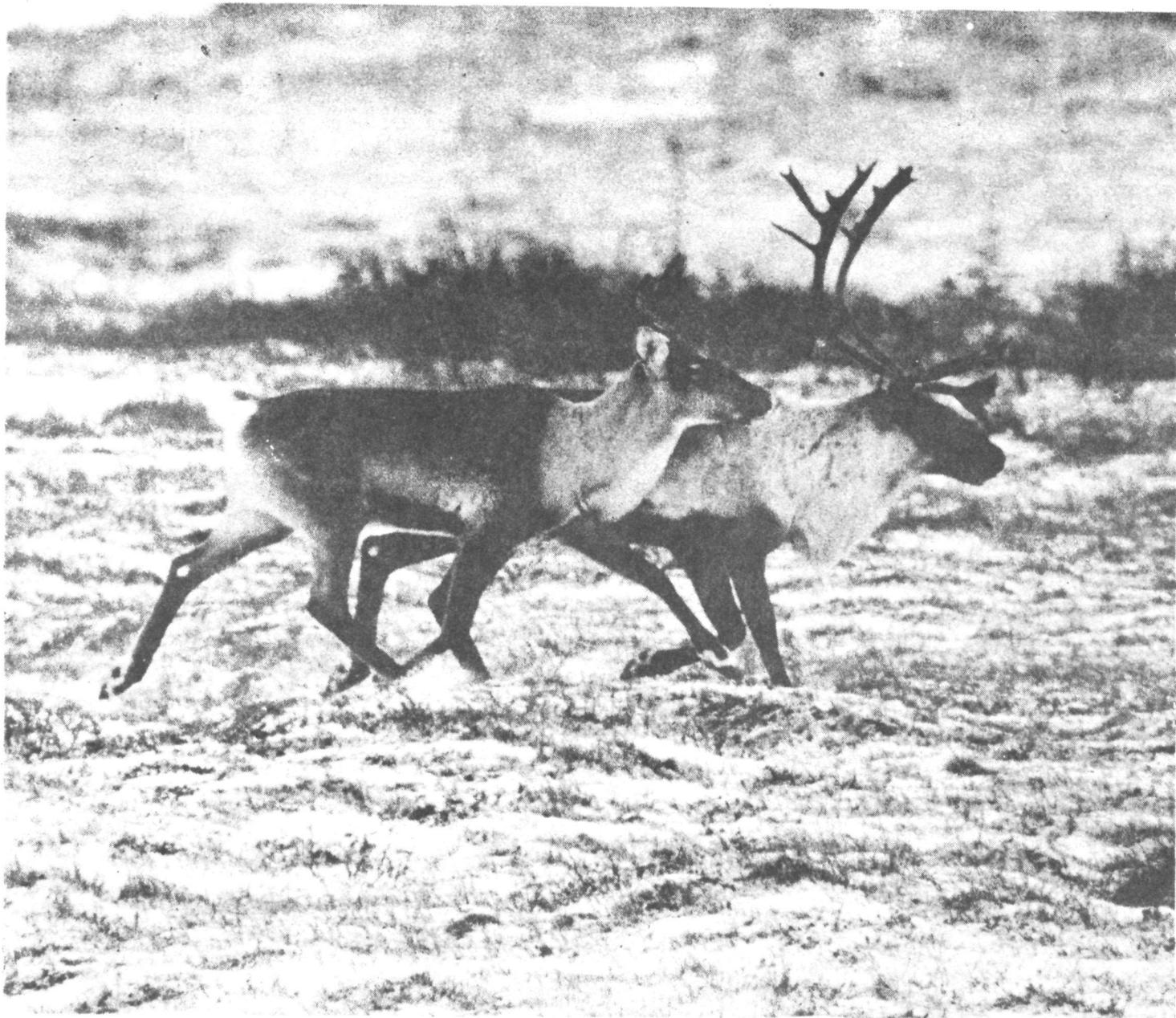


no. 102 (June 1986)

THE POLAR TIMES



Scientists can now use sophisticated tracking devices to follow the movements of caribou on Alaska's North Slope to learn more about their migration patterns.

Satellite tracking is also useful for monitoring polar bears and musk oxen in Alaska.

(U.S. Fish and Wildlife Service photo)

National Oceanic and Atmospheric Administration

The Polar Times

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Opening mystifies scientists

Ozone levels drop above South Pole

WASHINGTON (AP) — Scientists are trekking to the icy wastes of Antarctica, where they will use high-altitude balloons to study a mysterious and alarming ozone "hole" in the atmosphere above the South Pole.

Because of the importance of the atmospheric studies, 13 scientists will be on one of the first flights in August to the winter-locked U.S. base at McMurdo Sound, the National Science Foundation announced Sunday.

Six ski-equipped transport planes will make the 2,100-mile trip from New Zealand, a hazardous night journey normally restricted to personnel essential for the seasonal opening of McMurdo and a few scientists manning crucial experiments.

The sun stays below the horizon for much of the Antarctic winter, which, south of the Equator, occurs in what is summer in northern climes.

Four groups of researchers will use 33 high-altitude balloons and sophisticated instruments in hopes of finding out what causes the recently discovered phenomenon of a drastic drop in the total amount of ozone each spring over the South Pole.

This hole — about the size of the continental United States —

The Polar Times

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by the
AMERICAN POLAR SOCIETY,
August Howard, Secretary,
98-20 62nd Drive (Apt. 711),
Rego Park, New York 11374

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 \$2.00 a year or \$5.00 for 3 years, which entitles members to receive THE POLAR TIMES twice a year.

The American Polar Society is classified as a tax exempt organization under Code Section 509 (a) (2).

occurs in a layer of the stratosphere above the South Pole that protects the Earth from harmful solar radiation.

A form of oxygen that exists in small amounts throughout the atmosphere, ozone also is concentrated 15 miles above the Earth in the stratosphere.

Ozone is critical because it screens out almost all of the sun's harmful ultraviolet radiation. Scientists say a drop in ozone would increase the incidence of skin cancer, possibly harm plant life and cause a number of other adverse effects.

Concern about the ozone layer surfaced a decade ago when some scientists suggested it was being depleted by wide use of certain fertilizers and chlorofluorocarbon chemicals used as refrigerants in cooling systems and propellants in aerosol sprays. The concerns led to restrictions on use of some of these chemicals.

Scientists say the Antarctic episodes do not appear to be an immediate threat to worldwide ozone levels because no completely empty hole has appeared, only a relatively small proportion of the ozone layer is affected and because each incident lasts only a month.

Telltale Meteorites

Since 1969 Antarctica has been recognized as the richest hunting ground for meteorites in the world. A new study shows that meteorites found in Antarctica are not only more numerous than those found elsewhere; they are also chemically different.

Japanese glaciologists discovered 16 years ago that the West Antarctic Ice Sheet is a natural collecting mechanism for meteorites. A fallen meteorite typically sinks deep into the ice sheet, where it may remain buried for hundreds of thousands of years. But Antarctic meteorites often become caught in the slow currents of ice "rivers" which, when diverted to the surface by outcrops of rock, bring their cargo of meteorites with them. Once brought to the surface of the ice, the meteorites are easy to spot; more have been collected in Antarctica since 1969 than everywhere else in the world combined.

Dr. Jane E. Dennison and colleagues at Purdue University report in Science that stony meteorites from Antarctica contain significantly different trace elements than those found elsewhere. The Antarctic meteorites also tend to be far older; ero-

sion destroys most meteorites lying on the ground within 200 years, while the meteorites brought to the surface in Antarctica, having been preserved in ice, are typically 300,000 years old.

But why should age make such a difference in the composition of a meteorite? The Purdue group concludes that the differences between modern-day meteorites and meteorites that fell 300,000 years ago must reflect extraterrestrial differences. Ancient meteorites may be debris from an entirely different type of extraterrestrial object than the kind that produced today's meteorites, the scientists surmise.

Solo Hiker Arrives At the North Pole

PARIS, May 12 (Reuters) — A French doctor has completed a solitary 63-day, 500-mile walk to the North Pole.

An organizer for the expedition, Michel Franco, said in a telephone interview from the expedition's base in Resolute Bay, Northwest Territories, that Jean-Louis Etienne, 39 years old, had radioed to the base that he was in good physical condition and great spirits. He said Mr. Etienne said he had reached the pole at 10 P.M. Saturday. He set off on March 7 from Ward Hunt Island, the northernmost point in Canada.

Mr. Franco said satellites had confirmed that Mr. Etienne had reached the pole by detecting flares he lit.

He said Mr. Etienne had to walk 20 hours nonstop.

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The Polar Times

No. 102

JUNE 1986

South Pole Expedition Loses Ship to Pack Ice

A GROUP of amateur British explorers, rescued by United States helicopters after their ship was crushed by pack ice, gathered at McMurdo Station yesterday for evacuation from Antarctica.

Three members of the party, Robert Swan, Roger Mear and Gareth Wood, succeeded Saturday in completing an 833-mile trek from Ross Island to the South Pole, covering essentially the same route traversed in 1911-1912 by Capt. Robert Falcon Scott of the British Navy and four companions. Captain Scott and his men, who were beaten to the Pole by a Norwegian expedition led by Roald Amundsen, died on the way back.

