

on the earth's mantle, and eventually split.

The parts slowly "drifted" apart, he said, to become the land masses in the positions we know today.

ESKIMOS IN ALASKA USE PAY-TELEVISION

BARROW, Alaska (UPI)—The Eskimos who populate this northernmost town in the United States not only own refrigerators but they also have television.

A closed-circuit station has gone into operation, offering programs 12 hours a day for which subscribers pay \$20 a month.

A few days before the station went on the air, a Fairbanks merchant flew in with 25 sets and sold them all.

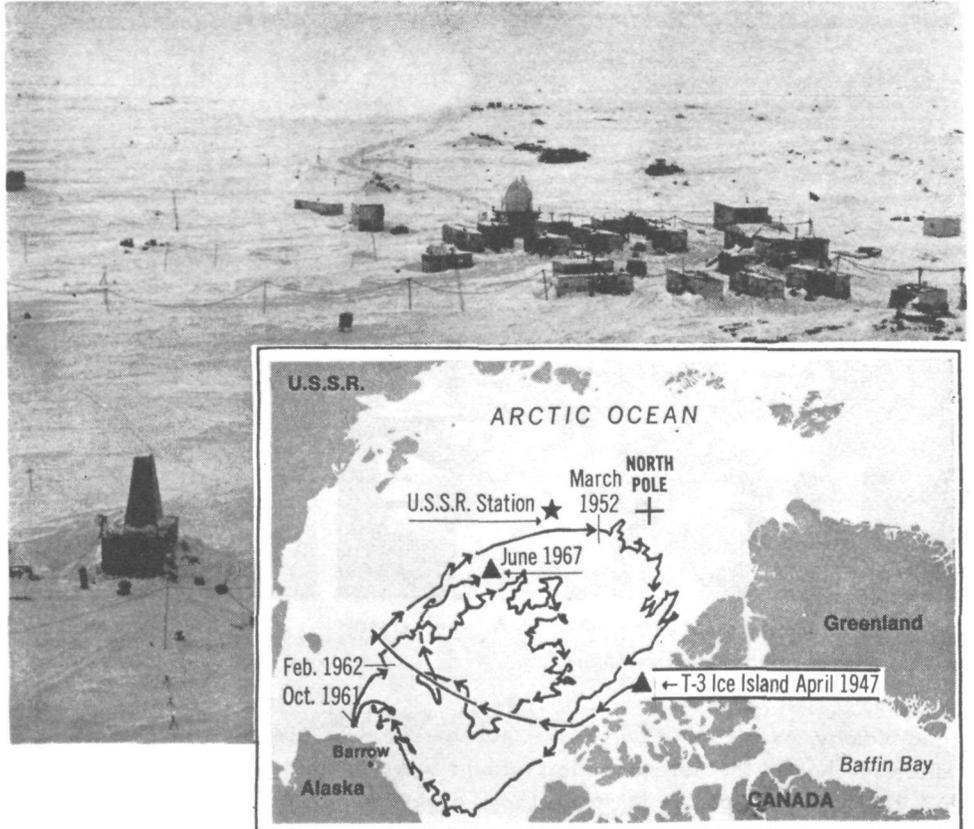
Ship of Ice

T-3 is the biggest bargain the U.S. Navy has ever known. Unsinkable, stable in even gale-force storms, it sails the Arctic Ocean in ice floes that would crush the strongest icebreaker. Furthermore, T-3 did not cost a cent to build or to fuel.

Indeed, T-3 is an ice island that meanders through the Arctic Ocean, propelled solely by currents, as fast as 7 miles a day. It is about 6 miles long and 3 miles wide—approximately the size of lower Manhattan broken off at Central Park—and has a saucer-shaped bottom 100 feet thick. The whole ball of ice came to the U.S. free and clear about twenty years ago when a huge chunk broke off a glacier on Canada's Ellesmere Island; Air Force radar eventually sighted the drifting mass along with two other ice islands and designated it T- (for target) 3. In 1952 an Air Force party landed on the island and made it a station for studying the ocean; since then T-3 has flown the Stars and Stripes.

Currently T-3 is floating about a dozen geophysical, biological and meteorological research programs financed by the Office of Naval Research, supervised by the University of Alaska's Arctic Research Laboratory and all aimed at finding out more about the least-explored body of water on earth. "We know more about the surface of the moon than about the bottom of the Arctic Ocean," says Barry Allen, Lamont Geological Observatory oceanographer. Last week some 40 technicians and staff members were working on the island. In the main camp, a group of trailers and huts near an indentation called Colby Bay, scientists were conducting unclassified research; a second camp, the highly classified AC Electronics Defense Research Laboratory, is located a mile away so that its sensitive acoustical instruments will not be disturbed by the noise of the "big" settlement. Right now everyone on the island is summered in. With the beginning of the arctic summer, rising temperatures (to 32 degrees Fahrenheit) have eroded and pocked the 4,100-foot stretch of iced runway that is T-3's only access to the outside world. From now until September—when the temperature begins to drop to the winter levels of minus 40 to 50 degrees—T-3 must get its supplies by parachute.

Thaw: T-3 wanders in the world's fourth largest ocean; but militarily and economically, the Arctic might some day be the most important seaway of all. Today, nuclear submarines sailing beneath the ice floe represent a quiet threat to both superpowers, for the Russians must defend their 10,000-mile Siberian coastline, while the U.S. and Canada guard nearly 7,000 miles. In the future, the possibility of commercial freight-carrying submarines is attractive for both the U.S. and the U.S.S.R.; such vessels, plying the great-circle routes under the ice



Life and times of T-3: Photo shows main camp; red line traces wanderings

floes, could lop as much as 7,000 miles off some trips—just as over-the-pole airplane flights do now. Not surprisingly, both nations have extensive arctic research programs. The U.S.S.R. has operated fourteen major ice stations since the 1950s; the U.S. has established five in the same period. A fleet of at least 80 planes supports the Russian effort.

Oddly enough, the arctic immensity seems to have thawed out some cold-war rivalries. Russian and American pilots use each other's radio beacons for navigation, and in the last year U.S. and Russian scientists made exchange calls three times, trading cigarettes and caviar. But the grim business of ASW (anti-submarine warfare) research continues.

In their isolated camp, the AC defense laboratory crew continually monitor the noise level of the Arctic Ocean with hydrophones suspended beneath the island. The group has also established satellite camps 2 to 3 miles away from T-3 on the surrounding ice pack. There they set off explosive charges under the ice to see how well sound travels through the frigid arctic water. To test long-range sound propagation, the crews deploy in small aircraft and work through the ice from distances of hundreds of miles.

To detect submarines successfully the acoustical properties of the water must be known, and T-3's oceanographers have already made an important discovery: "The Arctic Ocean," says Lamont's Kenneth Hunkins, "is a good place for someone who is listening but not for someone who wants to hide." In the Atlantic, for instance, abrupt changes in salinity and temperature can conceal enemy submarines by deflecting the probing pulses of sound emitted by sonar de-

vices. Also, a sound-scattering layer of plankton provides cover. The Arctic Ocean is relatively quiet. There is some plankton but uniformly increasing salinity allows sound to travel freely. The lid of ice suppresses waves which make background noise and also reflects sound.

Most of T-3's work is pure science. Lamont oceanographers are using sonar devices to map the bottom of the Arctic Ocean as T-3 wanders over it. The rugged peaks and canyons they have discovered are further evidence that the Arctic Ocean shares a tortured geological history with the Atlantic and Pacific, and is not just a shallow basin.

Delicate: And at the University of Washington Norbert Untersteiner has made a computerized model showing how sunshine and warm water from the Atlantic affect the ice pack. Untersteiner's work illustrates the very delicate balance of the arctic climate—even slight increases in heat could melt the ice pack. In fact, as Lamont's Maurice Ewing and William L. Donn suggest, such warming could bring on a new ice age. Evaporation from the exposed water would put moisture into the air which in turn would build giant ice sheets over much of the Northern Hemisphere.

T-3 has been so useful that the U.S. will probably stay aboard until the island either disintegrates or drifts out into the North Atlantic. Neither event is likely in the next few years. In fact, the only time T-3 has given its passengers serious trouble was in October 1961, when it ran aground near Barrow and was abandoned by the USAF. Currents pulled it loose again and it was rediscovered—and reboarded, this time by the Navy—in February, 1962. © 1967 by Newsweek, Inc.

COAST GUARD ENDS 1967 ICE PATROL

Season Had Been Extended
Because of Late Bergs

The New York Times

July 14

At 8:48 A.M. today the 1967 season of the International Ice Patrol, conducted annually by men and equipment of the United States Coast Guard, came to an end.

The season had originally been scheduled to end on June 18 but was ordered held open indefinitely last month because of the discovery of a large batch of late-season icebergs in the North Atlantic.

Comdr. John E. Murray, the patrol's commanding officer, said here yesterday that the last of the 31 icebergs discovered in mid-June had melted down. According to aerial observation on Wednesday, the iceberg remnants consisted of a small "dry dock," Ice Patrol argot for a small, horse-shoe-shaped berg with an opening in the center, and it was deteriorating very rapidly.

Pointing out the rapid rate at which such bergs at present are being melted by warming Atlantic waters, Commander Murray noted that a similar berg, discovered a few days ago, some 30 miles southwest of Halifax, N.S., was found to have turned into a "growler," or low-lying icefloe, when spotted again on Wednesday.

All of these, he added, are expected to be gone by tomorrow.

During the season itself, which started on March 10, about 440 bergs were spotted during the course of the 62 observation flights undertaken by the Coast Guard air detachment from Argentia, Nfld.

The total was about 70 more than the normal number of bergs counted in a season.

As for being forced to continue the ice observation work for almost four weeks beyond original schedules, Commander Murray explained that the 31 bergs responsible for the continuation had been discovered "well east" of the area normally covered, or about 100 miles east of normal aerial search limits.

He speculated that an eastward shift in the Labrador Current, the cold stream of water that carries bergs southward, was responsible for abnormal berg drift patterns.

He added that he expected additional information to be shed on such phenomena as a result of oceanographic re-

Head of Marine Inspection Here Master of Arctic and Antarctic

Coast Guard Commander Has
Tried to Circumnavigate
Both Areas in Icebreaker

The New York Times

By WERNER BAMBERGER

Dec. 17

Capt. William M. Benkert is probably the only Coast Guard vessel commander to have attempted the circumnavigation of both the Antarctic and the Arctic.

The 44-year-old officer, who for the last two and a half years has been in command of the icebreaker Eastwind, has recently been assigned here to take charge of the New York Marine Inspection office.

In an interview after his arrival here, Captain Benkert said he succeeded last year in sailing the 269-foot Eastwind around Antarctica in an easterly direction, starting out at McMurdo Sound in Ross Sea, a six-week, 5,000-mile voyage.

His attempt to sail around the Arctic, which began in August with his ship and sister ship, the icebreaker Edisto, was frustrated when the Russians did not allow the vessels through an 80-mile stretch of territorial waters.

"We were trying our best to bull our way through 15-foot-thick Arctic pack ice around the northern tip of the Severnaya Zemlya group of islands," he said. "But when we got to about 82 degrees north latitude and only made a mile of headway on a good day, it was decided to abandon that route and to try to continue by passing through the Boris Vilkitski Strait."

That 80-mile strait separates the island group from the Siberian mainland and links the Kara and the Laptev Seas.

"In our only direct communication with the Russians, Capt. William K. Earle, Edisto's skipper and group commander, indicated our desire to pass through the strait. The Russians replied that they felt, since the strait was their territorial waters and since we were warships, a 30-day notice to pass through these waters was requested," Captain Benkert said.

Captain Benkert added that because of the lateness of the

search work to be started next week by the 180-foot buoy tender Evergreen, assigned to the patrol as an oceanographic research vessel.



Capt. William M. Benkert

season it was inadvisable to wait 30 days for permission, and, as a result, the first attempt at Arctic circumnavigation was abandoned.

The aborted mission was primarily a scientific voyage to obtain data on the interchange of waters among the Arctic, Atlantic and Pacific Oceans.

Subsequent to the cancellation, Captain Benkert said, "we put in a profitable seven weeks in the Kara Sea and made a very complete oceanographic survey of the entire sea, which had only been partially surveyed before by United States vessels."

The survey work included the taking of water samples and bottom samples outside the continental shelf, water temperatures, salinity tests and the taking of biological samples, such as plankton.

Asked to compare his impressions of the Arctic and Antarctic, Captain Benkert said that despite basic similarities, the Antarctic seemed a little friendlier.

"There are more animals and wildlife in the Antarctic, and you see penguins, whales, seals and lots of birds down there," he explained. "Up in the Arctic there isn't much except an occasional polar bear and seal."

"And the one thing you don't find up north are the huge Antarctic table-top icebergs."

During the six-week circumnavigation, he said, the Eastwind came across one berg that measured 50 by 20 miles and rose about 200 feet above the surface of the sea.

In his new post, with head-

A RUSSIAN TRAWLER SEIZED OFF ALASKA

DUTCH HARBOR, Alaska, Aug. 4 (UPI)—A Soviet trawler seized by the Coast Guard for violating the United States 12-mile fishing limit was towed into port today.

The trawler, the SRTM 8-457, was also seized March 22 off Seal Cape in the Shumagin Islands. The skipper at that time, Leonid M. Kuschenko, was fined \$10,000.

The Coast Guard cutter Avoyel, a seagoing tug, towed the trawler into Dutch Harbor in the Aleutian Islands from a point about 10 miles north of Akutan Island.

The seizure was the fourth incident of its kind this year. Three involved Soviet vessels.

When the 230-foot Avoyel approached the 180-foot trawler, the Russian crewmen were observed throwing "unidentified material" overboard, the Coast Guard said.

A spokesman said a boarding party found no fish, but the Coast Guard said the vessel had been fishing when she was first sighted by the Avoyel.

U.S. Drops Fishing Charge Against a Russian Skipper

ANCHORAGE, Alaska, Aug. 14 (AP)—The United States Government dismissed a charge of fishing inside the 12-mile territorial limit against a Russian trawler captain, Daniel Baronik, in United States District Court today.

The United States Attorney, Richard McVeigh, told the court that the Government had reviewed the evidence, found it circumstantial and not sufficient to continue the case.

