

# ANTARCTIC

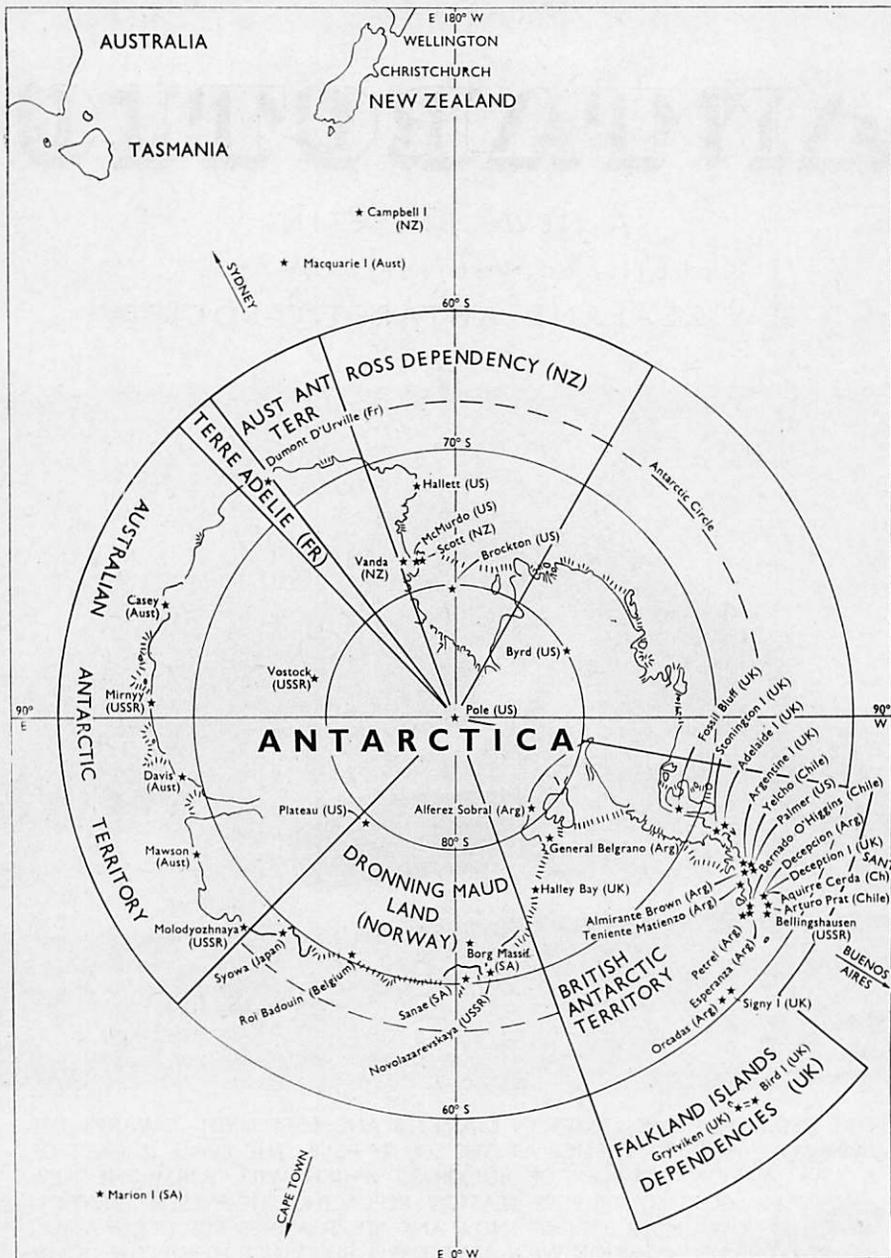
A NEWS BULLETIN

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THIS GEODESIC DOME—164FT IN DIAMETER AND 55FT HIGH—DWARFS THE JAMESWAY HUT ON THE ICE AT THE SOUTH POLE. THE DOME IS PART OF A \$3.5 MILLION COMPLEX OF BUILDINGS WHICH WILL FORM THE NEW AMUNDSEN-SCOTT SOUTH POLE STATION, REPLACING THE PRESENT STATION WHICH IS NOW UNDER 35FT OF SNOW AND ICE. PLANNED FOR OCCUPATION IN 1974, THE NEW STATION WILL HAVE THREE BUILDINGS INSIDE THE DOME.

—Official U.S. Navy Photo



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More than 60 years have passed since the Great Antarctic Tragedy. We refer to the loss of Scott and his four companions, an event that not only shocked the world but brought home the danger ever-present for man when he pits himself against the forces of nature on the White Continent.

Since then Antarctica has claimed other lives. It is only a few months since four young scientists came very close to adding their names to the Antarctic Roll by taking undue risks in an inimical environment. The lesson they learned is one for us all; play safe and never take chances!

# LAVAL LAKE FOUND IN MT EREBUS

Discovery of an active laval lake in the crater of Mt Erebus, one of Antarctica's two known active volcanoes, was the most significant feature of New Zealand's summer research programme. New Zealand had its largest number of men (and one woman) on the continent during the season—about 200, including soldiers and airmen. All the field programmes but one were completed, and New Zealanders took part in the Dry Valley Drilling Project—man's first deep penetration of the continent's bedrock—and visited Antarctica's oldest base, Camp Ridley at Cape Adare.

The discovery of the laval lake is considered significant because it contradicts earlier beliefs, based on information from aerial photographs of the crater, that Erebus has been only mildly active in recent years. When Sir James Clark Ross sighted Erebus 132 years ago he wrote of it emitting smoke and flame in unusual quantities; since then only a perpetual plume of steam at the summit of the 12,450ft mountain has hinted at the volcano beneath the ice and snow.

To study the crater of Erebus the New Zealand research team was flown to within 500ft of the summit. The five men, Dr G. L. Lyon, of the Institute of Nuclear Sciences, Messrs P. Kyle and J. Keys, Victoria University of Wellington, Dr W. F. Giggenbach, and Mr J. Shorland, Chemistry Division, Department of Scientific Research, spent two weeks at the summit of the mountain.

After Mr Shorland, a highly skilled climber, had made a reconnaissance drop into the huge outer crater, using a special harness and winch, he and Dr Giggenbach were lowered on a cable 250ft to the extreme edge. Despite a 30ft overhang at the bottom of their descent, they were able to spend some time walking about inside the crater. The steam temperature was 80deg and moss was growing on the crater walls.

About 450ft below this point the temperature of the laval lake was

estimated at 1100deg. In spite of the heat and continual explosions Dr Giggenbach and Mr Shorland were able to look into the spluttering inner crater, which is about 600yds wide, and watch molten rock exploding, freezing over, and then blowing out again and again. Gas samples could not be taken from the inner crater because of the heat and the flying rock.

While Dr Giggenbach and Mr Shorland were enduring intense heat, the support team above had to cope with the altitude and temperatures as low as minus 30deg. A polar tent erected over the hand winch gave the men some protection from the bitterly cold wind.

A closer study of activity in the laval lake will be made by New Zealand scientists next season. As far as is known there are only four volcanic laval lakes in the world. Study of the Erebus lake will help scientists to determine whether volcanic activity is increasing or decreasing, and also whether such activity goes in cycles.

Next season two or three highly-skilled and experienced New Zealand climbers may be called on to undertake what might be an extremely dangerous operation. Their task would be to descend deep into the crater of Erebus and assist scientists to make a closer study of the laval lake and take samples from it.

The scheme is being considered by the Antarctic Division, Department of Scientific and Industrial Research. Mr

R. B. Thomson, superintendent of the division, says that with the co-operation of the United States Navy a base camp could be set up on a level area of Erebus about 800ft down on the western slope. The three climbers and three scientists could stay there for about three weeks to do their research.

After the first team's visit three geologists from the Dry Valley Drilling Project were landed 500ft below the crater rim of Erebus by a United States Navy helicopter. Messrs S. B. Treves, University of Nebraska, J. Stuckless, Northern Illinois University, and Mr Kyle, on his second visit, saw from the rim of the crater red molten lava far below. They stayed for five hours at the summit and saw an eruption within the crater which threw ash and rock 400ft into the sulphurous and steamy air above the crater floor.

### DRILLING PROJECT

New Zealand's part in the Dry Valley Drilling Project—a major three-year programme developed by American, New Zealand, and Japanese scientists—began on January 21 when a team of New Zealand and Canadian drillers began their exploratory probe into the rock of Ross Island. The drill rig was established near the earth sciences laboratory at the foot of Observation Hill, McMurdo Station. Originally it was planned that the bore would go to a depth of more than 900ft but after nearly three weeks' drilling the hole was abandoned at a depth of 661ft because the drill head hit extremely hard rock which jammed the rod mechanism.

On February 9 the rig was moved to a site 300ft below the abandoned hole, and drilling began again on February 10. Drilling stopped on February 21 when the bore hole had reached a depth of 558ft, and the equipment was prepared for winter storage.

Nine New Zealanders were concerned with the drilling programme. They were Messrs Kyle and J. Adams, geologists from the Victoria University of Wellington, and the drillers were Messrs A. Erskine, B. Webster, B. Samuels, J. Hoffman (Wellington), W. Milne (Christ-

church), M. Williams (Hamilton), and M. Allaway (Auckland). Co-ordinator of the whole project is an American geophysicist, Dr L. D. McGinnis. With him were two American geologists, Messrs Stuckless and Treves.

When the drilling of the first hole began the New Zealanders and the Canadian experts who trained them in new methods struck red pyroclastic rock at the 200ft mark. This is believed to have formed the platform built up during the first eruptive phases of Mt Erebus that produced Hut Point Peninsula. After seven days of drilling the bore reached a depth of more than 600ft, and was still in permafrost.

Forty-eight individual rock units were identified by Messrs Kyle and Treves. These were tentatively assigned to three eruptive sequences. The first and youngest was about 24ft thick, and consisted primarily of thin, basaltic lava flow. These rocks were probably related to the eruption that produced the twin craters of a small extinct volcanic cone near McMurdo Station. Two of the basalt flows contained black, shiny crystals of hornblende. The youngest flow was about 500,000 years old.

Crystals of black, glassy pyroxene and green olivine were exhibited in the basaltic laval flows of the second sequence, which was about 280ft thick. The tops and bottoms were marked by great thicknesses of red, oxidised fragmental and highly vesicular lava. These rocks resembled those exposed at Crater Hill, an older extinct volcanic cone about 2500ft east of the drill site.

The third sequence was about 132ft thick, and consisted of fragments of volcanic rock (ash, lapilli, blocks and bombs) ranging in size from less than four millimetres to more than 32 millimetres. Basal parts of this sequence contained altered glass. This sequence was not exposed at the surface of Ross Island, and might be part of the early eruptive sequence that formed the volcanic platform upon which this part of the island was built.

Preliminary temperature measurements made in the bore hole indicated that permafrost temperatures (less than 0deg

C) might extend to depths as great as 1320ft below the land surface or to a depth of 1089ft below sea level. The drill site was 231ft above sea level.

Five lava flows were identified in the core recovered from the No. 2 bore. Messrs Kyle and Treves found that these ranged in thickness from 33ft to 46ft, and were massive black basalts with cinder-like tops and bottoms. Microscopic examination indicated that the flows contained crystals of hornblende.

### LAYERS OF ICE

Ice layers as thick as 13in occurred in the core. The ice was crystal clear and contained only a few air bubbles. In the rock associated with the ice was a white secondary mineral, probably a zeolite.

An ice-filled cavity at a depth of 83ft below the surface showed 2in-long crystals of miraeilite, a hydrated sodium sulphate. This commonly occurs on the surface of Ross Island as a fine, white powder.

Almost 100 per cent of the core from the No. 1 bore, weighing two tons, was recovered. It was logged, photographed, and shipped to the United States. Small specimens of representative core were sent to scientists in Japan, New Zealand, and the United States, and 26 samples of rock were selected and prepared for distribution to laboratories in the three countries.

Next season sites will be established in McMurdo Sound and the dry valleys for the start of the three-year drilling programme. The drilling rig will be towed by tractor across the sea ice to a site north of the Dailey Islands between McMurdo Station and the eastern Taylor Valley in 990ft of water. There bores will be made through the sea ice and samples taken from the ocean bottom. An attempt will be made to retrieve marine sediments which are expected to date back 30 to 40 million years.

From the McMurdo Sound site the rig will be towed to the mainland and then shuttled by helicopter to Vanda Station where a bore will be made into Lake Vanda. After three weeks' testing sites will be established on or near

Lake Vida, Don Juan Pond, Lake Bonney, Lake Fryxell, and on the shoreline of New Harbour.

In preparation for next season's work several hundred pounds of equipment were transported to Marble Point by the United States supply ship Mirfak. Navy helicopters lifted the cargo over the final 16 miles of solid sea ice.

Other New Zealand activities during the summer included the first parachute descent by a New Zealander in Antarctica, the supply of specially built equipment for the new Siple Station in Ellsworth Land, and a three-month field programme carried out by a geologist who lost a leg and his other foot in an Antarctic accident 13 years ago.

The parachute descent was made by Sergeant J. R. Bitters, of the New Zealand Special Air Service, who is wintering as a dog handler at Scott Base. He made two jumps from a helicopter onto the Ross Ice Shelf with the United States Navy's Antarctic airborne rescue team. The jumps were made from 3600ft in a temperature of minus 15deg C.

### N.Z. BUILT RECEIVER

A VLF receiver which will be used for upper atmosphere investigation of the earth's magnetic field was flown 1,250 miles to Siple Station at the foot of the Sentinel Mountains by a U.S. Navy Hercules. The receiver was designed and built by Mr R. G. Brown, of the D.S.I.R. Physics and Engineering Laboratory, who flew to the station to instal the equipment and operate it for three weeks so the four men who will remain for the winter were familiar with its operation.

Mr Brown, who is an electronics technical officer, built the receiver at the request of Stanford University, California, which is conducting magnetosphere research at Siple Station. He completed the receiver in the middle of 1971 so the joint D.S.I.R.-Stanford University programme could begin that summer. Because of delay in completion of the station, the receiver was installed at Scott Base where it was used until early this year.

The New Zealand amputee, Mr J. H. Lowery, of the Geological Survey, returned to the Antarctic to make a survey of dikes of igneous rocks on the continent.