Although the latest British assault on the Pole was successful, the yacht supporting the expedition was not so lucky. Aboard the 139-foot Southern Quest, 18 men and three women narrowly escaped death Saturday when unusually heavy pack ice crushed and sank the vessel in deep water near Ross Island's Cape Evans. Lloyd's Registry of Ships describes the Southern Quest as a trawler converted into a pleasure yacht. It was built in 1958 and was strengthened two years ago for use in icy waters.

The expedition plan called only for

a one-way overland trip to the South Pole, where the United States maintains a large year-around research station. (It is currently midsummer in Antarctica.) A Cessna 185 light plane carried by the Southern Quest was to take off from the sea ice, fly to the Pole and pick up Mr. Swan, Mr. Mear and Mr. Wood. Instead, however, the heaving pack ice stove in the sides of the 322-ton vessel; the ship then sank, and its 21 occupants escaped to a nearby ice floe.

Guy Guthridge, spokesman of the polar programs division of the United States National Science Foundation, said two HH52 helicopters operating from the Coast Guard icebreaker Polar Star were used to evacuate the 21 people stranded on the ice floe. The helicopters brought them to Beaufort Island, from which United States Navy UH1N helicopters ferried them the rest of the way to McMurdo Station, the main American base in Antarctica.

The Polar Star happened to be available for the rescue at the time because it was in the process of cutting a channel through the ice covering McMurdo Sound, which separates Ross Island from the Antarctic mainland. The channel is needed to enable a supply ship to make its annual trip

to McMurdo Station, carrying fuel, heavy equipment and other supplies. McMurdo Sound, the southernmost body of water in the world, is covered by ice up to 12 feet thick for all but about two months a year.

Mr. Guthridge said that although the McMurdo channel normally takes only about one day to cut, an entire week was required this year because of the exceptionally heavy ice.

The three Britons who trekked to the Pole were to be flown to McMurdo Station aboard one of the Navy's four-engine C-130 ski planes that serve South Pole Station every day during the austral summer. "We're getting all 24 of them out of Antarctica as expeditiously as possible," an American spokesman said. "They're scheduled to arrive in New Zealand on Wednesday."

While the United States claims no territory in Antarctica, American facilities are the largest and best equipped on the continent, and local American officials exercise a certain degree of informal administrative control. Since Antarctic rescue responsibilities often fall to American officials, they try to discourage ill-prepared expeditions of any nationality.

National Science Foundation officials could offer no immediate explanation for the heavy ice this year, although both low temperatures and unusual wave and wind conditions probably played a role.

MALCOLM W. BROWNE

The New York Times / Jan. 14, 1986

Antarctic explorer in SA

Robert Swan, the young Briton who arrived at the South Pole two months ago after a 1 400 km walk across Antarctica, laid a wreath of proteas on March 26 at the monument on Cape Town's Foreshore to the man whose footsteps he followed — Captain Robert Falcon Scott.

He did so at a ceremony arranged by the Society of Master Mariners of South Africa to mark the death in Antarctica of Scott and his companions in March 1912 — and also to give thanks for the safe return of Swan and the other two members of his 1985/6 polar party, Roger Mear and Gareth Wood.

Captain Scott called at Simonstown in his ship *Terra Nova* in 1910 and was warmly received there — as were Robert Swan and his expedition when in Cape Town in December 1984.



Roald Amundsen takes a sighting at the South Pole.

Amundsen Photos Turn Up

News of Norway

Long-forgotten photographs recording Norwegian explorer Roald Amundsen's Antarctic expedition have emerged from an Oslo attic, nearly 60 years after his death. Historians say the 240 hand-colored glass slides, found in a malted milk crate, are a "national treasure of immense importance." Amundsen captured the world's imagination and won international acclaim when he reached the South Pole on December 14, 1911, beating Capt. Robert Scott, leader of an ill-fated British expedition that perished on the return trip, by only a month. Most of the rediscovered photos were taken by Amundsen himself.

8 U.S. Tourists Killed as Plane Crashes on an Island in Antarctic

By GEORGE JAMES

They were eight Americans, all men, united in a trip that would take them on the adventure of a lifetime — spending New Year's Day at a Chilean Air Force base in the fog-shrouded wastes of Antarctica.

But on New Year's Eve the adventure ended in tragedy for the men, one of whom was identified as Paul R. Cox, a Brooklyn teacher.

The twin-engine Cessna Titan 404 taking them from Punta Arenas, Chile's southernmost city, 1,000 miles to the Lieutenant Marsh Air Base in the South Shetland Islands crashed on an island near the base, killing them and two Chilean crew members, the authorities said yesterday.

"Whether they knew each other before or just happened to end up in the same plane, we don't know," Wendell Belew, the duty officer at the United States Embassy in Santiago, Chile, said in a telephone interview.

To Confirm Identities

Last night a consular officer, Larry Huffman, from the embassy in Santiago, about 1,250 miles north of Punta Arenas, was scheduled to arrive at the base on King George Island to confirm the identity of the victims. He was then to set into motion the process that would begin State Department notification of next of kin in five states.

The cause of the crash, at the northern tip of the Antarctic Peninsula, was not immediately known.

Felipe Molina, a spokesman for

Aeropetrel, a charter company that has operated Antarctic tourist flights for six years, said the plane overflew the fog-shrouded runway at the air base and crashed on Nelson Island, about six miles away. The base offers overnight accommodation to tourists.

The accident reportedly occurred at 8 P.M. Tuesday during the region's summer, when there is almost round-the-clock daylight.

Initial reports indicated that the plane climbed to give the tourists a panoramic view of the area before landing, and then lost altitude and crashed.

According to later reports, however, the pilot made an approach to the landing strip but could not land because of fog. Mr. Molina said the pilot informed the base by radio that he was going to make another approach. Then radio contact was lost and the plane disappeared.

48-Hour Excursion

The eight tourists had apparently taken advantage of a twice-monthly charter trip from Punta Arenas that costs about \$7,000 per group. The 48-hour excursion includes lodging at the base and visits to breeding areas of penguins and sea lions.

The names of the eight tourists were disclosed by the charter company. Hanns Ebensten of Hanns Ebensten Travel Inc. of Key West, Fla., which arranged the tour, also provided to The Associated Press a list of the tourists and their hometowns. Occupations were obtained from registration cards at the Cape Horn Hotel in Punta Arenas, where the men stayed before the flight.

The victims were identified as: Ben Callis, 33, Key West, Fla.; Paul R. Cox, 59, teacher, Brooklyn; James C. Howell, 43, teacher, Yellow Springs, Ohio; James M. Jasper, 56, librarian, Oxnard, Calif.; Irving Lambrecht, 63, retired, Los Angeles; Tim Lang, 33, petroleum manager, Carmichael, Calif.; Walther P. Michael, 72, teacher, Columbus, Ohio, and Wayne Riddle, 61, engineer, Buchanan, Mich.

Colleagues of the two men from Ohio, quoted by the A.P., said Mr. Michael was an economics professor at Ohio State University and Mr. Howell was a biology professor at Antioch College.

None of the eight had ever been to Antarctica before, Mr. Ebensten said. "They were all looking forward to this tremendously," he said.

Last night, a call to the only Paul R. Cox listed in Brooklyn, at 184 Columbia Heights, reached an answering machine.

Neighbors in the small co-op building said Mr. Cox, a professor at Brooklyn College, was mainly interested in

drama, French and French literature, and they found it hard to believe that he would be interested in traveling to Antarctica.

"As far as I know, he was on his way to Paris," said a neighbor, Margaret C. Appenzellar.

Also killed were the pilot of the 10-seat plane, Ivan Martinez Diaz, who was also the company's general manager, and his co-pilot, Armando Soto. Mr. Diaz was described as an experienced pilot.

Weather Delays Flight

The men had arrived from Argentina on Saturday, according to employees at the Cape Horn Hotel. They were to have flown to Antarctica on Monday, but their flight was delayed by bad weather.

About 300 tourists have visited the Lieutenant Marsh Air Base in recent years, according to a spokesman for the Chilean Government. The base has 30 permanent residents and can provide accommodations for 40 visitors. It has been the site for scientific and diplomatic meetings.

Chile is the first country to offer overnight tourist accommodations in Antarctica, which has become a growing attraction for cruise ships and charter flights.

In 1979, an Air New Zealand charter DC-10 crashed on Ross Island, killing all 257 Antarctic sightseers aboard in the continent's worst disaster.

Last night a Santiago funeral home reported that it had sent eight coffins to Punta Arenas at the United States Embassy's request.

Bounty of Antarctic Fish Appears Overestimated

Antarctic krill, the shrimplike crustaceans once touted as a virtually inexhaustible source of food for the world, may never fulfill their promise, according to marine biologists from the University of California at Santa Barbara.

Krill, they found, are not nearly as plentiful in the wild as once thought and the current comparatively low volume of krill fishing may be depleting the population.

Just a few years ago experts forecast that krill could supply up to 150 million tons of high-quality protein per year, more than double the total amount of seafood harvested worldwide. Now, it looks as if the current krill harvest, a modest 1 million tons a year (mainly by Warsaw Pact countries and Japan) may not be sustainable. The Soviet catch has fallen to one-quarter of what it was three years ago.

New studies of the life of the two-to-three-inch-long animals shows that their huge schools are not distributed uniformly and that their reproduction is about half as prolific as once thought. Also, the main fishing season, the Antarctic summer, is also the breeding season. This means krill trawlers have an unusually severe impact on the species' reproductive potential.



The New York Times/Jan. 2, 1986

Plane crashed near air base.



