ANTARCTIC

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NEW ZEALAND ANTARCTIC SOCIETY

THE BOOMERANG GLACIER FROM THE SUMMIT OF MT BROWNING, SOUTH VICTORIA LAND.

Official D.S.I.R. photo.

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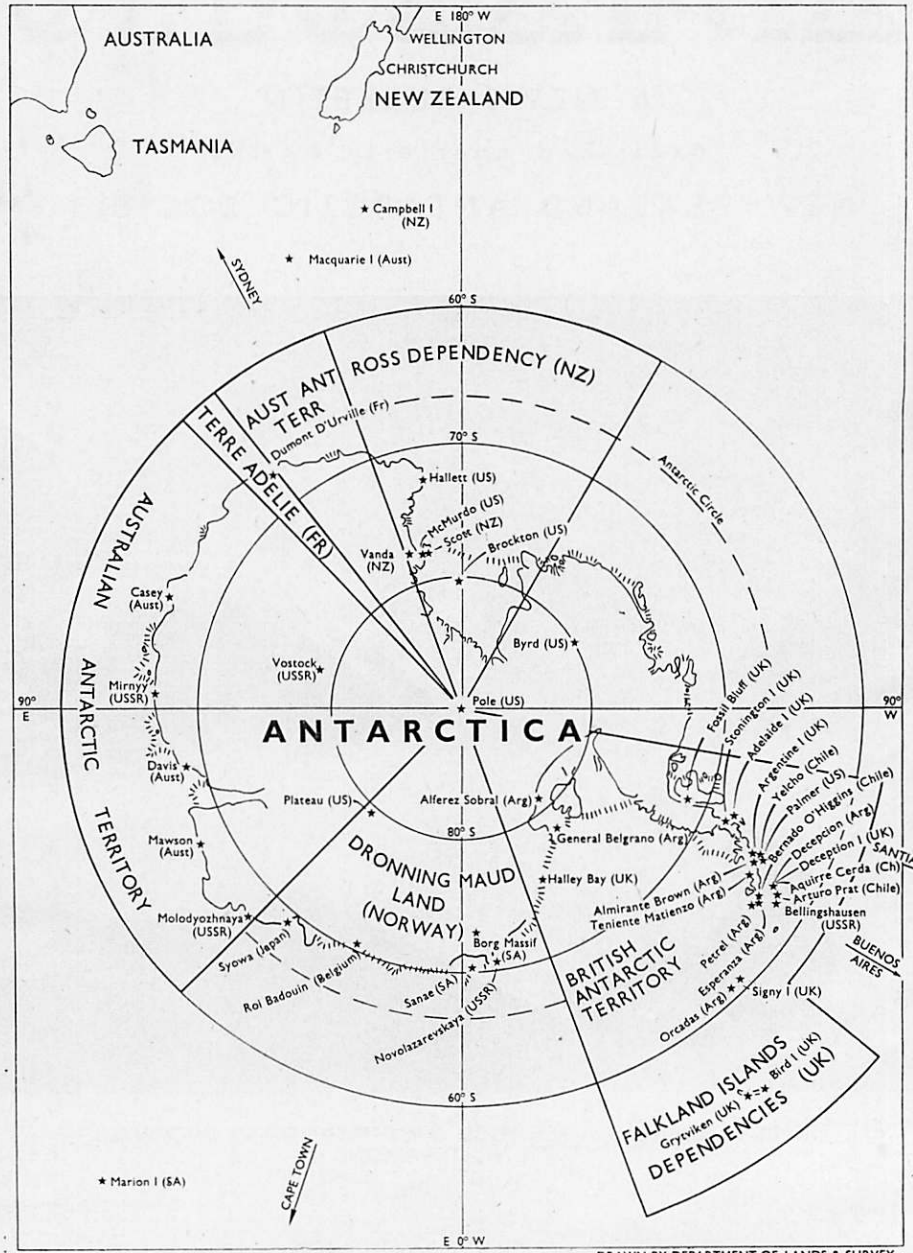

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Editor: H. F. GRIFFITHS, 11 Dartford Street, Christchurch 5.
Asst. Editor: J. M. CAFFIN 17 Wilfrid Street, Christchurch 4.
Address all contributions, enquiries, etc., to the Editor.
All Business Communications, Subscriptions, etc., to:
The Secretary, New Zealand Antarctic Society, P.O. Box 2110, Wellington, N.Z.

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NEW ZEALAND'S ANTARCTIC PLANS FOR 1970-71 SEASON

There will be no winter party at Vanda Station in the Wright Dry Valley next year. This is one of the features of New Zealand's Antarctic research programme for 1970-71 announced by the Minister of Science (Mr B. E. Talboys). Although requests for scientific observations during the 1971 winter have been received, the Ross Dependency Research Committee does not consider that a winter party at Vanda is justified.

This year the 70 members of the New Zealand team will do their basic indoctrination course at the Army's training area at Balmoral, Lake Tekapo, from August 14 to 21. In previous years the training was done at Waiouru.

A wide range of scientific studies in the field during the 1970-71 summer season and at Scott Base until the spring of 1971 is included in the programme announced by the Minister. Details are:—

SCOTT BASE.—The studies in auroral physics, earth currents, geomagnetism, ionospheric physics, meteorology, radio propagation and seismology will be continued.

The atmospheric electric field recording will be started partly to determine whether the abnormal results obtained at Vanda Station are typical of Antarctic conditions and partly because Vanda Station will not be occupied durineg the 1971 winter. In addition, sea noise measurements will be made throughout the 1971 winter to supplement the proposed Auckland University 1970-71 summer programme. This will involve a wintering party of ten D.S.I.R. men as in 1969-70.

VANDA STATION.—The current programme in meteorology, hydrology, glaciology and geophysics will be continued until the end of the 1970-71 summer.

FIELD PARTIES

Geology.—Four men including two geologists from Auckland University, will spend about three weeks studying the granitic complex and basement rocks of the Robert Scott-Amundsen Glacier area. This party will operate from an American base camp on the Amundsen Glacier which will also be used by an American party carrying out a complementary programme. Another party of four will spend six to eight weeks carrying out detailed studies of the petrology and geochemistry of the injection complex on Mt Dromedary in the upper Koettlitz Glacier area. The results of this detailed study are particularly important because such complexes are fairly common in Antarctica and none have yet been studied in detail.

Hydrology and Glaciology.—Three men will spend most of the summer carrying out surveying and hydrological and glaciological observations required for the special study of the unusual climatic and environmental conditions in the Vanda Station area. This party will also carry out a small programme of observations on the McMurdo Ice Shelf to provide scientific data associated with the continued operation of air-fields in this area.

Nuclear Sampling.—One scientist, with limited assistance from Scott Base staff, will spend about six weeks obtaining the air, snow and ice samples necessary for studies of nuclear products occurring both naturally and as a result of nuclear explosions. Sampling is required principally at Scott Base, Vanda Station and Pole Station. Sea-water samples will also be taken by H.M.N.Z.S. Endeavour at ten locations between New Zealand and Antarctica.

Oceanography.—Two men with the assistance of Scott Base staff, will spend four weeks making sea current, temperature and plankton measurements along a considerable extent of the ice-shelf edge in the McMurdo Sound area. This work is associated with a multinational project involving drilling through the Ross Ice Shelf to study the effects of the ice cover, at large distances from the ice edge on biological, physical and geological aspects of the environment.

UNIVERSITY WORK

VICTORIA.—An expedition of eight men (including two Australian scientists) will spend two to three months making detailed studies of the rocks of the Beacon and Ferrar Groups between the Mackay and Darwin Glaciers in southern Victoria Land. This will establish a sound regional stratiographic framework for these important rock groups. Two men will continue the study of the geology of the seabed and variation of the earth's magnetic field between New Zealand and Antarctica. This will involve proton magnetometer observations in passage during the resupply cruise of H.M.N.Z.S. Endeavour.

CANTERBURY.—Two men will spend five weeks continuing the population studies of the Weddell seal in the southern part of McMurdo Sound. Apart from their scientific value, such studies are essential to ensure that the killing of seals for dog food conforms with the principles of conservation adopted by the Antarctic Treaty nations. The biological studies in the Cape Bird area will be continued but with a change of emphasis from predominantly terrestrial to predominantly marine. This will require a party of four men for the whole summer period and two or three in addition for part of the period only.