Walking on artificial legs, Mr Lowery, with a Canadian field assistant, Mr K. R. Lefever, explored large areas of the dry valleys, the Polar Plateau, and the Trans-Antarctic Mountains region. The two men travelled across the sea ice

from Ross Island to the mainland by tracked vehicles, and then were flown by helicopter to Vanda Station.

Their next move was to Shapeless Mountain. Then they travelled by motor toboggan to Mount Fleming, and finally by helicopter to the Asgaard and Olympus Ranges for more field work. They returned to Vanda Station at the beginning of February and were flown back to Scott Base.

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## CAPE BIRD INQUIRY FINDINGS

Four men from the University of Canterbury marine biology unit at Cape Bird who drifted helplessly for five days on ice floes in McMurdo Sound when their trimaran was swept into pack ice and had to be abandoned would not have been involved in the mishap if they had followed all the directives and instructions in the manuals of the Antarctic Division, Department of Scientific and Industrial Research. This was the main finding of an inquiry held after the men had been rescued and returned to New Zealand ("Antarctic", pages 264-265, December, 1972).

A summary of the proceedings released for publication by Mr R. B. Thomson, superintendent of the Antarctic Division, also referred to the relation of Scott Base to the mishap. It stated that there should have been more control and stricter supervision, particularly in regard to communications, by those responsible at Scott Base for control and safety of field parties.

Some of the more important recommendations arising from the inquiry are:

Small boat operations should not take place unless icebreakers and/or amphibious helicopters are operating in the area.

Small stations such as Cape Bird, when occupied by university parties only, and used as a staging station for their small boat operations and/or field parties, should be provided with an

officer-in-charge from the Antarctic Division to control operations and communications, and ensure safe installation of equipment with adequate maintenance.

Responsible officers at Scott Base must ensure that they maintain adequate supervision over communications, operations, and activities at remote stations.

In addition to the radio the Cape Bird party should have had with it, all small boats in future should be equipped with smoke bombs, signalling mirrors, and a radio homing device.

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## FIVE EMPERORS FOR MUSEUM

Five Emperor penguins, seven Adelie penguins, an Adelie nest and clutch of eggs, and a clutch of skua gull eggs, were collected last season by the Canterbury Museum's assistant zoologist, Mr G. A. Tunnicliffe. They will be used for large-scale diorama displays in the museum's planned Hall of Antarctic Discovery.

The museum also obtained last season nine scattered spare parts, including the spare wheel, from the Arroll-Johnson car which Shackleton took south on his 1907-1909 expedition. Mr V. J. Wilson, one of the New Zealand Antarctic Society's two caretakers, was given permission to bring back the parts when he visited Shackleton's hut at Cape Royds.

# New Zealand Team Works at Oldest Base in Antarctic

One of the most historic spots in Antarctica—desolate Ridley Beach at Cape Adare—was visited by two members of the New Zealand Antarctic research programme early last month. Seventy-eight years ago four men from the whaler *Antarctic* landed on the windswept pebbly beach and became the first to set foot on the continent. On February 18, 1899, one of the men, C. E. Borchgrevink, returned as leader of the first expedition to winter on the mainland. The six men of Scott's northern party spent ten stormy months on the beach before they were picked up by the *Terra Nova* early in 1912.

Two huts built by Borchgrevink's party and named Camp Ridley—his mother's name was Ridley—are the oldest buildings in the Antarctic, and the camp where ten men lived and one died is the oldest base. New Zealand is responsible under the Antarctic Treaty for the preservation of what have been designated historic monuments, among which are Borchgrevink's huts. The possibility of restoring the huts was considered in 1971 when aerial photographs were taken to obtain some idea of the condition of the buildings after 74 years.

Because of the difficulty of access to the huts—landings at Cape Adare can be made only from a ship—there have been few visitors to the area since Scott's last expedition. Scott's Northern Party, Lieutenant V. L. Campbell (leader), Raymond Priestley (geologist), Dr. G. M. Levick (surgeon), Petty Officers G. P. Abbott, F. V. Browning, and Seaman H. Dickason, were landed by the *Terra Nova* on February 18, 1911, established their camp in Borchgrevink's huts, and built a third hut. They were embarked on January 3, 1912.

As far as the records show the next party to call at Robertson Bay was in late January, 1959. The United States icebreaker *Staten Island* went there to establish oceanographic and marine biological stations. She remained close inshore for several hours, and a small party landed to inspect the old huts. The party included Sir Raymond Priest-

ley, now the last survivor of Campbell's party, and two New Zealanders, the late Mr. M. Robb, and Mr. D. C. Thompson, who described the visit in the September, 1959, issue of "Antarctic."

A New Zealander and an Australian spent three weeks on Ridley Beach in 1961. Dr. B. Reid, biologist at Hallett Station, and his assistant, Dr. C. Bayley, of Adelaide, were landed there on January 12 by the United States icebreaker *Eastwind* to assess the wild life. They camped some 60yds from Borchgrevink's hut but in the first blizzard their two tents were damaged by flying rocks, and sea spray blew in and froze.

Only one of Borchgrevink's huts had four walls and a roof but because the windows and doors were broken it was full of ice. The two men decided to dig out the ice. Their tents just lasted until they had made enough room to move into the hut. Then to keep warm they dug out the rest of the ice. A call was sent to the Antarctic Division, Department of Scientific and Industrial Research, for timber and canvas to secure the windows and doors and prevent snow blowing in. The *Eastwind* brought the material on February 3 and took the men back to Hallett Station.

A New Zealand magnetic survey party visited Ridley Beach in 1964. Seven years later the cruise ship *Lindblad Explorer* called at Robertson Bay. Tourists went ashore in two rubber boats and took photographs from the beach. These, and the aerial photographs



Antarctica's oldest buildings are on Ridley Beach, Cape Adare. On the left in this photograph is the hut built in 1899 by C. E. Borchgrevink's expedition. Another building used as a storeroom is also still standing. On the right are the remains of the hut built in 1911 by Scott's Northern Party.

—Photo: Antarctic Division, D.S.I.R.

late in November the same year, provided the only information about the condition of the huts for the two men sent by the Antarctic Division to study them and assess the possibility of restoration.

Mr S. Norman, deputy-leader at Scott Base, last season, and Mr L. K. Cairns, spent two weeks at Cape Adare. They were landed at Ridley Beach on February 3 by the United States Coast Guard icebreaker *Burton Island* on her way round the coast. The two men experienced stormy weather like their predecessors many years ago. To ward off the 100-knot winds they had to weigh down the skirts of their tent with 800lb of gear and stones.

In the last 74 years Antarctica's oldest buildings have suffered from winds and dampness—the sea is only 25yds away, and spray is blown in every time there is a gale. The hut used by Borchgrevink's party as the main living quarters is the

only one in reasonable shape. It has been cleared of snow, tidied up, strengthened with props, and the roof has been roped securely.

An old door from the hut used by Scott's Northern Party has been placed in front of the door to Borchgrevink's hut as a wind-break. The 20ft square hut built by the Northern Party, which lived first in Borchgrevink's hut, is on the verge of collapse, and the third building used by Borchgrevink's party as a storeroom, has no roof.

Relics of Borchgrevink's expedition and the Northern Party were brought back to Christchurch by Messrs Norman and Cairns. They include a sailor's trousers, long john underwear, fishing lures, old snow goggles, boots, a brush made of penguin tail feathers, an anemometer, and a woollen vest once worn by Lieutenant Campbell, which is stained with age but without holes. There is also a sunshine scale which shows

that on October 5, 1899, Cape Adare enjoyed  $6\frac{1}{2}$  hours of sunshine.

In Borchgrevink's main hut the men found clothing, tools, tables and chairs from the Northern Party hut, tinned food, photographic materials, a large quantity of candles, and enough heavy calibre ammunition to withstand a minor siege. This Martini-Henry ammunition was used by Borchgrevink's party. New Year's Day, 1900, was celebrated by a rifle shooting contest. The men shot at a target at 150yds range, and Borchgrevink was the winner.

On a shelf in the hut Messrs Norman and Cairns found a letter dated May 31, 1910, to Petty Officer Abbott from his aunt at Stoke-on-Trent, Mrs E. Vernon. In this she apparently enclosed a postal order for a guinea for him to buy "something like a thermos flask."

During their general survey of the Cape Adare area, Messrs Norman and Cairns found the first known grave in the Antarctic—that of Nicolai Hanson, the Norwegian zoologist with Borchgrevink's

expedition, who died on October 14, 1899. Hanson asked before he died to be buried at the foot of a big boulder 1000ft up on Cape Adare.

The grave, also designated an historic monument, has a steel cross on the boulder bearing a bronze plaque with Hanson's name. Messrs Norman and Cairns found that the plaque had come off the cross, and it was wired on again.

In addition to checking the condition of the huts on Ridley Beach, the two men made a topographical survey, kept a full meteorological record, and made a count of the Adelie penguins in the rookery there. They estimated the number of penguins at 50,000. In November, nesting time, this figure could rise to more than 200,000.

Mr Norman is an Englishman who served for three years with the British Antarctic Survey, first on Deception Island and then on Stonington Island. Mr Cairns is a New Zealander who has spent two seasons in the Antarctic with the New Zealand research programme.



## SIGNALS FROM ICEBERGS

To learn more about the weather and ocean currents round the Antarctic Continent scientists of several nations have placed transponder beacons on icebergs this season. These electronic devices will receive signals from the E.O.L.E. 1 satellite launched for the French in 1971 by the United States National Aeronautics and Space Administration, and will transmit replies automatically.

The French National Space Research Centre has made 10 responder beacons available to six countries regularly engaged in Antarctic research, Argentina, Australia, the United States, Britain, Japan, and the Soviet Union. France has retained three beacons for her own programme. Originally New Zealand was invited to take part in the programme but she had to withdraw be-

cause ships were needed to place the beacons in position.

Three beacons were placed in position by United States Coast Guard ice-breakers this season. Two were put on icebergs in the Ross Sea by helicopters from the Burton Island and the Northwind because they are too fragile to be air-dropped. The Glacier failed to find a suitable berg. They will provide information about surface ocean circulation near the Antarctic Continent in the winter. Little winter oceanographic data has been available in this area.

The experiment will continue until June 30 this year, although the French National Space Research Centre may prolong the research until early next year. Data from the tracking operation will be collected by the centre and made available to the co-operating countries.

# NEW SIPLE STATION MAJOR U.S. PROJECT

Completion of the new Siple Station at the foot of the Sentinel Mountains in Ellsworth Land, 1250 miles from McMurdo Station, was the major achievement of the United States naval support force in Antarctica this season. Bad weather delayed supply flights in December but the station was completed and handed over to the National Science Foundation on January 25. The last flight to the four scientists who will winter there was made on February 4.

Last season men of Mobile Construction Battalion 71 took two months to build the 216ft long, 22ft high and 44ft wide metal arch under which three portable vans were put together to form an enclosed building 44ft by 24ft. These vans were originally part of the Longwire ancillary research station near Byrd Station, and after being flown to McMurdo Station in the summer of 1971 for maintenance were taken to Siple Station last December.

## SUPPLY FLIGHTS

Fifty-one supply flights were made by Hercules aircraft of the Navy's VXE6 Squadron to Siple Station. Because of bad weather flying was possible only on six days in December. Thirty-five flights were made after January 1. Half of the 51 flights were to carry fuel to the station which will need 35,000 to 40,000 gallons annually.

Siple Station has been built to last for three years. The metal arch will protect the buildings for three years; occupation for a longer period might cause the arch to fall under the weight of accumulated snow.

Plans are being considered for construction of a larger station to house about 12 scientists in about four years time. This depends on whether scientific results from the new station are satisfactory.

Seabees also continued work on the geodesic dome, 55ft high and 164ft in diameter, which is part of the \$3.5m

complex which will replace the present Amundsen-Scott South Pole Station, now buried under 30ft of ice and snow. Work started in November, 1971, and the new station is expected to be completed by 1974.

One of the major construction projects at McMurdo Station was the building of a new pier facing and repairs at Elliott Quay in Winter Quarters Bay. About two-thirds of the original pier was badly damaged by a severe storm in March last year.

Two 65ft sections of the sea wall were reconstructed, and the job was completed in spite of obstruction by ice blown from the 11-mile channel in McMurdo Sound cut by the Coast Guard icebreakers Northwind and Glacier in December. The pier was ready for the arrival of the U.S.N.S. Mirfak, the first resupply ship, which brought 2200 tons of materials on January 15.

## HAY AND STRAW

Hay and straw were tested as insulation and building material in the construction of an "ice wharf" in Winter Quarters Bay. A test section, measuring about 50ft by 25ft and 15ft thick was used successfully in mooring the cargo ships and the 25,000-ton tanker Maumee, which unloaded more than 7,000,000 gallons of petroleum products—the biggest load ever carried to Antarctica—between February 17 and 20. Next season a 600ft long, 100ft wide

and 20ft thick ice wharf extension over which vehicles can be driven will be constructed.

In the 19th year of support operations more than 2300 men of the United States Navy, Air Force, Coast Guard, Marine Corps, and Army, passed through Christchurch on their way to the Antarctic. About 150 American scientists were transported to begin their studies at various locations around the Antarctic Continent as well as aboard Coast Guard icebreakers off the Oates Coast, and in the Ross, Amundsen, and Weddell Seas.

Hercules aircraft of VXE6 Squadron had one of their busiest seasons although their operations were reduced by the loss of one aircraft which crashed and burned without loss of life when landing at the South Pole on January 28. Supported by similar aircraft of the Royal Air Force and the Royal New Zealand Air Force, they transported a record 1000 tons of cargo from New Zealand. United States Air Force Starlifters made more than 40 flights south during the four months of the support season.

First flights by VXE6 Squadron in the Antarctic were on October 17 to open Hallett Station. Twenty men were flown to Byrd Station to establish a surface camp, which was used as a staging point for shuttling supplies and fuel for the construction of Siple Station. Ten thousand gallons of fuel were left at Byrd Station in case an emergency flight to Siple Station is needed this winter.

A 1650-mile flight across the continent from McMurdo Station to the Lassiter Coast area was made on November 13 by a Hercules which put into position six men from the United States Geological Survey. When the men were picked up on January 26 they had mapped more than 2000 square miles of the Northern Lassiter Coast and the Southern Black Coast.