Mr. McVeigh also canceled a civil action that would have permitted the Government to confiscate the trawler upon Captain Baronik's conviction.

Alaska Gets Reindeer Aid

WASHINGTON, Sept. 16 (AP)—Interior Secretary Stewart L. Udall announced today a state-Federal agreement to promote Alaska's reindeer industry. The Bureau of Land Management will manage the grazing areas and the state of Alaska will be responsible for the guidance and promotion of slaughtering, processing and marketing reindeer meat.

quarters at the Coast Guard Building at the Battery, Captain Benkert is preoccupied with such matters as vessel inspection, accident investigations and related work.

U.S. Halts Arctic Expedition as Soviet Bars Ships

By PETER GROSE
The New York Times

WASHINGTON, Aug. 31 — The United States, backing away from a confrontation with the Soviet Union over Arctic navigation rights, has delivered a strong protest accusing the Russians of violating a freedom-of-the-seas convention, the the State Department said today.

Two United States Coast Guard icebreakers were ordered to abandon their mission of circumnavigating the Arctic Ocean rather than challenge a Soviet warning that their proposed route would violate the Soviet frontier.

The icebreakers were equipped with oceanographic research equipment.

"By denying to U. S. vessels their rights under international law, the Soviet Government has acted to frustrate a useful scientific endeavor," said the State Department spokesman, Carl Bartch.

At issue was the status of the Vilkitski Strait, an ice-bound Arctic waterway, 22 miles wide at its narrowest point, that links the Kara and Laptev seas north of Soviet Siberia.

According to the State Department, the Soviet Foreign Ministry asserted that the strait constituted Soviet territorial waters. To underline their claim, the ministry radioed the approaching icebreakers last Monday that their passage would be considered a violation of Soviet frontiers.

The research vessels had been under close surveillance by Soviet aircraft since Aug. 16, shortly after they set out on their mission.

The Russians' assertion was based on their claim of sovereignty over waters within 12 miles of Soviet territory. That would include the strait between the Siberian mainland and the Soviet islands of Severnaya Zemlya.

The 12-mile claim is not at issue now, according to State Department legal experts. It is rather the right of "innocent passage" through straits "used for international navigation between one part of the high seas and another part of the high seas."

This right, set forth in a United Nations convention, was to apply even within the territorial waters of a coastal



The New York Times Sept. 1, 1967

Heavy line traces path of Coast Guard expedition. Ships encountered heavy ice north of Severnaya Zemlya (1). When permission to use Vilkitski Strait (2) was denied, voyage was canceled. Broken line shows untraveled route.

state. The Soviet Union was a party to the convention, negotiated April 29, 1958, at the Law of the Sea Conference in Geneva.

The United States protest note, delivered in Moscow yesterday, declared that "Soviet law cannot have the effect of changing the status of international waters and the rights of foreign ships."

The State Department spokesman said that the United States nevertheless "considered it advisable to cancel the proposed circumnavigation."

The two icebreakers were the Eastwind and the Edisto,

both 3,500-ton, 269-foot vessels of the World War II wind class. Three ships of this class were lent to the Soviet Navy in 1945 and operated under the Soviet flag until 1951. On their present mission, the Eastwind and the Edisto were armed with twin five-inch, .38 calibre guns at the bows, standard Coast Guard equipment.

Government legal experts said that this small armament did not invalidate the claim of "innocent passage," which the convention defines as any passage "not prejudicial to the peace, good order or security of the coastal state."

The circumnavigation mis-

sion was announced Aug. 16 by the Coast Guard, just as the two vessels were leaving the Norwegian coast.

Their original itinerary would have taken them north of the Soviet islands of Noraya Zemlya, site of the 1962 tests of Russia's giant hydrogen bombs, and the islands of Severnaya Zemlya.

Last week in the Kara Sea, however, the ships encountered what the Coast Guard called some of the most difficult ice conditions in recent history.

These difficulties forced a change in the itinerary, and on Aug. 24 the Soviet Government was informed that the vessels would have to pass south of Severnaya Zemlya, through the Vilkitski Strait.

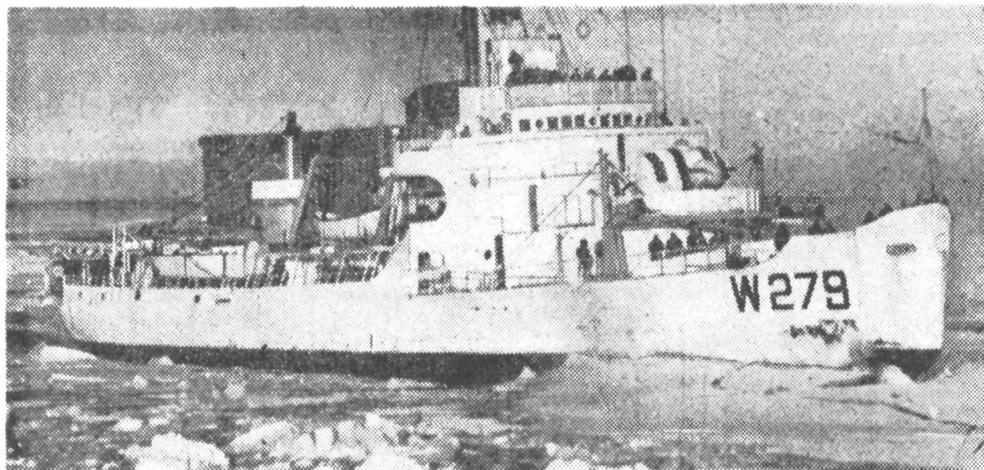
The State Department spokesman said that this advance notification was given as a courtesy, not as a requirement under international law. He added, however, that the Soviet objection did not come as a surprise.

The Vilkitski Strait forms part of the Northern sea route that the Soviet Government said last March would be open to foreign shipping, with Soviet icebreakers and pilots provided for a toll.

So far, only one Russian vessel is known to have used the route, plying from Hamburg to Yokohama, as a demonstration. Foreign shipping lines have shown little interest in it so far.

The strait is named after Boris Vilkitski, a Russian navigator and hydrographer, who discovered the Severnaya Zemlya island group during an expedition in 1913. In 1914, he became the first man to navigate the Northern sea route from Vladivostok to Archangel.

WASHINGTON, Aug. 16—



Coast Guard Photo

The icebreaker Eastwind: Its Arctic voyage shortened by the Soviets.

Data gathered during the cruise, the Coast Guard spokesman added, will determine the design of future polar icebreakers. All data, the Coast Guard said, are to be made available subsequently to the world through World Data Centers in Washington and Moscow.

The Edisto and the Eastwind were built from identical designs. They were launched in 1946 and 1943, respectively. They are powered by twin-screw diesel-electric machinery, rated at 13,300 horsepower and capable of driving the ships at 16 knots.

The Edisto, before embarking on the current voyage, was engaged in resupply operations off Greenland and Labrador.

Each vessel carries a crew of 220, composed of 20 officers, 195 enlisted men and five civilians in control of the oceanographic work. John Keily of the University of Washington and Gary Owens of the University of Southern California will head the two scientific parties.

The commanding officer of the Edisto and squadron commander is Capt. William K. Earle, 51 years old, a native of Reading, Pa. The Eastwind's commanding officer is Capt. William M. Benkert, a native of Chicago. Both ships make Boston their home port.

The oceanographic information to be collected by the two icebreakers is to be evaluated by the research and marine science staff of the Office of Naval Research and the Environmental Science Services Administration.

Aug. 22

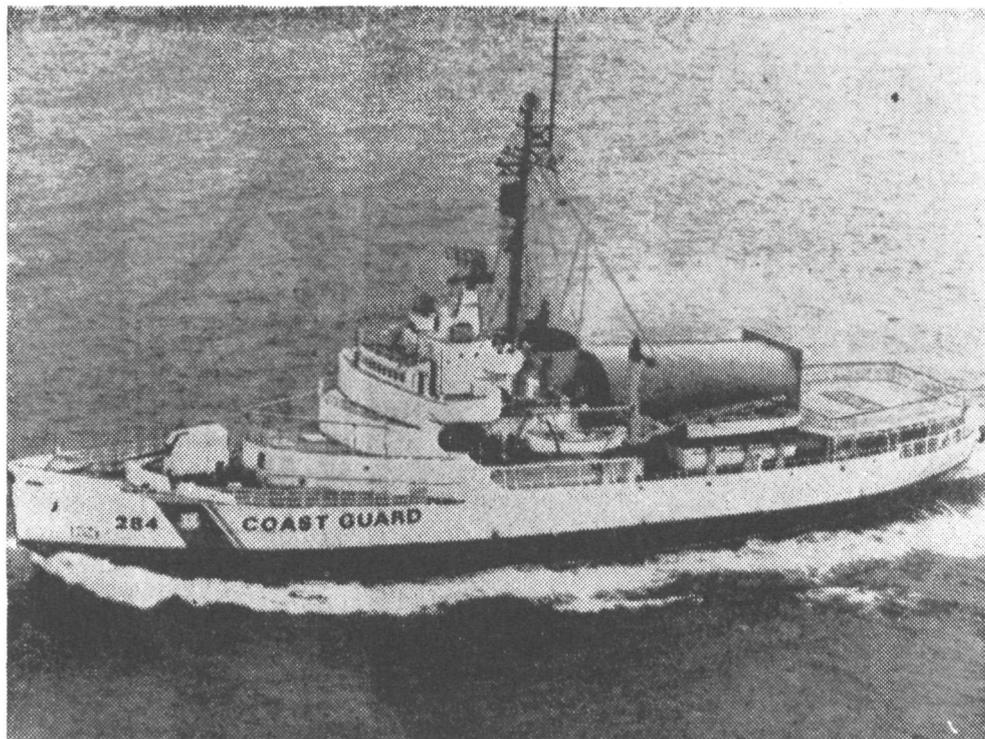
The two vessels are stopping every 200 miles to take plankton samples and to make Nansen bottle casts. A Nansen bottle is a scientific device for testing water depth, salinity, temperature and oxygen and nitrogen content. From these data oceanographers can determine water flow direction.

One of the main scientific objects of the Arctic circumnavigation is to obtain information to shed additional light on the interchange of water from the Arctic, Atlantic and Pacific Oceans.

Previous Attempt Described

A previous attempt to pass through the Vilkitski Strait was secretly planned but abandoned in 1965, according to Richard Petrow, author of "Across the Top of Russia."

Mr. Petrow says in the recently published book that he was told by a State Department official that the Coast Guard icebreaker Northwind would secretly attempt to pass through



Coast Guard Photo

The icebreaker Edisto: Ice was thick and the Russians just as firm.

the strait while conducting Arctic exploration in the area of Severnaya Zemlya. Mr. Petrov was aboard the ship as a write.

When the Northwind, which was under constant surveillance by the Russians, came within 30 miles of the mouth of the strait, Mr. Petrov writes, it was decided not to attempt passage of the contested waters to avoid any challenge from the Soviet authorities.

Instead, the captain, Kingdrel N. Ayers, decided to attempt a passage from the Atlantic to the Pacific by going around the top of Severnaya Zemlya. He informed his superiors of this plan and actually navigated around the top of the Arctic island before they ordered him to abandon the attempt and return to the United States by way of the Atlantic, according to Mr. Petrov.

Mr. Petrov says the decisions to abandon both the attempt to sail through the Vilkitski Strait and around Severnaya Zemlya had been dictated by a United States determination to avoid a showdown with the Soviet Union over Arctic passage.

Yukon Updating Archives

WHITEHORSE, Yukon Territory (Canadian Press) — Alan Innes-Taylor is working on an inventory and catalogue of the archives of the Yukon from 1893 to the present. Mr. Innes-Taylor was hired by the territorial government to gather such documents as maps and details of ghost towns.

Paddler Nears End of 2700-Mi. Arctic Voyage

INUVIK, Northwest Territories, Sept. 16 (AP)—Luther (Duc) Meyers was waiting in the fisheries research station here for the weather to clear before jumping back into his canoe.

"Retirement doesn't have to restrain your way of life," he said Friday. "But countless people let it knock the wind out of them."

Duc should know. He's 71. Eight months ago, he took the last poke at his typewriter as a reporter for the San Francisco Examiner.

July saw him slip a 17-foot plastic-covered canoe into Summit Lake, 40 miles north of Prince George, B.C., on a solo zig-zag voyage to the Arctic Ocean through the Yukon, Alberta and Northwest Territories.

The 2700-mile trip will end at Tuktoyaktuk, a small Eskimo settlement on the coast of the Beaufort Sea, 75 miles northeast of Inuvik and 1200 miles north of Edmonton. Afterwards, Duc says he plans to paddle along the coast of Herschel Island, where San Francisco whalers sometimes spent the winter, before flying home to California.

HELICOPTERS URGED FOR MOUNTAIN CLIMB

KLUANE LAKE, Yukon Territory (Canadian Press)—Helicopters can take some of the worry and strain out of mountain sport—if you can afford them.

Jim Davies, a 28-year-old pilot with 3,000 hours of helicopter experience, most of it in Western Canada's mountain areas, says the apparent risk in mountain helicopter flying is psychological.

"The helicopter is a safer machine in the mountains than a fixed-wing aircraft," he maintains.