Walter R. Seelig, New Zealand National Science Foundation representative, extends best wishes to internationally known Dr. Martin Pomerantz, University of Delaware, who studies solar oscillations each year at the South Pole.

30 Australian Scientists Rescued in Antarctica

HOBART, Australia, March 17 (AP) — An Australian ship has rescued 30 Australian scientists stranded in Antarctica, reaching them just ahead of advancing winter ice, Science Minister Barry Jones said today.

Scientists from Australia's Mawson station were rescued during the weekend, joining 22 others from Edgeworth David base who were rescued March 7.

Mr. Jones said the Australian supply ship *Nella Dan* at times had to seek shelter behind icebergs during fierce gales and to thread her way through treacherous ice floes to reach the scientists and researchers.

"It was operating close to the edge of the ice window when the freezing of the sea could have prevented ship access," he said. "It was a touch-and-go operation."

The rescued scientists were among 91 researchers who were to leave Antarctica late last year during the Southern Hemisphere summer. Plans went awry when the *Nella Dan*, a Danish ship on charter to Australia, became trapped in sea ice for five weeks.

The icebreaker *Icebird* finally freed the *Nella Dan* from frozen seas, but both vessels had to return to Hobart for repairs before starting another rescue effort. Hobart is the capital and chief port of Tasmania, Australia's southernmost state.

Some expedition members have

been in Antarctica since January 1985.

Temperatures in Antarctica are now around 50 degrees below zero.

Mark Wolff, a spokesman for the Government's Science Department, said none of the scientists were in life-threatening situations.

"The worst that could happen is that some of them will have to remain in Antarctica until October," he said in an interview. "All the bases have at least a year's supply of emergency food."

Mr. Wolff said Australia did not ask New Zealand or the United States for help because it did not want to divert them from their scientific research work in Antarctica.

He said an airborne rescue had been ruled out because no Australian station in the Antarctic had a landing strip.

Mr. Wolff said the *Nella Dan* was now in open water about 350 miles north of Mawson Station, traveling at a speed of 11 knots, and was due to reach Albany, in western Australia, on March 26.

Mr. Wolff said the *Icebird* was on her way to Casey and Macquarie Island stations to pick up the remaining expedition members. He said the ship had about one week's leeway before sea ice would make it impossible to continue.

The scientists were doing research on the upper atmosphere and cosmic ray physics, land-based and marine biology, glaciology and weather observations, he said.

Scientists find ancient fossils in Antarctica

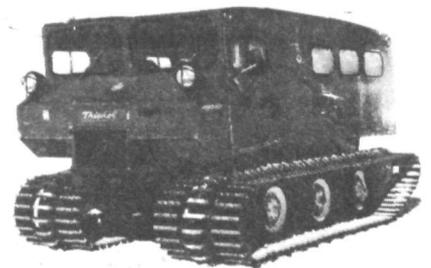
WASHINGTON (AP) — Scientists probing the cold rocks of a mountain range in Antarctica have found 225-million-year-old fossils of reptiles and amphibians, which they say may broaden the range of time researchers believe the animals lived on the now-frozen continent.

A team of scientists working along the transantarctic mountain range during the recently ended antarctic summer found more than 350 vertebrate fossils, including bones belonging to four new species of amphibians and reptiles, the National Science Foundation announced Sunday.

The foundation, which sponsored the expedition headed by Dr. William Hammer of Augustana College, Rock Island, Ill., said the cache included a triangular 2-foot-long skull and a jaw with inch-long teeth from two amphibians, animals at home on both land and in water.

"We shipped back 45 crates of material weighing several thousands of pounds," Hammer said in a telephone interview. "Most of the fossils are still in their surrounding material, and we have to get them out for detailed study and dating."

The discovery is significant because about 50 of the fossils were found at a Triassic period rock level that is 1,000 feet higher than levels where bones associated with that geologic period had been found previously, he said.



This "Antarctic taxi" is comparable to a wild horse and gives a somewhat rougher ride across the ice and snow.

Each year between early October and mid-November, the Air Force flies approximately 17 C-141 resupply flights from Christchurch to McMurdo Sound, which acts as a staging area for cargo and passengers headed to inland research projects.

Polar Explorers to debut in Alaska

A block of four 22¢ stamps which commemorate five intrepid polar explorers will be issued by the U.S. Postal Service May 28 in North Pole, Alaska. (North Pole is a station of the Fairbanks post office.)

The first day ceremony will take place at 1 p.m. at North Pole High School. Members of the Alaska Congressional delegation and state officials are expected to participate.

Details of the designs of the four stamps will not be released by the USPS until the block is unveiled May 21 at a meeting of the New York Explorers Society in New York City.

This is the reason no illustration of the designs accompanies this story. *Linn's* will picture them as soon as they are released by the Postal Service.

The four stamps honor the following:

— Elisha Kent Kane, who threw open the door to the North Pole by sailing his tiny ship *Advance* northward hoping for a sighting of the Polar Sea.

Kane was born Feb. 3, 1820, in Philadelphia, Pa. He was educated as a physician and became a U.S. Navy surgeon in 1843.

In 1850, he led an unsuccessful expedition to Greenland to search for the British explorer Sir John Franklin, who had been missing since 1845.

In 1853, Kane again made plans for an expedition to find Franklin and to establish whether or not there was an open sea around the North Pole.

Pushing into what is now known as Kane Basin and the Kennedy Channel as far as Cape Constitution, he thought he sighted the open Polar Sea.

Although his ship became icebound and none of Franklin's crew was found, Kane and his party accomplished much geographical and scientific work.

Ravaged by scurvy and often near starvation, the group took 83 days to reach safety in August 1855.

Kane died two years later.

— Adolphus Washington Greely, who endured devastating hardship to reach a point that was the closest any ex-



LINN'S STAMP NEWS MAY 19, 1986

plorer got to the North Pole for 21 years.

Greely was born at Newburyport, Mass., in 1844. He became an Army officer and was assigned to the Signal Corps in 1867. During his career, he introduced radio telegraphy to the corps.

In 1882, he led an expedition that explored Ellesmere Island and established a new northernmost record on Lockwood Island.

Greely's group collected valuable meteorological, tidal and magnetic data, faithfully carrying out their work as outlined by the International Circumpolar Conference.

But because scheduled relief ships never arrived, the party of 26 suffered two tragic years of lengthy marches, devastating blizzards and only six to ten ounces of rations per man before Greely and six other survivors were rescued.

In 1887, Greely became chief signal officer in the Signal Corps. He also supervised the building of telegraph lines in the Southwest.

Greely died in 1935.

— Robert E. Peary and his resourceful assistant, Matthew Henson, whose expeditionary assaults ended in triumph at the North Pole in 1909.

Peary, who also was commemorated on an Arctic Explorations stamp issued in 1958, was born May 6, 1856, in Cresson, Pa. He graduated from Bowdoin College.

From 1879-81, Peary served as a draftsman for the U.S. Coast Guard and Geodetic Survey in Washington, D.C. He then became a civil engineer in the U.S. Navy.

His significant discoveries

and mapping accomplishments done in explorations over a 23-year period often were overshadowed by the struggle between him and his beloved adversary, the Arctic.

Peary endured numerous setbacks and the loss of eight toes to prove that man can conquer the planet he inhabits.

With his goal at hand, Peary led five forced marches totaling 133 miles to reach the North Pole on April 6, 1909 — and then covered 485 miles in 16 days to get off the opening ice pack.

Peary retired from the Navy in 1911 with the rank of rear admiral. He died in 1920.

Matthew Alexander Henson, a black, was born on a farm in Maryland in 1867. He was the only American who accompanied Peary when the explorer reached the North Pole in 1909.

Although Peary sent back five support teams on his final dash to the Pole, he kept Henson because, he wrote, "I can't get along without him."

Henson was Peary's invaluable associate from 1887-1909. His sledge driving and hunting skills were considered equal to the Eskimos' best.

Henson died in 1955.

— Vilhjalmur Stefansson, who explored the Beaufort Sea, the last great unknown Arctic area.

Stefansson, often called the "prophet of the north," was born Nov. 3, 1879, in Arnes, Man., Canada.

Of Icelandic descent, he spent a year among the Eskimo in 1906-07, acquiring an intimate knowledge of their language and culture, and forming the belief that Europeans

could live off the land in the Arctic by adopting Eskimo ways.

From 1908-12, he and Canadian zoologist Rudolph Anderson carried out ethnological and zoological studies among the Mackenzie and Copper Eskimo in Canada's Northwest Territories.

A 1913-18 Canadian Arctic Expedition helped fill in the map of the northernmost islands of the Canadian archipelago.

Stefansson sledged thousands of miles safely, but when his ship was caught in ice and sank, only nine out of 20 persons survived a 60-mile trek across a rugged ice pack in weather 45-55 degrees below freezing.

In World War II, Stefansson advised the U.S. government, surveyed defense conditions in Alaska, and prepared reports and manuals for the armed forces.

He died in 1962.

The designer of the four stamps showing these five men was Dennis Lyall of Norwalk, Conn.

Lyall also has designed commemoratives which honored Joseph Priestley, issued in 1982; American inventors, a block of four issued in 1984; and Horace Moses, issued in 1985.

He also designed the 20¢ Thomas Gallaudet and 6¢ Walter Lippmann definitives in the Great Americans series.

The art director for the issue was Howard Paine, a design coordinator for the Citizens' Stamp Advisory Committee.

Richard Sennett of the American Bank Note Co. was the stamps' modeler.