Early in January mail and 1500lb of electronic equipment were flown from McMurdo Station to the Soviet Vostok Station. Aboard the Hercules was Dr D. L. Vance, an exchange scientist who wintered at Vostok in 1971. He returned

to familiarise the Russian winter party with the equipment, and also delivered mail to the new exchange scientist, Dr E. Grew. It was the first mail Dr Grew had received since November.

Temperatures had plunged to minus 50deg Fahrenheit at the South Pole when VXE6 Squadron made its last inland flight. On February 13 a Hercules carried 25 cases of fresh eggs, 25 gallons of milk, 2037lb of fresh vegetables, and 1222lb of mail to the eight scientists and 13 sailors at the Pole Station. On board was the support force commander, Captain A. N. Fowler, who will see the men again late in October or early November when their eight months of isolation will end.

Final task for the hard-worked crews of the remaining two Hercules aircraft was to bring back more than 700 men to New Zealand. Almost daily turn-round flights were made, the last of the season on February 24.

### NO NUCLEAR POWER

This winter power for McMurdo Station will be supplied by diesel generators. The nuclear power plant on Observation Hill has been closed for safety because of a fault. Diesel fuel was running low when the tanker *Mau-mee* arrived towards the end of last month. If it had been delayed the station might have been evacuated and only a skeleton staff left for the winter.

Next summer television will be introduced to the Antarctic. McMurdo Station is expected to be the first station to have a closed circuit system. It will be black and white, and will cost about \$55,000.

Six cameras will be placed in a studio at the station, and between 20 and 30 receivers at assembly points. Men who want sets in their quarters will have to buy them from ships' stores.

About 45 hours of films and features shown in the United States in the last 10 years will be screened plus about 15 hours of sporting events and news not more than 15 days old. There will also be some live programmes from the station studio.

## B.A.S. ACTIVITIES

# Heavy Pack Delays Biscoe's Relief of Island Bases

Heavy pack ice in November and December delayed the relief of two British Antarctic Survey bases this season. The Royal Research Ship John Biscoe could not reach Signy Island in the South Orkneys as early as planned, and was unable to relieve Adelaide Island off the Antarctic Peninsula before Christmas. In the late summer there was less ice in most areas; the R.R.S. Bransfield, after leaving Halley Bay, found open water in the Weddell Sea, and reached 78deg 4min S on February 17, exceeding her 1972 record.

The John Biscoe attempted to relieve Signy Island early in the season so work could be started on a new slipway. She was thwarted by a belt of fast ice and dense pack ice, and went on to South Georgia.

Materials originally intended for Signy Island were used by the building team on board to build a slipway and boatshed at the base at King Edward Point. A large botanical greenhouse and a 42ft long building housing a 10,000-gallon pillow tank were also constructed as planned. The tank will supply the new biological wet laboratory with sea water in closed circuit.

Helicopters from H.M.S. Endurance airlifted two glaciological field huts to the Hodges Glacier area. Another small field hut on Bird Island, at the western extremity of South Georgia, was re-equipped and has been occupied by biologists throughout the summer.

One of the high-lights of the Christmas season at South Georgia, was a candle-light carol service held in the picturesque old whalers' church at Grytviken. It was attended by 50 men from the base and the John Biscoe. Music was provided by an old treadle organ which was found to be still in good order.

Signy Island was eventually relieved by the Bransfield on December 7, but even then stores had to be transported some distance across the sea ice. She

then proceeded to the west coast of the peninsula and called at Anvers Island to disembark glaciologists and geologists who were later flown south to Alexander Island by way of Adelaide Island.

Very heavy pack ice prevented the relief of Adelaide Island before Christmas, and the Bransfield returned to the Falkland Islands, arriving there on Christmas Eve. She then sailed to Montevideo to collect summer visitors, including the survey's director, Sir Vivian Fuchs, the senior logistics officer, Mr Derek Gipps, the radio officer, Mr Barry Peers, a South African observer, Mr J. G. Nel, Dr Takao Hoshiai, of the National Science Museum, Tokyo, and four United States' geologists led by Professor I. Dalziel. Both Dr Hoshiai and Professor Dalziel's party spent several weeks working on South Georgia.

### REPAIRS TO SHIP

The Biscoe returned to the Falklands shortly after Christmas and was found to have a cracked cylinder head. Arrangements were made for her to go into dock at Puerto Belgrano where with the assistance of the Argentine naval authorities repairs were carried out.

By this time the southern part of the peninsula was fairly free of ice. The Biscoe was then able to relieve Adelaide Island and carry out a hydrographic

survey in Marguerite Bay in cooperation with the *Endurance* until the end of January.

After collecting the summer party from Montevideo, the *Bransfield* continued her voyage by way of South Georgia to Halley Bay. She arrived on January 24 and the rebuilding of the base began immediately. It appears to be progressing exceedingly well. All five tubes have now been completed and work is well advanced on the huts being built inside them.

The *Bransfield* remained at base until the major work had been completed. She then took advantage of open water to continue south-westwards, reaching 78 deg 4min S, on February 17, thus exceeding her 1972 record.

Bad weather restricted flying throughout much of December, but an ice reconnaissance was flown over the west coast for the *Bransfield*, and men and supplies were taken from Anvers Island to Alexander Island and from Adelaide Island to Stonington Island and Fossil Bluff. Advantage was taken of good weather over Christmas to transport a field party from Fossil Bluff to the southern Eternity Range, festivities being postponed and not cancelled!

### SUMMER MELT

With air support, geophysicists continued work on the plateau edge and in the southern Eland Mountains, and surveyors worked on the east coast of Palmer Land. Geologists are working north-east of George VI Sound in the Clarke Glacier area.

As usual, the summer melt restricted operations in George VI Sound. Two shallow melt-water lakes, which formed immediately north and south of Fossil Bluff, tempted all men then in residence to take the plunge.

One of the two *Twin-Otters* flew across to Halley Bay on February 15 to pick up Sir Vivian Fuchs and Messrs Gipps and Peers so they could join the *Biscoe* at Adelaide Island. The return flight was carried out the same day.

Now that this route has been established, it will increase the amount of useful work that can be done by senior

summer visitors, especially those supervising work at the two main geophysical stations, Halley Bay and the Argentine Islands, which are about 1000 miles apart.

Other field work has included continued local glaciological levelling and geomagnetic survey at Halley Bay.

Several ships have been operating in the area during the summer. The *Lindblad Explorer* has visited several bases in the course of several voyages; the Chilean *Piloto Pardo*, the United States' *Hero* and Jacques Cousteau's ship the *Calypso* have also visited west coast bases. Cousteau and his son Phillippe have been filming in the area.



## BAD WEATHER ON TRAVERSE

Bad weather in January and February delayed the return of the French scientific traverse party to Dumont d'Urville after it had terminated in December the last stage of its 2000-kilometre two-year journey across Wilkes Land to the Soviet Vostok Station. But on February 13 it was only 50 kilometres from Carrefour, the small advance base 40 kilometres inland from Dumont d'Urville, and reported no technical problems.

The party of 10 men in five vehicles terminated the traverse at the 400-kilometre mark on December 16 because of trouble with the vehicles and very rough terrain. Supplies, fuel, and spare parts for the ailing vehicles were dropped by a United States Navy *Hercules* from *McMurdo Station* on December 29.

Towards the end of January the party made slow progress because of the weather and terrain. Then it was stopped by a long spell of bad weather, and the need to make scientific observations. In its last report to the United States Antarctic support force, the party reported that it did not need another air drop, and indicated that two parachutes retrieved from the drop on December 29 would be returned to the United States.

## AUSTRALIAN NEWS

# Two Traverses from Casey in Anare Summer Programme

Two inland traverses from Casey to make detailed glaciological and geophysical measurements were included in the Australian National Antarctic Research Expeditions' 1972-73 summer programmes. An autumn traverse was programmed to reach as far as 45 miles south of the summit of Law Dome, and the spring-summer traverse, along a line near the Wilkes-Vostok traverse of 1962, was planned to reach a point about 187 miles south. In the Mawson region the Prince Charles Mountains summer party, operating from the Mount Cresswell base, was to carry out block aerial photography, and geological and survey work.

Once again the Nella Dan provided the main support for ANARE parties. She relieved Macquarie Island in November, and then took the relief parties to Mawson and Davis. When she returned to Fremantle late in January, she had travelled 7000 nautical miles in the first seven weeks of her tour of duty.

A report from the Antarctic Division of the Department of Science says that the Nella Dan sailed from Melbourne on December 7 with 55 passengers, including 14 of the 25 men to winter at Mawson, the 14 men of the 1973 relief party for Davis, and 19 men for summer exploration in the Prince Charles Mountains.

On the voyage south a transponder beacon supplied by the French National Committee for Antarctic Research was placed on an iceberg 310 miles north of Davis to track its movements by means of the EOLE satellite. This was done on December 20.

Three helicopters and the Pilatus Porter fixed wing aircraft ferried 30 men with 13,000lbs of equipment to Mawson Station on December 25 and 26. Later there was an airlift of 27 men and 5000lbs of equipment several hundred miles inland into the southern Prince Charles Mountains, using the staging camp at Mount Cresswell. This

party was to carry out geological, geodetic, and radar programmes.

Manhauling sledges had to be used to haul gear over the rotting sea ice close to Davis when the 1972 party was relieved. This was because the Pilatus Porter aircraft was 400 miles away in the Prince Charles Mountains.

A medical officer was ferried from Davis to Mount Cresswell by way of Sandefjord Bay. This operation was aided by the Soviet expedition working near the bay. Members of the party ferried the doctor ashore to be picked up by the Pilatus Porter.

### ROOKERY FOUND

When the Nella Dan sailed from Fremantle again last month she took the remaining men for the Mawson party. The remainder of the summer programme included the transport of bulk supplies to Davis, and the recovery of the Prince Charles Mountains party for return to Australia this month.

Underwater biological surveys were made at Mawson during the summer. A large rookery of silver-grey and Antarctic petrels was discovered at Scullin Monolith 88 miles east of the station.

ANARE biologists made surveys of Lichen Island, the Bauer Islands, the Vestfold Hills, and islands near Davis.

The 1973 programme at Davis included studies in geodesy, cartography, geology, upper atmosphere physics, glaciology, and certain aspects of medical research.

The Thala Dan left Melbourne for Casey on January 29, carrying a party of 29 men, including two Americans. The Americans were to obtain data from satellite observations to determine accurate geodetic positions in support of the United States scientific and geodetic mapping programme in Antarctica.

### INLAND TRAVERSE

Tractor trains were to make a traverse inland towards the Soviet Vostok Station. On the journey scientists were to make measurements of ice movements, record ice thickness by radar sounding, and estimate snow and ice accumulation. In addition ice cores were to be collected for study in Australia.

On her return to Australia the Thala Dan called at Macquarie Island. She reached Melbourne on February 13.

ANARE research programmes for 1973 covered the usual wide variety of scientific disciplines. The main fields of investigation were geodesy and cartography, bathymetry, geology, meteorology, glaciology, geomagnetism, seismology, upper atmosphere physics, biology, and medical research.

Biological studies occupied a large part of the summer programmes for Mawson, Davis, Casey, and Macquarie Island. At Mawson marine biology studies planned included observation of sea water composition, plankton, and littoral and benthic ecology. In the terrestrial life studies were a bird census at Scullin and Murray Monoliths; a biological survey near the Taylor Glacier, offshore islands and coastal rock outcrops; banding of Cape petrels at Forbes Glacier; an aerial census of Emperor penguins at Auster Rookery; and seal counts on the sea ice during helicopter flights. The water programme included censuses of Emperor penguins, counts of other birds, and seal counts.

The summer programme at Davis included the establishment of a biolog-

ical laboratory; a biological survey of Long Peninsula; elephant seal population and distribution studies; a census of Adelie penguins; and counts of giant petrels and Weddell seals. The winter programme will include marine and lake aquatic biology, studies of free-living terrestrial arthropods, and the collection of aerial plankton.

Biological surveys on as many of the adjacent islands possible were planned for Casey. Other work included the banding of giant petrels, the counting of silver-grey petrels, Cape petrels, and Antarctic petrels. Elephant seals were to be counted and measured.

Studies of the population, habits, and effects of wild cats on Macquarie Island were among the projects co-ordinated by the Tasmanian advisory committee on the island. Others included botanical work on the grasses growing on the island, rabbit control using myxomatosis spread by the European rabbit flea, and a population count. The banding of giant petrels, the light-mantled sooty albatross, and the wandering albatross, were listed in the bird studies.

### AURORAL STUDIES

In the upper atmosphere physics programme auroral studies at Mawson, Davis, Casey, and Macquarie Island, are aimed at an investigation of magnetic substorms. Cosmic radiation studies at Mawson are mainly directed to observations of time variations recorded to investigate interplanetary and galactic phenomena. Ionospheric soundings were taken at Mawson, Casey, and Macquarie to determine the apparent heights and penetration frequencies of the main regions in the ionosphere.

The detailed glaciological and geophysical measurements made during the traverses from Casey will include strain net measurements which will enable longitudinal and traverse strain rate calculations to be made several years later. During the autumn traverse the programme provides for trials of the downhole sampler for carbon dating, and of the terminal probe, both to be done on the Law Dome.

Other disciplines covered in the

research programmes, and the places where observations will be made are:—

**Meteorology**—Surface synoptic observations and upper air wind measurements at Mawson, Davis, Casey, and Macquarie Island. Radiation measurements and atmospheric radon observations at Mawson. Macquarie Island will add ozone measurements to the other work common to all four stations.

**Geomagnetism**—Magnetic observations at Mawson and in the field out from the station. Similar observations on Macquarie Island.

**Seismology**—Earthquake recording at Mawson and Macquarie Island by a short period vertical component seismograph.

**Geodesy and cartography**—Block aerial photography from 20,000ft, operating from Mount Cresswell base with helicopters and the Pilatus Porter. Tellurometer traverses and barometric height determinations by surveyors in the southern Prince Charles Mountains. Survey work and checking, particularly in relation to neighbouring islands and the nearby area of Casey by the summer party, using helicopters.

**Bathymetry**—Ocean soundings south

of 60deg S towards Mawson and Casey by the relief ships until their arrival at destination points. Soundings on the approaches to Macquarie Island.

**Geology**—Collection of rock specimens in the southern Prince Charles Mountains, and a summer collection of specimens near Davis. Studies of geology, glacial geomorphology, and coastal and marine land forms, during the changeover at Macquarie Island.