WAIKATO.—A combined party of four soil scientists (two from D.S.I.R.) and three or four biologists will spend about six weeks studying the soil processes and biology of the lakes in the Taylor and Wright "dry" valleys. Similar soil studies were planned for the 1969/70 summer season but could not be made. The availability of climatic observations over a period of two years at Vanda Station in the Wright Valley should materially assist in evaluating the results of both the soil and biological investigations.

AUCKLAND.—Two men will spend about four weeks studying the attenuation and transmission of underwater sound in Antarctic waters and setting up equipment for the continuous recording of ambient sea noise, biological noises, earthquakes, etc. This party will also set up the equipment for measuring the atmospheric electric field at Scott Base.

The Ministry of Defence will support the programme by one resupply trip by H.M.N.Z.S. Endeavour and three R.N.Z.A.F. Hercules flights between New Zealaned and McMurdo Sound. If H.M.N.Z.S. Endeavour cannot make a trip, three additional Hercules flights will be included in the joint American-New Zealand effort.

Future of Vanda?

Although there will be no winter party at Vanda Station in 1971 the station will remain as a summer base because scientific interest in the Wright Dry Valley area is unlikely to diminish for many years, according to Mr R. B. Thomson, superintendent of the Antarctic Division of the Department of Scientific and Industrial Research.

Mr Thomson said in Christchurch that by the end of the 1970-71 summer season sufficient data will have been gathered at Vanda to keep New Zealand scientists occupied in its evaluation for the succeeding 18 months. A break will also allow scientists to determine whether it is necessary to go back to Vanda Station for another winter.

When it made its original recommendations to the Government the Ross Dependency Research Committee stated that one winter at Vanda Station was vital, and that two winters would most likely be required, depending on the amount of scientific data collected.

WOMAN WILL LEAD N.Z. ANTARCTIC PARTY

Dr Ann Chapman, a Lecturer at the University of Waikato, will lead a University biological team to work from a base camp in the Taylor Dry Valley next November and December. The four scientists will study the adaptation of lake organisms to extreme conditions. They will visit various research sites, travelling by helicopter.

The other members are Dr J. P. Leader, C. S. Hatton and Dr T. J. Brown.

NEW ZEALAND ANTARCTIC NEWS

HOVERCRAFT FOR ANTARCTIC

Trials of a New Zealand-made hovercraft will probably be made in the Antarctic this season by the Antarctic Division of the Department of Scientific and Industrial Research. If a hovercraft is available in time it will be taken south early in the summer.

Mr R. B. Thomson, superintendent of the division, said in Christchurch that the division had in mind using the hovercraft between Ross Island and the Victoria Land coastline, and between Scott Base and Cape Bird. It might also be tested in the lower valleys of the glacier region.

If found suitable, the hovercraft could replace helicopters in a number of areas and would be considerably cheaper to run. Mr Thomson estimates that costs would be down to about 20 per cent. of helicopter costs for some tasks. But the division has no intention of buying the hovercraft until it has been fully evaluated and has undergone a series of tests.

Mr T. G. J. Crowley, managing director of the hovercraft firm, Commercial Hovercraft Industries of Auckland, says the standard four or five-seater model should be easily available when it is required by the division. The only modifications that might have to be made would be some form of adjustment to the carburettion system to adjust the machine to cold working conditions.

The hovercraft is powered by two Wankel rotary engines which have been tested already on snomobiles. It is 14ft 6in long, 6ft 6 in wide, and 4ft 9in high. It can carry two or three persons and their equipment at speeds of 25 to 30 miles an hour.

Mr Thomson said that the original suggestion to use a hovercraft in the Antarctic came from Victoria University of Wellington. A hovercraft was considered a valuable transport vehicle for the type of work planned by the university expedition in the coming summer season.

New Leader for Scott Base

A former Yorkshire coalminer Mr Brian Porter, of Auckland, will be the leader at Scott Base for 1970-71. His appointment was announced by the Minister of Science (Mr B. E. Talboys) and he began duty this month.

Mr Porter, who has lived in New Zealand for 16 years, is the operations manager of a plastics firm. He is 40, and was an experienced rock climber and mountaineer in Britain and Europe. Since he came to New Zealand he has done little serious climbing. He has kept fit with squash, golf, and gardening.

When Mr Porter came here in 1954 he settled first in Wellington, and then Christchurch. He worked for a synthetic resin manufacturing company in Wellington, and went to Christchurch as works manager for a plastics firm in 1963. Last year he was transferred to Auckland as operations manager of the plastic sheeting division of his firm.

Mrs Porter, once a climber and mountaineer, says that if she were a man she would be in the Antarctic too. She thinks it is a shame women aren't allowed.

CANTERBURY BRANCH MEETING

Canterbury the strongest branch of the New Zealand Antarctic Society, held its annual meeting recently. It has 220 members.

The Rev. J. F. B. Keith was elected president, and the vice-presidents are Messrs. A. Anderson and S. Smith. Committee members are: Messrs B. Norris, J. Cross, J. Mather, B. Duffield, F. Gurney, H. C. Gray, Mesdames M. Williams, and E. Cross, the president, vice-presidents, honorary secretary (Miss J. Garraway) and the honorary treasurer (Mrs B. Burley). The honorary auditor is Miss I. Orchard.

CANADIAN P.M. LEARNS ABOUT ANTARCTICA

The discovery of rich oilfields in the Arctic has made Canadians more conscious of the potential destructiveness of oil pollution. That is why pollution in Arctic or Antarctic waters was one of the subjects discussed by Canada's Prime Minister (Mr Pierre Trudeau) when he met New Zealand scientists during his brief visit to Christchurch last month.

Mr Trudeau's host was the Minister of Science (Mr Brian Talboys) whose department includes the Antarctic Division. The Deputy Secretary of Foreign Affairs (Mr G. D. L. White) who signed the Antarctic Treaty for New Zealand in 1959, was one of the guests, and others have had a close association with New Zealand's Antarctic efforts.

The dinner for Mr Trudeau was organised as an informal affair, and pollution problems were the main topic of conversation. Other subjects which interested Mr Trudeau were the difficulties of controlling weed growth in lakes and the protein potential of Antarctic krill.

Among the guests were Dr E. I. Robertson, Assistant Director-General, D.S.I.R., and chairman of the Ross Dependency Research Committee; Mr R. B. Thomson, superintendent of the Antarctic Division; Mr L. B. Quartermain, Antarctic historian and former editor of the bulletin; Professor G. A. Knox, head of the department of zoology, University of Canterbury, and secretary of the biological working group of S.C.A.R.; Professor R. H. Clark, head of the department of geology, Victoria University of Wellington, and chairman of the university's Antarctic group; Mr C. Clark, a former leader at Scott Base; and Mr A. J. Heine, a glaciologist with the Antarctic Division for several seasons.

Heard when about fifty feet out from Fremantle wharf when departing for Davis and Mawson in January. The temperature had been over 100°F. for the past week. This day was no exception. One of John Stalker's boys called out to him: "Hey, Dad! Are you getting cold yet?" (From "AURORA").

VUWAE 15

STILL ANOTHER WOMAN

Dr Peter Barrett, the man who discovered in 1967 the first land vertebrate fossil ever found in Antarctica, will lead the 15th summer expedition sent to the Antarctic by the Victoria University of Wellington. This season the expedition will include a woman, 21-year-old Miss Rosemary Askin a B.Sc. honours student. She will be one of three New Zealand women students to go south this season.

Dr Barrett discovered the bones of the labyrinthodont while working with an Ohio State University Institute of Polar Studies team between the head of the Beardmore Glacier and the head of the Shackleton Glacier about 325 miles from the South Pole. He is an Auckland University graduate, and has participated in and led four expeditions to Antarctica. At present he is a post-doctoral fellow at Victoria University.

Deputy leader of the party will be Mr Barry Kohn, a Ph.D. graduate student at Victoria, who has worked in the Antarctic before. Other members are Mr Rodney Grapes, a junior lecturer at Victoria, and two field assistants, Messrs John McPherson and David Reid. Two Australians will also be included in the party. They are Dr Alex Ritchie, paleontologist at the Australian Museum, Sydney, and an assistant.