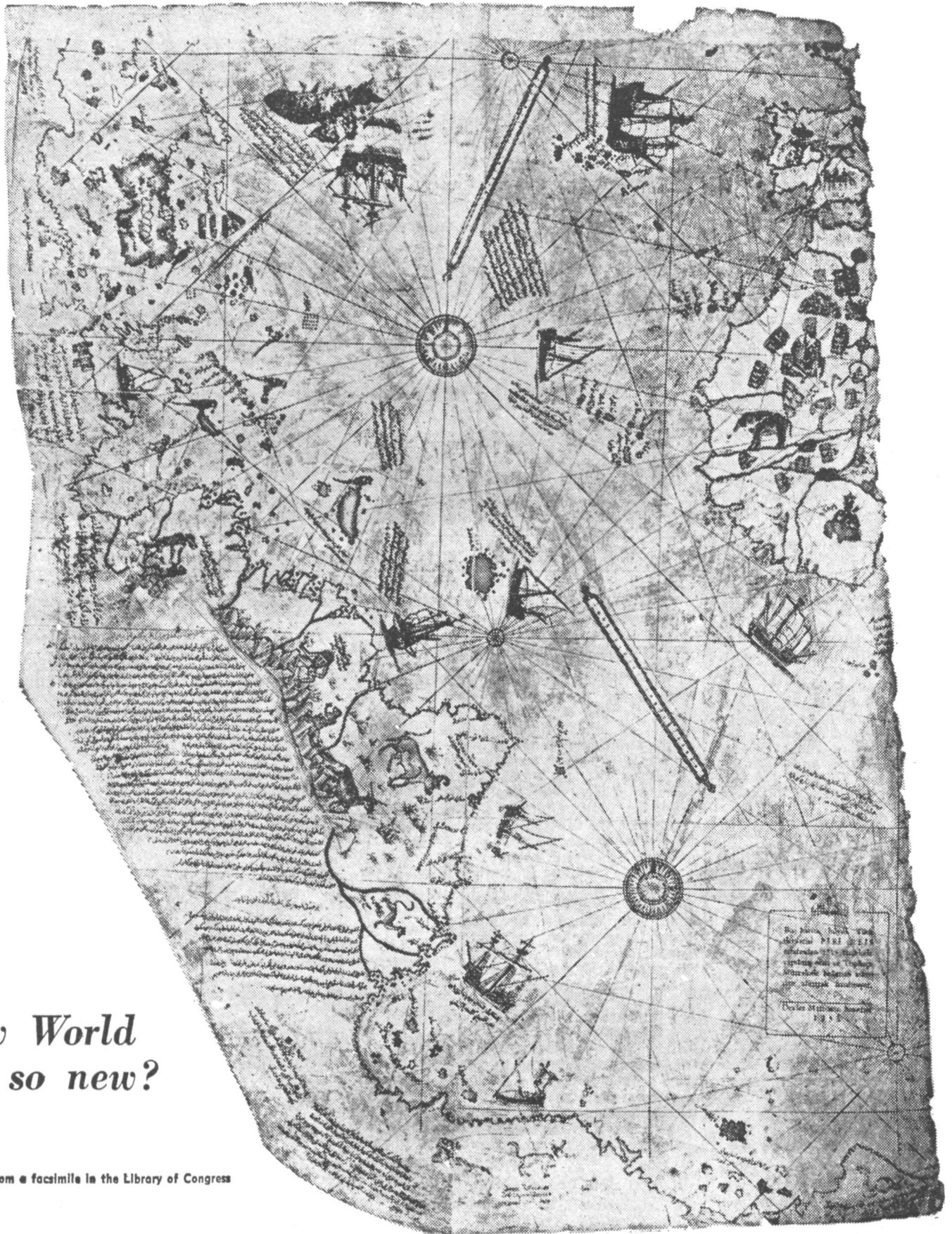
In the first place, a helicopter can stop, back up or turn around in the mountains no matter how tight the corner, he asserts.

Also, if the machine loses power, it will glide and can be put down anywhere, while a fixed-wing aircraft requires at least some approach and landing room, he adds.

The helicopter's ability to land almost anywhere allows it to take mountaineers, skiers or hunters into mountain areas where they otherwise would have to walk. It can pick an injured climber off a mountainside swiftly and smoothly.

The major factors preventing helicopters from being used more often by sportsmen are their cost and the heavy demand for their services.

Helicopter operation may cost well more than \$200 an hour, substantially costlier than fixed-wing aircraft.



New World not so new?

From a facsimile in the Library of Congress

This is a map drawn in 1513 by a Turkish admiral named Piri Re'is. Starting at top left, the black line is believed to show the Atlantic coast of Central and South America—the latter's bulge easily recognizable. Spain and western Africa are presumably at upper right. The startling feature of this map is that the bottom portion bears a strikingly accurate resemblance to what modern techniques

have fixed as the actual Antarctic land profile. If the Piri Re'is map (based as it was on earlier sources) does indeed include the Antarctic (which the Turkish mapmaker mistakenly attached to South America), then the polar coast was mapped with incredible accuracy prior to 1513—either through hundreds of feet of ice or else before the continent was even covered with ice!

The continent that history lost

A new look at some old maps suggests that once there lived a great people who somehow, sometime, were lost to history. Lost with them, so the theory goes, was memory of their knowledge of the great continent we call Antarctica. Here is a look at clues that have shaken 20th-century assurance of exploring Antarctica for the first time.

By Wiley Mitchell

The Christian Science Monitor

REFERENCES TO A GREAT SOUTH-POLAR continent reach back across more than 2,000 years to the early Greeks.

Most modern writers have argued that these references were merely based on a guess that the presumed north-polar continent should be balanced by one at the south pole.

In 1929, however, a startling clue appeared. In the old Imperial Palace in Constantinople, a map was found showing much of the Western Hemisphere and the westernmost bulge of Africa. The map was dated 919 in the Moslem calendar—1513 of the Christian era—and was signed Piri Re'is (pronounced Peeree Reece), a well-known Turkish admiral and writer.

Great excitement followed. On the map was the statement that it was partly based upon a map drawn by Columbus. But after some years, scholars were unable to verify the truth of the statement. As can be seen in the reproduction of this map (upper left), it is clearly the outline of the New World, but it is also badly distorted.

Piri Re'is and his map were again forgotten.

Then, in 1956, a Turkish naval officer brought a copy of the Piri Re'is map to the Hydrographic Office of the United States Navy. A Navy cartographer showed it to a friend, Capt. Arlington H. Mallery. A retired engineer, he was also a navigator, archaeologist, and student of old maps.

Captain Mallery returned the Piri Re'is map to his friend with the startling statement that he believed the bottom portion of the map depicted islands and bays on the Queen Maud Land coast of Antarctica.

What makes this almost unbelievable is that these islands and bays now are under hundreds of feet of ice. In fact, it was only in 1954 that soundings through the ice had begun to show the complexity of land beneath the smooth ice surface.

The implication of the Mallery theory was clear: If true it meant that someone before 1513 had either mapped this coast through hundreds of feet of ice

or else had mapped it before it was covered with ice at all.

Expert opinion was sought. One person consulted was the Rev. Daniel L. Linehan, S.J., director of Weston College Observatory, Weston, Mass. Father Linehan had carried out the actual field work in 1954-1956 measuring, for the first time, the thickness of Antarctic ice. He did this by setting off explosives on the ice and measuring electronically the time it took for an echo to return from the bottom of the ice to the surface.

Interpretations agree

Father Linehan compared Captain Mallery's interpretation of the Piri Re'is map with his own firsthand knowledge of the area, and found no reasonable doubt of the agreement. He expressed this view in an August, 1956, radio-forum broadcast from Georgetown University, Washington, along with Captain Mallery.

A transcript of the broadcast was sent to Prof. Charles H. Hapgood, then professor of the history of science at Keene State College of the University of New Hampshire. Professor Hapgood found the question so interesting he made a class project out of it for several years. In 1966 Professor Hapgood summarized nearly a decade of work in "The Maps of the Ancient Sea Kings" (Chilton Books: Philadelphia and New York. \$14.50).

Professor Hapgood and his students worked out what they believe to be the four different map grids used by Piri Re'is or one of his more immediate sources.

Nearly 100 specific points, easily recognizable, were measured for latitude and longitude. Almost half the points were found to be in error by only a degree or less—often no measurable error.

Yet it was only in the 18th century that a practical means of measuring longitude (east-west location) was invented. And even latitude measurement had only been made practical for sailors by a method introduced in 1485.

If Professor Hapgood is correct, it is difficult to imagine how the Piri Re'is map could have been drawn

in 1513, let alone back at the beginning of the Christian era, in Alexandria, which Piri Re'is stated was the source of most of his information.

And as for the supposed Antarctic section, one scientist whose work is the compilation of data from current Antarctic explorations, goes even further. He says that even if the Piri Re'is map were a forgery (which no one has seriously suggested), he does not believe any 1929 forger could have anticipated the discoveries to be made beginning in 1954 of the complex land form under the silent Antarctic ice cap.

'Portolano' puzzle

There is more than just the Piri Re'is map to indicate that some ancient and unknown people were capable of drawing accurate maps. For more than 100 years scholars have puzzled over the so-called "portolano" maps of the Mediterranean. More than 400 specimens have survived, dating from the 14th to 16th centuries. All appear to have been copied from a single, unknown original.

A. E. Nordenskjöld, Swedish geographer and explorer, published his conclusions in a book titled "Periplus," in 1897. It was he who pointed out that the earliest portolanos appeared to be the most accurate maps.

An excellent specimen, dated 1339, was studied by Professor Hapgood. He agreed with Nordenskjöld's earlier finding that the 1339 portolano was a much better map than Ptolemy's Mediterranean map. Yet Ptolemy, who worked in Alexandria in the second century, was for centuries regarded as the father of geography.

Professor Hapgood also found the 1339 portolano better than most maps as late as the 16th century.

Who drew the original of this map? Nobody knows.

Still other maps, studied carefully, show the same surprising indications of early geographic knowledge. One map, by Nicolo de Caneiro, dated 1502, stretches from the middle of Scandinavia to the Cape of Good Hope, Africa, and from the east to the west coast of Africa. It seems impossible that any of the explorers mentioned in accepted history could have furnished the data for this map. But there it is, awaiting explanation.

A Venetian chart of part of the Africa coast, dated 1484; a map of China, dated 1137; a 1380 map of northern Europe—all show detail out of keeping with history as it is written today.

Even regarding Antarctica, however, the Piri Re'is map does not stand alone. It has long been agreed that almost all maps drawn during the 16th to 18th centuries, showing a supposed but unexplored Antarctic continent, traced back to a single source.

Earliest certain appearance of this outline is from Oroncé Finé (or Oronteus Finaeus), dated 1531.

Most writers have assumed that this outline is the result of an excellent "guess" by Finaeus, or an unknown contemporary. How excellent the "guess" was may be seen on this page (lower left). Here the 1531 map outline has been superimposed on the latest outline of the actual land mass underlying the 8-million-cubic-mile ice cap of 20th-century Antarctica. It should be realized that the latest outline is not definitive and may be altered appreciably by further explorations.

In making this comparison, the shape of the 1531 map has been retained, but the latitude and longitude markings have been ignored. This is done on the assumption, as made by Professor Hapgood, that Finaeus had a source map with either no coordinates, or with coordinates he did not understand.

The Magellan voyage of 1520-1521 had mistakenly reported the island of Tierra del Fuego, the south side of what was named the Straits of Magellan, as being part of the long-sought Antarctic continent.

Finaeus may have used this report as the basis for establishing the size of Antarctica. Since Tierra del Fuego is more than a thousand miles from the main Antarctic ice cap, this grossly overstated the continent's size. But the shape, presumably taken from Finaeus's source map, was remarkably accurate.

Because of this mistake in size, little serious attention had been given to the Finaeus Antarctic map, and its descendants, until Professor Hapgood pointed out the similarities in shape.

Particularly provocative on the 1531 map is the clear indication of rivers and valleys, headlands, and bays which we now know exist under hundreds of feet of ice. Indeed, ice depths up to nearly three miles now have been measured on Antarctica, though not on the immediate coast.

This brings up the question of the age of the south polar ice cap. An accepted theory of the ice ages does not exist. Theories, yes, in abundance. But none has won general support.

The best that can be said is that some theories would allow the coast of Antarctica to have been ice-free perhaps as recently as 10,000-15,000 years ago. On this basis, then, the presumed mapping of Antarctica would have had to take place 10,000 to 15,000 years ago, unless we assume a more recent people with a technology more or less equal to that of the 1960's.

More evidence

One more piece of evidence appears. An astronomer, Dr. Livio C. Stecchini, wrote in early 1966 that he had traced a series of texts antedating Greek science. From these texts he tabulated data locating land points ranging from the Congo and Zambezi Rivers in Africa to central Russia. Such unlikely features as mountain peaks in Switzerland were included, he says.

He adds, "I have desperately tried to ascertain errors, but I have never been able to establish an error of latitude greater than a minute or an error of longitude greater than possibly five minutes in 10 degrees. Luckily the documentation is relatively simple. . . ."

By comparison, when the French Government, at the time already a center of cartography, launched an all-out mapping project of France in the early 1700's, errors of a degree—60 minutes—were the rule as compared with the best earlier maps.