**Medical research**—Studies of human adaptability to cold environments at all four stations. Some investigations of the relation between arbovirus and the human population at Macquarie Island.



## REINDEER HERD ON SOUTH GEORGIA

Twenty years ago the reindeer introduced to South Georgia by the Norwegian whalers in 1911 had grown to a herd of several hundred, flourishing in the tundra and tussock meadows of Cumberland and Stromness Bays. There they provided sport and fresh venison for the staffs of the shore whaling stations and officials of the Falkland Islands Dependencies Survey.

Now the herd is several thousand strong, and a former member of F.I.D.S., Mr David James, M.P., has asked the British Government to introduce the reindeer to the Falkland Islands. Mr James, who was in the Antarctic in 1945-46 and was an adviser for the film, "Scott of the Antarctic," told the House of Commons last month that the reindeer had adapted themselves to tussock grass, and did not compete with sheep.

In his reply to Mr James the Minister of State at the Foreign Office (Mr Julian Amery) told his fellow Conservative that imported reindeer might upset the present balance of wild life on the Falklands where grazing land was limited. But he said also that the possibility of this interesting scheme was being investigated by the Falkland Islands Company.

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## NORTHERN IRELAND POLAR CLUB

There is a polar club in Northern Ireland, and its members have invited members of the New Zealand Antarctic Society to exchange news and views. The "Troubles" in Belfast have reduced the activities of the Northern Ireland Polar Club, according to its secretary, Mr Eric Wilkinson, and it must look to others to keep it up-to-date.

Mr Wilkinson, who served with the British Antarctic Survey, says in a letter to "Antarctic," that the club has about 40 members, mostly from the Falkland Islands Dependency Survey and the Dew Line (distant early warning radar) units in the Arctic. Their patron is Sir Raymond Priestley, a veteran of Scott and Shackleton's expeditions, and they meet monthly for lectures, films, and exhibitions.

# SOVIET SCIENTIST'S STUDY OF LAKE VANDA TEMPERATURES

Volcanic activity rather than solar radiation may be the reason for the unusually warm temperatures at the bottom of Lake Vanda in the Wright Valley. This theory has been advanced by Professor A. E. Kriss, head of the Institute of Microbiology of the U.S.S.R. Academy of Sciences, after investigations at the lake last season.

In recent years scientists have attempted to discover the secret of the lake, which is covered with ice the year round but becomes progressively warmer towards its floor. Professor Kriss who studied the problem as a microbiologist, does not agree with the theory that solar radiation is the cause of the warmer temperatures.

When he returned from the Antarctic, Professor Kriss said in Christchurch that it would probably take many millions of years for the brief rays of the summer sun to reach the floor of the lake. Also the solar radiation theory did not explain why the temperature on the lake floor was 25 to 27deg F., and just below the ice it ranged from zero to 8 or 10deg F. Between these there was a thermal layer where the temperature varied between 10 and 16 deg F.

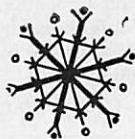
Professor Kriss selected an area of the lake at its greatest depth. Within one kilometre six holes were made in the ice, and samples were taken at various levels from the surface to the lake floor.

In some lakes it has been found that micro-organisms can help to raise water temperatures. But Professor Kriss found that in Lake Vanda micro-organisms were much fewer than expected. The only reasons for the high concentration of hydrogen sulphide—three times as concentrated as at the bottom of the Black Sea—could be volcanic action.

Professor Kriss was the first scientist to have worked at both the North and South Poles. He spent four days at the Amundsen-Scott South Pole Station, where he investigated bacteria in snow

samples taken seven kilometres from the station.

In 1954 Professor Kriss worked on a drifting ice station which eventually came to rest at the geographic North Pole. There he studied the bacterial content of the snow. He said there was significantly less bacteria content in the samples from the South Pole than in those from the North Pole. But the North Pole was much closer to the world's populated areas.



## SHIP'S MEAT PLATE FOR MUSEUM

A relic of Rear-Admiral Richard E. Byrd's 1933-35 expedition, which seems to have been an "unofficial" gift from the ship's crockery by a member of the crew of the Bear of Oakland, has been presented to the Canterbury Museum for its Antarctic collection. It is a meat plate made for the expedition by the Traunfelter China Company, of Zanesville, Ohio.

While the Bear of Oakland was at Dunedin members of the crew apparently visited a Maori settlement at Otakou, near the city. The meat plate was presented to Mr Rangi Ellison's mother, and he has now given it to the museum.

**SANAE 14**

# New Tracked Vehicle Tested on Journey from Sanae

South Africa's 14th Antarctic expedition sailed in the research ship RSA for Sanae Base in western Queen Maud Land from Cape Town on January 9 and arrived there on January 22. Supplies and equipment were unloaded in just over two days by working 12-hour shifts in the good weather.

The departure of the RSA had to be delayed for three days because its cargo included a new prototype tracked vehicle called SANAE. This vehicle was built in Johannesburg and had to be transported to Cape Town by road after men had worked day and night for several days to complete it.

Five days after the RSA reached Sanae Base, Mr C. J. J. van Rensburg, head of the Antarctic Division of the Department of Transport, who was on his third visit south, left to test the new vehicle. It is completely enclosed for housing scientific equipment, and will be used especially for the radio echo-sounding programme. Power is provided by a six-cylinder air-cooled Deutz diesel engine, the transmission is hydrostatic, and there is independent coil spring suspension.

Tests of the vehicle were made over a distance of 130 kilometres from the base. The vehicle, which has seating and sleeping facilities for three men, handled well, and was economical on fuel. It was comfortable to ride in, and equipment did not bounce around. Final tests will be made this season.

Twenty-five years ago on December 29 Marion Island, the small island in the Southern Indian Ocean, was annexed for South Africa by the commanding officer and crew of H.M.S.A.S. Transvaal. In the three months after the annexation a South African weather station was established on the island, and has been an important link in the international network of sub-Antarctic and Antarctic weather posts. Other scientific projects

have been added over the years, and there have been three biological expeditions to the island and nearby Prince Edward Island.

The 29th meteorological team on the island is nearing the end of its term of duty, and is expected to be relieved early next month. Since it arrived in April last year it has been carrying out a comprehensive surface and upper air weather observation programme. Sun photometer readings, a new part of the programme, are part of a worldwide air pollution research programme.

Ionosphere and geomagnetic research programmes were started by the team. They have both been beset by difficult teething troubles, and problems peculiar to island conditions. But the experience gained this year augurs well for a successful continuation of the programmes in future years.

## BIRD STUDIES

Members of the third South African Biological Expedition to Marion and Prince Edward Islands are studying the birds, seals, penguins fish, plants, and soils of the islands. A census is being made of the fur seal (*Arctocephalus tropicalis gazella*) and data is being obtained whenever possible.

Other research studies include the ecology of some forming organisms on the shores of Prince Edward Island, and borings for fossil pollen, an analysis of which will be given an insight into the island's botanical history. An analysis of surface pollen samples will show the present day distribution.

Studies are being made of the feeding behaviour of the gull *Larus Dominicanus* and the food preference of nototheniid fishes. A collection of lichens with notes on their habitat is being made, and a record of sightings of birds not normally recorded from Marion Island is being made. The chemical status of the plants and soils of Marion Island is being examined, and geo-chemical and primary production studies are being made of lakes, tarns, pools, wallows, rivers and streams.

The diet of the Marion Island penguins is being studied. To do this the scientists are using the stomach pump method.

The meteorological team on Gough

Island has the honour of being the first on the island to use the new weather measure equipment. The Weather Bureau has been testing radiosondes and receivers since July, 1971, and finally decided on the weather measure system and Viz radiosondes. The main reasons are that the equipment is compact, there is little interference at 1680 MHz, the weather measure antenna is directional, and reduction of the upper air data is very simple.

Gough Island was the second South African station to switch over to the new system, Pretoria being the first on September 1 last year. The system will be introduced to Marion Island during April this year.



## Shackleton's Motor Sledge

One of the relics of Shackleton's Imperial Trans-Antarctic Expedition of 1914-17, the motor sledge used unsuccessfully by the Ross Sea Party, and described by Ernest Joyce as a "useless toy," is now ready for display in the Canterbury Museum. Museum workers have spent many hours removing thick layers of rust from the sledge's metal parts and engine, and regluing the light plywood of the body work.

Abandoned at Cape Evans more than 50 years ago, the sledge was brought to New Zealand in 1957 and placed in the Dominion Museum in Wellington. It was transferred to Christchurch at the end of 1970. The four-stroke two-cylinder Simplex engine was still lying in a corner of Scott's hut at Cape Evans at that stage; it was brought back early in 1971 through the good offices of Rear-Admiral D. F. Welch, a former commander of the United States Navy's Antarctic support force.

The sledge has not been restored: the aim of the museum workers has been to halt the corrosion and deterioration that have taken place over the years. When they started work there was rust up to

a quarter of an inch thick on the metal parts and controls, and some were still "frozen" with rust. Two of the "scoops" on the paddlewheel-like drive wheel were rusted away completely; they were the scoops on the bottom, sitting in the snow and slush when the sledge was abandoned.

In spite of its age—it was built in 1907—the Simplex engine was in quite good condition. There was virtually no internal corrosion at all, and the inside of the engine showed little wear. The main engine problem until a local firm made a gift of a large tin of anti-rust fluid was rusted-up valves. The carburettor and inlet manifold were missing, and this had allowed water to get into the valve gear.

Another problem is the lack of parts. The magneto and oil-feed mechanism are missing. But a search for suitable parts is being made with the assistance of the owner of a local motor museum. Some of the engine's missing parts may still be lying in Scott's hut. But it may be difficult to find them, and even if they are there, they might be hard to recognise after so many years.

**SOVIET NEWS**

## *Russkaya will be winter station from next year*

Russkaya, the seventh Soviet research station in the Antarctic, was occupied from February 17 to March 3 this year by members of the 18th Soviet Antarctic Expedition. Next year the station, which is at Cape Burks, off the Hobbs Coast of Marie Byrd Land, will be enlarged and occupied all the year round. Cape Burks is at the entrance to Cordell Hull Bay in West Antarctica, and its location is at 74deg 43min S/137deg 07min W.

News of the establishment of the station for which the veteran research and supply ship *Ob* made a reconnaissance late in the 1971-72 season, was given by Dr P. Senko, leader of the Soviet expedition, when the *Ob* called at Lyttelton this month to take on fuel and supplies for her return to the Antarctic. The station consists of three buildings which house the generator, radio equipment, stores, fuel supply and living quarters.

Construction materials and equipment were transported to the site of the new station with the aid of the *Ob*'s large twin-engined MI-8 helicopter, which can be used to carry passengers and cargo. As a transport helicopter the turbine-powered MI-8 carries 28 passengers; the cargo-carrying version has 24 tip-up seats along the side walls of the cabin, and can lift a load of nearly three tons.

Dr Senko also had news of the progress of a Soviet scientific traverse party involved in the International Antarctic Glaciological Project in Wilkes Land. The party of 27 scientists and drivers in six tracked vehicles was 240 miles from Mirny on March 13. It has been carrying out ice drilling and studies of the movement of the ice sheet, and is due back at Mirny on April 1.

Scientific work at Soviet stations went well during the summer, according to Dr Senko, and the health of the men was good. Little change in the size of Soviet expeditions was expected in the

next few years. There remained the possibility that at some future time scientists might be flown to the Antarctic from the Soviet Union but this was far away. Only *Molodezhnaya* had suitable terrain for a runway, and there were no immediate plans for a survey.

Dr Senko was on his sixth trip to the Antarctic (his fourth as leader of the expedition). With him aboard the *Ob*, which encountered heavy ice only off Marie Byrd Land, were 60 scientists bound for Soviet stations. Scientific research was carried out on the voyage from the Soviet Union, and the *Ob* kept in touch by satellite.

### LONG ASSOCIATION

Not surprisingly arrangements for the *Ob* to take on fuel and supplies at Lyttelton were handled by the shipping agents, Kinsey and Company Ltd. Now nearly a century old, the firm has had a closer association with ships operating in Antarctic waters than any other in New Zealand, and the name of its founder, Sir Joseph Kinsey, is part of the history of exploration in the south.

Kinsey's served Scott's two expeditions, and Shackleton's, and Sir Joseph Kinsey was a friend of both men as well as their business representative. Since the United States became involved in a continuing Antarctic research programme the firm has regularly provided stevedoring for Antarctic supply ships calling at Lyttelton.

# HARRY MACKAY, MASTER OF THE TERRA NOVA

By A. G. E. JONES

Scott wrote at length about the voyage of the *Discovery* in 1901-04, while Gerald Doorly gave a full account of the voyage of the *Morning*, recently supplemented by an article in "Antarctic". The voyage of Captain Henry Duncan Mackay, master of the *Terra Nova*, sent out in 1903-04 to assist the *Morning*, hitherto neglected, and the career of Captain Mackay, are pieced together in this article.

Scott was camped at the edge of the ice in McMurdo Sound in January, 1904 supervising the ice sawing which he hoped would release his ship from the ice which had held her since 1902. He wrote in his diary on January 5:—

"Our tent door was open . . . and I gazed dreamily out . . . when suddenly a ship entered my field of view. . . . Wilson looked up and said, "Why, there's another." And sure enough there were now two vessels framed in our doorway. We had of course taken it for granted that the first ship was the *Morning*, but what in the name of fortune could be the meaning of this second one? We propounded all sorts of wild theories of which it need only be said that not one of them was within measurable distance of the truth. . . . I learnt at once that her captain, Mackay, was an old acquaintance whom I was more than pleased to welcome in this Far South region. . . ."

Scott learned from Captain Colbeck that the Admiralty had decided to send two ships to relieve the *Discovery*, despite the feelings of Clements Markham, president of the Royal Geographical Society, who had taken a leading part in the planning of the National Antarctic Expedition.

On June 15, 1903, the Treasury asked the Admiralty to take up the relief of Scott, and then things moved fast. A committee was formed comprising Rear-Admiral Pelham Aldrich (who had served with *Nares* in the Arctic in the expedition of 1875-76), Rear-Admiral G.