Professor R. H. Clark, head of the geology department, and chairman of the university's Antarctic research committee, who announced the party for the 1970-71 season, said in Wellington that it would work on exposed rock areas surrounding the Skelton Neve, on the edge of the Polar Plateau, and also in the Darwin Mountains, about 200 miles south of Scott Base. Detailed collections of fossil fish and plants would be made, and also intensive studies would be made of the Beacon Sandstone in both areas.

This year Victoria University was able to select the expedition party without discrimination of the sexes. Professor Clark explained that previously women students had been ruled out simply because they were women. Now selection could be made solely on academic and personal merits. Miss Askin's special interest—the study of fossil pollens could be of great value in the proposed work on the Beacon Sandstone.

REPORT FROM SCOTT BASE

Numerous short periods of poor radio conditions in April, including a complete blackout on April 17, and communications trouble in March, were noted in reports from Bruce Willis, leader at Scott Base. The weather in March was generally calm and overcast, and April was a month of dull, cloudy days and northerly winds.

The sky was heavily overcast and a good northerly was blowing on April 24 when the station flag was lowered at 12.48 p.m. with due ceremony, and laid aside until the return of the sun in spring. On April 23 a brief southerly reached a velocity of 56 knots. The lowest temperature of minus 41.1 degrees Centigrade was recorded on April 12. There was an increase in auroral activity during the month.

RADIO BLACK-OUTS

Two special radio telephone circuits were needed on April 3 and April 20 because of transmitter fault and a poor international circuit. The Scott Base-Vanda circuit experienced some disturbances but was generally reliable.

Scott Base to Wellington circuits were disrupted from 4 p.m. on March 6 to noon on March 9 because of a communications blackout. There were slight magnetic disturbances towards the end of the month but communications were maintained.

The Scott Base to Vanda circuit was satisfactory although some weather broadcasts were missed. The Vanda to Wellington circuit was disrupted on occasions. Eventually the trouble was traced to the galley water pump cut-off relay.

ICE BREAK-OUT

In March southerly winds gusting to 40 knots were experienced on March 21 and March 30. There was an extensive ice breakout in front of the base on March 3 with some portions of the shelf also breaking out. There was a further small breakout on March 8 which took a small portion of the dump out to sea.

FIELD ACTIVITIES

Field activities in March and April were restricted to outings with the dogs. Trips were made towards Black Island and Windless Bight. Two old dogs, Georgea and Chris, were put down in March.

Sundown Day was observed at Vanda Station on April 24 but there was no flag lowering ceremony because the station has no flag. The leader, Harold Lowe, reported that loss of daylight had been very noticeable. Everyone was busy preparing for the months of winter darkness, making the annual stocktaking, moving fuel, and stock piling ice for the melter.

The first wind of the month, a westerly, lifted the temperature from minus 11 degrees Centigrade to minus 9 degrees in 18 hours. The highest temperature was minus 8 degrees on April 24 and the lowest minus 42.9 degrees on April 19. Half an inch of snow lay for nine days there was frequent moderate auroral activity, and the month ended with gale force winds.

March was a month of calm days which went out with westerlies of 54 knots and a rise in temperature from minus 37 degrees to minus 13 degrees. The highest temperature was .1 of a degree on March 6 and the lowest minus 38.4 degrees. The first aurora was seen on the night of March 25-26.

Communications with New Zealand were reasonably good except for a blackout about March 8. Some of the new Tilley lamps used in the mess were troublesome, the kerosene being reluctant to vapourise when the temperature dropped below minus 30 degrees Fahrenheit.

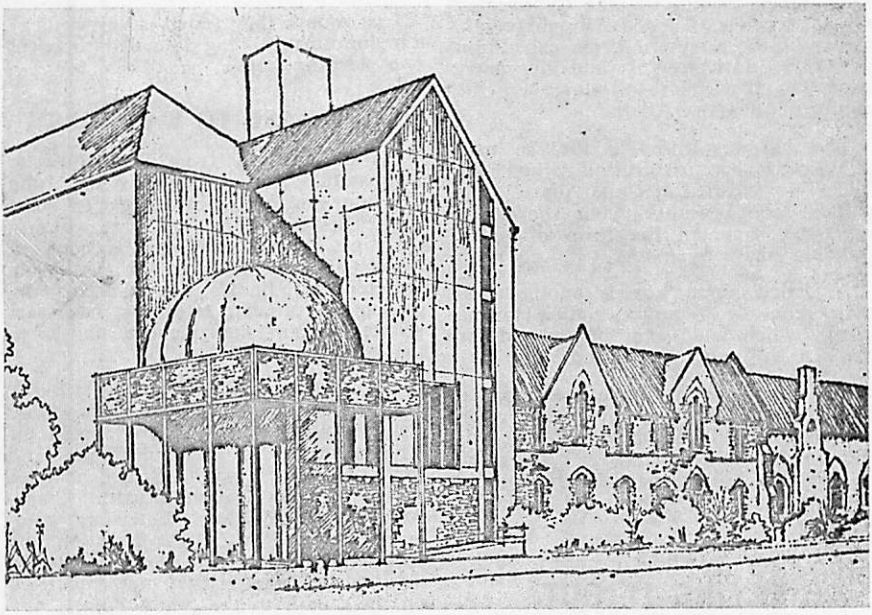
AT VANDA STATION

Local earthquakes were recorded frequently at Vanda in April, and records were obtained for the whole month. Ablation of the ice at Lake Vanda was negligible for most of the month but increased to an average .5cm in the last week at the start of westerly gales.

A temperature profile venture had to be abandoned after unsuccessful attempts to free a frozen probe and the subsequent seizure of the ice drill in the lake. The ice drill, being frozen in only about 2ft, has been abandoned until the spring.

Temperatures at Vanda in April were general higher than those in April last year although the weather was similar. There were fogs on four days, and snow fell on four days. Auroral activity was observed on 16 days. There was no significant wind until the westerly gale on April 29.

NATIONAL ANTARCTIC CENTRE FOR CHRISTCHURCH



The proposed new Anniversary wing of the Canterbury Museum is shown on the left of the above sketch.

New Zealand will have a national Antarctic and alpine centre in Christchurch by 1974. That is when the Canterbury Museum Trust Board hopes to complete the first stage of a new $400,000 four-storey wing to mark the museums centenary which will be celebrated on October 1 this year.

Since the days of Scott and Shackleton the museum has accumulated a rich store of Antarctic relics and other material related to life on the continent. It will be adequately displayed in the new centre which will occupy about a quarter of the 21,000 square feet of the anniversary wing.

All aspects of exploration will be featured in the 90ft by 40ft display hall. Dr Roger Duff, director of the museum, said recently that there will be particular emphasis on the Scott-Shackleton period but there will also be space for the mechanised phase.

According to Dr Duff the display hall will also serve for exciting displays of the unique natural history of Antarctica and the sub-Antarctic islands. There will be space for a polar reference library, which will include Arctic material, and an archive and map repository that can be used by overseas scientists. The centre will also house relics and records of historic New Zealand mountaineering expeditions.

A large storeroom in the museum holds many Antarctic relics which will be displayed eventually in the new centre. One man who is looking for-

ward to 1974 is Mr Baden Norris, honorary curator of Antarctic relics.

Recently Mr Norris revealed some of the treasures in the storeroom to the writer of a special article on the Antarctic relics in the "Christchurch Star." One of the earliest relics of Antarctic exploration he produced was the Union Jack taken south by the Norwegian school teacher, Carstens Borchgrevink, leader of the Southern Cross expedition in 1899. Borchgrevink and his party were the first men to winter on the continent at Cape Adare.

The flag was found in 1911 by men of Scott's last expedition when the Terra Nova called at Cape Adare. It is still in good condition but shows the marks of time in the form of holes, possibly made by moths.

A sealed metal box is another historic relic. It contains 25 fine Havana cigars which will never be smoked for the box will never be opened.

The cigars were to have been smoked by Captain Scott and his party when they reached the South Pole. That was the hope of the givers. A typewritten line on the box reads: "For final dash. Compliments of the Sol factory, Havana."