ABNC prepared the stamps and contracted J.W. Fergusson and Sons of Richmond, Va., to print them by the gravure process on a leased Champlain press in yellow, magenta, blue, tone black and line black.

The printed stamps were shipped to the ABNC plant in Chicago, Ill., for perforating on L-perforators and processing into post office panes of 50 stamps each.

Marginal markings on each pane include the Copyright,

Bear watchers give oil firms room

R.C.N.



By The Associated Press

Figuring that polar bears can make life a little too tense on drilling rigs, at least one oil company has turned to professional spotters to watch for the powerful ghosts of the Beaufort Sea ice.

Mel Keeney and Bob Jensen recently set up their 4-by-4 shack near a man-made drilling island at Cape Halkett, about 100 miles northwest of Prudhoe Bay. With a hairdryer to keep the windows clear and a small stove to ward off the Arctic cold, their job is to alert oil company crews on a nearby drilling rig of approaching bears.

The two work for Polar Bear Monitoring Services, a small business started several years ago by Fairbanks hunting guide Gary Wallace, Keeney said. He said the firm now employs about a half-dozen monitors.

"We're just hunters and fishermen and outdoorsmen," said Keeney, 42. "We've had close encounters with bears and learned different ways to deal with them."

There are few specific skills needed for the job, but paramount is patience and a long attention span. A polar bear monitor is not supposed to read or listen to the radio while on his 12-hour shift. Instead, he scans the horizon continually.

Amoco Production Co. pays the monitoring firm \$31 an hour because it wants nothing to do with the large, white critters. It decided the precaution was necessary, especially in spring when the bears' main food supply—the ringed seal—starts popping up near the

drilling sites, said Wayne Smith, Amoco's Alaska manager.

In Canada, where oil companies have been working on the polar ice pack for years, close encounters with polar bears have become common. On islands of the high Canadian Arctic farther east in the Beaufort Sea, and much farther offshore than Alaska companies have been working, polar bears have attacked and killed drilling crew members in recent years.

Jensen, a 35-year-old Nenana resident, advocates frightening rather than shooting the bears. He had ample opportunity recently to practice his scare tactics while stationed at an Exxon drilling structure in Alaska's Beaufort Sea. In 22 days, polar bears approached the rig six times, he said.

One came within 50 yards of the rig and another spent nearly two hours nosing around before lumbering off, he said.

Steven Amstrup of the U.S. Fish and Wildlife Service has studied polar bears in the Alaska Arctic since 1980.

He estimates there are about 2,000 polar bears on the ice pack between Point Barrow and Cape Bathurst, Canada, an area as large as about half of the continental United States. That works out to about one bear every 60 miles of sea ice, "so the chances of bumping into a bear are not all that great," he said.

But the animals are curious and totally unafraid, Amstrup said. "They are clearly the toughest individuals in the valley and don't have to be concerned about anything else."

The bears have not learned to fear man, mainly because any bout with a human usually ends with a dead bear, Amstrup said. He said the animals must be respected because of their strength and size, but that they are not marauding killers.

If the bears and humans are to co-exist, they are going to have to learn to share the ice, he said. Already, half a dozen artificial islands have been constructed in polar bear territory in the search for oil.

"Last fall, we caught numerous polar bears within sight of two drill rigs, so we are advancing out to their area," Amstrup said. "And when in their world, human beings must take care to stay out of their way."

"Remember, the things polar bears eat are about the size of people."

Greenland to issue semipostal

Greenland will issue a 2.80-krone+50-ore semipostal stamp April 17 showing a man on a fishing bladder.

This is a popular spot in Greenland. A harpoon line is attached to the fishing bladder. The man is then drawn to shore.

Thue Christiansen designed the stamp with the aid of the Greenland Sports Union.

Researchers Draw Back the Curtain On the Mysterious Aurora Borealis

By WALTER SULLIVAN

The New York Times

FAIRBANKS, Alaska — Ever since human beings first settled this region they have been awed by the aurora borealis — towering, rippling, multicolored curtains of light that often hang above this city on clear, dark nights. Yet only recently have scientists been able to demonstrate the forces that control these “northern lights.”

In particular the scientists believe they have discovered, through computer simulations and laboratory experiments, the cause of the strikingly uniform folds that often appear in the aurora. Some hope, in addition, to manipulate and “orchestrate” aurora displays by beaming powerful radio waves up from the ground.

Recent tests have also indicated that a related phenomenon, the polar electrojet, a “river of electricity” flowing through the upper atmosphere, may have a practical application. In Norway the electrojet has been used to create extremely low-frequency (ELF) radio waves of the type that the United States Navy would like to use for communication with submerged submarines.

Study of the aurora borealis has been aided by a supersensitive, ground-based video camera that can make extended recordings of the displays, thus bringing their rippling behavior within view of physicists unable or reluctant to spend frigid nights in the Arctic.

The recordings have documented the many forms auroras take, including the rhythmic undulations that led early observers to see them as some form of glowing celestial snake. When Fairbanks is directly under a display, one can look up into a towering cathedral of light whose multicolored walls are more than 100 miles high.

Explanation for ‘Pleats’

An explanation for the remarkably “pleated” auroral curtains has emerged from theoretical speculation followed up by computer simulations here and by laboratory tests at the General Electric Company in Schenectady under the near-vacuum conditions in which auroras form.

The auroral curtains are produced by sheets of high-energy electrons magnetically guided from space into the thin atmosphere between 60 and 200 miles aloft. Oxygen molecules glow red or yellow when struck by the electrons, depending on the electron energy. Hydrogen molecules also glow red. Individual oxygen atoms glow green. Nitrogen atoms emit a purple light and, at lower levels, two-atom nitrogen molecules glow pink.

Dr. Syun-Ichi Akasofu of the University of Alaska’s Geophysical Institute here explained that the plunging electrons induce an electric field in the electrified air, or plasma, on either side of the auroral sheet. North of the sheet they generate an electric field directed toward the south, whereas on the opposite side the field is directed north.

This causes plasma north and south of the sheet to flow in opposite directions at about 1,400 miles per hour. It is this counterflow, according to Dr. Akasofu, that produces the folds, like swirling eddies along the edge of a river.

The auroral record was further enriched last May when a space shuttle flew close to the southern auroral zone, perhaps even through some of the “southern lights” between Antarctica and Australia. Photographs taken by the astronaut Don Lund show a snaking wall of light, reddish at the top, white in the middle and bluish at the base. Others show a narrow, glowing white “highway” across the southern sky.

Dr. Akasofu, taking with him the new photographs and laboratory results, recently flew to his native Japan at the invitation of Emperor Hirohito to brief him on the findings. The Emperor, Dr. Akasofu said, has had a special interest in auroras.

Early Warning of Disturbances

From observations of solar eruptions that lead to enhanced auroral displays, supplemented by data from spacecraft, he said in an interview, it may soon be possible to warn the Air Force well in advance of auroral dis-

An antenna system may be able to “orchestrate” an aurora’s colorful displays.

turbances that could affect space missions, radars or missiles.

Normally the aurora, at any one moment, forms a narrow, globe-encircling band that remains fixed relative to the direction of the sun as the earth rotates beneath it. While invisible in daylight to human eyes the entire oval can be recorded in ultraviolet light from spacecraft.

The auroral oval is centered at the geomagnetic pole in the Canadian Arctic rather than the geographic pole. At local midnight its southernmost part often lies over this city.

Twelve hours later, when it is midnight in Europe, the oval has rotated eastward and that same sector lies over Iceland and the Norwegian coast.

When a magnetic storm, following a solar flare, disrupts the earth’s magnetic field, the auroral zones can swell rapidly, forming in each polar region a far larger area of radiation hazard.

Low-Frequency Radio Signals

The demonstration that the auroral electric current, or electrojet, can be used to generate extremely low-frequency, or ELF, radio signals has been reported in the British journal *Nature*.

A station on the ground in northern Norway transmitted extremely powerful high-frequency radio waves into the electrified upper air through which the electrojet flows. This altered electrical conductivity of the air and, since the heating was intermittent, the electrojet was modulated to generate radio signals at such extremely low frequencies as 1,040 and 1,570 Hertz (cycles per second).

Such waves, reflected back and forth between the earth and the ionosphere, can travel great distances with little energy loss and can penetrate more than 30 feet into the sea. The signals generated by the electrojet were received as far away as Lycksele, Sweden, 345 miles to the south.

To make it possible for submarines to receive messages without deploying an antenna that could reveal their positions, the Navy has long supported research on generation of ELF emissions that can penetrate water. Project ELF, a dual transmission facility with a 56-mile antenna at Sawyer Air Force Base in the Upper Peninsula of Michigan and a 28-mile one near Clam Lake, Wis., is nearing completion and has already been able to communicate with submerged submarines.

However, because ELF waves are 2,000 miles or more in length, to generate powerful transmissions the antenna should be hundreds of miles long. The scale of the ELF Project has been severely restricted by local fears of adverse health effects.

The Navy has supported attempts to generate ELF signals by modulating low-latitude ionospheric currents. In the tests, conducted by Pennsylvania State University, coded messages were sent in this manner over various distances. One was sent from Puerto Rico to the campus at University Park, Pa., using the giant antenna at Arecibo, Puerto Rico, to modulate the overhead current.