H. T. Boyes, Director of Transports, and Rear-Admiral Sir William Wharton, Hydrographer.

The first step was to choose a ship, for which purpose Aldrich with Shackleton and Cyril Longhurst (who was secretary to the National Antarctic Expedition) went at once to Dundee, the only whaling port in Britain. Inquiries were made in Norway and the British Consul-General in New York was asked to find out about American steam whalers. In all, Aldrich listed and commented on 25 vessels.

## REEKING OF OIL

C. T. Bowring and Company Ltd., of Liverpool, who were active in the Newfoundland sealing trade, wrote on June 24, 1903, offering to hire the *Kite* (which had been used by Peary) or the *Terra Nova*. The latter vessel was surveyed at Dundee and, not surprisingly, found to be in an "almost incredibly filthy state . . . everything reeking of seal oil," but was generally sound. On July 6 she was bought for £20,000 with all stores on board, less £500 kept in hand for repairs which needed to be done. Then she was sent to Dundee Shipbuilders Ltd., who (despite the trade holidays) set 300 men to work to repair, refit and re-rig her in a fortnight. The engineers aligned the shaft and repaired the engines.

In a whaling port there was no difficulty in finding a crew. When they had signed on Aldrich described them as a "fine looking lot of men . . . nearly all

with experience in ice navigation," but next day he wrote, "The men indulged freely in whiskey before coming on board." But this was usual with a whaling crew and for this reason sailing was planned for the following day. There were a number of volunteers who could not be offered a berth.

Ernest Shackleton had been medically examined and found fit, and Aldrich thought he would be a very good chief officer, but Shackleton had no such inclination.

### WHALING CAPTAIN

When the Terra Nova docked at Dundee she was commanded by Captain Arthur Jackman, who had been her master for some years; but Aldrich's comment was, "expectorated continually . . . could not entertain him in any capacity."

After making inquiries widely, Aldrich wrote to the Hydrographer on July 22, 1903, "I recommend that Captain Mackay should command the Terra Nova. I had satisfactory accounts of him on all sides and he gives me the impression of being a good sound man . . . I cannot hear of any other likely master . . . a whaling captain of large experience . . . I think he will do all right." He was bespoken to command the Viking in the seal fishery in the following season, but after some negotiation he was appointed at £42 a month.

Scott had, indeed, met Captain Henry Mackay once before, when the Discovery was launched at Dundee in January, 1901.

Scott was right in describing the Terra Nova as "one of the finest whaling ships." Built at Dundee in 1884 by Alexander Stephen and Sons, she was 744 tons gross, 456 tons net, and was the newest of the whalers. She was also the most powerful, having inverted compound engines of 120 horsepower by Gourlay Brothers of Dundee. For nearly 20 years she had been employed in the Newfoundland and Greenland sealing and whaling trades. The sum of £4526 was spent on refitting her, and it was agreed that C. T. Bowring should have the first refusal when she was sold again.

Henry Mackay was, at this time, the youngest of the Dundee whaling masters. Born there in 1857, he was the son of James Mackay, a gas worker. He obtained his master's "ticket" in 1882 and in 1889 became master of the Aurora, 386 tons, owned at first by William Stephens and later by W. B. Bowring of Liverpool. In her, Mackay went to Newfoundland, bringing back 11,166 seals and 130 tons of oil in his first season.

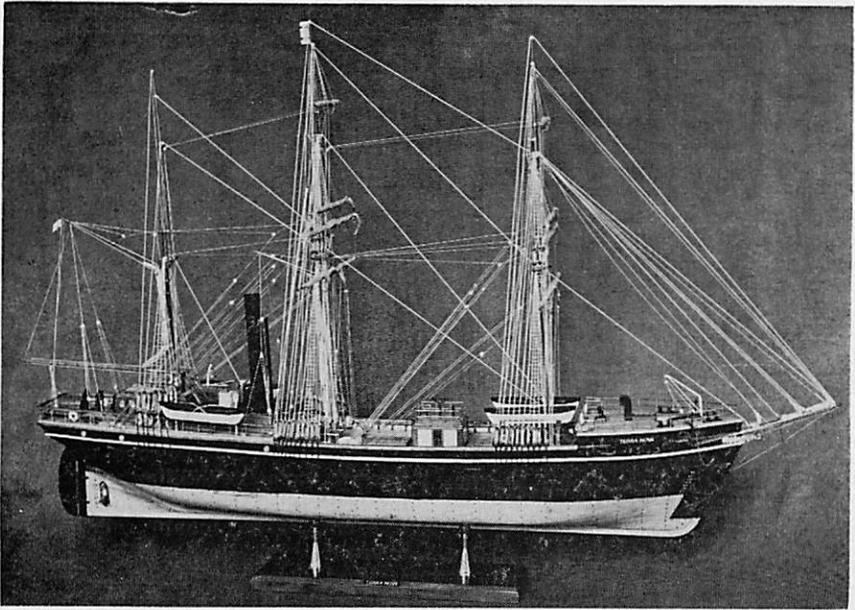
In 1893, Mackay, the youngest whaling captain of Dundee, took command of the Terra Nova, owned by D. Bruce and Co., of Dundee, and in her he went to Baffin Bay, partly for the sealing and whaling and partly on a search expedition. In the previous year, two Swedish explorers, Björling and Kalstenius, had visited Baffin Bay in the Ripple (37 tons, of St. John's) and had not returned. In June, 1893, Mackay searched the Cary Islands, discovering the wreck of the Ripple and finding some papers which indicated that the crew had taken to their boats and were presumably lost. For bringing this information back he was awarded the medal of the Swedish Anthropological and Geographical Society.

### ARCTIC FISHERY

In addition, at various times, Mackay had been master of the yacht Eskimo, and the Blencathra in their Arctic cruises, and in 1902 he was master of the iron screw yacht Caterina. In his first season in the Terra Nova his catch was 14 whales, a record for the later years of the Dundee sealing trade. His catches were as good as those of any of the masters, he having become one of the most experienced ice masters in the Arctic fishery.

Henry Mackay was a striking man in appearance, handsome and well-liked. All his officers seem to have got on with him, and later he worked well with Captain Colbeck, and with Scott who described him as "excellent company for a depressed state of mind." He was also a leader of men, as the master of a Dundee whaling ship needed to be.

When the Terra Nova sailed the men



**A model of the Dundee whaler Terra Nova, which sailed with the Morning in 1903-1904 to the relief of Scott's first expedition. She also took Scott's last expedition to Antarctica. The photograph is by courtesy of the director of the museum.**

had to be brought aboard from the bars of the town; as the first officer said, "mostly very drunk . . . disreputable looking lot . . . fighting, singing and dancing in forecabin." At Hobart at one time, half the crew were in prison, being mad drunk, and when Mackay left that port one man was discharged, having been sentenced to three months in prison. At Dundee three men went adrift and at Hobart seven went absent without leave.

Although the crew were put into naval uniform before leaving Scotland, Mackay had no powers over them other than those of a master in the merchant service: but this was the usual state of affairs in the whaling ships, and with such a crew and with officers with no previous experience in polar work he made a successful voyage.

Mackay was appointed master on July 25 for a voyage described as: "Dundee to Hobart, to South Polar regions not exceeding 85°S.—not to exceed three

years—crew of the Discovery may be supplemented from the Terra Nova—to work cargo, etc., as necessary—voyage to be at their own risk."

The Terra Nova sailed from Dundee on August 21, 1903, reached Portland on August 26 and left on the same day, towed by H.M.S. Minerva, as far as Gibraltar which was reached five days later. The Terra Nova was here for two hours, time enough for Mackay to have a sharp difference of opinion with Admiral Sir Compton Domville over repairs, before being taken in tow by H.M.S. Vindictive.

The tow was taken up at Port Said by H.M.S. Fox, and was cast off on September 19 when they were off Socotra, the winds at that season being such that the Terra Nova could make the rest of the passage under sail and steam. For much of this time she had kept up 9 to 10 knots and had reached 13½ knots.

For the next six weeks, Mackay made

the best of his way to Hobart. He had been expected to reach that port on November 17, but with the help of the Navy he reached there on October 31, in less time than the regular mail service. Here he met the generosity of Tasmania and New Zealand.

The ship was given a library by the Tasmanians, while the Marine Department helped with repairs free of charge, so that he was able to report that she had taken on board 480 tons in all and that "the ship is in excellent condition below and aloft and in my opinion thoroughly sound and fit for the work that will be before her."

### SLOW PASSAGE

The Terra Nova and the Morning sailed for McMurdo Sound on December 6, 1903, and they parted company once only. It was a slow passage because the Morning could not make the same speed as the Terra Nova, and every day the Terra Nova made a circle round her consort. It was not until December 26 that they entered the pack ice on the Antarctic Circle.

After two days in the pack they sighted Scott Island. During this time they had some nasty squeezes against the ice, and the Dundee men taught the crew of the Morning how to sally\* to free the ship. They left the pack on January 1, 1904, sighting the Admiralty Range that very evening at a distance of 150 miles. They made direct for McMurdo Sound, sighting Mts Erebus and Terror on January 4 and the Discovery on January 5.

Then came the long wait which has been described so well by Scott. Despite the efforts of Scott, Colbeck and Mackay, it was not until February 16, 1904, that the Discovery was freed.

As the result of a hurricane the three ships did not sail from McMurdo Sound until February 19. The Morning left from Wood Bay to make the best of her way to the rendezvous at the Auckland Islands, while the Discovery and Terra Nova passed through the Possession Islands to Cape Adare.

It had been intended that Scott and Mackay should keep company, but they soon lost sight of each other in a blizzard. It took the Terra Nova three weeks to reach the Auckland Islands, where it was learned that the other two ships had made a very rough passage in the face of continuous gales. A week was needed at the rendezvous before they were able to sail for Lyttelton, which they reached on April 1. Here they were given a great reception and had every help.

The Royal Navy dry-docked, caulked and cleaned the Terra Nova, while Mackay and his officers were brought into the social life of Christchurch. After six weeks, she sailed for Port Stanley, taking seven weeks in the passage. After coaling, she sailed for Sheerness where the crew were paid off on August 18, 1904.

When the ships reached Lyttelton, Captain Colbeck wrote to the Antarctic Relief Committee about the "heartly co-operation and assistance rendered by Captain Mackay." but this gratitude was not shown in all quarters.

When the Terra Nova got alongside the Discovery, Mackay transferred 50 tons of coal to Scott's ship: and since he knew Mackay's stock, could have asked for more.

### SCOTT'S LETTER

But when Scott reached the Auckland Islands he wrote a personal letter to the Hydrographer (ending it, "Yrs very sincerely") complaining that "the coal was a great disappointment", and adding that if he had been given the coal that Captain Mackay was then offering him, he could have discovered what lay between Cape North and Adelie Land. He added, disparagingly, "Captain Mackay did. I suppose, as much as one could expect from a whaler captain."

Evidently Scott did not complain directly to Mackay who, in due course, at home, received a letter of complaint from the Hydrographer. In a blunt reply, Mackay explained that, still having some of the stores which the Morning should have taken, and having received stores from the Discovery, his ship was

\* Running from side to side to roll the ship.

badly stowed and much of the coal had been difficult to get at; and there the matter rested.

The steward, R. H. Morgan, who had been in the merchant service for 20 years, was also in trouble. He had issued provisions with the agreement of Mackay as and when required. He received from the committee a schedule of deficiencies and surpluses and was asked to account for them. Morgan commented—a little acidly—that he would have kept an account to the “oz.” if he had known that to be the Service practice. He had been engaged at a salary of £96 per annum, with an allowance of £4 a month store allowance at the end of the voyage if satisfactory.

Mackay received less than justice at the hands of Scott and Markham. In his narrative, Scott referred to “the unremitting labour” of Aldrich, Boyes (who did almost nothing towards the preparations) and Wharton—men who could help him in his professional advancement.

The men who could not help him in his career—Shackleton, Mackay, the owners of the shipyard at Dundee and Gourlay Brothers—were forgotten. Clements Markham made scant reference to them, and in writing about Mackay's search for the Rinnle merely referred to him as “a whaler”.

There is little left from this successful voyage, apart from a few documents, photographs and the Polar Medal of the first engineer, Alexander Sharp, now preserved in the museum at Dundee. Mackay is almost forgotten in his home town. The Terra Nova was lost in the Newfoundland sealing fishery in 1943.

Mackay returned to his home in Tavnort. In 1905 he took command of the *Diana*, 341 tons gross, 212 tons net, owned by Robert Kinnes\*, the leading owner in the Dundee sealing and whaling trade. By this time these trades at Greenland, in Davis Strait, and off

Newfoundland were showing the effects of active fishing and catches were poor.

In 1909 Mackay returned with one small whale, but took 1564 seals. This was a poor return compared with his catches in the 1890s. Since the cost of fitting out was about £3500, it is not surprising that he should have parted from his owner.

So far as we know, Mackay did not go to sea again. At the end of the 1890's he moved from Dundee to Tayport, the new residential district on the other side of the Tay. There he lived for some years in a pleasant detached house overlooking the river, where he could see the shipping arriving at the docks and sailing. He died on November 9, 1925, at the age of 71, and was buried at Tayport, where a grey polished granite stone marks his grave.

Harry Mackay was not a great man, but whatever he did he did efficiently. Scott gave his name to a cape on the southern side of Ross Island.

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\* Some of the vessels owned by Kinnes were well known in the Antarctic—the *Active*, *Diana*, *Morning*, *Scotia*, *Balaena* and the *Pole Star*. He had started trading to the Arctic about 1870, and at one time employed about 300 Eskimos.

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## Isolated for Nine Months

Four American scientists at Siple Station in the Sentinel Mountains of Ellsworth Land will be the smallest completed isolated group to winter in the Antarctic since 1934. They will have at least nine months of isolation; Rear-Admiral Richard E. Byrd spent 137 days alone in a tiny hut on the Ross Ice Shelf 123 miles from his base at Little America.

Siple Station, built in 1970, sits on ice more than a mile deep. Hitherto it has been manned only during the Antarctic summer. This winter the four men at the station can expect temperatures as low as 65 degrees below zero (Fahrenheit). In 1934 the temperature at Byrd's advance base dropped to 74 degrees below zero on May 20. On July 19 it was 75 degrees below, and at 3 a.m. next morning the temperature was 80 below, and later it dropped to 83 degrees—an incredible 115 degrees of frost.

Conditions at Siple Station will be vastly different from those at Bolling Advance Weather Base 39 years ago. Siple Station is less than 1000 miles from the Amundsen-Scott South Pole Station, and 1350 miles from McMurdo Station. The men, living in two attached buildings, each about 45ft long and 25ft wide, will be in radio touch with the other stations during the winter.