TRYING IT OUT

A night in a snow cave could have been a pleasant change for two Scott Base men, had they not chosen the coldest night of winter for their experiment.

Chris Knott, of Stratford, dog handler, and Howard Marriott, of Gisborne, base engineer, were sheltered from the 30-knot wind in their snow cave, but not from the temperatures which dropped as low as minus 50 degrees Fahrenheit.

Their home for the night was about 15 feet long and four to five feet deep, with entrances at either end.

They cooked their meals and slept end to end in sleeping bags in the tunnel.

"We did it just to see what sort of conditions those early chaps had to face and also to see what it was like to dig a cave in the type of snow we have down here," Knott, an experienced alpinist, said.

Though not exposed to the wind in their cave, conditions were uncomfortable and both men suffered frostnip—Mr Knott to his ears and Mr Marriott to his fingers.

This was the second time during the winter that the men had spent a night out.

Last month they tested a "bivvy bag" a nylon survival bag intended to cover two sleeping bags.

SCOTT BASE TO KATMANDU

It's a long way from Scott Base to Katmandu. Wing Commander John Claydon was in the Antarctic 15 years ago. This month he will start work in the tiny capital of Nepal as one of three technical advisers for the Asian Development Bank's air transport development project. He has been appointed airport management adviser to the bank.

Assistant manager at the Christchurch airport for almost three years, John Claydon went to the Antarctic with Sir Vivian Fuchs, Sir Edmund Hillary and Mr J. H. Miller, in the British advance party of the Commonwealth Trans-Antarctic Expedition. Later he commanded the R.N.Z.A.F. flight in the Antarctic, supporting New Zealand's field parties and Hillary and his team on their dash to the South Pole.

John Claydon retained his interest in the Antarctic after he retired from the R.N.Z.A.F. He was a vice-president of the Canterbury branch of the New Zealand Antarctic Society, and presided at the annual meaeting a few weeks before his departure.

BLIZZARD HITS BASE

A report from Scott Base on June 28 stated that huge drifts of snow have accumulated round buildings and in parts have buried the connecting covered-way in the first prolonged southerly blizzard this winter at the base.

The storm began early yesterday morning when the wind turned to the south. The strongest gust of the week-end 103 m.p.h., was recorded about 3.45 a.m. yesterday.

CARETAKERS AT CAPE ROYDS

By MICHAEL ORCHARD

There were just the two of us—Peter Skellerup and myself—standing outside our wanigan at Cape Royds surrounded by our gear and supplies. We watched the helicopter that had brought us over from McMurdo Base take off, and head back towards its gregarious warmth. We looked at the 12′ × 8′ hut that was to be our home for the next fortnight. Then we turned to each other and said, "well, we're here!"

It all started when the Antarctic Division of the Department of Scientific and Industrial Research decided that Caretakers for the historic huts at Cape Royds and Cape Evans were essential now that tourism had reached those icy shores. (See "Caretakers for Historic Huts", Page 323, "Antarctic Vol. 5, No. 7, September 1969). The Canterbury Branch of the New Zealand Antarctic Society was approached to supply two Caretakers at Cape Royds for a period of two weeks in November-December on a trial basis. From the large number of applicants Peter and I were the lucky two to be chosen.

We flew down to McMurdo on the evening of November 20th, arriving at Williams Field at 3.30 a.m. on November 21st. We wer taken to Scott Base where we spent a day being instructed by the Base Leader, Mr Bruce Willis, in what was expected of us. Most of our time was occupied in gathering tools timber, paint, and our 20-man ration packs, followed by a hurried lessoen on radio reception. Then, after a half-consumed lunch, and best wishes from the men, we were off to catch our helicopter. Most of the life at McMurdo revolves around the availability of transport. A Party may sit around for days waiting for suitable conditions, but they must always be ready to go at a few minutes notice.

The helicopter trip took only twenty minutes, but was a fascinating experience. We flew over hundreds of acres of sea ice, occasionally broken by large icebergs. Long glaciers descended into the sea with the distant mountains of the mainland in the background across the Sound. Directly below now was our home for the next two weeks: a little orange 'box' amidst barren rock and snow close to the Shackleton Hut.

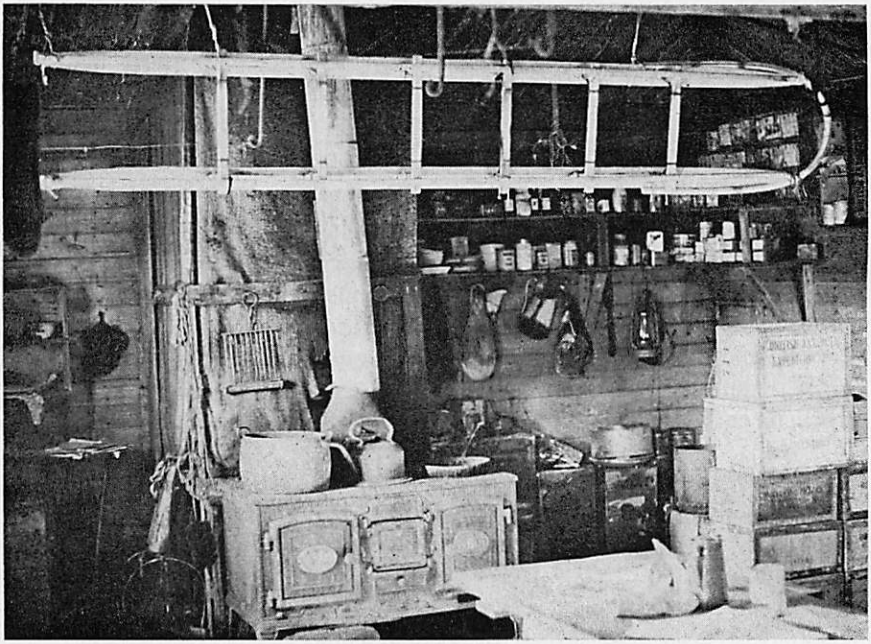
SETTLING IN

We soon settled into this 12′ × 8′ plywood hut, and decided to set to work immediately to fix the door, which was almost jammed solid. We chiselled the doorway wide, and freed the rusted hinges with American Salad Oil. Improvisation was often a necessity at Cape Royds!

At first we thought we would be quite isolated, but in the first 24 hours we were visited by 11 people in four different parties who often just seemed to appear from nowhere. After that, however, we saw no one for a whole week. A few hundred yards away across Pony Lake, the Adelie penguin colony kept up a constant chatter of "Rauk-Rauk" right throughout the 24 hour day. Most had laid at least one egg by this time, but some were still building their little stone nests.

THE SHACKLETON HUT

Shackleton's hut built in 1907 nestling in the shadow of Mt Erebus (12,449′) was an exciting prospect with it's wood bleached white with age and the snow piled up to the window sills; this old



Inside Shackleton's Hut at Cape Royds.

hut had quite a story to tell. Inside it was almost as it had been left in those early days of exploration (after being restored in 1960 by Les Quartermain and his party). Unopened boxes marked "British Antarctic Expedition 1907" were stacked in the corner alongside a 60-year-old ham and tinned foods, looking almost new. Old sealskin sleeping bags lay on the bunks alongside some original clothing and on the table was "The Illustrated London News" for November 1909! Along the outside wall, tins of food were gradually rusting away and the old garage and stable, constructed of food boxes were slowly thawing out of the snow. The hay bales used as pony fodder were in remarkable condition, while the dried corn spilled out of boxes marked 'Nimrod'—Lytttelton. Our task was a pleasant one, for we were always discovering new things in the course of our work. We cleaned out all the snow from the entrance porch and storeroom, before it froze into ice. While cleaning out the signs of recent occupation (candles and spilled food) from Shackleton's tiny room, we found his signature "E. H. Shackleton" written in ink on a piece of paper at the head of the bunk. We dare move little of the snow piled up in the stable area for fear of damaging some of the historic objects buried in it.