Next spring, in a related experiment, an antenna system 30 miles east of here is scheduled to probe the

Computer Age Comes to Eskimos in Canada

By CHRISTOPHER S. WREN

The New York Times

FROBISHER BAY, Northwest Territories — Eskimos need iceboxes too, so 11 settlements in Canada's eastern Arctic are building walk-in freezers to store the game that hunters shoot to feed their families from the land.

But the Eskimos, or Inuit as they call themselves, are taking progress a quantum leap further. The Baffin Regional Council wants to computerize the freezer inventories so that if one hamlet finds itself long on caribou but short on seal, it can trade with another.

In the Arctic, computers are an idea whose time has come, and keeping an inventory of country foods, as local game is called, is only one of the uses envisioned.

"It really is the introduction of a new technology into the North," said Ron Mongeau, executive officer of the Baffin Regional Council. "It won't have the immediate impact of television, but it will have a long-term impact in changing the sociology of the North."

The council was formed in 1977 to coordinate the interests of 14 predomi-

aurora with extremely powerful radio pulses and may be able to "orchestrate" its colorful displays. The tests are being conducted by Dr. Alfred Y. Wong of the University of California at Los Angeles. He has built a circular array of dipole antennas 680 feet in diameter to generate pulses of 1.8 megawatts at one-second intervals. These, as well as continuous transmissions, are designed to stimulate the auroral plasma and test its properties.

Effect on Power Supply

Another practical aspect of auroral research under way at the Geophysical Institute here concerns the extent to which the electrojet induces currents in long conductors, such as pipelines and power lines. Power companies are concerned that, as their systems grow in the north, this could lead to blackouts. Pipeline operators see a danger of current-induced corrosion.

The Alaskan power utilities are completing a north-south tie linking the coastal power grid centered on Anchorage, with the interior one based at Fairbanks. Auroral-induced fluctuations have already been recorded in the tie linking a coal-burning power plant at the Healy mine near the Alaska Range and Fairbanks.

Although witnesses have reported hearing auroral "sounds," no noises audible to the human ear have been documented. They do, however, generate sound waves far below audible frequencies that have been recorded by nets of microphones based here, in Antarctica and Australia. The manner in which such sounds they are generated is still uncertain.

nately Eskimo communities on and around Baffin Island. It works as an intermediate layer of government, interceding on behalf of the settlements with the territorial government.

The effectiveness of the Baffin Regional Council has been hampered by the distance between communities in the Arctic. The Eskimos traditionally reach decisions by consensus, and it has been costly and time-consuming to fly the elders to meetings in Frobisher Bay, the largest town.

The inefficiency of the postal system makes it hard for hamlets to stay in touch. Mr. Mongeau recalled one letter he mailed from Frobisher Bay that took five weeks to reach Grise Fiord, the most northerly settlement.

By contrast, the telephone system, which uses a satellite, is excellent. But communities have little money beyond what the Government provides and cannot afford frequent long-distance calls.

Computers seemed one way to surmount such problems. The challenge was to find one that would not daunt people with a high school education at best. They needed software not only in English but also in Eskimo.

The council chose the Apple Macintosh, a portable computer that uses images to convey commands.

Ed Horne, a schoolteacher in Lake Harbor, a settlement on Baffin island, wrote a software program with fonts recreating the lines and circles of the Eskimo alphabet.

The council is spending \$4,300 to equip every settlement with computer hardware, including a telephone modem, by the end of March. Computers are already in use at council headquarters here and in Arctic Bay, whose Mayor, Phillip Kalluk, uses his com-

puter in Eskimo.

The computers will be used to audit spending of funds, draw up reports and financial statements and exchange information, all for the price of a telephone call at off-peak hours.

"We can drop correspondence into the computer in the day and set a timer on the modem so we can send when the telephone rates are lowest at night," Mr. Mongeau said.

He acknowledged that computers would not provide an immediate panacea for overcoming the historical isolation of the Eskimos. But they have adopted easily to other machines like snowmobiles, which replaced dogsleds as the common mode of winter transportation.

The Arctic temperatures, which can plunge beyond 50 below zero, pose only a temporary nuisance. "We have

popped frozen disks into the computer and get absolute garbage," Mr. Mongeau said. "But if you let the disks warm up, you won't have difficulty."

Island of ice to be oil rig pad

ANCHORAGE, Alaska (UPI) — The first oil drilling pad ever constructed entirely out of ice is being built about 300 miles north of the Arctic Circle, just beyond Alaska's northern coast, oil company officials said.

Amoco Production Co. will pump a minimum of 265 million gallons of sea water from the Beaufort Sea and spray it into the air, where it will freeze into ice crystals that will settle on the frozen ocean, said spokesman Ted Neptune in a telephone interview from the company's Denver office.

Temperatures must remain below zero for the technique to work, Neptune said. He said oil companies experimented with a smaller ice island last winter, but this will be the first ice island ever built to support an exploratory oil drilling rig.

The ice island is to be 950 feet in diameter and extend 20 feet above sea level. The ice mass will sink to the ocean floor where it will be grounded. The depth of the ocean at the site is 25 feet.

When Amoco is finished looking for oil, it will remove the rig and living quarters and let the ice melt — leaving no trace of the frozen drilling pad.

The \$22 million project includes \$9 million alone for constructing the ice island, but Neptune said that cost represents "one-third to one-half what it would cost to build a gravel island."

Other firms looking for oil in the shallow waters of the Arctic Ocean's Beaufort Sea beyond Alaska's northern coastline have constructed gravel islands for their drilling rigs.

Buildings that generate heat and have significant weight will be elevated with a 2-foot air space between the ice and the bottom of the building, Neptune said, and fans will blow the warm air out.

6 Reach North Pole, With Only Dogs for Help

By ERIK ECKHOLM

The New York Times / May 3, 1986

In a grueling test of endurance and self-reliance, six American and Canadian explorers reached the North Pole yesterday evening after nearly two months of walking, jogging or skiing over the rugged Arctic ice pack. They were the first people to reach the Pole assisted only by dogs since Robert E. Peary planted a flag there in 1909.

The explorers, accompanied by 21 huskies pulling two sledloads of food, fuel and equipment, reached the top of the world at 6:50 P.M. Central daylight time (7:50 P.M. Eastern daylight time), 56 days and 500 miles from their starting point.

"This Pole trip is probably the ultimate in self-reliance," Will Steger, a 41-year-old former science teacher from Minnesota who led the expedition, said in February before beginning the perilous journey. In the trip across the ice, two of the team's original eight members were airlifted out because of injuries.

'On Edges of Our Seats'

"Everyone is ecstatic because we've been sitting on the edges of our seats now for two days hoping that we'd hear from them," said Jennifer Kimball, of the Fibertill Division of E. I. du Pont de Nemours & Company, a major sponsor of expedition. "We've heard from the team that it's very overcast at the Pole, and therefore we can't pick them up until it is clear."

Three two-engine Twin Otters at Resolute Bay, in Canada's northern archipelago, 1,100 miles from the Pole, were awaiting orders to make the 24-hour round trip to pick up the explorers and their dogs.

Seven men, one woman and 49 dogs set out with five sleds on March 8 from Ward Hunt Island, the northernmost tip of Canada 500 miles from the Pole.

70 Degrees Below Zero

Two days earlier, an attempted start was abandoned in the face of 50-foot ice ridges, winds and temperatures 70 degrees below zero.

In a reluctant concession to modern technology, made to protect both humans and dogs, the group carried a radio and a satellite homing device that could reveal their location. As planned, 28 of the dogs were airlifted out as the load of food lightened, and empty sleds were burned as fuel and the dogs' services became unnecessary. Early Arctic explorers such as Peary ate their redundant dogs.

One man was picked up along with seven dogs April 2 after he injured his ribs while pushing a sled over an ice

ridge. A second man was airlifted to safety April 16 with frostbitten feet. The rescue planes did not bring any new provisions and gave the explorers, who were navigating by the sun, no information.

Shifting Pack Ice

The dogs pulled supplies in 16-foot-long wooden sleds loaded with 800 pounds of provisions each. The humans trotted or skied alongside. The group traveled about 12 hours a day, keeping to their own schedule in the virtual 24-hour sunlight of Arctic spring.

The North Pole, which is covered with shifting pack ice, has been visited many times by airplane, snowmobile and submarine. But no one has made the trip without mechanical assistance since Admiral Peary, an American explorer who claimed that on April 6, 1909, he was the first man to stand on the North Pole. Although some historians have questioned whether Peary stood precisely on the Pole, most find his claim more credible than that of Frederick A. Cook, who said he had made it nearly a year before.

The Steger team established that they had reached the Pole by using celestial navigation instruments that showed the sun was circling them at a constant angle. This only occurs at the earth's poles.

Clouds Are Enemy

With the magnetic north behind them, the team navigated with age-old tools such as the sextant, which explorers have used for centuries to determine the angle of the sun and stars. Clouds were their enemy, making readings impossible and sometimes forcing them to stop to avoid wasting motion in the wrong direction.

After slow going over rugged ice for their first 10 days, the group made good progress, averaging 20 miles a day, until last Wednesday, according to James Gasperini, who talked with the explorers occasionally by radio and tracked their progress with the aid of the Canadian military aircraft.

Mr. Gasperini, speaking by telephone on Friday from Resolute in Canada's northern archipelago, said that as the team approached the Pole, they progressed only three miles on Wednesday and six on Thursday, according to information gained from the satellite beacon.

Mr. Gasperini said aerial observations of conditions near the Pole suggested that the group might have been delayed by 30-foot ridges of ice, pushed up when plates of ice crashed and buckled.