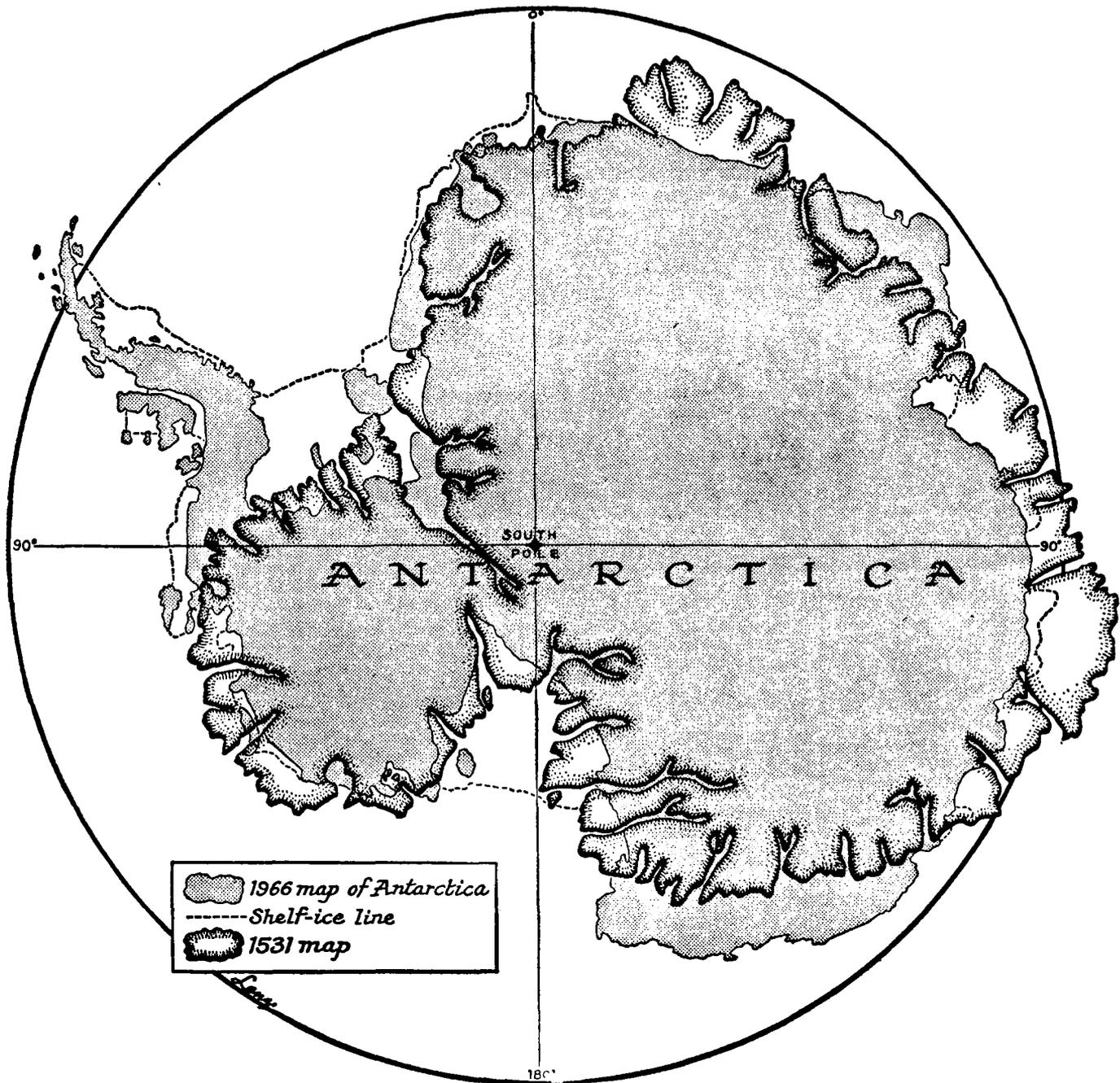
Clearly, then, there is strong evidence that sometime in the remote past there lived an unknown people with technical skills at least equal to those of the West in the 18th century. It would appear that this people knew most of the globe, mapped it accurately, left a number of fragmentary records behind them—maps, positional tables, or perhaps both.

The suggestion is that these people lived prior to the beginnings of written history, but this is little more than a guess. We can hardly be sure, for example, that the Phoenicians could not have done all this, although they have left no record suggesting as much.

In 1936, Prof. A. W. Brogger, at the time presiding over an international congress of archaeologists meeting in Oslo, had placed the golden age of navigation at about 5,000 years ago. He suggested that by 1500 B.C., when historical references to Phoenician seafaring begin to appear, sailing was already in a state of advanced decline.

All of this is so far largely theory. But the question brought to a head by the Piri Re'is map is taken seriously by most of the many scholars who have encountered it, although some feel Professor Hapgood has tried to prove too much in his book.

Whether the Piri Re'is map will ever lead to the discovery of a prehistoric civilization no one can say. But it seems certain that unexpected discoveries will continue to be made in trying to unravel the mystery of the continent history lost.



By Russell H. Lens, chief cartographer.
The Christian Science Monitor

Through the ice

This map shows the similarity between a 1966 map of land under ice (compiled from field information of the American Geographical Society) and a 1531 map by Oronteus Finaeus—based, like the Piri Re'is map above, on earlier sources. The 1531 outline was taken from a polar projection redrawn by Prof. Charles H. Hapgood of the University of New Hampshire. If the theory outlined on this page is correct, the peninsula at the left could easily have been lost during any of the many recopyings supposed to have taken place in the centuries preceding Finaeus.

FAIRBANKS GIRDS FOR HARD WINTER

Quake and Flood in Summer Make Task More Difficult

FAIRBANKS, Alaska, Nov. 11, (UPI)—The wolfwinds are beginning to howl down from the northways. The snow will soon be drifting deep along the road.

Ordinarily, preparing for the long winter's night in Fairbanks is a routine operation. This year it has been a frantic race against time.

Every winter here is harsh, but last summer nature went on a rampage in the "golden heart of Alaska." First was an earthquake; then a flood. The quake caused considerable damage; the flood almost washed out the town.

Alaskans are a hardy people, and the folks in Fairbanks are tough. They didn't ask for charity. All they wanted was a little credit.

A typical comment came from Lenny Johnson, a city electrician.

"Just a few weeks ago there was four feet of water in my place," he said. "Now the floor is buckled. The walls are warped, some of the doors won't close. But we'll be okay.

"It's going to be a tough winter for a lot of people. I suppose I'm just about as ready as I can be. I just hope the furnace runs without too much trouble."

The Chena River, which flows through the heart of Fairbanks, crested Aug. 15 at 18.82 feet, 6½ feet above flood stage. This was the result of phenomenal rains that fell in the wilderness northeast of Fairbanks, which is situated on the flat plain of the Tanana Valley.

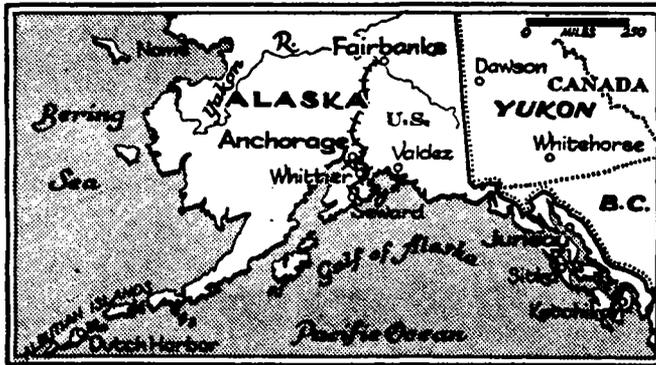
The flood came so fast it caught the residents by surprise. Lowland villages in the valley also were flooded—Nenana, Big Delta and Minto.

Fairbanks, the second largest city in the state, was hit hardest of all. The flood of 1967 was the worst thing that has happened to Fairbanks since it was founded during the Gold Rush days at the turn of the century.

About 1,500 have left since the flood. Many of them might have left anyway with winter coming on.

But, said Mayor H. A. Boucher, "the people with roots are going to stay."

The flood inflicted damage



The New York Times Sept. 10, 1967
Alaska railway (heavy line) from Anchorage north to the city of Fairbanks marks the central Railbelt area.

Alaska Urged to Coordinate Transportation to Cut Costs

By FARNSWORTH FOWLE
The New York Times

Alaska needs coordination of sea, rail, road and air transportation to bring down costs that are impeding the state's economic development, according to a staff study just released by the Federal Maritime Commission.

"The fundamental problem of Alaska," the study found, "is unduly high prices in most regions, particularly on many food items and construction materials. With the exception of the Railbelt, these prices are, in part, due to ocean transportation charges and local marketing practices."

The Alaska Trade Study said the other parts of the state "have been exposed, for the most part, to a single-mode, noncompetitive type of service, sometimes resulting in infrequent and higher-cost service."

The Railbelt in Alaska's south-central region extends from the coastal cities of An-

chorage, Seward, Whittier and Valdez on the Gulf of Alaska north along the Alaska Railroad nearly 500 miles to Fairbanks. It is served by eight common carriers including competing container and other specialized ships ferrying freight cars from the Puget Sound area.

The study found that "efficient, modern and competitive" ocean transportation to the Railbelt "not only has benefited consumers but also has helped to make this area more competitive with external sources of supply."

But it found that there had been no real attempt by the carriers to expand services to the more remote areas or to coordinate the different modes—sea, rail, road and air—to establish routes to them.

One point that emerged in the study and brought immediate correction was the dis-

estimated at more than \$200-million and sent most of the city's 16,000 residents fleeing to high ground. It soaked the city for almost a week. Once the water began to recede the townspeople waded back to their homes and businesses and began their race with winter.

First on the agenda, of course, was warmth. Every basement furnace in the city had been flooded out of commission and most other heating systems had been ruined or damaged.

Al Swearingin, service manager for a heating company, said his crew worked around the clock to restore furnaces and other home heating units.

Today, he estimated, only about 15 per cent of the city's homes are without normal

heating. Portable electric heaters, wood-burning stoves and fireplaces have been installed in many houses where furnaces were ruined.

Transportation is another problem. Lonnie Hall, a garage operator, explained that cars and trucks that were inundated might be working now, but when the freeze sets in, drops of water in transmissions and gears will turn to ice and lock the assemblies.

"We're going to see a lot of people walking this winter," Mr. Hall said. "Maybe some of them will go back to using dog teams."

Ray Willman, coordinator for the Office of Emergency Planning, said he believed public utilities, streets and buildings had been repaired well enough to get through the winter.

covery that the advantages of containerization were suffering from "misdescription, misweighing and mismeasurement of cargo shipped in containers."

The Federal Maritime Commission, as a result, started a program of unannounced inspection of containers at carriers' terminals to see if the cargo inside matched the manifest.

The staff study urged the state, shippers and carriers to consider establishing integrated systems that would move cargoes by fast carriers from Seattle to distribution centers in Alaska's southeast, southwest and northwest regions. It could then be moved by smaller carriers to communities "that cannot or should not support the burden of larger self-propelled vessel operations," it said.

It urged a sea-air van service for such northwest ports as Nome, which is frozen in winter, with joint through rates for shipments from Seattle that would be shifted from water carrier to plane in Anchorage.

The study also suggested that freight liners sailing a great circle route between Seattle and Japan could stop at Dutch Harbor to pick up and discharge containers with cargoes brought by barge feeder service from other northwestern ports.

Already, trade between Alaska and Japan has been growing and there has been considerable Japanese investment in the lumber and fishing industries in Alaska. Last week Gov. Walter J. Hickel of Alaska disclosed that the state planned to construct a major port at Ketchikan. This came during talks in Japan between an Alaskan trade delegation and officials of Tokyo's Kawasaki Line, which now has a monthly freighter service from April through September.

Gov. Hickel said Alaska, in planning to expand facilities at Ketchikan, was asking the shipping line to provide service all year round. No dates were set for new construction.

Gets Alaska Post

Capt. Howard S. Cole, a veteran of 36 years with the U.S. Coast and Geodetic Survey, has been named field director of Alaskan operations of the Survey.

Cole, a native of Washington, is a commissioned officer in the Environmental Science Services Administration, the parent body of the Coast and Geodetic Survey, and has been serving as a technical assistant in seismology and geomagnetism at Survey headquarters in Rockville.

3 Icebreakers Race to Free The Northwind

Oct. 3

JUNEAU, Alaska — The icebreaker *Northwind* is all but trapped in the Arctic icepack 500 miles northwest of Barrow, Alaska. Underway to assist her are the icebreakers *Staten Island* and *Glacier* and the Canadian icebreaker *MacDonald*.

The *Northwind* had just set a new record for northern penetration of the western Arctic by a surface ship as she attempted to resupply a scientific research station on ice island T-3. The icebreaker came within 634 miles of the North Pole but her supply mission was unsuccessful.

Extremely heavy ice and a four foot-long crack in the underwater hull of the ship prevented her from coming any closer than 42 miles to the island. T-3 will be supplied by aircraft instead.

Turning back, the *Northwind* lost a blade off the starboard propeller and she has reported her speed to be only about two miles a day.

The *Northwind* is believed to be in no immediate danger but assistance is needed to get her out of the ice before the Arctic winter sets in.

The icebreaker had penetrated to 79 degrees 25.5 minutes north latitude, (10½ degrees from the Pole), 168 degrees and one minute west longitude before being stopped by the ice. The previous record for penetration of the western Arctic was set by the icebreaker *Burton Island* in 1962 when she was operated by the Navy.

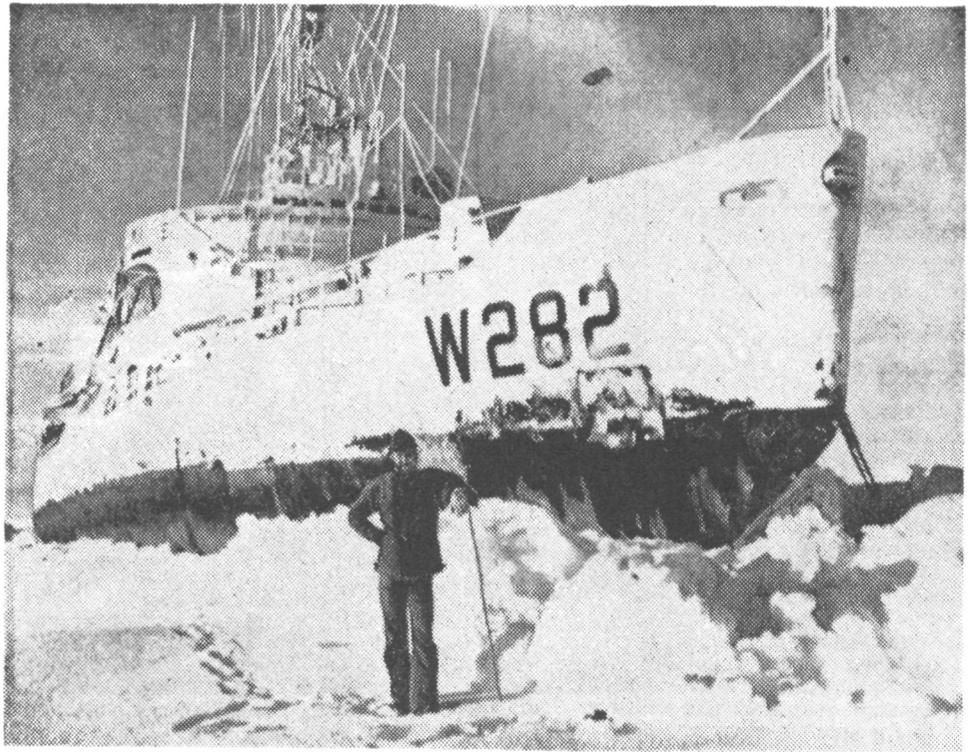
The *Northwind* was able to break the *Burton Island*'s record only because of a shift this year in the ice toward the Eurasian continent.