Life together in the summer hut was very pleasant and seemed to pass quickly. The weather was mainly fine, with cold winds and temperatures averaging just below zero (degrees C.). We quickly adapted to the continuous daylight and cold temperatures and on two bitter, freezing days resolved to stay in our sleeping bags. The "De-Hi" meals wer nutritious if not varied, with plenty of hot drinks and the occasional addition of some frozen meat as a treat; this being kept in a pile of snow at the back door. Contrary to popular opinion, we found it much easier to obtain water by melting snow, rather than ice and always had sufficient.

"ZLYR Cape Royds calling ZLQ Scott Base"—familiar words which we shall never forget, especially since our radio receiver broke down. Our scheduled call times were at 1845 hours, Tuesdays and Thursdays, but at first we could make no contact. It was not until we picked up our own transmissions on Peter's shortwave radio, that we realised Scott Base could hear us. Even so, the receiving set spent some time in pieces as we followed instructions in the field manual trying to rectify the fault. Improvisation was again necessary when our primuses refused to function for lack of spare parts. However, two old "Valor" heaters, dug out of the snow piled against the summer hut were put to good use.

SUMMER VISITORS

Thea visitors to Cape Royds were guided around the penguin colony (the most southerly in the world) and also around Shackleton's Hut their visit being enriched by Peter's extensive knowledge of the Shackleton era and by my zoological training. Our resourceas were really put to the test near the end of our stay, when one morning helicopters began flying a shuttle service between McMurdo Sound and Cape Royds. It was the occasion of the 10th Anniversary of the Antarctic Treaty and many visitors made the trip out as part of their programme.

In all some thirty people were shown around in thre hours, with a few having to be restrained from approaching too close to the penguin colony and prevented from removing historic articles from the Hut. Most of the people however exhibited a very responsible attitude, and their visit was a success, even though it left the penguins a littlet agitated.

During the course of our stay we erected some signs requesting visitors not to disturb the penguin colony, since it is in a state of delicate balance. In the twelve years of man's occupation it has been reduced to one fifth of it's original size, and in future when regular tourists visit the area, Society members will need to be on hand to safeguard it.

LAST DAYS

As our days at Cape Royds neared their end, and with our jobs completed, we began to venture further and further afield. Each day we learnt something new, as we went for long walks uncovering the secrets of that volcanic wasteland on which we lived. At the time, the sea ice was slowly breaking up, and before we left we had hoped to see open sea surrounding the penguin rookery, so that we could watch them feeding and swimming. This break-out of the sea ice is often associated with an influx of many species of sea-feeding birds into the region, but a northerly wind change, sweeping in mile after mile of jagged ice, meant we would not witness this.

And so we left Cape Royds, with a promise to return again, to our little community of black rock set in a white wilderness of unbelievable beauty.

Sixty-year-old stores stacked against the outside wall of the Shackleton Hut.

BRITISH ANTARCTIC SURVEY NEWS

AIRCRAFT AND SHIPS

After a very successful summer season, the Twin-Otter and Turbo-Beaver aircraft left Adelaide Island on March 25 and were flown north to Toronto by stages. Unpleasant as it is to fly the long stretch across the Drake Passage in light aircraft, the crews were nevertheless unanimous in voting 10 hours acrojs the Brazilian jungle with inadequate maps as even worse! But all went well, and the aircraft arrived at de Havillands in Toronto on April 4, and will remain there until they are flown south again next season.

JOHN BISCOE DELAYED

Heavy pack ice persisted throughout the season along the west coast of the peninsula and continued to delay the John Biscoe. Stonington Island was relieved on February 11, but it took her three weeks to extricate herself from Marguerite Bay and return to the Argentine Islands. She then proceeded to Punta Arenas where His Excellency the Governor of the Falkland Islands, Sir Cosmo Haskard, and Lady Haskard joined the ship for a voyage to Signy Island and South Georgia. The Biscoe then returned to the United Kingdom via the Falklands and Montevideo, and arrived at Southampton on May 15. The Perla Dan returned to Southampton on March 19.

BASE ACTIVITIES

With the departure of the ships, the bases have been settling down to the normal routine. The following bases will be manned throughout the 1970 winter: South Georgia, Signy Island, Argentine Islands, Adelaide Island and Halley Bay and small parties will also winter at the old Horseshoe Island base in the north of Marguerite Bay, and at the advance base, Fossil Bluff in George VI Sound. In May a glaciological party from Fossil Bluff, travelling in two Muskegs and two Foxtrac motor toboggans, carried out field work in George VI Sound and laid a depot 70 miles north-east of base. Further glaciological journeys of short duration have been made along the Brunt Ice Shelf from Halley Bay. Three main sledging parties worked from Stonington in April. Another party, including a geophysicist, worked on Pourquoi Pas Island in northern Marguerite Bay, using Horseshoe Island as their base.

SOUTH GEORGIA PARTY

The first wintering group of 11 men at the newly acquired South Georgia base have settled in happily, but find it difficult to adjust to such luxury after the more spartan conditions at the other bases. Equipment is superb and the living conditions are described as first-class—comparing favourably with a good hotel in England. Until numbers are increased, each man is able to have a separate bunkroom with a view over the bay.

SCIENTIFIC PROGRAMME

Scientific programmes at South Georgia area now under way. The three botanists have had a very busy summer carrying out their own programmes and participating in the International Bipolar Botanical Project. The two ionospherics did not arrive until mid-January and have only just completed fitting out the ionospherics room and erecting their 100-ft. mast, but their programme should commence shortly. Temporarily the meteorological programme has unavoidably been reduced to a minimum (1200, 1800 and 2400 G.M.T., with pilot balloon ascents when possible) but next year observations will be made at all the main synoptic hours.

REINDEER HUNTING

A departure from normal B.A.S. routine has been reindeer hunting. As mentioned in the September 1969 issue of "Antarctic", a total of 21 reindeer were introduced to South Georgia by the Whalers in 1909 and 1925, and by 1957 these had increased to about 4000. Present numbers are not known but there is now the threat of serious overgrazing in some areas, and hunting forays have not only provided fresh meat for the South Georgia and Halley Bay bases but will also help to protect the island's vegetation. In future years it should be possible to send a supply of venison to all bases.

(Continued foot column 1 next page)

SOUTH AFRICA TO BUILD NEW BASE

South African National Antarctic Expeditions have until now occupied only two bases in the Antarctic. SANAE 1 and 2 lived in Norway Station, the base previously used by the Norwegians. Norway Station was evacuated at the beginning of 1962 and SANAE 3 moved into SANAE, the South African base which was designed and erected by the South African Department of Public Works.

Although this base was intended to be used for five years only, it is still in use. As far as we know, this is a record for a base erected on a floating ice shelf and all credit must be given to the Department of Public Works.

The present base is covered by 40 feet of snow and a new base will be erected by the Department of Public Works during the coming relief voyage in January, 1971. Since the present design proved to be so successful, only minor alterations were made to the present layout. We trust that members of SANAE 12 will be very happy and comfortable in the new base.

RADIO ECHO SOUNDER ORDERED

South Africa has ordered a radio echo sounder for thea glaciological programme and the operator, Mr T. G. Schaefer, is receiving training in the United Kingdom at present. This will include a field excursion to test the apparatus as well as visits to experts in Denmark and other countries.

RELIEF VOYAGES

The annual relief voyage to Marion Island took place during March and April. Scientists of the Bernard Price Institute for Geophysical Research were also on board the M.V. "RSA" during this trip to investigate the structure of a portion of the south-west Indian Ocean.

The RSA returned from Gough Island on 25 May, 1970. In future relief voyages to the island will take place during October.

THE NEW SHIP

The new ship (see "Antarctic", December 1968) is now to be launched in early August. She is to be named the Bransfield in honour of Captain Edward Bransfield who sighted and chartered part of the coast of the Antarctic Peninsula on 30 January, 1820, and was therefore the first person to chart any part of the Antarctic mainland. It is possible that Bellingshausen saw parts of the continental mainland on 27 January, 1820, but his original records do not indicate that he recognised land. (See article on page 435 of this issue).

A smaller vessel some 50 ft. long, which is being built for service in South Georgia, will be shipped to South America in September and will then sail via the Falkland Islands to South Georgia. This vessel will be used mainly to transport men around the island but it will also be able to undertake some marine zoological work.