Such pressure ridges are one of the main obstacles to Arctic travel. Dog sledders must chop a trail over them if they are too wide to go around. Traversing ridges would have been especially strenuous for the explorers last week, Mr. Gasperini said, because to save weight they had thrown away

most of their tools, keeping only a pick, an ax and a shovel.

The travelers might also have been held up by patches of open water called "leads," which can be miles long and range in width from inches to miles. If such cracks in the ice, which open unpredictably in the spring warmth, are narrow enough, a sled can be used as a bridge. Otherwise, travellers must wait for the water to freeze over.

The human travelers lived on a bland, high-fat diet of 7,000 calories a day of pemmican, butter, cheese, oats, peanut butter and energy bars.

The dogs ate seal and walrus meat they had carried along, "science diet" dog food and pemmican. The group did no hunting.

Temperatures ranged from more than 60 degrees below zero to minus 5 or 10, Mr. Gasperini said. The Du Pont Company, which along with the National Geographic Society sponsored the expedition, supplied special clothing designed to preserve warmth while preventing retention of moisture from sweat; wet clothing, which then can freeze, is one of the greatest hazards of polar travel.

The dogs, Alaskan and Eskimo huskies, relied on their own coats. "The dogs are totally at ease," Mr. Gasperini reported. "they actually held up better than anyone."

Reaching the North Pole were Mr. Steger, Paul Schurke, the co-leader, and Anne Bancroft, all from Minnesota, Geoff Carroll from Alaska, and Brent Boddy and Richard Weber of Canada. The two members who were rescued were Robert McKerrow, of New Zealand, and Robert Mantell, of Alaska.

US scientist lauds SA fossils

The South African Museum's fossil collection is probably the finest in the world for the intermediate period prior to the evolution of mammals. This is the view of a palaeontologist from the University of California, Berkeley, Dr Tim Rowe, who recently visited Cape Town as a guest of the South African Museum.

Dr Rowe's special subject is the early evolution of mammals. He believes mammals appeared about 150 million years ago and are therefore some 40 million years "younger" than was previously supposed. He is also researching the patterns with which evolutionary transformations are recapitulated in the growth of all mammals, including humans; particularly in the months between conception and birth.

600 Applaud Returning Arctic Explorers

ST. PAUL, May 4 (AP) — Four members of the six-person team that reached the North Pole Friday after a 56-day, 500-mile trek received a heroes' welcome here today.

"What a fantastic, miserable and wonderful trip," one of the team members, Geoff Carroll, told a crowd of 600 people who waved American flags and cheered as the team's jet landed.

"We all love you," Gov. Rudy Perpich told the team. "Congratulations on a wonderful journey."

"We're overwhelmed," said Will Steger, the team's leader. "The experience taught us the powers of faith and perseverance."

Using dogsleds to transport provisions and navigating only by sextant, they had duplicated the 1909 race to the Pole by Robert Peary. The expedition's log is to be compared with Peary's journal and with that of his arch rival, Dr. Frederick A. Cook, who said he had beaten Peary to the Pole by a year.

The four flew here from their base camp at Resolute Bay in Canada's Northwest Territories, where they had been flown Saturday from the Pole.

The adventurers, who had been two months without news, were shocked on arriving at Resolute Bay to learn of the bombing of Libya by the United States and of the accident at a nuclear power plant in the Soviet Union.

Besides Mr. Steger and the expedition's co-leader, Paul Schurke, both of Ely, Minn., and Mr. Carroll, of Juneau, Alaska, the expedition included Ann Bancroft of Sunfish Lake, Minn., and Richard Weber and Brent Boddy, both



Associated Press

Will Steger, leader of the expedition to the North Pole, getting a hug from a supporter after four of the explorers arrived in St. Paul.

of Canada. Two others who started the trek, Robert Mantell of Anchorage and Robert McKerrow of Anakiwa, New Zealand, were injured on the way to the Pole and had to be evacuated by air.

The adventurers brought sad news. Critter, a lead sled dog, died just before the expedition reached its goal. Critter was owned by Mr. Mantell, who was evacuated April 16. Team members

said Critter never pulled well after his master left and died last Wednesday of unknown causes.

Members of the team planned to travel to the Washington Tuesday for a news conference at the headquarters of the National Geographic Society. The society and the Fiberfill Division of E. I. duPont de Nemours & Company were major sponsors of the expedition.

Explorer Describes Grueling Trek

By CHRISTOPHER S. WREN

The New York Times

OTTAWA, May 5 — After Will Steger enjoyed his first hot shower, change of clothes and proper meal in nearly two months, he thought about what he and five comrades had just accomplished: the first confirmed trek by dogsled without resupply to the North Pole.

Mr. Steger said the polar expedition "took all of my physical, spiritual and mental resources — I had to hone these all down and strive for perfection."

"The first couple of weeks were just ungodly cold," he said as he talked by telephone from Resolute in Canada. "I've never had anything like it." The temperatures plunged to 70 degrees below zero before the team's thermometer stopped working.

Then came two severe blizzards: "There were 60 mile an-hour winds, but the temperature was 45 below." Mr. Steger estimated the wind-chill factor at "who knows? — 120 below?" The six explorers sat out the blizzards in their tents and later were delayed once more by "white-outs," with visibility so bad they could not navigate.

Mr. Steger, a 41-year-old former high school teacher from Ely, Minn., had logged 12,000 miles of Arctic travel, much of it solo, before he set off for the North Pole. He and seven companions headed north on March 8 from Ward Hunt Island, at the northernmost tip of North America, with 49 dogs and five wooden sleds piled with supplies.

Last Thursday, after 55 days of intense cold and frequent encounters with ice ridges up to 40 feet high and open patches of freezing water, six of the explorers and 20 dogs arrived at the North Pole. They then spent a day establishing their location with a sextant that showed the sun at the same angle.

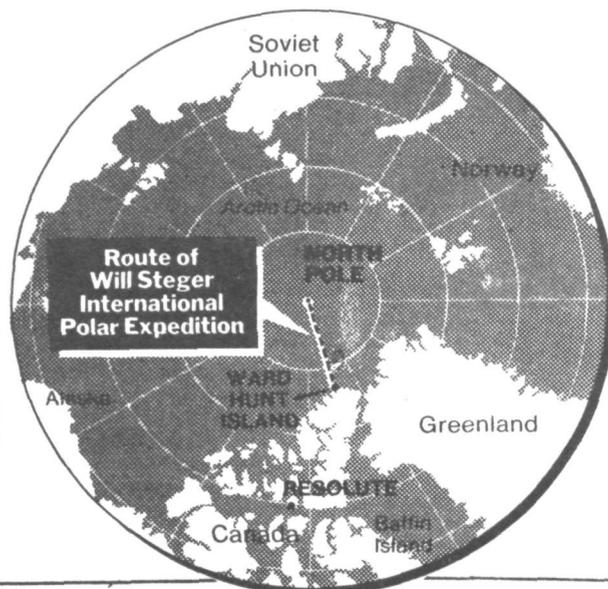
Two injured team members and 28 exhausted dogs had been evacuated earlier by aircraft. A favorite lead dog collapsed and died. The Steger International North Pole Expedition refused to be resupplied and reached their goal with barely 10 pounds of food among them.

The Steger party is the first to reach the top of the world without mechanical transportation since Adm. Robert E. Peary did so on April 6, 1909. Frederick A.



The New York Times/Christopher S. Wren

Ann Bancroft with dogs used in North Pole expedition.



Cook disputed Peary's claim to have discovered the pole, however, contending that he beat the Admiral by nearly a year, reaching it on April 21, 1908.

But the Steger team, four Americans and two Canadians, was the first to be confirmed at the North Pole, by both satellite reading and overflying aircraft.

The explorers included Ann Bancroft, a 30-year-old physical education teacher from Minnesota who was the first woman to trek there unsupported. At one point she fell in, up to her waist, in one of the patches of open, freezing water, or "leads," and was quickly hauled out. At those temperatures wet clothes can freeze almost instantly and cause hypothermia. She changed to dry clothes in a hastily erected tent, and the team headed off again.

While they traveled north along a 75-degree longitude, Paul Schurke, a 30-year-old Minnesotan who was co-leader of the expedition, took daily readings with a hand-held sextant, which measures the angle of the sun and other celestial bodies to determine the latitude and longitude.

He led the team to within a hundred yards of the North Pole with the sextant. A radio signal relayed to a satellite confirmed to the expedition headquarters at Resolute that their location was latitude 89 degrees, 59.9 minutes — a scant second away from the 90 degrees of true north, Mr. Steger said. The explorers zigzagged around the drifting ice to make sure

they crossed the northernmost point on earth.

"It's phenomenal — it's beyond luck," said Mr. Steger, who credited Mr. Schurke with the feat.

In a telephone interview from Minneapolis, Mr. Steger was asked to expand on his reasons for subjecting himself to such exquisite misery:

"I do these things for self-growth. It's an exercise not just of the physical but of the growth of finer powers. It's the challenge and adventure. I can't deny it — an exercise in excellence."

The air distance from Ward Hunt Island to the North Pole is 500 miles, but Mr. Steger estimated that they traveled at least 900 miles because of detours forced by pack ice that had collided and buckled up into ice "pressure ridges."