Trapped U.S. Icebreaker Led to Safety Off Alaska

OTTAWA, Oct. 8 (AP)—The United States Coast Guard icebreaker *Northwind*, which had been trapped in heavy polar ice about 400 miles off the north coast of Alaska, is out of danger, the Transport Department reported Sunday.

The Canadian icebreaker *John A. MacDonald* said rescue ships had led the *Northwind* out of the heavy ice into an area of broken ice and relatively open water.

The rescue operation began Sept. 25 when the United States ship radioed that she had dam-



AT LAST—The Coast Guard icebreaker *Northwind* lies trapped in arctic ice floe where she was caught Sept. 23. The *Northwind* was freed by two other icebreakers and left Barrow, Alaska for Seattle. Michael McAuliff of Dallas, Texas, stands in the foreground.



Ship is stuck (X) near T-3.

aged one of her two propellers in eight-foot-thick ice and was unable to move. If the operation failed, the stricken ship would have remained marooned in the ice all winter.

BARROW, Alaska, Oct. 10—The Coast Guard icebreaker *Northwind*, rescued from the swelling Arctic icepack last week, dropped anchor here yesterday for a short stop before sailing to Seattle for repairs.

The *Northwind* broke a blade from one of her two propellers and got stuck in the ice Sept. 23 after an attempt to reach a small group of scientists on an ice island near the North Pole.

The Coast Guard spokesman said the cargo of fuel would be unloaded here and be flown to the ice island.

CANADA TO PERMIT HUNTING OF MUSK OX

OTTAWA (Canadian Press)—For \$4,000 each, big-game hunters next year will be able to shoot the placid musk ox in Canada's Arctic islands.

Paul Kwatorowsky, superintendent of game for the Northwest Territories, conceded that all one had to do to kill a musk ox was walk up to it and shoot it.

"It's no sport in the proper sense," he said. "There's no skill to it. The only skill required is to select the biggest one."

"Where we can capitalize on this is that the musk ox is an extremely rare trophy and we already have applications from Germany to hunt them."

The Northwest Territories Council has decided in principle to permit big-game hunting of musk oxen for the first time since 1917 as a means to bring in revenue for the Eskimos, who apparently will not be permitted themselves to shoot the animals. The limit will be 32 musk oxen in the first year, one to a hunter.

The decision, still to be confirmed in October after a survey of the number of animals, was taken over the strenuous objections of the Canadian Wildlife Service.

ELLESMERE ISLAND HAS OWN DEAD SEA

OTTAWA (Canadian Press)—Canada has her own salt-water dead sea. It is called Lake Tuborg, and is on Ellesmere Island, Canada's most northerly land mass, 40 miles southeast of the base camp of the Defense Research Board on Tanquary Fiord.

Dr. Geoffrey Battersley-Smith, a board glaciologist who returned here from leading his 13th expedition to Ellesmere, said the 13-mile-long lake contains a 60-foot layer of sea water trapped between 120 feet of fresh water.

A species of plankton never before observed in the Arctic waters has been found living in the salt water of the lake and has been identified.

The sea-water layer has been tested with carbon and found to be 3,000 years old. It flowed into the lake from Greely Fiord, a water-filled canyon that extends into the heart of Ellesmere from the Arctic Ocean.

About 30 centuries ago, a glacier advanced across the eastern, or inland, end of the fiord, trapping the sea water in the depression now called Lake Tuborg. Melting water from the icecap to the south and adjacent glaciers resulted in the layer of fresh water atop the heavier sea water.

Study Due on Northern Spur for Alaskan Rail Line

The New York Times

ANCHORAGE, Alaska, Aug. 5—A Washington company has been commissioned to prepare a preliminary feasibility study of a proposed 500-mile extension of the federally owned Alaska Railroad, north into the Arctic.

The study, to be made by E.B.S. Management Consultants, Inc., was commissioned during a three-day meeting of the Northern Operations of Rail Transportation and Highways Commission — the so-called NORTH Commission.

This was the major action taken at this first meeting, which included a trip from Anchorage to Fairbanks over the present route of the Alaska Railroad and a flight to the north over the proposed extension, which would start at Dunbar in the Fairbanks area and extend to the mining camp of Bornite near the village of Kobuk on the Kobuk River, north of the Arctic Circle.

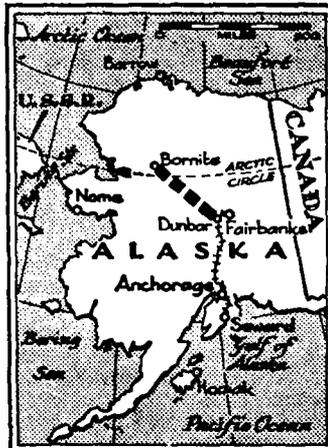
Gov. Walter J. Hickel, a Republican who is the state's second elected Governor, has undertaken the Arctic extension of the railroad as a major project of his administration.

The NORTH Commission was created this spring by the Legislature and consists of five Alaskan members and five commissioners from outside the state, all of whom are appointed by the Governor.

The five Alaskan commissioners are John B. Coghill, a Nenana businessman; John Manley, general manager of the Alaska Railroad; C. W. Snedden, publisher of the Fairbanks Daily News-Miner; Albert Swalling, owner of the Swalling Construction Company in Anchorage, and Jack White, an Anchorage real estate executive.

Commissioners from other states are Samuel F. Pryor Jr., retired vice president of Pan American World Airways, New York City; William P. Lear, chairman of the board of Lear Jet Industries Corporation, Wichita, Kan.; Russell G. Smith of San Francisco, former executive vice president of the Bank of America and chairman of the Asiatic Development Committee; Everett Hutchinson, Under Secretary of the Department of Transportation, Washington, and Reginald N. Whitman, an official with the Great Northern Railroad, Duluth, Minn.

During the first meeting, Governor Hickel appointed Mr. Swalling as chairman; Mr. Whitman, a former manager of the Alaska Railroad, as vice chairman, and Mr. Coghill as



The New York Times Aug. 6, 1967
Dotted line shows proposed Alaska railroad extension.

secretary.

The Governor also told the commissioners that Sargent Shriver had agreed to serve as an ex-officio member of the commission.

While the sessions were mainly devoted to organizational matters, the flying trip over the proposed route provided a dramatic highlight.

The commission made the trip from Fairbanks last weekend in a chartered airliner that landed them north of the Arctic Circle at Bornite where the Kennecott Copper Company has spent some \$10-million in developmental work on what appears to be extensive high-grade copper deposits.

The proposed railroad would provide the copper company with a relatively inexpensive method of transporting the copper ore to the sea, when and if the mine goes into production.

In turn, Governor Hickel is counting on the copper operation—and perhaps other future mining ventures — to provide the high-tonnage traffic needed to make construction of the railroad extension feasible.

The commissioners' plane took them north over what is actually route B, one of three proposed routes surveyed north as far as the Yukon River in years past by Alaska railroad crews.

Routes A and C travel a few miles to the east and west, taking advantage of low foothills in their first miles rather than crossing the swampy Minto Flats.

Actually, all of the proposed route would be through relatively low river valleys, with the highest point on route A only 1,200 feet above sea level.

North of the Yukon River a definite proposed route has not

'64 ALASKA QUAKE MOVED MOUNTAINS

Report Finds Seismic Wave Went as Far as Antarctic

WASHINGTON, Nov. 11 (AP) —The Commerce Department said today that the Alaskan earthquake of 1964 was so powerful that it moved mountains, temporarily raised the level of the Mississippi River and sent a seismic wave as far as the Antarctic.

The department's Coast and Geodetic Survey, more than three years after the Good Friday disaster, is still gathering data on the effects of the strongest earthquake ever recorded on the North American continent.

Some of the findings are incorporated in a technical report issued by the Environmental Science Services Administration.

It said a seismic wave was recorded in the Antarctic 22½ hours after the quake.

This giant wave, the report said, had traveled 8,445 miles at 430 miles an hour.

The earthquake caused 131 deaths and more than \$750-million in damage in Alaska and along the Pacific Coast.

Other findings:

Mountains on Kodiak Island and the Kenai Peninsula and the Chugach Mountains near Prince William Sound subsided seven feet or more. Earlier surveys revealed that some Kenai Peninsula mountains shifted laterally about five feet.

The ocean floor rose in an area 480 miles by 127 miles. The highest upheaval was 50 feet—the biggest ever recorded—between Kodiak and Montague Islands.

Shock waves oscillated the

yet been selected and there have been no detailed surveys, although some field reconnaissance work was done as far back as 1942 when the Army Corps of Engineers studied a proposed railroad or highway route to Nome.

Crossing of the Yukon would be made near the Ramparts, which is also the proposed site of the controversial Rampart Dam. A recently released report by the Department of the Interior disapproved the hydroelectric project but suggested the railroad be considered as a feasible substitute for development of the north.

water as far away as Key West, Fla., 3,968 miles distant. Surge of water began along the Gulf coast of Louisiana and Texas between 30 and 40 minutes after the quake.

At New Orleans, a sudden rise of one and one-half feet in the Mississippi River caused vessels to break from their moorings. Near Dunham Springs, La., the water receded five feet, and at Houston, Tex., three 10,000-ton ships broke their moorings.

Of the 131 deaths, only nine occurred outside the areas hit by sea waves. Fifteen deaths were outside Alaska, including 11 in Crescent City, Calif., and four in Newport, Ore. At Crescent City, five died when they stopped for beer and were trapped by a wave, the report said.

The highest point reached by the surging waves was 220 feet above sea level near Valdez, Alaska, where a piece of land about 4,000 feet long and 600 feet wide fell into the sea.

JAPANESE TRAWLER SEIZED OFF ALASKA

WASHINGTON, July 16 (UPI) —The Coast Guard said tonight that it had confiscated a Japanese fishing trawler for violating American territorial waters off the Alaskan coast.

The trawler was first seen on radar some 5,200 yards off Segula Island in the Aleutian Island chain that stretches out from the southwest tip of Alaska. The Coast Guard said the vessel was moving slowly in a dense fog with its trawling net down.

An armed Coast Guard party boarded the ship, which was then escorted to the Alaskan port of Adak.

Japanese Trawler Released

WASHINGTON, July 21 (UPI) — A Japanese trawler seized by the Coast Guard last Sunday for fishing in United States territorial waters off Alaska has been allowed to leave for home after the captain paid a \$35,000 fine. A Coast Guard spokesman said yesterday that the skipper of the vessel, the Tenyu Maru, paid the fine before a Federal official in Adak, Alaska.

Alaska Road 25 Years Old

JUNEAU, Alaska, Nov. 20 (AP)—One of the construction wonders of World War II, the Alaska Highway, was completed 25 years ago today. The highway connects Dawson Creek, B. C., with Fairbanks, Alaska.

Sprouted Seeds' Age Put at 10,000 Years

By ROBERT REINHOLD
The New York Times

Oct. 6

Canadian botanists have grown normal healthy plants from seeds believed to have lain dormant for at least 10,000 years in Canada's frozen Arctic wastes.

These specimens are thought to be the oldest living organisms on earth, three times as old as the giant sequoias in California, said Dr. A. E. Porsild, a botanist at the National Museum of Canada, who directed the plant-growing experiment.

The bristlecone pines of the California mountains are said to be even older than the sequoias, but only half as old as the seeds.

Previously, the oldest seeds to have sprouted plants were three dormant sacred lotus seeds found buried in a neolithic canoe in a peat bog near Tokyo in 1951. These seeds were 2,000 years old.

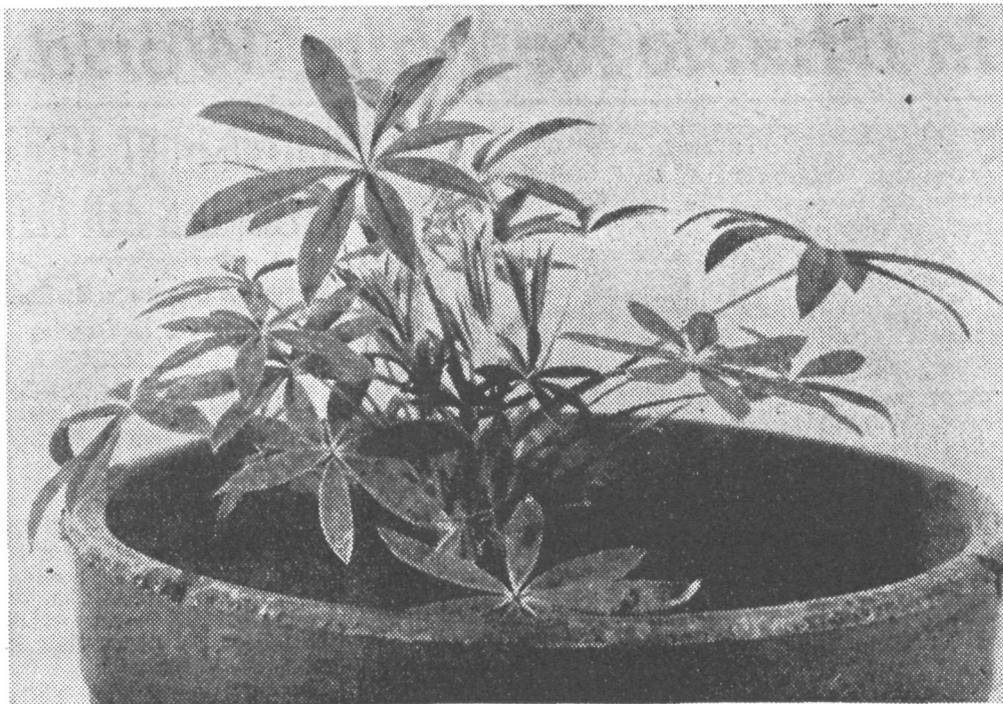
The plants that were grown from the Canadian seeds are arctic lupines, commonly found today throughout Alaska and Arctic Canada. They are similar to the Russell lupine, a garden plant sometimes grown in moderate climates for its spikes of colorful flowers.

The seeds, about the size of rice kernels, were unearthed in 1954 at Miller Creek, in Canada's Yukon Territory, by a mining engineer who did not realize their scientific significance until a paleontologist from the National Museum of Canada learned of them 12 years later.

The engineer, Harold Schmidt, found two dozen lupine seeds carefully concealed in rodent burrows permanently frozen in silt from 10 to 20 feet below the surface.