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BELGIAN PROGRAMME INTERRUPTED

The 1970 Belgian Antarctic summer expedition (in logistic collaboration with South Africa) planned to continue and extend its 1969 airborne radio echo sounder survey in the neighbourhood of Sanae. The party consisted of:

Glaciology: T. Van Autenboer (leader) and H. Decleir.

Electronics: S. Berckmans and J. M. Corbishier and an aircrew of four.

An accident in the beginning of the season destroyed the Otter aircraft of the expedition and prevented the main programme of being carried out. (See Antarctic March 1970, P. 381). Fortunately no one was injured.

As a substitute a detailed topographic and morphological survey was carried out of the depressions in the ice shelf near the coast where the 1969 radio glaciological survey showed areas of thin ice (50m) to exist in sharp contact with the 150m thick ice shelf. It is hoped to establish whether the 50m reflection corresponds to the ice thickness or to a reflection on brine infiltrated layers.

(Continued Page 426, coloumn 2)

THE DEVELOPMENT OF AUSTRALIA'S ACTIVITY IN ANTARCTICA

By M. R. O. MILLETT,
Publications Officer, Antarctic Division, Department of Supply, Melbourne.

For a number of reasons it is not surprising that Australia has been interested in the Antarctic region for many years past.

Though separated from our continent by a considerable expanse of the Southern Ocean, Antarctica is Australia's southern neighbour; this alone would have been a sufficient reason for Australia to direct its attention southwards.

EARLY EXPLORERS

That greatest of navigators, Captain James Cook, not only discovered the east coast of Australia in 1770 during his first voyage south of the equator; he also circumnavigated Antarctica during his second voyage (1772-75) when he had been commissioned to search for a southern continent which some felt surely existed in southern regions. Cook did not actually sight the Antarctic coast, but his second remarkable voyage when he probed deeply south, crossing the Antarctic circle, confirmed the belief of navigators and geographers that a large land mass must exist in this unexplored part of the globe.

Following the publication of Cook's accounts of his exploration, British sealers began to work from sub-Antarctic South Georgia as early as 1778. The sealing industry quickly developed as the Americans entered it. By 1791 there were over 100 vessels hunting in the Southern Ocean for fur seals and elephant seal oil. As supplies from these breeding grounds became exhausted by over-exploitation, sailors started to explore further afield and made discoveries among other sub-Antarctic island groups.

Although sealers may have been the first to have sighted Antarctica itself, there is, not surprisingly, any record, for they jealously guarded against divulging secrets of great commercial value to the discoverer.

Considering claims to priority of discovery of the Antarctic mainland by British, American and Russian interests centre around the years 1819-21. It is not appropriate here, however, to set out the arguments used by various Antarctic historians in the course of this continuing and unresolved debate.

Between 1810 and 1917, ships of about 20 expeditions to sub-Antarctic islands or Antarctica called at one or other of the Australian ports of Sydney, Melbourne or Hobart and this, too, helped make Australians Antarctic-conscious. Not only did Antarctica become a recurrent subject in Australian newspapers, but our citizens often supplied food and other materials to the southbound ships and fraternised with explorers and crews. Indeed, it frequently happened that adventurous Australians signed on as replacement or additional crew members. Later in this period a few Australians joined expeditions as scientists before the ships left British or other ports.

AUSTRALIAN INTEREST

Although these visiting expeditions also stimulated a growing interest in Antarctica amongst Australian scientific circles, it was not until 1886 that this interest led to action. In that year the Royal Society of Victoria and the Royal Geographical Society of Australasia set up the first Australian Antarctic Expedition Committee. Comprised of some eminent scientists, such as Baron Ferdinand von Müller, the committee worked hard but unsuccessfully for 10 years to sponsor expeditions. It did, however, manage to generate interest in Antarctica among commercial and scientific circles overseas H. J. Bull, of Melbourne organised a small Norwegian expedition to investigate southern whaling prospects and, at Cape Adare in January 1895, effected the first landing on the

Antarctic mainland. Later, one of the crew C. Borchgrevink (a Norwegian), organised and led the British Antarctic Expedition of 1898-1900, which was the first to spend a winter on the Antarctic continent. A young Tasmanian physicist L. C. Bernacchi, a member of this party, was the first Australian to visit and winter in Antarctica.

Exploration and research in Antarctica have sometimes been divided by historians into four eras:

(1) the "maritime" era, from 1820-1900;
(2) the "heroic" era, from 1900-1916;
(3) the "developmental" era, from the end of World War I to the outbreak of World War II;
(4) the "mechanised" era, from post-World War II to the present time.

From the exploration and scientific standpoint, Australians first became prominent in the "heroic" era when Douglas Mawson, an Adelaide geologist, and Edgeworth David, a Sydney geologist, joined Shackleton's first British expedition of 1907-09. Later on T. Griffith Taylor and Frank Debenham, both geographers and former students of David, took part in the ill-starred British expedition led by Scott in 1910-13.

AUSTRALIAN ANTARCTIC EXPEDITION

It was not long, however, before the Australasian Antarctic Expedition (AAE) of 1911-14 was organised by Mawson: AAE established bases in King George V Land and Queen Mary Land, as well as on Macquarie Island. This was an outstanding success including the charting of 700 miles of new coastline and a penetration by Mawson 250 miles inland, the first excursion into the interior of what was subsequently proclaimed as Australian territory. The excellent organisation, staff, equipment and performance of this first Australian scientific expedition resulted in extensive observations of high standard and considerable significance.

THE BANZARE EXPEDITION

The first World War then interrupted Antarctic exploration, but within 15 years Sir Douglas Mawson next organised and led the British, Australian and New Zealand Antarctic Research Expedition (BANZARE) of 1929-31.

This expedition was not only notable for some valuable exploration and discovery and re-charting of the coastline, but also for the fact that British sovereignty was proclaimed at seven localities. Two years after this expedition returned, Australian Antarctic Territory was proclaimed by an Order in Council on 16 March, 1933. By the provisions of the Australian Antarctic Territory Acceptance Act, the Australian Government became responsible for the area now know as Australian Antarctic Territory.

In bringing Australian activity and achievement in Antarctica to this culmination Sir Douglas Mawson had the invaluable aid of the celebrated navigator. Captain John King Davis, who helped him earlier in the AAE (1911-14), as he also did Shackleton in the British Expedition of 1907-09.

ANARE

In 1939, war interrupted plans to mount a new Australian Antarctic expedition. In 1947, however, the Australian Government established a body known as Australian National Antarctic Research Expeditions (ANARE). Appointed as leader, Group Captain Stuart Campbell was responsible for its guidance during the first two years of its life. During the summer of 1947-48 stations were established at Heard Island and Macquarie Island, but thick pack-ice off the Antarctic coast prevented the expedition ship **Wyatt Earp** from completing its reconnaisance voyage.

IMPORTANCE OF METEOROLOGY

It is fitting at this point, to digress by mentioning the importance of Antarctic meteorology. Griffith Taylor, though his main interest was in geology, climatology and geography was a very powerful influence in the development and application of meteorological science for improved weather forecasting in Australia. He was, indeed, for a short time engaged on special work at our Bureau of Meteorology after his return from Scott's 1910-13 expedition. He insisted that southern Australian weather was predominantly controlled by air masses originating in Antarctica and modified by the Southern Ocean as they travelled towards Australia. Meteorologists came to acknowledge that the difficulty in accurately predicting southern Australian weather in particular was due to the fact that there were no reporting stations in Antarctica, and only very occasional meteorological reports from ships not far south of the Great Australian Bight.

Meteorology has therefore been a most important consideration in justifying the establishment of stations on sub-Antarctic islands and the Antarctic mainlaind, thus endeavouring to fill in the huge gaps in this neglected area of the world network of meteorological stations.

In the last few years, meteorological science, under the leadership of the World Meteorological Organisation (WMO) of the United Nations, has left its earlier narrow confines of national and regional applications, expanding into a great public utility of global significance. Australia is thus an extremely important part of this evolving applied scieence, being strategically placed geographically herself and in relation to Antarctica. For this reason Australia can be regarded as a natural centre for southern hemisphere meteorology. This was recognised by the establishment in Melbourne of the headquarters of both a Southern Hemisphere Analysis Centre and an International Antarctic Meteorological Research Centre, the latter operating under that name for ten years until merged recently with the Synoptic Analysis Centre of Australia's Bureau of Meteorology. It is not irrelevant thus to have digressed by tracing the links in the chain commencing with early Australian Antarctic exploration and research, the work of Professor Griffith Taylor, and the ultimate burgeoning of modern meteorology when later technological advances on a national and international basis made the achievement of proposals by the visionaries possible.