On skis, they scouted routes through the ridges, but the dogs could not always haul their sleds, laden with half a ton of supplies each, up the slopes. So each sled had to be hauled by two dog teams instead of the usual one. Describing the double-teaming, Mr. Steger said "we would bring the loads forward seven or eight miles" and then go back with the dogs to pick up the next group of loads.

This meant that "for the first 120 miles, we traveled 360 miles," Mr. Steger said.

"There were times when I almost think that what we were doing was impossible," he said.

On March 17, a team member from New Zealand, Bob McKerrow, broke several ribs when a bouncing sled slammed into his chest. He was evacuated out by plane along with seven dogs, some of which had been hurt in dogfights.

A couple of weeks later, with 300 miles to go, Robert Mantell, a 31-year-old Alaskan, suffered severe frostbite of his feet. "He was in extreme pain," said Mr. Steger, who had him evacuated, too.

As the food, which accounted for most of their load, was eaten, the team members burned two sleds for firewood and flew a third out to a museum along with the weakest dogs. Admiral Peary and Dr. Cook killed their spare dogs for food.

Mr. Steger had bred some of his dogs from Eskimo and Alaskan stock, with a little wolf mixed in for intelligence and endurance. Mr. Mantell brought his lead dog from Alaska, but most of the animals were leased from two Eskimo communities in Canada.

"The Eskimo dogs really were stars when the workload was heavy and the weather was cold," Mr. Steger said. But on the flatter ice, "doing 30 miles a day," he said, "I

would say my dogs did better. They were out front all the time."

The explorers traveled at least 12 hours a day. "We kept the dogs as strong as possible," he said. "The food was real short at the end. They were about as tired as we were."

A day before they reached the pole, he said, Mr. Mantell's Critter, a friendly lead dog of which team members were especially fond, went into convulsions and died. "We couldn't figure out why," Mr. Steger said. "He had a good appetite and been eating well."

Mr. Steger worked several years planning the trek, which he estimated cost \$350,000 in cash and an additional \$400,000 in donated supplies and services.

He devised a high-fat diet of 7,000 calories a day, nearly three times the intake for a normal adult. It featured butter and peanut butter, cheese, noodles and oatmeal cooked up in two bland meals.

The high fat was meant to provide a slow but consistent release of energy.

But he said, "I had a bad reaction to it for the last three weeks — stomach cramps and some diarrhea." For his next expedition, in which he hopes to cross Antarctica, he said he would modify the diet in times of less-severe temperatures. "I would probably have a couple of biscuits during the day, maybe more variety — rice instead of all noodles," he said. "We needed more dry meat. Two ounces of dried meat would have gone a long way."

Even so, Mr. Steger reported, nobody lost too much weight. "Everyone is strong hard and lean," he said. "It's not just walking 30 miles; it's pushing and grunting and hauling."

Blood samples taken at the North Pole will be analyzed this week at the University of Minnesota to check cholesterol level.

Mr. Steger said the team stayed clear of "shear zones," treacherous areas where the ice is cracked and pulled apart by ocean currents.

When they encountered the "leads" of exposed water, they had to wait for

Little Diomedé — population of about 140 — clings precariously on a steep, rocky mountainside in Bering Sea

LITTLE DIOMEDE ISLAND — Spring usually arrives late at Little Diomedé Island, a barren, rocky outcrop in the middle of the Bering Strait.

But the island's 154 residents take winter in stride, using the Arctic ice as a platform from which to harvest seals, walrus, crabs, fish and polar bears.

Despite its remoteness, Diomedé gets a trickle of visitors. In summer, a few tour boats tie up at a landing below the village, comprised of several dozen wooden buildings rising steeply up a treeless, windswept slope.

Many of the visitors come to buy ivory carvings turned out by the villagers, mostly Yupik eskimos.

Others, in winter, land on a runway carved from Chukchi Sea ice to buy some of the sweet, succulent king crabs harvested near the island.

There's only one telephone in the village. That's located in a combination firehall and post office. The general store, about 100 feet away, doubles as a meeting place and sales room.

Smiling, bubbling children are indulged in the store for a few minutes before being shooed outside to play on their plastic sleds or to throw snowballs at each other from rooftops.

Little Diomedé is one of America's last outposts. The island is separated by 2½ miles and the International Dateline from Big Diomedé, which is Soviet territory.

But the villagers shrug off the Cold War as they do the cold weather, going about their business of surviving in the harsh Arctic environment.

refreezing. "On one lead about 30 yards wide, we used a block of ice and ferried the dogs across," Mr. Steger said.

The farther north they traveled, the more they worried about the ice breaking up in the spring thaw. "The last 30 miles were bad," Mr. Steger said. "You could see the ridges moving on you, opening and pushing and grinding."

To lighten their loads, the team jettisoned two sleeping bags, because ice accumulation had increased their weight from 15 to an estimated 50 pounds apiece. The four sleeping bags left were zipped together in two pairs, each shared by three people. "It was very tight, but we saved a lot of weight," Mr. Steger said.

He praised the synthetic insulation provided for the clothing and sleeping bags by E.I. du Pont de Nemours & Company, a principal expedition sponsor. Unlike down, the insulation, even when wet, held in body heat.

The expedition leader said the team members worked well together, though they suffered some "tent fever" toward the end.

Geoffrey Carroll, a 35-year-old Alaskan, has called the trip "fantastic, miserable and wonderful," and Mr. Schurke has likened the pushing of dogs and sleds up and over the ridges to "pushing cars out of snowdrifts 12 hours a day."

Two Canadians, Brent Boddy, 31, and Richard Weber, 26, completed the team.

"I'm starting to feel an achievement and realize just what we have done," Mr. Steger said. "But what I come out of the trip with is, I guess, humility and thankfulness. I was totally amazed at the power of faith and perseverance. I had such faith in the people with me and the millions of people at home. I knew this was what was going to make the Pole. It was faith.

"It was an incredible experience and humbling all the way through."

Ivan Papanin, Explorer, Dies; Led Soviet Ice-Floe Research

By THEODORE SHABAD

The New York Times / Feb. 7, 1986

Ivan D. Papanin, the Soviet polar explorer who commanded the Russians' first ice-floe station in 1937-38 in one of the more daring exploits in polar history, died Jan. 30 in Moscow. He was 91 years old.

One of the best known public figures in the Soviet Union, Mr. Papanin was the last survivor of the four-man crew that drifted for nine months from the North Pole to the vicinity of southeast Greenland. The drift, which ended in a dramatic rescue as the floe threatened to break up in warmer water, was front-page news around the world.

Ice-floe research stations have become routine since then, with the Soviet Union regularly operating two or three at a time.

All four crew members of the first station received the title of Hero of the Soviet Union, the nation's top military award, and went on to hold high positions in science and Government. Pyotr P. Shirshov, the crew's marine biologist, who became Minister of the Merchant Fleet, died in 1953; Ernst T. Krenkel, radio operator, who had spent time in the Antarctic with Adm. Richard E. Byrd, died in 1971, and Yevgeny K. Fyodorov, geophysicist, died in 1981.

Mr. Papanin, in the book "Life on an Ice Floe," published in New York by Messner in 1939, described how the four men and a dog, Jolly, were deposited by plane on the ice in May 1937, and found themselves and their tents in melt water in summer and in temperatures of 50 below zero Fahrenheit in winter before they were rescued by icebreakers in February 1938.

After a triumphal reception in the Kremlin, Stalin made Mr. Papanin head of the Northern Sea Route Administration, a Government agency that operated shipping and research stations along the northern Siberian coast.

In that capacity, Mr. Papanin led an expedition in January 1940 to free the icebreaker Georgi Sedov after it had drifted for 26 months across the central Arctic, trapped in ice. The rescue

operation earned Mr. Papanin a second title of Hero of the Soviet Union.

Born in 1894 in the Crimean naval base of Sevastopol, the young Papanin went to sea at an early age and served as a sailor on one of the czarist naval vessels that had a crew mutiny at the time of the Bolshevik revolution in 1917.

Starting in 1932, he devoted himself to Arctic exploration. Before being named commander of the ice-floe station, he headed polar research stations at Tikhaya Bay on Franz-Josef Land and at Cape Chelyuskin on the Siberian coast.

Named Rear Admiral During War

In World War II, Mr. Papanin played a key role in Arctic shipping operations, and was given the rank of rear admiral in 1943.

In 1948, he became associated with the Academy of Sciences, serving as a deputy director of the Oceanography Institute and, after 1951, as the head of marine research expeditions. From 1952 to 1972, he was also director of the academy's Institute of Biology of Inland Waters.

Mr. Papanin held the degree of doctor of geography, and from 1945 to his death was the chairman of the Moscow branch of the Soviet Geographical Society, which has its headquarters in Leningrad.

Among his many awards, in addition to the double title of Hero of the Soviet Union, were nine Orders of Lenin, the Order of the October Revolution and two Orders of the Red Banner.

Ahmaogak hot on Eskimo garb

Times Juneau Bureau

JUNEAU — North Slope Borough Mayor George Ahmaogak will take his seal skin mukluks and lambskin parka over the U.S. military's best clothing issue anytime he's tramping across Antarctica ice fields.

Ahmaogak, who lives in Barrow, was invited by the National Science Foundation to test cold weather survival gear on the world's southernmost continent. He spent

the last two weeks in McMurdo, Antarctica, comparing Eskimo garb with survival gear used by the military.

"They really need good clothing," Ahmaogak said. "Parkas and warm pants. I'll stick with mine anytime."