Mr. Schmidt kept the seeds, along with a rodent skull from one of the burrows, in a dry place over the years. This prevented the seeds from germinating naturally until the palaeontologist, Dr. D. R. Harrington, obtained them and brought them to the museum in Ottawa for study.

There, Dr. Porsild placed the best of the lot on wet filter paper in a laboratory dish. Six germinated within 48 hours. Later they were transferred to pots and placed in a greenhouse, where they have since grown into vigorous young plants indistinguishable from



Science—Research Branch, Canada Agriculture

FROM 10,000-YEAR-OLD SEEDS: The plants are the same as today's arctic lupine

ordinary arctic lupines.

Now one year old, the plants are on display at the museum. The scientific findings concerning them are published in the current issue of *Science*, weekly journal of the American Association for the Advancement of Science.

Dr. Porsild believes that the seeds were probably preserved after a landslide or a deep layer of volcanic ash covered the burrows, smothering the rodents and keeping the surrounding soil dry and permanently frozen.

"There is no reason to believe there aren't seeds in even older deposits in the North," Dr. Porsild said yesterday. "They could date back one million

years to the beginning of the Ice Age."

The age of the seeds was established from the rodent skull and the nature of the burrows. The deeply stained, fragile skull was identified as that of a collared lemming, an animal that disappeared from the Miller Creek area about 10,000 years ago, during the Pleistocene era.

Animals bones found in similar burrows in this area have been dated back to at least 14,000 years by radioactive analysis.

The question of seed longevity is one that scholars treat with great caution. Earlier in this century, seeds found in ancient Egyptian pyramids

were germinated. Those plants, called "mummy wheat," have since been established as coming from seeds either carried in by modern rodents or sold fraudulently as ancient seed.

It is believed by some botanists that seeds are more likely to be preserved for long periods if under frozen conditions, as in the case of the Canadian seeds.

In his report, Dr. Porsild, who worked in collaboration with the Canadian Department of Agriculture, said:

"It would seem reasonable to predict that seed stored dry and at temperatures well below freezing could remain viable indefinitely."

Colds Kill Eskimo Children, Canadian Investigator Says

Dr. Brian E. Maxwell, a Canadian investigator working on the central Arctic coast, has implicated colds as a cause of death among Eskimo infants and older children, the magazine *Medical World News* reports.

The death rate among Eskimo children 1 to 4 years old is 13 times the national average. Pneumonia is listed most often as the cause of death.

Dr. Maxwell believes that a fourth to a third of these deaths are a result of colds. Eskimo babies are carried next to the mother's body beneath a double layer of caribou skin, but this protection is insufficient in outdoor temperatures as low as -40 degrees Fahrenheit, the doctor found.

DEW Pact Is Renewed

Federal Electric Gets \$24.3 Million Job for 11th Year

Newark News.

PARAMUS — The U.S. Air Force's \$24.3 million contract for operation, maintenance and supply of the Distant Early Warning Line (DEW Line) across Alaska, Canada and Greenland has been awarded for the 11th consecutive year to Federal Electric Corp., International Telephone and

Telegraph Corp. service associate.

Completed in 1957, the DEW line is the world's longest radar surveillance - communications network.

The contract calls for the operation and maintenance of all electronic and power generation equipment, vehicles and buildings as well as the year-round supply operation. High-priority items are delivered weekly to each site along the 3,600-mile DEW Line. The bulk of deliveries, however, takes place during the brief Arctic summer when ships can navigate the northern rivers and seas.

The DEW Line contract is administered from Paramus by Detachment 1 of the 1st Air Force, commanded by Col. R. O. Gruetzemacher.

At Hudson Bay, a Collision of Time

By R. J. R. JOHNSON
St. Paul Dispatch

Dispatch Staff Writer R. J. R. Johnson visited the Eskimos of Povungnituk, in the Quebec Arctic, with a Minnesota Historical Society tour group. The flight north also included visits to sites historically important in the fur trade.

Davidialook tells stories in stone, but he is not a Stone age man.

This Hudson Bay Eskimo uses steel tools to shape gray steatite (soapstone) into dramatic representations of his people, the animals he knows, the stories he has heard.

He works outside in the summer, in a corner of his plywood house in winter. Then he sells his finished work, for cash, to the Hudson's Bay Co. or to his own Eskimo Cooperative Association.

The money buys traps and fuel oil, groceries and cigarettes, and gasoline for the outboard motor and the yellow Ski-doo snowmobile.

Much of this is quite new to Davidialook. Until half a dozen years ago, his village, Povungnituk, was composed of tents in summer and snow houses (igloos) in winter. This had been so for a long, long time. Archeologists have found evidence that Povungnituk, on the east coast of Hudson Bay, was a village 3,000 years ago.

THE LAND is endless and timeless: From the sea water of Hudson Bay it lies in a blue, green, brown mosaic of lakes, rocks, mosses and lichens. No tree breaks the horizon.

The people are not timeless. Instead, they have collided with time and now are wrestling with the 20th Century. They still are tied to sea and tundra, sources of fish and white arctic fox. They still have their language, their clothing, their ways. But the modern, southern world is undoing these things at a pace that would make a city-dweller's head spin.

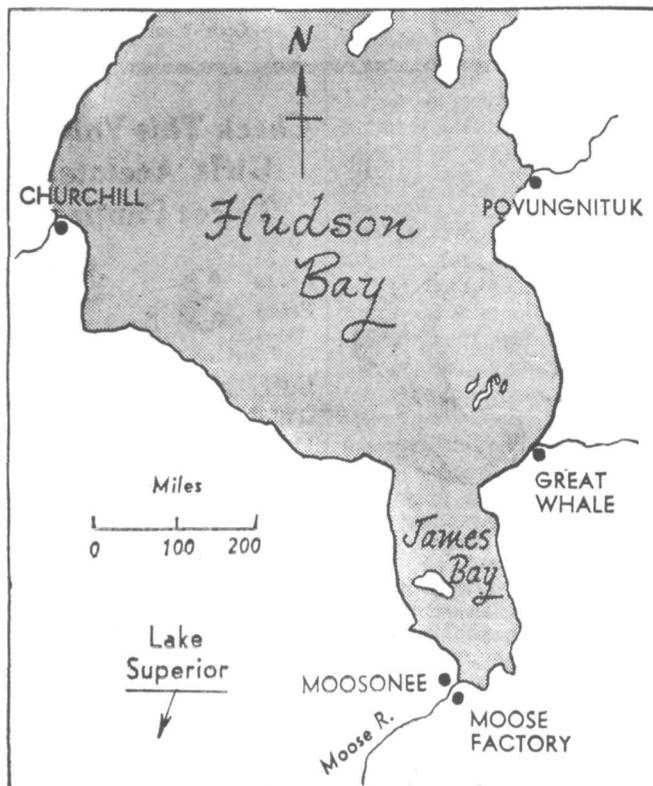
There are new goods, new ideas, new chances for life, new diseases to kill. The intrusion of white, 20th Century man has definitely complicated Eskimo life.

Babies and old people live who would have died in the old days. So families are bigger, houses more crowded, diseases harder to control. Scarcely anyone misses a stay at the Moose Factory Hospital. Many learned their English

there, where the railroad ends and the North begins. Treatment for TB takes a long time.

NIGHTS in Povungnituk ring with the howling of sled dogs. The morning quiet is cracked by the sounds of people coughing.

The people used to be nomads; now they stay in one place. Sanitary facilities are nonexistent. The odor is memorable.



An anthropologist friend believes that the Eskimos should be left alone; that a people who were able to come to terms with such a harsh world have nothing to gain

and much to lose in contact with the modern, European world.

"We must stop and think what we are doing," he said.

Look how fast things have happened in this 3,000-year-old village:

IN 1954 the Hudson's Bay Co. post was established. In 1956 the Oblate missionaries of Mary Immaculate founded a mission, with schooling and medical aid. In 1958 the Catholic missionary got the Eskimo Cooperative started. In 1962 the cooperative added a credit union. In 1964 tourist cabins were built.

The population has grown from 200 (with about 150 camped on the tundra) in 1956 to nearly 600 this summer. There now is a federal school with grades 1 through 8 and the Province of Quebec is also starting a school. A few youngsters have gone down to



CHILDREN OF Povungnituk play hard in the long, warm evening while snowmobiles wait for the return of winter. The time is about 9:30 p.m. The village is well above treeline, but below the Arctic Circle. Sunset in late July as about 10 p.m.

Quebec for high school. They are the pride of the village.

An airstrip has been built and a road is being hand hewn across two miles of tundra to connect it with the village. It will end those periods of isolation during freeze-up and break-up when aircraft cannot land on the Povungnituk River — a period when fate seems to bring the worst epidemics and the most serious injuries.

AT LEAST 100 tourists are expected to visit Povungnituk this summer. They will spend money. The 20th Century.

White workers at Povungnituk believe they are doing right. They disagree with the anthropologist that isolation is possible, even if desirable.

The Rev. Andrew Peter Steinmann, the Oblate, is a man with a mission but no congregation.



Fr.

Steinmann Father Steinmann has been 29 years in the Arctic. He has starved with Eskimos in the old culture. He got the Povungnituk Co-op and credit union started. He conceded that "we may be killing a culture," but believes events in the North should be watched "without too much sentimentality."

"HAVE YOU ever seen a minority that was not swallowed by a majority?" Father Steinmann asked. "We are doing all we can to save the Eskimo culture, but we must make them able to face what's coming. We must face facts and be realistic. We try to save some of these things, but if we lose, we shouldn't cry about it."

Father Steinmann cited the Eskimo language as a poor fit in the modern world. It lacks a technical vocabulary.

"So the carburetor is the stomach of the engine? So's the gas tank! And what do you call everything else? What's the engine's heart? Or genitals?" Father Steinmann sees little hope for such a language in a world of machines.

The priest has no patience with sentimentality about the

old Eskimo life — "a damned miserable one."

"AN OLD man tells me, 'Thanks to the whites I can live; otherwise I would go onto the ice to die.' Who wants to die? Who laughs about it? I lived the Eskimo life. I stank like them. I starved like them. I say to those who talk of Eskimos: Let them try it."

Father Steinmann speaks of a new "security in living" for Eskimo people.



Furneaux

Pat Furneaux is federal Administrator of Northern Affairs for Povungnituk. He sees his task as helping to integrate the Eskimos with the rest of the 20th Century.

"We have to teach them how to live in this world," Furneaux said. "Really, that world is only about as big as an orange now. This place hasn't been remote for a long while."

CLAUDE Valois, administrator for Quebec, wonders if the province can do better by the Eskimo than the federal government has as it gradually takes over. He sees a day when the Eskimos will be entirely self-supported, when the nursing station, for example, will be staffed by Eskimo nurses.

Or will the Eskimos all go south and lose their language and culture? he asks.

Meet a girl of 14 who speaks as good English as you do.

"I ought to," she says. "I'm 2,000 years old, you know, and I spent half my life in your world." Then she laughs and runs away.

Meet a young lady just out of high school. She has come north to Povungnituk to visit her family. She is proud and it shows. She was born in another Eskimo community, spent six years in Moose Factory Hospital, then lived with a Cree Indian family at Moose Factory so she could be near her doctors. Now she hopes to go to teacher's college. She speaks Eskimo, English and French; most of the Cree is "lost."

WILL SHE return to Povungnituk to teach? No. She explains: "By the time I'm ready to teach all my contem-

ALTITUDE ILLNESS FOUGHT ON A PEAK

Tests on Mount Logan Seek Solution to Ailment

MOUNT LOGAN, Yukon Territory (Canadian Press)—An experiment that had its genesis in the Himalayan fighting between India and China in 1962 is under way here at the highest research station in North America.

When Indian troops went into battle against Chinese Communist forces in the southern reaches of the world's highest mountains five years ago, the Indian soldiers were afflicted by mountain sickness.

Crippling headaches, nausea, breathing difficulty and feelings of depression and physical weakness drastically cut their effectiveness. The Chinese soldiers appeared to be much better acclimatized to life on the high plateaus.

Western military authorities were disturbed. The United States wanted to be prepared for a possible war with China, a war that could involve operations in the Himalayas. The Canadians felt it necessary to prepare a mobile command for the eventuality of a peacekeeping or other military operation in any mountainous area.

The problem was to find a way to cope with mountain sickness. Researchers believe a drug called Diamex holds the key to the altitude and isolation illness. In order to test it under authentic conditions they established a research station 17,000 feet up on North America's second highest mountain—Mount

poraries will have married and have families. It's their children I would be teaching. I wouldn't like that."

But she does plan to teach in the north.

Listen and watch as Davidialook tells the story of his carving: How his grandfather's sister was surprised by a polar bear as she fished through the ice, the attack, the mangling, her death.

Join the Friday night trading crowd at the Co-op or the Hudson's Bay, or share a shore picnic of raw fish and Coke.

Listen and stare into the night as a bush pilot circles the village, hoping the fog will break somewhere before his gas burns out.

Listen to the dogs and the loons and the laughter.

Logan, 19,850 feet high and 200 miles west of Whitehorse.

The knowledge gained at the Logan High Camp will be useful not only to military authorities but to mountaineers, aviators and to athletes competing in high-altitude spots such as Mexico City, where the 1968 Olympics will be held.

The Logan operation was launched when the Arctic Institute of America invited the Institute of Aviation Medicine in Toronto to participate. The United States Army and a group of New York scientists joined in.

Operations at the camp, on a plateau, are confined to about six weeks a year in July and August because of weather conditions. Last summer a research station—a wooden building 32 feet square—was put up on the selected site on Logan's west side.

Volunteers from the Princess Patricia's Canadian Light Infantry in Calgary became the first human guinea pigs.

The primary study is on the use of Diamex as a means of achieving quick acclimatization. The drug, generally used to treat heart failure, is believed to restore the alkali-acid balance in the bloodstream by stimulating the kidneys to produce more alkali.

It is thought that heavy breathing at high altitude produces heavy quantities of carbon dioxide, which is stored in the body as an acid. The excess acid creates some of the symptoms of mountain sickness. The bloodstream apparently holds more oxygen when there is an "alkali state" in the blood.