ANTARCTIC DIVISION FORMED

In January 1949 Stuart Campbell was succeeded as leader of ANARE by Phillip Law who was appointed Director of a new organisation known as the Antarctic Division of the Department of External Affairs. ANARE had the advice and guidance of the ANARE Executive Planning Committee among whose members were Sir Douglas Mawson and Captain J. K. Davies. The Division was faced initially with three major tasks:

(1) to find a suitable ship to transport men and materials;
(2) to make a landing on the Antarctic continent where as yet no facilities existed;
(3) enlist the support of scientific and official organisations interested in Antarctic research.

The Danish motor vessel **Kista Dan** was specially suited for ANARE's purposes and the owners, the J. Lauritzen Line, chartered her to the Australian Government. Similar polar vessels, subsequently on charter to the Antarctic Division, have been **Magga Dan, Thala Dan** and **Nella Dan.** An expedition, sailing in the **Kista Dan,** set up Australia's first station on the Antarctic mainland in MacRobertson Land on 13 February, 1954 and named it Mawson after Australia's most notable Antarctic explorer.

In 1955, the station on Heard Island was closed, but in January, 1957 a second mainland station was opened in Princess Elizabeth Land and named Davis in honour of Captain J. K. Davis, ship's master in several important expeditions. In January-February 1957, the United States established Wilkes station in Australian Antarctic Territory, for the International Geophysical Year; Australia agreed to take over the administrative control of Wilkes in 1959. Australia by this time was manning four stations throughout the year.

The Antarctic Division thus laid its plans and managed ANARE during the post-war "mechanised" era which succeeded the work of Mawson's expeditions of the pre-war "developmental" era. The latter phase was one where expeditions had been largely dependent on private arrangements and organisation, with minimal government financial backing; from 1946, however, the "mechanised" era was made possible by, and had the great advantage of, more recent developments in, and more generous provision of ice-breaking ships, snow vehicles, aircraft and other aids, such as radar and the gyro-compass. Interest and drive had now reached the governmental and diplomatic levels, with considerations such as national prestige and international co-operation uppermost in the minds of the legislators.

INTERNATIONAL GEOPHYSICAL YEAR

In the IGY, 1957-58 it had been decided by the co-operating nations that the major scientific effort was to be devoted to Antarctica, which had not previously been technically possible. Earlier geophysical years, so far as polar observations were concerned, had to confine their attention to the Arctic region, apart from equatorial and other

globally significant locations. In 1957-58, eleven nations, expending many millions of dollars, organised expeditions to Antarctica to establish more than 40 stations there. Jointly, the participants embarked on elaborate and extensive programmes of scientific research, and they planned to view on the ground or from aircraft every square mile of the continent.

The IGY achievement was such a success story in the field of international scientific co-operation that there was a revival in many quarters of sentiments akin to that expressed by America's polar explorer, Rear-Admiral R. E. Byrd (1888-1957): "I am hopeful that Antarctica in its symbolic role will shine forth as a continent of peace, as nations working together there in the cause of science set an example of co-operation.

THE ANTARCTIC TREATY

Although the United States government had in May 1958 submitted a proposal for an Antarctic Treaty, it was not until 15 October, 1959 that a conference was convened to discuss this matter in Washington. The Australian Minister for External Affairs, Rt. Hon. R. G. Casey, was quick to lead a strong delegation to that conference. He made an important speech supporting the proposal and stressing Australia's contribution. Among other things, Mr Casey said: "In view of Australian activities in the Antarctic over more than a century and our scientific efforts in the Antarctic over several decades, I feel that I am justified in claiming that Australia has made an important contribution to the opening up of this difficult and inhospitable continent . . . Apart from the world-wide importance of the establishment of an area of permanent peace in the Antarctic, the whole world will benefit from the scientific co-operation among the signatories to the Treaty."

The Antarctic Treaty was signed on 1 December, 1959 by the nations which had been active during the IGY: Argentina, Australia Belgium, Britain, Chile, France, Japan, New Zealand, Norway, South Africa, the Soviet Union and the United States. The Treaty was left open for accession by other States. The essential features of the Treaty include the following: provision for complete freedom of access of scientific expeditions to any part of the Antarctic continent for interchange of the scientific information obtained; no military activities of any kind may be carried on in Antarctica, with a system of inspection ensuring that this provision is not evaded; existing national territorial claims are "frozen" so that no future activities of any country can affect the status quo which existed when the Treaty was signed, thus postponing the settlement of questions of national claims which were previously contentious and an obstaclea to co-operation; the Treaty was to remain in force for at least 34 years.

Australia through ANARE has continued and expanded its own programmes of exploration and scientific research since signing the Antarctic Treaty, and has been regularly represented at Consultative Meetings attended by Treaty signatories. It has also contributed scientific papers and discussion at the frequent international Antarctic Symposia which have been a feature of recent years. Developments in modern technology have made possible continued improvements in living conditions and other amenities for station personnel and in radio communications, while in mechanised transport on the Antarctic continent's surface, and in the air above it, vastly improved mechanisation has enabled the completion of successful programmes oef coastal exploration and mapping, and long excursions into the interior, mainly further to map the altitude and thickness of the ice-cap and the height above sea level of the underlying bedrock. Improvements in scientific instrumentation and laboratory techniques had made possible a widening of the fields and an increase in the variety and depth of scientific research. All of this has stemmed from a soundly based and happy union of logistics and science.

ANTARCTIC DIVISION TRANSFERRED

In May 1969 the Australian Government completed arrangements for the transfer of the Antarctic Division from the Department of External Affairs to the Department of Supply, which had both the long experience of administering a wide range of governmental scientific research programmes and a suitable organisational structure necessary to give direction and assistance to the further development of Antarctic research. The same year saw the com-

pletion of the station to replace Wilkes which had had a constantly recurring problem of drift accumulation and subsequent meltwater. Over a period of four years, taking advantage of the more favourable weather conditions of the short summer, a station of completely new design was erected on a suitable site about a mile away across Newcombe Bay. The design to keep the station well above the ground and clear of wind-driven snow accmulation was based on aerodynamic principles and models tested in wind tunnels. Fire risk has been also minimized. It was fitting that this station was named to honour the former Minister for External Affairs Rt. Hon. R. G. Casey, now Lord Casey, who had pressed for many years the claims of Australian Antarctic research for adequate financial support. The commemorative plaque reads:

"This station, opened on 19th February, 1969, is named in honour of Lord Casey, Governor-General of the Commonwealth of Australia. It replaces the U.S.A.R.P. station stituated at Stonehocker Point, 1½ miles north of here, which was transferred to Australian administrative control in February 1959."

SCIENTIFIC PROGRAMMES

What of Australian scientific research at its current stage of development? The present programmes continue the work in the field of exploration, surveying, mapping and meteorology which were the early vital growing points of the younger research organisation. In addition, there are now investigations in the field of upper atmosphere physics, cosmic rays, geomagnetism, seismology, glaciology, geology, zoology, botany and medical science. It is not possible here to do justice to the complexity and significance of this work in suitable detail. A few points of interest, however, may be selected and reduced to their simplest terms to indicate some of the actual and potential significance of such research as might be applied to the practical demands of living in the modern world.

At Mawson and Casey, glaciologists are studying the rates of accumulation and melting of the ice, and also obtaining information about layers of ice far down in the ice cap (which in some places is nearly 3 miles thick), deposited thousands of years ago, only to be buried under successive later layers. These studies are of great importance in testing theories about long-term climatic changes. They may yet have relevance to practical hydrological problems and the growing world demand for available freshwater, most of which is locked up in the Antarctic ice cap.