To make the winter isolation endurable the four men will have 60 films to watch, radio to listen to, and 500 paperbacks and 500 technical books to read

when they are off duty. There is plenty of food—ten tons of it, including lobsters, steaks, dehydrated shrimp, eggs covered with oil to keep them fresh, and concentrated milk.

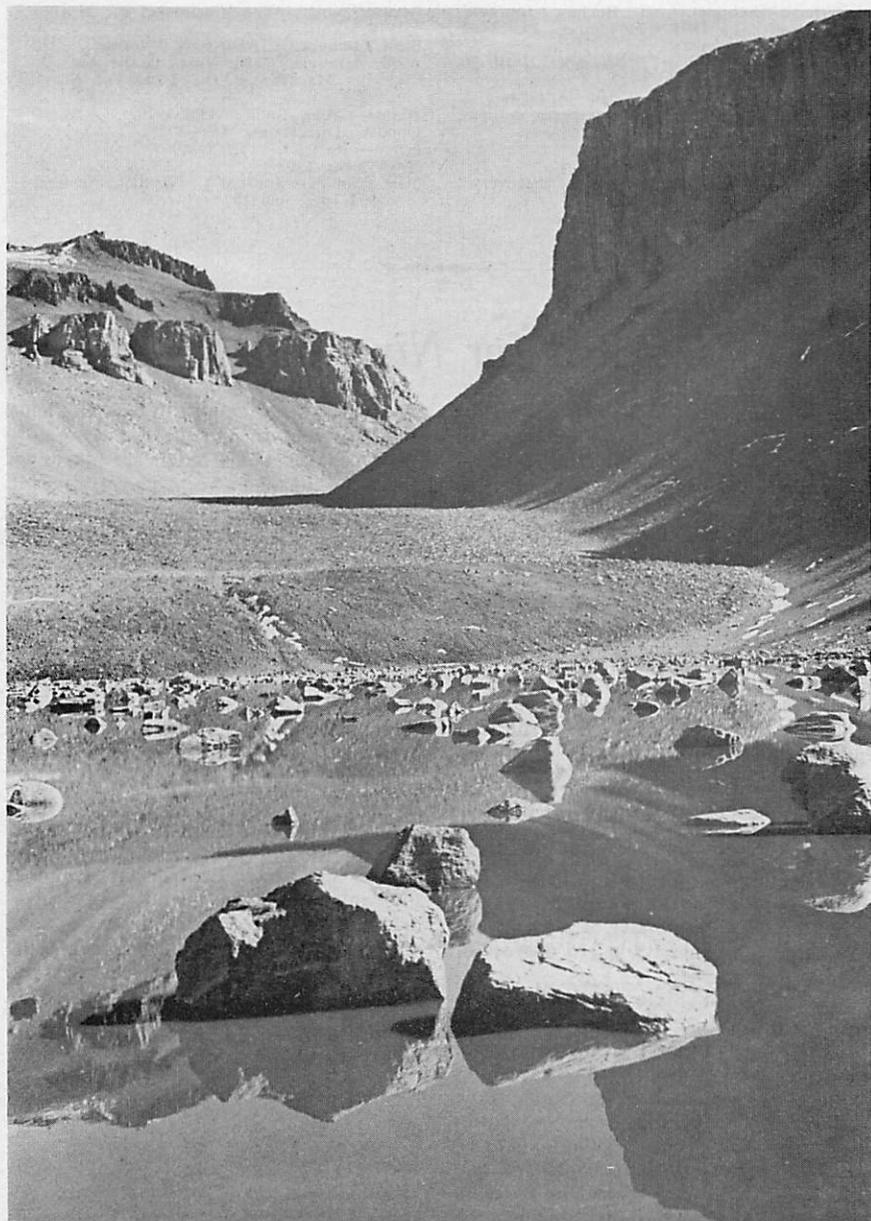
During their stay at Siple Station the scientists will concentrate on learning more about the ionosphere and the magnetosphere, regions of the earth's atmosphere which are important for the transmission and receipt of radio signals. Siple Station is built at the bottom of a kind of "magnetic rainbow" made up of invisible lines of force in the earth's magnetic field. The other end of the rainbow dips down into Quebec, Canada.

Using a 13-mile-long ground antenna, the scientists will try, with their colleagues in Canada, to learn more about the interaction between the electromagnetic waves of the magnetic field, and electrified particles bombarding the earth's atmosphere from the sun and elsewhere in space.

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## VOLUME V INDEX

Subscribers to "Antarctic" are reminded that the index to Volume V (1968-70) has been printed. Copies can be obtained from the New Zealand secretary, P.O. Box 1223, Christchurch. The price is 35 cents in New Zealand currency or the local equivalent.



**Don Juan Pond in the Wright Valley is an inland body of water which dries up in the Antarctic summer, leaving a salt deposit on the surface. Its salinity is six times that of ordinary sea water. Next season a drilling site will be established at the pond as part of the three-year programme of the Dry Valley Drilling Project.**

—Official U.S. Navy Photograph

# Chilean Plans to Extend Activities in Antarctic

In the next two years the Chilean Antarctic Institute hopes to double its activities in the Antarctic. The Chilean Government has doubled its budget this year, bringing the amount available to about five million escudos (\$US120,000). But future expansion depends on the availability of scientists and research workers from Chilean universities.

A five-year plan of Antarctic investigation has been prepared by the institute, which promotes, finances, and co-ordinates national scientific work in Antarctica. Since 1972, in accordance with the plan, the institute has started studies in limnology, the migration of birds, the auto-ecology of fishes, and the availability of krill.

Chile has three bases in the Antarctic Peninsula area. They are General Bernardo O'Higgins, on a small island off the coast of Trinity Peninsula, Presidente Frei, on King George Island, and Capitan Arturo Prat, on Greenwich Island. The Army, Navy, and Air Force each man a base throughout the year. The armed forces also provide logistic support for the institute's summer programme from December to February. Last season the programme involved about 40 scientists.

Glacial and meteorological studies are carried out at the bases, and the institute is also involved in detailed volcanic experiments aimed at proving that Antarctica was once part of South America.

The institute has established a new telecommunications system at Frei. The station will be able to dispatch meteorological information direct to Santiago instead of through McMurdo Station and Washington, D.C., as at present. Chilean scientists will be able to provide weather observations of international importance, which will be distributed more rapidly to other countries.

In 1966 Chile agreed to install an Antarctic meteorological station which will be responsible for analyses and

predictions for the Antarctic Peninsula about one-third of Antarctica).

Installations for the station are being completed. The institute has been responsible for the financing and the general programme, assisted by the electricity department of the University of Chile, Valparaiso, the Chilean Air Force, and ENTEL-CHILE.

Next season the institute wants New Zealand to be represented in its scientific programme. Mr Roberto Rotger, head of its administration department, told a New Zealand Press Association representative in Santiago this month that New Zealand will be invited later this year to send scientists to participate in its work.

This invitation has been welcomed by Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research, but it raises such problems as language, transport, and the availability of scientists for the research planned by the Chileans. Also New Zealand already has standing invitations to take part in Japanese, Russian and South African Antarctic research activities.

New Zealand will, however, be able to advise the Chileans about mountain climbing equipment used by their Antarctic teams. The institute frequently has difficulty in obtaining equipment. It will have to import climbing gear, and will need skis, ropes, and ice axes.

The institute is seeking information about the equipment available in New Zealand; Mr Thomson has said that the division will certainly provide it.

# Fuji Again Meets Fast Ice on Relief Trip to Syowa

As in the past three seasons the icebreaker Fuji encountered tough fast ice on her relief trip to Syowa Station with the 40 men of the 14th Japanese Antarctic Research Expedition (JARE 14). Cargo had to be carried 40 miles to the station by helicopters, and an attempt to drive snow vehicles over the ice had to be suspended because high temperatures made the surface too soft.

The airlift of cargo, construction at the station, and the field survey were all completed on time, however, and the formal change-over of the 13th and 14th expeditions took place as planned on February 20. Thirty men of JARE 13 embarked on the Fuji for Cape Town and were to fly back to Tokyo at the end of this month.

The Fuji is expected to return to Tokyo on April 20. She will call at Cape Town about the middle of March and at Singapore at the beginning of April.

On November 25 last year the Fuji sailed from Tokyo on her relief trip. She called at Fremantle and picked up a transponder beacon provided by the French National Space Research Committee as part of the international programme to study weather and ocean currents round the Antarctic Continent. This transponder was set on an iceberg off the Prince Olav Coast on January 5. The position of the iceberg was 68deg 50min S—38deg 45min E.

In the latter part of December the Fuji entered the sea of ice floes off Enderby Land. After proceeding westward she reached the edge of the pack ice at 65deg 27min S—43deg 14min E on December 30. She made a fairly easy penetration of the pack and reached the edge of the fast ice on January 1.

Because she met rather tougher fast ice than in the last season the Fuji had to use her two Sikorsky S61 helicopters to fly cargo to Syowa while waiting for the ice conditions to improve. Transport of snow vehicles, including one

KD-60 type inland survey vehicle weighing about seven tons, over about 30 miles of ice to the station, had to be suspended because high temperatures had made the surface of the fast ice too soft although it was thick enough to bear the weight of the vehicles.

JARE 13, led by Mr Sadao Kawaguchi, successfully finished its scientific programmes. Seven sounding rockets were launched in a series of observations of the aurora, continuing the JARE 12 programme.

The upper atmosphere rocket sounding programme, using S-210JA rockets, was launched in the 1972 winter under the supervision of Dr (Susumu Kokubun). Valuable data on the aurora and the emanation of X-rays and ultra-violet rays, and data on the magnetic field and spontaneous radio waves, were successfully collected.

Mizuho Camp, the small inland station about 185 miles south-east of Syowa and 6765 feet above sea level, was occupied from April last year to January this year. Two supply trips were made from Syowa by snow vehicles during the winter.

Two glaciologists remained at the station for about nine months without a break. They were engaged in thermal drilling of the ice-cap, the equipment being installed in a snow mine.

The scientific activity of the JARE 14 summer party of 30 men led by Dr Takeo Hirasawa, is largely a continuation of programmes of the previous year. Station observations cover the following disciplines: cosmic rays,

aurora and airglow, ionosphere, whistler and VLF emission, geomagnetism, meteorology, seismology, cartography, oceanography, glaciology, geography, geochemistry, and human physiology.

Seven S-210JA sounding rockets will be launched into the aurora during the winter under the supervision of Dr Hirasawa. Mizuho Camp will be manned for a few months for research into glaciology, meteorology, geomagnetism, and human physiology.

An inland traverse of about 80 miles from November to January next year is planned. The main objects will be the resurvey of strain grids set up by JARE 10 in the Yamato Mountains area, and glaciological programmes.

Relief and re-supply operations in the 1972-73 summer were completed successfully, and shipboard programmes in the Fuji, including physical, chemical and biological oceanography, marine-meteorological observations, and upper atmosphere physics, were carried out under the leadership of Dr Kou Kusunoki.

Preparations for JARE 15 have begun already. Candidates for membership of the expedition have been assembled, and winter training was planned for the end of February in the Japanese Alps.

In accordance with the Japanese Government's scheme to invite foreign observers to join the JARE summer programmes, Dr W. L. Hofmeyer, deputy director of the South African Weather Bureau, was with JARE 14 aboard the Fuji between Fremantle and Cape Town.

Dr Takao Hoshiai, a Polar Research Centre biologist, was invited to join the British Antarctic Survey summer programme, and studied at the marine laboratory on South Georgia. Dr Hoshiai was able to complete his biological studies of shallow waters successfully. He was concerned particularly with the feeding behaviour of the Antarctic fish *Notothenia*.

A National Polar Research Institute has now been established by the Japanese Government. As from April 1 the present Polar Research Centre will be separated from the National Science

Museum. The new institute will function as a research organisation for joint use by scientists who do not belong to any university.

In 1970 the Polar Research Centre was established in the National Science Museum, and was concerned not only with polar research but also with the planning and execution of Japanese Antarctic research expeditions. The secretariat for JARE headquarters was set up in the Ministry of Education.

Since then there have been many requests for the establishment of a national polar research organisation. It was suggested that there could be an interchange of scientists wishing to study polar subjects, and that the organisation should be responsible for co-operation with JARE.

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## *Wider scientific interest*

A broader scientific approach to Japan's Antarctic research programme is being sought by the Japanese Polar Research Association. The main emphasis at Syowa Station, on Ongul Island, off the Prince Olav Coast, has been on upper atmosphere physics; the association believes that a wider range of scientific disciplines would be beneficial.

Dr T. Tori, general secretary of the association, who was in Christchurch earlier this season, after his 12th visit to the Antarctic, is compiling a 700-page comprehensive book on the Antarctic which, he hopes, will generate interest among Japanese scientists, to whom the continent is little known. His association is also trying to interest the Japanese Government in more scientific exchanges with other nations taking part in Antarctic research programmes. Japanese scientists work now only with the British and New Zealand programmes.

For the last three years Japanese scientists have worked with the New Zealand programme, operating from Vanda Station in the Wright Valley. Last season's research will not be con-

tinued; it is unlikely that Japanese will join New Zealanders in the valley again for at least three years.

The Japanese were unable to participate with the New Zealanders and Americans in the dry valley drilling project, which began on Ross Island near Observation Hill, overlooking McMurdo Station, towards the end of

January. Although Japan has been concerned in the development of the programme, the Japanese Government was unable to allocate the necessary funds for participation in the drilling project. But three scientists who had been making a geochemical study in the Wright Valley remained at McMurdo Station to help where they could.

## PROBLEMS OF OLD ICE IN McMURDO SOUND AREA

For the first time since the early 1960s Winter Quarters Bay and much of McMurdo Sound were frozen over this month. The ice had not melted and been blown out to sea as normally happens, usually before the last scientists and servicemen leave McMurdo Station when summer operations end in the Antarctic.

The old ice which was left—and this included the annual ice runway at Williams Field—was reported to be very rough and full of melt pools. Warmer weather and strong winds were needed to melt the ice and blow it out to sea, but they were not expected.

Temperatures in the McMurdo Station-Scott Base area late this month were about 10deg lower than has usually been the case at this time of the year. Usually the average temperature at Scott Base is about minus 15deg F. This month the average was about minus 28deg F.