Other projects planned include a United States Army study of factors, such as heart and lung tissue conditions, that limit oxygen intake at high altitude.

Psychological studies of various kinds dealing with isolation and fear will be made, as well as studies of kidney functions and blood flow to the brain at high altitudes.

Money for the program is coming from the United States Army and Arctic Institute. The Canadian Forces are providing a research team, at least \$30,000 worth of equipment and transportation.

Explorers Club Names Head

Sept. 2

Dr. Walter A. Wood, past president of the American Geographical Society, has been elected president of the Explorers Club, it was announced yesterday. Dr. Wood, who succeeds the late Edward C. Sweeny, is a geographer, explorer and mountaineer who participated in 17 expeditions and led 12 of them.

Plaisted Plans New Pole Trip

By DON BOXMEYER
ST. PAUL DISPATCH

Nov. 3

Ralph Plaisted, Arctic explorer whose assault on the North Pole by snowmobile last spring was thwarted by the elements, will have another go across the snow next year.

The 39-year-old White Bear Lake insurance man said that his expedition will set out for the Pole March 1—a month earlier than his departure the first time.

Five of the 1967 crew will accompany Plaisted. At least two other veteran snowmobilers will serve from here in communications capacities.

Those slated to take part in next spring's trip are: Donald Powellek, 39, of 2119 Clear Ave., St. Paul, an electronics engineer; Dr. Arthur Aufderheide, 44, a Duluth pathologist; Walter Pederson, 39, St. Cloud snowmobile dealer; Gerald Pitzl, 33, 1524 Osceola Ave., geography instructor at University High School; and Jean Luc Bombardier, a Canadian engineer.

Plaisted's group will begin training for the second assault in December with intensive snowmobile practice near Bruno, Minn.

"We'll be up there as soon as we get snow," Plaisted said. "The area is thick with muskeg swamps. The rugged ground best simulates conditions in the Arctic."

Although training techniques will be changed somewhat, the mission is the same—to successfully cross the Arctic ice and reach the pole.

That ambitious task has not been accomplished since 1909, when Admiral Robert E. Peary traveled with dogsleds to the North Pole (there is doubt in some quarters—and Plaisted concurs—that Peary did in fact reach the pole).

In Plaisted's first expedition, the snowmobilers set out from Eureka, a bleak spot on Ellesmere Island some 800 land miles from the Pole.

For the first few days, the group made 50 to 70 miles a day. But then large stretches of open water were encountered and the expedition had to go up to 50 miles off course to reach solid ice.

The weather got warmer as the season moved into April. Ice turned to slush and the open water "leads" grew larger. A support plane contracted to bring supplies to the advance party had difficulty landing.

High winds, which increased as the weather got warmer, blew snow in blinding storms that lasted for days.

Finally, shortly after the first of May, the discouraged party was airlifted back to Eureka. They had logged hundreds of miles of zig-zag traveling, but the closest they got to the pole was 370 nautical miles.

"I was beaten badly after that," Plaisted said, "until we returned and people reminded me it was the first time anyone had ventured so far onto the ice afoot since Peary's trip."

The expedition will originate from one of the northernmost tips of Ellesmere land—Ward Hunt Island, just 15 miles from the point of Peary's departure and only 600 miles from the Pole, versus Eureka's 800 miles.

At this point, Plaisted is busy lining up equipment for the trip. He would like to see more individual, local sponsors for the \$125,000 venture, he said.

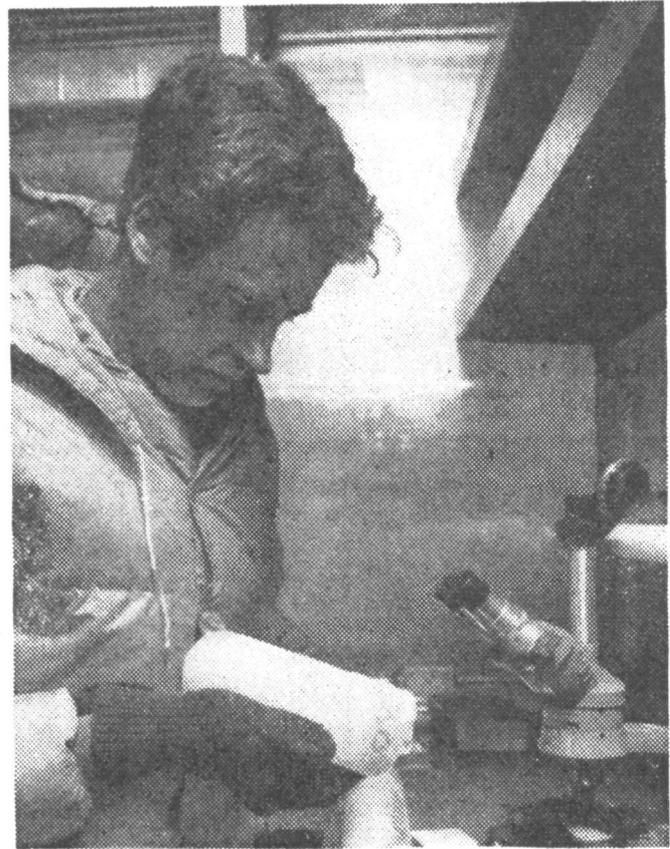
Whaling Ship Declared U.S. Historic Landmark

MYSTIC, Conn., July 23 (UPI)—A whaling ship that has reputedly sailed more miles and caught more whales than any other sailing vessel has been declared a national historic landmark at the restored seaport here.

The Charles W. Morgan last week became the fourth ship in the United States to be designated a landmark.

A plaque was fixed to the old ship on Friday during the designation ceremonies

4 Plan 3,000-Mile North Pole Trek



United Press International Telephoto

Dr. Roy M. Koerner examining an Antarctic ice core in the laboratory of Ohio State Institute of Polar Studies.

COLUMBUS, Ohio, Dec. 28 (UPI)—Four men, including an Ohio State University scientist, will begin in February what they call "the longest, coldest walk ever attempted by man."

They say they will walk across the North Pole from Point Barrow, Alaska, to Spitzbergen, north of Norway, a journey of 3,000 miles. The trip is expected to take 16 months.

The expedition is under the auspices of the Royal Geographical Society of Britain, with the Duke of Edinburgh as patron. The purpose of the journey is to take scientific observations across the North Pole.

Those who will make the trip are Dr. Roy M. Koerner, 35 years old, Ohio State glaciologist, and three Britons—Capt. Kenneth Hedges, 32, of the Royal Army Medical Corps, a physician; Alan Gill, 36, of Bradford, England,



The New York Times Dec. 29, 1967
Broken line denotes route.

a photographer; and Wally W. Herbert, 32, of York England, leader of the expedition.

The men say they will depart about Feb. 5 behind dog sleds. Supplies will arrive monthly by air drop. Daily radio contact will be maintained with the United States scientific station T-3, an ice island drifting with the Arctic current near the pole.

A Force That Pushes Continents Apart

By WALTER SULLIVAN

The New York Times

July 9

The forces that in recent months and years have thrust new islands up through the floor of the North Atlantic, when considered with other new evidence gleaned from the ocean floors, have engendered wide acceptance of the view that our planet is in the throes of dynamic changes.

In the current Polar Record, P. F. Friend of the Scott Polar Research Institute, at Cambridge University in England, assesses the hypothesis that Europe and North America were contiguous 100 or 200 million years ago, then were forced apart to form the Atlantic:

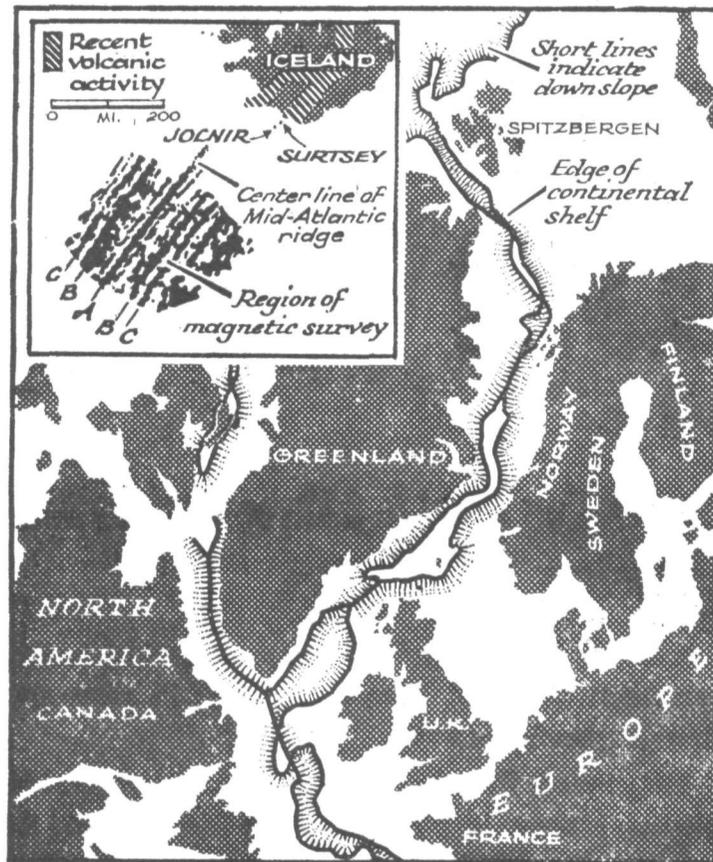
"Recently," he writes, "evidence has accumulated to establish beyond a reasonable doubt that this drift has indeed occurred." The attention of geologists henceforth, he says, "should now be turned from the question of whether drift has occurred to the manner in which it has occurred."

The theory that has evolved in recent years is that hot, plastic rock creeps upward from the bowels of the earth like porridge over a flame, spreads out on the surface and then sinks down in some other region—the edge of the "pot," so to speak. The upwelling occurs along the midocean ridges, as dramatically manifest in the formation of Surtsey and Jólnir islands off Iceland during the last four years. The subsidence begins where material that has flowed outward from the ocean ridges, reaches the continental margins.

A large percentage of the world's earthquakes occur either along the midocean ridges or along continental margins where subsidence is thought to be taking place—for example, the coast of Chile, the Aleutians, Japan and other places around the Pacific basin.

As an example of the striking fit between land masses on opposite sides of the North Atlantic, Friend publishes a map drawn by Sir Edward Bullard and his associates at Cambridge University with the aid of a computer. The fit is between the outlines of the opposing continents as determined by their continental shelves—not by coastlines showing on current maps.

The coastline is drawn by the whims of climate that determine sea level. Should polar ice melt, raising worldwide sea levels, Florida and many other coastal areas may vanish. When much of the world's water is tied up in great ice sheets, the oceans recede from the continental shelves that, for example, reach hundreds of miles to seaward from New York. It is the edges of these shelves that divide the world, structurally, into



Large computer-drawn map shows how continents might have been joined 100-200 million years ago. Magnetic patterns in inset are discussed below.

two provinces: continental blocks and ocean basins. Bullard's computer relocated the blocks of Canada, Greenland and Europe to achieve the best fit.

Another of the most recent lines of evidence has come from the magnetic mapping of the ocean floors. The magnetic maps show regions that deviate, either positively or negatively, from the average. This has revealed peculiar striped patterns parallel to virtually all the midocean ridges. What is more remarkable, the patterns seem to be symmetrical on opposite sides of the ridge.

The explanation that has gained a wide following in the last year is that these patterns are caused by rock that has flowed away from both sides of the ridges. As the rock comes out of the depths and cools, it is imprinted with the earth's magnetism existing at that time.

If, as many now believe, the magnetic field of the earth flips over at intervals measured in thousands or millions of years, these reversals will be recorded in the outflowing rock, just as information is imprinted in a tape recorder.

Laboratory experiments indicate that such reversals occur where magnetism is generated within a rotating fluid, like the earth's interior. If such an event occurred,

the north needle of a compass would point south.

One of the most clearly defined magnetic patterns on the ocean floor arose from a survey of a limited portion of the ridge region southwest of Iceland. The center line of its symmetrical pattern, marked "A" on the chart above, coincides with the center line of the ridge. It is also roughly aligned with the new islands off Iceland and the regions of most recent volcanic activity on Iceland itself.

In the chart, based on one published by Dr. James R. Heirtzler and others at the Lamont Geological Observatory of Columbia University, the features marked "B" and "C" show the symmetry of magnetic features on opposite sides of the ridge. The timetable of the more recent magnetic reversals has been determined by study of lava flows in Iceland and elsewhere. The resulting pattern of reversals seems to fit the sequence of magnetic changes imprinted on the ocean floor. The indicated rate of spreading is a few inches per year in the Pacific and about one inch in the Atlantic.

Friend cites evidence collected from cores, or cross sections of the ocean floor, obtained in many parts of the Atlantic. In some areas—presumably younger parts of the ocean—fossils from the Upper Cretaceous Period, some 70

million years ago, are absent. From this it has been concluded that at that time the ocean was only about two thirds its present size.

One of the most remarkable features of the worldwide system of midocean ridges is the existence of deep clefts along their midlines. These rifts are presumably torn open by the upwelling process. Such a rift runs directly across Iceland and it is now appearing in the evolution of Surtsey. The island has continued to erupt and change its geography. Early this year its area was almost one square mile and in March it was still growing at a rate of 2,400 square yards daily.

The evidence for ocean floor spreading has injected new life into the seemingly static science of geology. Much of the world appears to be in flux. At this spring's meetings of the American Geophysical Union some 10 sessions were devoted to the subject and evidence relating to it. Such long-standing mysteries as the "Andesite line" in the Pacific Ocean seem now to be explicable.

This line passes through the islands of the western Pacific. Islands on the continental side of the line have rocks containing andesite—a basaltic rock often rich in minerals. Its name derives from its presence along the Andes, which it has enriched with gold, silver, copper, tin and other ores.

It is now proposed that andesite pushes upward where rock that has spread across the ocean floors is sinking down under the continents. The rock has become hydrated and has picked up continental type material on the way. As it sinks, its lighter fractions push upward, forming the island arcs and volcanoes that rim such oceans as the Pacific.

As one geophysicist put it after a recent discussion of the subject: "It's a revolution. The geology texts will all have to be re-written."