Ahmaogak, who is a whaling captain when he's not running the nation's northernmost government, said the science foundation needs to improve much of its

survival training program. He said the scientists could learn something from the Eskimos in dealing with dehydration, frostbite, and shelter and food requirements.

The mayor said a team of 20 people flew from Christchurch, New Zealand, to take part in the experiments.

Ahmaogak said he'll make an official report to the National Science Foundation later this year.

Modern technology helps old custom

Associated Press

FAIRBANKS — Natives are using state-of-the-art technology to help them in their primitive pursuit of whales off Alaska's northern coastline, and it seems to be helping.

The whalers are using satellite images to help them find open water where migrating bowhead whales might be found.

Barrow residents have landed seven bowhead whales during the past month. That's nearly twice the number they've caught in a single whaling season in eight years, says Jana Harcharek, office manager of the Alaska Eskimo Whaling Commission.

Harcharek attributes at least part of the whalers' success this season to pictures of the coastline taken from a satellite circling more than 450 miles above the Earth.

The whaling commission ordered the photographs from the Geophysical Institute at the University of Alaska-Fairbanks.

The black-and-white satellite images show where leads of open water penetrate the ice along the frozen coastline, says Greta Burger, a research aide at UAF.

"The photos give whalers tidbits of information like where the ice is breaking off and where one might think about setting up camp," Harcharek says.

The photos are processed at a satellite tracking station owned by the National Oceanic and Atmospheric Administration on Gilmore Creek near Fairbanks.

Through a program called "Quick Look," researchers can process images of the coastline and distribute them to customers within a few hours after the satellite passes overhead, Burger says.

The whaling commission paid \$125 for each set of satellite images. The commission ordered three sets, but were able to inspect only two. "The third day was so cloudy, you couldn't see anything," Burger says.

Although the bowhead whale is considered an endangered species, Alaska natives are allowed to take a limited number each year for subsistence purposes. Quotas are set by the International Whaling Commission



After 14 months in Antarctica, the 26th South African National Antarctic Expedition recently returned to South Africa aboard the SA Agulhas. On landing in Table Bay harbour they commented that it would be difficult to adapt to Cape Town's "tropical heat" after having grown accustomed to working in temperatures dipping as low as minus 45 degrees Centigrade.

U.S. Submarines Meet at Pole

WASHINGTON, May 23 (UPI) — Three nuclear-powered submarines surfaced together this month at the North Pole on a mission that signaled a reinforced United States submarine presence under the Arctic ice pack, Navy officials said today.

The operation by the attack submarines Hawkbill, Ray and Archerfish comes at a time when Soviet submarines with intercontinental-range nuclear missiles have been increasingly exploring the Arctic depths from which they could launch weapons against the United States in the event of war, the officials said.

The Pentagon announced that the three attack submarines linked up and

surfaced at the North Pole May 6, but offered few details about their mission.

"The mission of the submarines was to collect scientific data and test submarine force readiness under Arctic conditions without logistics base support," a Pentagon statement said. The announcement was held up until the three submarines returned to their home ports, Navy officials said.

They said the mission involved locating underwater currents to determine where cracks in the ice may develop and experiments to determine how torpedoes and sonar and other anti-submarine warfare gear operate in frigid temperatures.

Soviets see big future for Arctic

By Andrei Baranovsky, economist,
Novosti Press Agency

According to Soviet economist Abel Agenbegyan, the development of the Arctic is the largest economic program for the future. Year-round navigation is essential for this development.

The Northern Sea Route Administration operates many ships specifically adapted for arctic navigation. They transport cargo from Murmansk in the west to the Port of Pevek in the east.

The use of aircraft, meteorological stations and special polar stations all help ships to navigate the ice-covered shipping lanes, but navigation along the Northern Sea Route remains difficult.

Cargo ships are usually lead by powerful icebreakers. The fleet of Soviet icebreakers includes three nuclear-powered vessels. The LENIN was built 25 years ago. Its 44,000 hp engine capacity and displacement of 15,300 tons were unmatched at that time. The LEONID BREZHNEV was built 10 years ago.

The third icebreaker, SIBERIA, will soon be joined by the ROSSIA which is

under construction. THE ROSSIA, with a displacement of 25,000 tons and 75,000 hp engine capacity, will make her maiden voyage in 1986.

Before the advent of nuclear-powered icebreakers, navigation of the western section north of the Soviet Union lasted only five months of the year. Year-round navigation in this section of the North-

ern Sea Route is now possible.

The emergence of a new type of cargo ship has increased prospects for development of the Northern Sea Route. These ships are able to carry special floating cargo containers. Each container can carry 376 tons, and the ship's on-board crane can load or unload a single container in 20 to 30 minutes.

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The stamps of the Australian Antarctic Territory are popular with collectors and noncollectors alike, something to be considered by the investor.

AAT stamps attractive

It hasn't produced a lot of stamps. It isn't a place visited by hosts of tourists every summer. There isn't much to do there, and the climate might not exactly attract surfers and blanket-party types.

In spite of all those negatives, the Australian Antarctic Territory manages to attract one species which is of common interest to readers of this page: stamp collectors and investors.

"I don't know," said one AAT enthusiast the other day, "it's just a romantic kind of place, stuck off down there at the end of the world. There's a kind of mystery about it that makes it interesting to get the stamps."

If popularity among philatelists and nonphilatelists alike were the chief criterion for stamp investment, then there would be a whopping big market for AAT issues.

Because not only are collectors fascinated by these stamps, but also there are many noncollectors who buy the stamps just because of their interest in the place.

Even some of the new issues provide good investment potential because they tend to rise rather rapidly once the original supply is sold out.

A case in point is the 1983 Wildlife se-tenant strip of five which features inhabitants of Macquarie Island (Scott L55), a part of the territory which has been a wildlife sanctuary since 1933.

The 1908 and 1909 South Pole exploration team leaders are featured on the set, as are other designs reminiscent of polar investigations.

Perhaps third in order of desire to acquire would be Scott L23-34. This is a handsome set of 12 values issued Aug. 15, 1973, and featuring for the most part fauna of the region.

This set is not uncommonly found, although it is believed that the printing for the total set was quite conservative. Right now it can be purchased for close to \$10-\$13 MNHVF.

Two other sets are probably important to the investor. The first is Scott L19-20. Issued June 23, 1971, this pair of stamps featuring snow forma-

tions and pancake ice symbolized the tenth anniversary of the signing of the Antarctic Treaty, an agreement which guaranteed — or at least promised — the peaceful use and continued scientific investigation of the territory.

While the signing of the treaty was amicable, the competition for control and exploration of the area has not been. This set now costs less than \$10 in MNH condition.

The final recommended set is the very popular Ships issue, an extended issue which saw the light of day variously for 1974 to 1981.

The set depicts ships whose history has intermingled with the events surrounding the discovery and exploration of the territory.

Of course, ships and vessels remain a very strong topical theme for collectors, and this set is expected to see increasing prices over the passage of time.

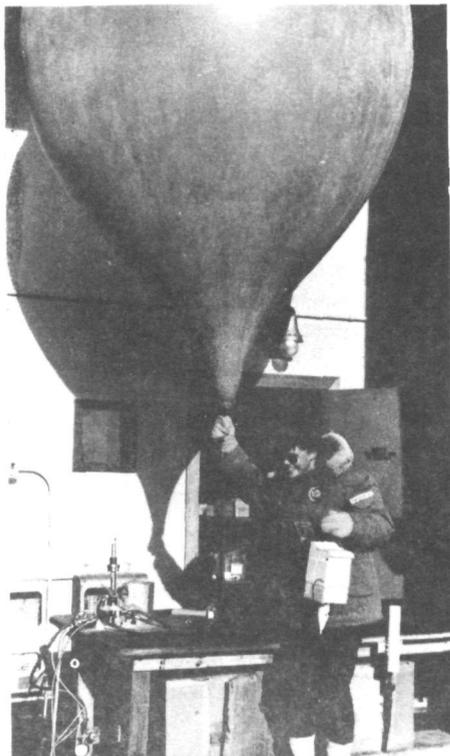
Right now it, too, can be bought for less than \$10 in MNHVF condition.

What I would strongly recommend to collector/investors is that they go back and, if they can get over the hump of the one expensive set, manage a complete collection of the "country."

To be sure, some of the singles are inexpensive and may not double or triple in value, but it is, as our friend said, a most romantic place. ■

At Amundsen-Scott South Pole Station Robin Moyle helps meteorologists with daily weather readings by releasing an instrumented weather balloon.

U.S. Navy photo by Caulkins.



Girl Scouts visit Antarctica

In Taylor Valley, Karen Prentice chips ice from a hole used by divers working in Lake Hoare.

U.S. Navy photo by Vaughn



U.S. Navy photo by Porbansky.

During the 1985-1986 austral summer, two Girl Scouts, Karen Prentice (alternate) and Robin Moyle (selectee) participated in the U.S. Antarctic Program. These two young women were selected to participate in the antarctic program by the Girl Scouts of the United States after a national competition. In this photograph Karen (left) and Robin (right) stand near the Richard Byrd memorial at McMurdo Station.

Robin Moyle and NSF geologist Anton Inderbitzen display the National Science Foundation flag at Amundsen-Scott South Pole Station. The geodesic dome, which houses the buildings at the U.S. station, and "skylab" can be seen in the background.

U.S. Navy photo by Caulkins.

Two emperor penguins watch Girl Scout Robin Moyle at the sea-ice edge.

U.S. Navy photo by Caulkins.