A cold winter at Scott Base—even by Antarctic standards—is likely this year, according to Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research. Prospects of a cold winter were reinforced by a report from the Amundsen-Scott South Pole Station. There a low temperature for March was recorded—minus 62.7deg F.

Palmer Station on Anvers Island off the Antarctic Peninsula, reported one inch of snow, and an Antarctic rarity—6mm of rain. A fall of rain was recorded at the Japanese Syowa Station

on January 8. Rain fell previously on January 10, 1958, and January 21-22, 1959. Traces of rain have been reported from McMurdo Station.

Unless there is a change in the weather in the McMurdo Sound area next month the United States Navy may be faced with runway problems next season when the first aircraft fly south. The old ice which has not moved out would need considerable preparation next season before wheeled aircraft could land on it.

Also next season the heavier ice could delay the operations of the United States Coast Guard icebreakers, which each season cut a channel through the ice in McMurdo Sound to McMurdo Station for the supply ships. Last season the icebreakers had to work the channel repeatedly to keep the ice broken up.

## N.Z. CARPET FLOWN SOUTH

Meat and timber have been exported from New Zealand to the Antarctic to supply the needs of the United States naval support force. Now New Zealand-made carpet has been exported for use by New Zealanders.

Last year a small shipment of carpet was flown south to be placed in rooms at Scott Base. It was produced by UEB Industries.

# Ice Damages Calypso on First Antarctic Voyage

Damage by storms and icebergs to his oceanographic research ship Calypso, and the death of his first mate in an accident, marred Commander Jacques Cousteau's first venture into Antarctic waters this season. The ice damage ended his exploration ten days earlier than planned, and the damaged Calypso had to be escorted to Argentina from the Antarctic Peninsula by the Chilean ship *Yelcho*.

Originally Cousteau planned to remain in the waters of the Antarctic Peninsula for more than a year. He and his crew sailed south late last year to do research on the effects of the abusive hunting of whales, and to study animal life in Antarctic waters.

The research programme included participation in an experiment with the Ames Research Centre, a branch of the United States National Aeronautics and Space Administration. Information was sent to the Calypso by satellite, giving reports on weather and ice conditions. The Calypso was able to avoid severe storms and dangerous ice; space-age technology still did not save it from storms and icebergs.

According to reports from the United States, the Calypso was damaged twice by icebergs. She was hit first on January 16, and then was at anchor in Hope Bay when 75-knot winds pushed blocks of ice into the ship, breaking one propeller shaft, and slightly damaging the other. She was damaged in a storm in Drake Passage early last month, and after the difficulties with ice had to proceed at 5.5 knots escorted by the *Yelcho*, to Ushuaia, the Argentine port on the island of Tierra del Fuego. She arrived there safely towards the end of last month.

Not long after the Calypso began work in the Antarctic Peninsula area the first mate, Michel Laval, was killed on Deception Island. He was leading a climbing group away from the ship's helicopter to examine a fissure on an extinct volcano when he slipped on some ice and fell into the rotating blades of the helicopter.

Last month Cousteau reported on his research to United States and European newspapers, using a satellite hook-up from the Calypso. He said that his team had discovered for the first time that abundant schools of squid existed in the Antarctic Peninsula area. The water was not badly polluted, the whale population had dropped six per cent, and the seals had barely recovered from last year's commercial harvest.

From November 6 last year the Calypso was in communication with Ames Research Centre scientists by satellite five days a week. Instruments aboard the ship constantly measured the amount of chlorophyll in the sea, the temperature, and the water transparency. These readings were transmitted to the United States and compared with data obtained from three earth-orbiting satellites. The purpose of the experiment was to learn how to monitor the oceans' biological productivity from space.

Monitoring the chlorophyll content in Antarctic waters is a guide to both, the amount of sea life and the amount of pollution. A median amount of chlorophyll is necessary for high productivity; too much chlorophyll can be a sign of pollution. Both chlorophyll and water temperature are closely related to the amount of planktonic life. High chlorophyll levels were recorded around Deception Island in the early stages of the Calypso's research.

On her voyage the Calypso also carried experimental communications and picture transmission equipment provided by the National Space and Aeronautics Administration.

## GLOMAR CHALLENGER

# Antarctic Glaciation Found to be 20 Million Years Old

Antarctica has been glaciated—frozen and covered with ice—for at least 20 million years. Australia broke away from the polar continent some 50 million years ago, and since has been drifting northward at a rate of two to three inches a year. Traces of components of natural gas exist in sediments beneath the sea floor near the Antarctic shores.

These are discoveries made on the first ocean exploration near Antarctica by the deep-sea drilling ship *Glomar Challenger* on the latest leg of the Deep Sea Drilling Project. They were reported in New York this month by Dr D. E. Hayes, of Columbia University. He and Dr L. A. Frakes, of Florida State University, were joint chief scientists on the *Glomar Challenger's* 10-week voyage into the Southern Ocean and the Ross Sea, which began at Fremantle, Australia, on December 20 last year, and ended at Lyttelton, New Zealand, on February 28.

Making its way through storms and among icebergs, the 400ft *Glomar Challenger* drilled 16 holes in the sea floor, and brought aboard 4,650ft of cores. Four of the 16 holes were drilled into the continental shelf area of the Ross Sea, and in three of them minor amounts of gaseous hydrocarbons—primarily methane and traces of ethane—were detected.

Dating and reading the layers of sediment and ice-rafterd debris, the scientists aboard the drilling ship discovered that the Antarctic had been glaciated—frozen and covered with ice—for at least 20 million years. Dr Hayes said in New York that the finding was in sharp contrast to the estimate of five to seven million years made by most scientists until now.

Dr Hayes says it appears that a major and abrupt change in the extent of glaciation took place about five million years ago. Beginning 20 million years ago, ice gradually built up on the

continent and shelf areas. Five million years ago it extended out as much as 200 to 300 miles further than it does now. Then it underwent a rapid melting and retreat to a position similar to today's.

Subsequent fluctuations have been relatively minor. But, says Dr Hayes, the melting could have created a worldwide rise in sea level of several tens of feet. Both the early glaciation and the melting may have been related to the circulation of waters caused by the separation and movement of Australia from Antarctica, he believes.

The scientists confirmed that such continental separation and drift in fact occurred, beginning about 50 million years ago. At several sites the age of the crust underlying the sediments was found to be in precise agreement with that predicted by magnetic evidence related to sea-floor spreading hypotheses. Australia, says Dr Hayes, is being carried slowly northward at a rate of two to three inches a year.

To prevent possible environmental pollution the holes in which the gaseous hydrocarbons were encountered were plugged with cement before being abandoned. Plugging of holes is routine procedure in cases where traces of such gases are found. Dr Hayes reports that the scientists also found fossil remains of several types of microscopic marine organisms which should be invaluable as indicators of past climatic and environmental conditions.

The discovery that the Antarctic glaciation dates back at least 20 million

years may help explain why sediments 10 to 40 million years old are missing from many deep ocean basin areas around the globe, Dr Hayes reports. The very cold Antarctic bottom waters are known to flow into all the deep basins of the world oceans; these waters define all deep-ocean bottom circulations and control patterns of sedimentation and erosion world-wide.

Dr Hayes says that the Antarctic glacial ice shelves (semi-permanent ice masses floating on the sea but attached to land) play a major role in the formation of these waters, and their longer history may now explain the missing deep sea sediments.

The Deep Sea Drilling Project is part

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## HURLEY'S CAMERA IN N.Z.

A camera used in the Antarctic more than 60 years ago has come to light in Christchurch as the result of a newspaper article about an early model box camera. It was used by Frank Hurley, who served with Mawson's Australasian Antarctic Expedition from 1911 to 1914, and later was owned by W. H. Hannam, who was a mechanic and wireless operator with the expedition.

The camera, one of the Model B cameras in the folding pocket range produced by Kodak, is now owned by a retired master mariner, Mr A. Walker. He bought it on a troop ship during the First World War from Hannam, who had bought it from Frank Hurley. The camera has three shutter speeds, and a range of aperture stops from f4 to f128. It takes a 5in by 4in frame but suitable film is no longer available.

Mr Walker says that when he bought the camera he was told that it was one of the few pieces of equipment which survived the expedition and was not discarded. As far as he was able to ascertain, it was the only camera Hurley brought back from the Antarctic although he took several. Hurley obtained his cameras, some with special fittings for Antarctic photography, direct from the United States.

of the National Science Foundation's ocean sediment coring programme. Its object is to learn about the origin and history of the earth through the study of samples of the planet's crust obtained from previously inaccessible sites. The Antarctic cruise was the 28th of the project, which is managed under contract by the Scripps Institution of Oceanography of the University of California at San Diego.

During its first Antarctic cruise the Glomar Challenger was attended by the United States Coast Guard icebreakers Northwind and Burton Island. At one site in the Ross Sea area the Burton Island pushed drifting icebergs from a course along which they would have drifted near the stationary drilling ship.

The Glomar Challenger left Lyttelton on March 2 on her 29th cruise, which marks the Deep Sea Drilling Project's second incursion into Antarctic waters. She is expected to call at Wellington on April 19.

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## AIR ROUTE OVER POLE

Lan-Chile, the Chilean international airline, has not abandoned its plans for a commercial route across the Antarctic Continent. Before 1974 it hopes to be operating an 11-hour service from Punta Arenas over the South Pole to Melbourne.

Discussions are reported to have taken place in the Chilean capital, Santiago, between representatives of the Chilean, Australian, and Chinese Governments. Chile wants landing rights at Melbourne and Shanghai for a route which would include Punta Arenas, Melbourne, Manila, Shanghai, and Tokyo.

Postponement of a Brazilian expedition to the Antarctic was announced in a brief report from Rio de Janeiro on February 14. The expedition, originally arranged for January, was said to have been put off until this month, because of financial difficulties about the purchase of an oceanographic ship costing \$760,000.

# SOLO ANTARCTIC YACHT VOYAGE FINISHES AT PALMER STATION

Eighty-six days after he sailed from Halfmoon Bay, Stewart Island, Dr David Lewis completed the second stage of his single-handed attempt to circumnavigate the Antarctic Continent in his 32ft steel sloop *Ice Bird*. On January 28 he reached Palmer Station, the United States base on Anvers Island, off the Antarctic Peninsula. His sloop had been badly damaged in two gales, and capsized twice, and he suffered frostbitten hands and feet.

When he reached Palmer Station the 55-year-old New Zealand-born adventurer was able to anchor alongside Commander Jacque Cousteau's oceanographic research ship *Calypso*. The first news that he was safe came from Palmer Station through the main United States base, McMurdo Station. Later Dr Lewis sent a brief report to Australia from the *Calypso* via a United States National Aeronautics and Space Administration satellite. Fuller details of his dangerous journey were sent to a Sydney newspaper through McMurdo Station.

Dr Lewis was able to use equipment from the *Calypso's* workshop to make a new mast for the *Ice Bird*, and to weld his damaged steel cabin. But early last month he decided to call off his voyage until next summer, return to Australia, and then return to Palmer Station in November or December. He expected then to sail the *Ice Bird* into Sydney Harbour in July, 1974.

A later report quoted Dr Lewis as saying that he intended to go immediately to Washington to write an article on Polynesian migration for the "National Geographic Magazine." He was to have left Palmer Station on February 28 aboard the Antarctic cruise ship *Lindblad Explorer*, and expected to return in April to resume his voyage. This seems unlikely because Palmer Station is now closed for the winter.

Five days after he reached Palmer Station Dr Lewis sent a message in which he described the two storms which turned over the *Ice Bird*, and the extent of the damage. He had reached Latitude 60deg S 136deg W when a hurricane-force gale capsized the sloop and dis-

masted her. The mast was broken off at deck level and also 6ft up. Much water was taken aboard, the self-steering gear, life raft, engine, and radio, were broken or lost, the sealed side of the coach roof over the cockpit was split, and the fore hatch was sprung.

When the *Ice Bird* turned over completely the sea was entirely white with ice. Dr Lewis spent hours baling out water, repairing the fore hatch, and clearing wreckage. He lost his gloves, and his hands were frostbitten. His feet were frostbitten although he had not removed his insulated boots for two months.

## MAST IMPROVISED

Two days after the capsize and dismasting Dr Lewis was able to improvise a mast with his spinnaker pole. Later he stepped the boom from the bow as a second mast, raising it by hauling the main sheet. He cut his staysail in two along a seam, and hoisted it with his trisail.

Three weeks after the first gale the *Ice Bird* capsized again. The second storm did extensive damage to the rigging, crushed the steel supports of the cockpit hood, jammed the companion hatch, and deflected the compass.

Dr Lewis sailed on, accompanied by flocks of the pale blue ice birds (fairly prions) after which his sloop was named. He had to ration his water to one and a half pints a day and eat cold food because his stove had been wrecked in the storms. His waterlogged charts and clothes dried slightly as the sloop moved to the east.

When the *Ice Bird* was due south of

Cape Horn, Dr Lewis laid a course for Palmer Station because the access was easier than his original destination, the British Argentine Islands base. He sighted the mountains of the Antarctic Peninsula, and then spent two days and three sleepless nights among huge icebergs, crushed ice, and rocky islands, be-

fore he anchored at four o'clock in the morning alongside the Calypso.

The Ice Bird survived the hazards of the Southern Ocean for many weeks; on February 2 she was in danger of being crushed by drifting ice. But the danger was recognised, and she was moved to another mooring.

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## THE READER WRITES

### Sidelights of Antarctic Research

Letters, preferably not longer than 500 to 600 words, are invited from readers who have observed some little-known facet of Antarctic life or have reached conclusions of interest on some Antarctic problem.—Editor.

A British Antarctic Survey botanist has challenged a statement in the Soviet news section ("Antarctic," June, 1972, Page 206) that two species of cereals have been found by Russian scientists on King George V Island in the South Shetlands, and that this is said to mark a new southern limit for flowering plants. Mr David W. H. Walton suggests that the statement is erroneous, and that much of the error may have arisen through inaccurate translation.

#### FLOWERING PLANTS

British Antarctic Survey  
Botanical Section  
Research Gardens, Winterbourne  
University of Birmingham

Sir,—The southern limits for flowering plants are considerably further south than the South Shetlands. *Deschampsia antarctica* and *Colobanthus quitensis*, the two native Antarctic plants, are known from as far south as Stonington Island (c. 68deg S). Two weedy species of grasses, *Poa annua* and *Poa pretensis*, have also been reported from the Danco Coast area (c. 64deg S) by the Argentinians.