Arctic Explorer Honored In Boston

Aug. 25

Boston (AP)—Congratulated on being the lone survivor of the 1908-09 expedition that discovered the North Pole, Rear Adm. Donald Baxter Macmillan twinkled, "There may be some Eskimos still living, you know."

The comment was made by the 93-year-old Arctic explorer as 300 leaders in science, government and exploration honored him Thursday for his "outstanding contribution toward public understanding of science."

In addition to the \$5,000 Bradford Washburn award and gold medal given by the Boston Museum of Science Macmillan received a proclamation declaring the date Macmillan Day in Massachusetts.

2 Russians Nearing the End of an Arctic Voyage

Explorers Seeking to Retrace 1,600-Mile Fur-Trade Route in 24-Foot Fishing Boat

Dispatch of The Times, London

MOSCOW, Aug. 2 — Two Soviet explorers in a 24-foot converted fishing boat are drawing to the close of a remarkable 12-week voyage along the Soviet Union's Arctic seaboard.

Dmitri Butorin, a retired trapper, and Michael Skorokhodov, a writer, set out from Archangel on May 14 to retrace the 1,600-mile route taken by medieval fur traders from the Ob River Estuary who sought to avoid the central market of Muscovy. Since May 14, the two men have covered about 1,000 miles, at first nosing through pack ice and now seeking to find a way across the Yamal Peninsula.

The two are heading for the fur city of Mangazeya, at the estuary of the Ob. In the Middle Ages this was the "Polar Baghdad," where goods from Europe were exchanged for furs, skins and mammoths' bones.

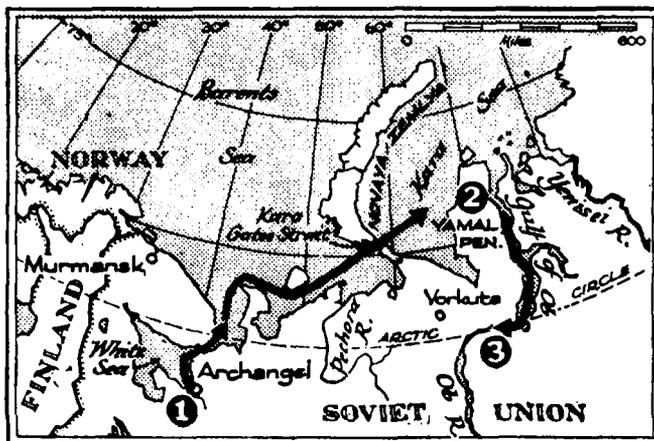
At the beginning of the 17th century, the western route across the icy peninsulas was forcibly closed by Moscow under pressure of Siberian merchants who resented their loss of revenue from the northern route. Now, only ruins of this trade center remain.

The boat, named the Schelia which moved out into the Arctic Ocean before the northern sea route was opened for navigation this spring, was no well-equipped Gipsy Moth IV such as carried Sir Francis Chichester around the world.

It lay as a wreck on an Archangel beach for eight years before Mr. Butorin bought it for five rubles (about \$5.55).

He reconditioned it, built a cabin in the bows equipped with a home-made stove and two bunks. He fitted a primitive jib and mainsail and two outboard motors. There is no radio on board and the adventurers maintained contact through fishing posts and meteorological stations along the shores of the Barents and Kara Seas. When they were overdue on one leg of the journey, an aircraft had to search for them.

A spokesman at Literaturnaya Gazeta, which is trying to follow their progress said today that they were somewhere on the Yamal Peninsula.



The New York Times

AUG. 3, 1967

Two Soviet explorers started from Archangel (1). They were said to be seeking a way across the Yamal Peninsula (2) in retracing a medieval route to the Ob estuary (3).

2 Missing Explorers Found By Copters in Soviet North

The New York Times

MOSCOW, Aug. 8—Two Russian adventurers missing more than two weeks on a desolate peninsula in the Arctic were found by helicopters today, according to Tass, the Soviet press agency.

Concern had mounted over the fate of the men, who set out May 14 from Archangel in a small motorized fishing boat eastward along a hazardous route used by English fur traders more than three centuries ago.

The men—Mikhail Y. Skorokhodov, a writer, and Dmitri A. Butorin, a hunter—were noted in the north—had last been seen when they reached the Yamal peninsula, 1,500 miles northeast of Moscow. They planned to cross the tundra of the 150-mile-wide peninsula by river and lake and continue their voyage in the estuary of the Ob River. Their destination is Mangazeya, once a thriving fur-trading center that was abandoned early in the 17th century when Moscow ordered the Arctic route closed to foreigners.

A search was ordered last week after the writer and the hunter had failed to emerge from the peninsula.

Pigs Feed on Sealskins

MOSCOW (UPI)—The newspaper Komsomolskaya Pravda complained that Siberian pigs dined on sealskin. It said one factory in the Far East that processed sealskins was too small to handle the supply, so hunters sold seals to state farms, which chopped up the seals and fed them to pigs.

Soviet Vessel in Japan After Arctic Crossing

TOKYO, Aug. 25 (Reuters)—The 3,700-ton Soviet freighter Novovoronezh docked at Yokohama today after opening a new sea route between Europe and the Far East through the Arctic Ocean.

The vessel left Hamburg July 29, carrying about 2,000 tons of cargo, and followed a Soviet icebreaker that cleared a path through heavy ice off the Siberian coast.

The Soviet shipping corporation plans to start a regular liner service across the Arctic Ocean next year. The new route is about 4,000 miles shorter than the traditional route by way of the Suez Canal.

Oil Reported Beneath Arctic

New York (Special)—Soviet geologists have discovered a huge petroleum deposit beneath the Arctic Ocean just north of the Yamal peninsula, according to reports reaching major United States oil companies.

Reportedly, the field is large enough to supply the Soviet Union's oil needs for 50 years. It is said to be at "reasonably accessible depth" beneath the surface of the ice-locked sea.

Nikolai Budnikov, the Soviet geologist said to be in charge of the operation, has claimed that the enormous reserves can be reached easily with modern techniques of drilling through the ice.

Soviet Ship Starts A Voyage to Japan Through the Arctic

HAMBURG, Germany, July 29 (AP)—The 3,726-ton Soviet freighter Novovoronezh sailed from this North Sea port today on a pioneer commercial voyage to Japan through the Arctic Ocean.

The vessel carried mail and a mixed cargo taken aboard at London, Le Havre, Antwerp, Rotterdam and Hamburg. She is expected to reach Yokohama in 28 days.

The voyage gained special attention through the current closure of the Suez Canal. The Arctic route from Hamburg, Germany's largest seaport, to Japan is 4,000 miles shorter than around the Cape of Good Hope, the route shippers are now forced to use, the ship's handlers in Hamburg said.

They said that Novovoronezh's voyage was the first commercial trip from a European port through the Arctic Ocean to Japan.

The Novovoronezh, manned by a crew of about 30, is equipped with special bow plating to enable her to plow through drift ice. Capt. Aleksandr Dedjurin said the ship could even cope with solid ice, if not too thick.

Captain Dedjurin said the vessel would make only one stop, her home port of Murmansk, between here and Yokohama.

German shippers were not optimistic that the Arctic route would find wide use. They noted that at best it would only be open three months of the year, and even then floating ice would be a danger.

Ships traveling the route would have to be equipped with ice shields and Soviet charges and fees for fuel and stores would have to be clarified and reasonable.

Fridtjof Nansen Film Being Shot

OSLO (AP) — Honoring a Norwegian who helped save Russians from starving in 1921, Russian and Norwegian movie makers together are filming a biography of Fridtjof Nansen — Polar explorer, humanist, diplomat and 1922 Nobel Peace winner. A 50-year-old Arctic schooner is being converted to represent Nansen's famous "Fram," now an Oslo museum piece.



This cover is a souvenir of the first winter-time Arctic exploration cruise of the USS "Sargo" (SSN-583).

Submarines -- A Topical

Lt. Paul H. Saylor, USN

The Electric Boat Division of General Dynamics Corp. has, for several years, been using a submarine silhouette as part of its meter indicia, as also has the Ingalls Shipbuilding Corp., Division of Littleton Industries.

The trend seems to be that companies involved with building submarines are using this type of advertisement on their mail.

With the advent of special fetes being made by nuclear-powered submarines, covers have become both popular and more readily available to help enhance a collection of this type.

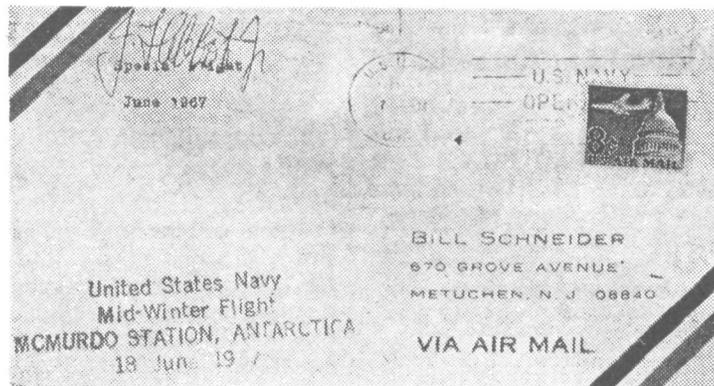
An event of much less renown was the 1931 attempt by Sir Hubert Wilkins to penetrate beneath the Arctic ice pack to the North Pole in a submarine that had been turned over to him by the U.S. government.

He was successful in making a short submerged penetration of the Arctic ice pack and did reach latitude 82 degrees 15' North. He finally scuttled his submarine in a Norwegian Fjord in November of 1931.

Submerged penetration of the Arctic ice to the North Pole remained for the U.S.S. Nautilus (SSN-571) to accomplish in August 1958, with the crossing of the pole at 2315 on the third of the month. The event was philatelically noted by the issuance of an appropriate cachet and postmark.

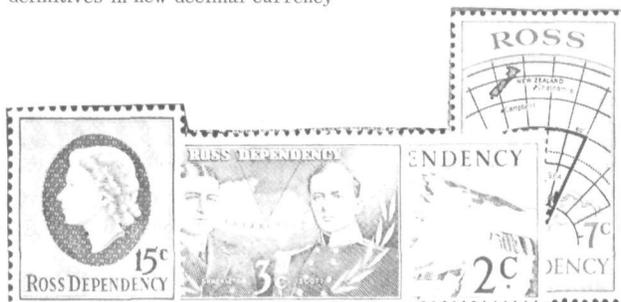
Since then, other notable events have taken place; namely, submerged passage through the Northwest Passage, U.S.S. Seadragon (SSN-584), submerged circumnavigation of the world, U.S.S. Triton (SSN-586); and first winter-time exploration of the Arctic, U.S.S. Sargo (SSN-583).

Also, multiple surfacing of submarines through the ice pack at the North Pole, U.S.S. Skate (SSN-578) and U.S.S. Seadragon (SSN-584). These events were all philatelically noted through cachets and postmarks.



EYES-OPEN POLICY PAYS OFF. "Last winter I read that a flight would be attempted to the Antarctic," explained Bill Schneider of Metuchen, N. J. when queried about the above cover. "It would test the feasibility of flying to the ice, since once the ship left, the area would be closed until the following October." That was clear enough, so he prepared a cover or two and sent them out in hope . . . his alertness and action paid off with the above example from a special flight of June—mid-winter, "down thataway".

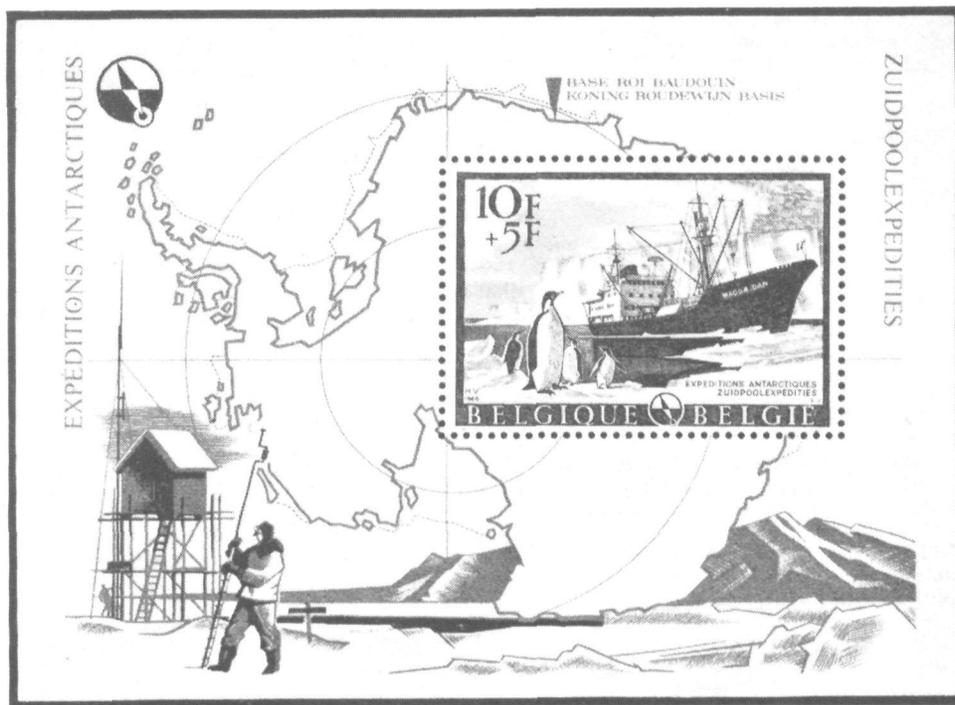
ROSS DEPENDENCIES. Four definitives in new decimal currency



GREENLAND. Greenland Legends series; single stamp features motif from "The Great Northern Diver and the Raven"

Polar Post Office Set Up

WELLINGTON, New Zealand—Because of an increased demand for postal and telegraphic facilities, the New Zealand Post and Telegraphic Department has established a post office at Scott Base in Antarctica, the New Zealand Newsletter reports.





SUMMER scenes in the Hudson Bay country: Eskimo girl carries a baby in a bright plaid shawl; little girls soon graduate from carrying dolls to baby brother.



The boys take advantage of a snowbank left on the tundra in July to practice archery with retrievable arrows.

Beach at Povungnituk features rocks, sledges and a wrecked boat.