As for King George Island itself, the British Survey maintained a base there at Admiralty Bay for some years. The grass *Deschampsia antarctica* and the

Antarctic pink *Colobanthus quitensis*, were then reported from the island. Thus the statement that "the only plants found there previously have been mosses and lichens" is also inaccurate.

It would seem most unlikely that the two species reported by the Russians are cereals. One of them is probably *Deschampsia antarctica* whilst the other may well be the weedy grass *Poa annua*. If this is so the base-building operations of the Russians may well have introduced this latter species to the island, since it has not previously been recorded from there. Since I believe the Bellingshausen base is a protected area, the introduction of alien species could be a serious matter.

The statement "two species of cereals—one hitherto unknown—is misleading since it does not make clear whether the species is unknown to science or merely unknown from King George V Island. Considerable interest and importance is attached to the occurrence and location of flowering plants in the Antarctic area. I trust this correction will put the Russian report in its correct perspective, although I do not wish to criticise the Soviet work in the Antarctic. Much of the error may have arisen through inaccurate translation.

Yours etc.,

DAVID W. H. WALTON.

## WILSON'S DIARY

Sir,—In the September issue of "Antarctic" the reviewer of Edward Wilson's diary of the Terra Nova expedition refers to a photograph of the title page of the South Pole diary, and suggests that its Maori motifs indicate that it was given to Wilson while the expedition was in New Zealand. As there are no diary entries for that period we do not know where the South Pole diary came from.

In his notes on the text and illustrations, however, the editor, Mr H. G. R. King, provides a clue which can be followed back to the diary of the Discovery expedition. The South Pole diary was written in a "Wellcome's Medical Diary and Visiting List". The medical diary is of a kind produced by medical supply firms for use by doctors.

It is possible that Wellcome's (the ancestor of the present firm of Bur-

roughs and Wellcome?) supplied such a diary or diaries to Dr Wilson before the expedition left England. The Maori motifs suggest, however, that the diary may have been produced for circulation to New Zealand doctors.

If that is correct Dr Wilson may have bought the diary in Christchurch. What seems more likely is that it was a gift from one of the doctors with whom he became friendly at the time of the Discovery expedition. In his Discovery diary he refers several times to Drs Jennings and Moorhouse, both of whom entertained him, and helped him with his specimens when the expedition returned.

I believe that descendants of both families live in Christchurch. Perhaps they may be able to establish how Dr Wilson obtained the diary.—Yours, etc.

JAMES PIGG.

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# ANTARCTIC BOOKSHELF



## ANIMALS OF THE FAR SOUTH

By Bernard Stonehouse

Published by Peter Lowe, London 1972

171 pp. Illustrations, Maps, Diagrams, Index. English Price, £3.25.

Ever since man's first tentative exploration of the Antarctic seas and continent he has been interested in its animal and bird life, much of which is unique to these regions. We recall that the Emperor penguin, largest and most southernmost of the species takes its scientific name *Aptenodytes forsteri* from that father and son team of naturalists who went with Cook on the epic circumnavigation of the southern ocean in 1772-75. But the Antarctic means much more than penguins. Its surface waters are the richest in the world and in summer the plankton—minute floating plants and animals—provides a rich food supply for a huge population of sea birds, seals and whales.

The story of all this animal life is told in full in this new book by Dr Stonehouse. He is admirably fitted to the task he has set himself, having trained as a biologist and served many seasons in Antarctica, devoting himself to the study of its wild life, especially the penguins, on which he has written extensively.

The author devotes his introductory chapters to a discussion of the Antarctic region and the waters which surround it. He then deals at length with the surrounding islands, several admirable maps pin-pointing their location.

Here let it be said that apart from its fascinating story the book is a visual delight, all of its 200 illustrations being

reproduced in full colour, a feature which would alone make it worth the price.

The pictorial value of the book is fully exemplified in the deservedly long chapter on Antarctic birds, for every species of penguin, albatross, fulmar, prion, petrel, cormorant and skua is not only described in detail but is accompanied by a photograph or painting showing its characteristics.

The same scheme is followed with the mammals. The photographs of whales and seals must surely make this one of the finest sets ever brought together.

But Dr Stonehouse has done more than write a book about Antarctic animals. He is concerned for their future now that man has begun to establish permanent settlements in their previously uninhabited icy domains. The author points out how commercial exploitation has reduced the whale population of the southern waters and at one stage nearly exterminated the fur seal.

He says "as specialised animals, rigorously matched to a rigorous environment, polar species are vulnerable to environmental changes. As isolated animals in a relatively empty homeland, they may be more than usually sensitive to disturbance by other species. As animals of a simple unbuffered ecosystem they are peculiarly liable to suffer if any of their delicately balanced relationships with other species are upset. On each of these counts they are vulnerable to man—a large noisy animal with larger, noisier machines, who changes environments to suit himself, disturbs everything with his restless excess of energy, and plays havoc with ecosystems wherever he goes. Even when he is not butchering seals to make fur coats, or whales to make lipstick, margarine and pet foods, his very presence in Antarctica, with ships, aircraft, tractors, dogs is a disturbance to the local inhabitants."

The author concludes with a plea for the continued protection of wild life in perhaps the last part of the earth's surface where, as yet they are still able to cope with man's intrusion.

The Antarctic Treaty has done much in this direction but Dr Stonehouse sees the need for further legislation for the protection of species which live outside the treaty areas.

This is a book which will appeal to all who are concerned with nature conservation.—H.F.G.

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## SCOTT AND THE DISCOVERY OF THE ANTARCTIC

Compiled by Sylvie Nickels. Published by Jackdaw Publications Ltd. London, 1972. N.Z. Price \$2.35.

This admirable series of project folders, now well past the hundred mark, has already covered great events in history, social changes, famous and infamous people (they even include Ned Kelly!), battles and wars. The latest addition turns to the Antarctic and is well up to the standard of its predecessors.

The title "Scott and the Discovery of the Antarctic" could be misleading as the exhibits include broadsheets on Antarctic exploration from its beginnings, the Heroic Era of Scott and Shackleton and the International Geophysical Year. There is a good map, and facsimile sheets of the last pages of Scott's diary. There is even an extract from the Antarctic Treaty.

All in all, this is splendid material for school studies, and every school library would benefit from having this folder on its shelves.—H.F.G.



New Zealand meat will be on the menus at Scott Base this winter. Three tons were shipped from Lyttelton in the United States supply ship Private John R. Towle earlier this year. The shipment included lamb, beef, veal, pork, ham, and cocktail sausages. For field trips next season there were 200lb of bacon in 11b packs.

## OBITUARY

# MAWSON EXPEDITION VETERAN DIES IN WESTERN AUSTRALIA

A veteran of Sir Douglas Mawson's two Antarctic expeditions, A. L. Kennedy, has died in Western Australia, aged 83. Alex Kennedy was one of the young and energetic men chosen from Australian and New Zealand universities by Mawson for his 1911-14 expedition to Adelie Land, and was physicist and navigator with the western party led by Frank Wild which spent a year on the Shackleton Ice Shelf.

Kennedy went back to the Antarctic in 1930-31 aboard the *Discovery* in Mawson's British, Australian, and New Zealand Antarctic Research Expedition (B.A.N.Z.A.R.E.). The cartographers have put his name on the map of Antarctica. Mount Kennedy, an 1820ft peak in Mac-Robertson Land, was named after Kennedy by Mawson in recognition of his work as physicist with the B.A.N.Z.A.R.E. cruises.

A small peak protruding above the continental ice at the west side of Scott Glacier on Queen Mary Coast was named Kennedy Peak by the United States Advisory Committee on Antarctic Names. It was delineated from aerial photographs taken by the United States Navy's Operation Highjump in 1946-47, and named in recognition of the close correlation of Kennedy's running survey of the eastern half of the Queen Mary Coast with the US-ACAN map of 1955 compiled from aerial photographs.

A South Australian, Kennedy was born in Adelaide, and took a degree in mining engineering at the University of Adelaide in 1911. In the same year he was stroke of the university eight which won the inter-university competitions. Late in 1911 he joined the Australasian Antarctic Expedition with C. T. Madigan, another engineering graduate and later a Rhodes Scholar, who had rowed bow in the same eight.

E. N. Webb, the New Zealand chief magnetician of the expedition, who now lives in Wales, says that Kennedy's admirable contribution to the expedi-

tion's data on terrestrial magnetism, obtained by arduous effort and great endurance under appalling conditions, is recorded in the official scientific report published by the South Australian Government.

After the expedition Kennedy joined the Department of Terrestrial Magnetism, Carnegie Institution, Washington, D.C., and established and operated a magnetic observatory in Western Australia. He joined the Australian Imperial Forces in 1915 and served as an officer in the 2nd Australian Tunnelling Corps until the end of the First World War.

On the *Discovery* cruises Kennedy re-occupied many of the magnetic stations set up by the Australasian Antarctic Expedition. The results are recorded in the B.A.N.Z.A.R.E. official reports where they are discussed by Dr C. C. Farr, who was professor of physics at Canterbury University College, Christchurch. Farr, also a South Australian and a graduate of the University of Adelaide, was a leading scientific figure in Australia and New Zealand for many years, and was associated with scientists in the Scott and Shackleton expeditions.

Until his retirement about 10 years ago Kennedy spent the rest of his career in various aspects of mining engineering. Webb, who served with him in Mawson's first expedition, has sent "Antarctic" this tribute: "His sound basic education and experience, cheerful disposition, ready wit, self-discipline, and staunch loyalty, ensured rewarding results in whatever cause he was engaged."

## DR MURPHY WORKED ON SOUTH GEORGIA

A distinguished American ornithologist, Dr Robert Cushman Murphy, died in New York this month at the age of 85. More than 60 years ago he sailed into Antarctic waters aboard the New Bedford whaling brig Daisy to work on South Georgia. In 1960 he was aboard the United States Coast Guard ice-breaker on her cruise in the Bellingshausen Sea.

Dr Murphy was an internationally known authority on ocean birds, and for many years was curator of birds at the American Museum of Natural History. He began his scientific career as curator at the Brooklyn Museum in 1911, and was 25 when the museum sent him to the Antarctic and sub-Antarctic aboard the Daisy on her cruise from Barbados to South Georgia. The voyage was from 1912 to 1913, and for

four months Dr Murphy worked on South Georgia, primarily as a naturalist.

In 1949 Dr Murphy published "Log-book for Grace", containing a narrative of the Daisy's voyage in the form of shipboard letters to his wife, Grace Barstowe Murphy. His major work, the two-volume "Oceanic Birds of South America," included the research he did on South Georgia. The experiences aboard the Daisy also resulted in an illustrated volume on old-time whaling methods, "A Dead Whale or a Stove Boat."

Dr Murphy led expeditions to South America, Antarctica, New Zealand, and the Pacific and Caribbean Islands. His association with New Zealand began in 1947 when he went to the Snares Islands to collect materials for habitat diorama displays in the American Museum of Natural History. He made another visit to the Snares Islands in 1949, and came to New Zealand again in 1960 and 1971.

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### *Much read newspapers and magazines*

Some of Antarctica's most-read newspapers and magazines are crumbling away. Contrary to the usual longevity of articles left in the permanent cold of the continent, they may have only a few years of life left.

The effect of time and weather, and the wear and tear of more than 60 years of reading and re-reading by explorers, scientists, and visitors at Scott's hut at Cape Evans, and Shackleton's hut at Cape Royds are beginning to show. The newspapers show signs of damp; their texture is powdery and rough, like blotting paper; and souvenir hunters have taken some pages.

According to Mr V. J. Wilson, one of the New Zealand Antarctic Society's caretakers at Cape Royds last season, the papers probably have only a few years of legibility left. He says that to preserve them under glass would spoil the authenticity of the huts, which are kept as they were when first used.

### DEATH IN PLANE CRASH

From the United States comes news of the death of another scientist of a later Antarctic generation. He is Dr E. Everett MacNamara, a polar pedologist and naturalist, of Phillipsburg, New Jersey, who was killed in a plane crash near Buffalo, New York, on December 16 last year. Dr MacNamara was 35.

An assistant professor of environmental science at Lehigh University since 1970, Dr MacNamara was the National Science Foundation's exchange scientist with the 12th Soviet Antarctic Expedition in 1966-68, and established what is probably the longest continuous span of time served by a pedologist on the Antarctic Continent. He worked primarily in Enderby Land, and among his discoveries were the deeply weathered soils which he termed "Red Ahumisol of the Cold Desert" ("Biuletyn Peryglacjalny" 20:299 and "Soil Science" 108:345).

## “ANTARCTIC”

is published quarterly in March, June, September, and December. It is the only periodical in the world which gives regular up-to-date news of the Antarctic activities of all the nations at work in the far South. It has a world-wide circulation.

Yearly subscription for non-members of the Antarctic Society NZ\$3.50. Overseas NZ\$4.50, includes postage (air mail postage extra), single copies \$1.00. Details of back issues available may be obtained from the Secretary, New Zealand Antarctic Society, P.O. Box 1223, Christchurch, New Zealand.

Overseas subscribers are asked to ensure that their remittances are converted to New Zealand currency.

### The New Zealand Antarctic Society

The New Zealand Antarctic Society was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have seen Antarctica for themselves, and all of whom are vitally interested in some phase of Antarctic exploration, development, or research.

The society has taken an active part in restoring and maintaining the historic huts in the Ross Dependency, and plans to co-operate in securing suitable locations as repositories of Polar material of unique interest.

There are two branches of the society and functions are arranged throughout the year.

You are invited to become a member, South Island residents should write to the Canterbury secretary, North Islanders should write to the Wellington secretary, and overseas residents to the secretary of the New Zealand Society. For addresses see below. The yearly membership fee is NZ\$3.00 (or equivalent local currency). Membership fee, including “Antarctic”, NZ\$5.00.

#### New Zealand Secretary

Mrs B. Hale, P.O. Box 1223, Christchurch.

#### Branch Secretaries

Canterbury: Mrs E. F. Cross, P.O. Box 404, Christchurch.

Wellington: Mr R. H. Blezard, P.O. Box 2110, Wellington.



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