Scientists at the station also carry out investigations of the physics of the upper atmosphere. Some of this work involves sending balloons aloft with instruments which transmit data by means of radio messages back to the men on the crowd. These balloons are often tracked to heights of more than 100,000 feet, giving information on solar-terrestrial relationships, and on the stream of powerful nuclear particles from outer space which are known as cosmic rays. Then there is practical use made of studies of the reflection of radio waves sent upwards from the earth to various layers of the ionosphere: these measurements provide information which helps to increase the efficiency of the world's radio broadcasting systems.

Coming closer to living things, medical officers study the response of members of their parties to their cold environment, and its effect on the health and performance of the men. Penguins and seals around the coast of Antarctica are closely watched by biologists, while at Macquarie Island, a most important and unique wild life sanctuary to the south of Tasmania and midway between Australia and the polar continent, continuous studies are made of the elephant seal, the fur seals and numerous birds of flight from the Southern Ocean, all of which use the island as a breeding place during the late spring and summer months.

WHAT OF THE FUTURE ?

If sufficient imagination is brought to bear upon current achievements and future probabilities of accomplishment, it is clear that Australia's originally instinctive interest in and curiosity about Antarctica have been justified by subsequent developments. Looking into the future, a rational appraisal should justify Australia's continued activity in an exciting region which is not only a unique, natural scientific laboratory but also a potentially rich source of food which may yet be needed to supplement the nourishment of the world's human population, whether or not it is controlled in its numbers.

FUTURE OF U.S. IN ANTARCTIC

A major study of the future role of the United States in the Antarctic has been made at the request of the White House. Rear-Admiral D. F. Welch, commander of the United States Navy Antarctic support force, said in Christchurch earlier this year that the study, which has been made by the Government's Antarctic policy group, will indicate the size and direction of future Antarctic activities.

There have been no developments as yet from the study. The policy group's report was due at the White House on May 1.

Rear-Admiral Welch was in Christchurch briefly last month on his way back to Washington after two weeks in Australia as the official American guest of honour at the Battle of the Coral Sea commemoration ceremonies. He said then that he did not know whether the Antarctic budget had been cut. "It is just a question of waiting to see what Congress will do, and we should know this by July," he said.

THE BIG SPENDERS !

Nearly $1,000,000 was spent by the United States Navy Antarctic support force in Christchurch on New Zealand products and services during the financial year which ended this month. This figure does not include salaries, fuels, and miscellaneous services for aircraft and ships, which amounted to more than $1,000,000 last year.

Annual local spending has increased by $360,000 in the last three years as a result of the support force's recent programme of buying more New Zealand products that are competitive with those manufactured in the United States. The financial year's figure represents an increased spending of about $100,000 over 1969, and $360,000 more than in 1968.

The additional spending has come from greater use of New Zealand supplies, equipment parts and construction materials at Harewood. This year the Navy bought New Zealand frozen dinners for the first time.

About $5000 was spent on the dinners. They were used as hot meals during flights between Christchurch and Antarctica.

PHILATELIC NEWS

Philatelists may have covers postmarked at South Pole and Byrd Stations in Antarctica and aboard Deep Freeze ships which operate a post office during the 1970-71 Antarctic season.

Collectors are limited to one cover per person to be post-marked at Byrd Station, South Pole Station, and from each Deep Freeze ship operating a post office. (If a cancellation is desired from only one station, the word "Byrd" or "Pole" should be written in the lower left corner of the cover).

Byrd and South Pole Station postmarks can be obtained by placing two addressed covers bearing United States postage at the letter mail rate in an envelope and mailing them to Deep Freeze Philatelic Mail; US Naval Construction Battalion; Davisville, Rhode Island 02854.

International reply coupons may be used by collectors from foreign countries to defray postage on covers.

Philatelic mail to be postmarked at Byrd and South Pole Station must reach Davisville not later than 1 September, 1970 in order to be processed during the Deep Freeze 1971 Antarctic winter. The postmarked covers should be received by the collector between October 1971 and March 1972.

Cancellations can be obtained from the following ships participating in Deep Freeze '71; USCGC Burton Island (WAGB-283), P.O. Box 20820, Long Beach, Calif. 90801; USCGC Westwind (WAGB-281), F.P.O. New York 09501; USCGC Staten Island (WAGB-278), F.P.O. Seattle, Washington 98799.

In all cases cutoff date for covers is November 13, 1970.

Covers postmarked aboard Deep Freeze ships will be returned to collectors during the operating season as expeditiously as postal backlogs permit.

AMERICANS WINTER-OVER

This winter the United States has 250 servicemen and scientists at its stations in the Antarctic. One scientist is wintering with the Russians at their Bellingshausen Station.

Ther are 21 men at the Amundsen-Scott Pole Station, 21 at Byrd Station, and 10 at Palmer Station on the Antarctic Peninsula. McMurdo Station has a winter population of 198.

SOVIET ANTARCTIC EXPEDITIONS

The 14th Soviet Antarctic Expedition has been successfully concluded with the arrival of the scientific research ship "Professor Viese" in Leningrad on 19 February, 1970. Paradoxically, the hardest of the 26,000 miles steamed by the ship were the last ones: unusually heavy ice in the Baltic could be passed only with the help of the icebreaker "Ivan Kruzenshtern".

During the operations of the 14th SAE an important scientific achievement has been the deep seismic sounding of the basic rock structure of the Antarctic. During the traverse from Mirny to Vostok station important researches were carried out of the dynamics of the ice sheet. The aerologists succeeded in launching a radiosonde to a record altitude of 45 km. In the summer season the biogenic chemical composition of the coastal ice has been studied with success. Methods have been worked out for recording the oscillations of ice-floes caused by distant storms, cyclones, calving of icebergs, etc. In Mirny registration was maintained of mu-mesons and neutrons in cosmic rays; this was the period of high solar activity with frequent decrease in the intensity of cosmic rays (the Forbush effect). It is expected that the data of these observations will be interesting.

THE 15th EXPEDITION

The XV SAE reached Mirny on board the "Ob" in February. The unloading was made difficult by strong winds, roughness of the sea, and blizzards. The wintering party of the XV SAE, 220 men, is headed by Dr. V. Gerbovich. In the first days of March the "Ob" arrived at the station Molodezhnaya in the Lützow-Holm Bay, where a radiogram was received from the Japanese icebreaker "Fuji" to the effect that she was held up in heavy pack. Moreover, the vanes of the ship's starboard propellor were badly damaged. Dr. Kusunoki, the Head of the Japanese Expedition, and Mr. Isobe, Captain of the "Fuji", visited the "Ob" and with the Soviet crew worked out plans for assistance.

In April, after a visit to the Bellingshausen Station (Waterloo Island) and having chosen the site for the new station Leningradskaya on the Oates Coast, the ship turned homeward. Previously the Soviet party visited the Chilean station Presidente Eduardo Frei, and the Chilean polar taem visited the "Ob". On the 20th of May the "Ob" was in Leningrad.

SCIENTIFIC WORK

In Molodezhnaya a large radio centre is being constructed, which is to become the most powerful on the Antarctic continent. In Mirny and Molodezhnaya for the first time simultaneous receipt of data from meteorological satellites has been maintained, these being used for the compilation of weather forecasts and surveys of ice conditions. At Vostok station equipment is installed for the deep drilling of the ice.

Interesting fossils of tree trunks and leaves, 300 million years old, resembling the southern beech and the southern birch, were discovered by V. V. Zamaruev, geologist, on Waterloo Island. Near Novolazarevskay seismic soundings were accomplished to the depth of 40 km. The analysis of all scientific data is now in progress.

BELGIAN PROGRAMME

(Continued from Page 419)

EXCHANGE OF SCIENTISTS

Geologists L. Lambrecht and J. Sekyra participated as exchange scientists in the USARP programme, the first one to study the coal deposits near Coalsack Bluff, the latter to compare the geomorphic evolution, the sedimentary formations with the metamorphic rocks of East Antarctica.

In Belgium work is continuing on the results of previous expeditions at different institutions. The ice thickness map of the Sanae area (by T. Van Autenboer and H. Decleir) has been printed and will be published as a data report by Exantar. This office continues to publish the different geophysical data reports of previous expeditions.

LEARNING FROM THE PENGUINS

By PROFESSOR A. F. NIKOLAYEV

Professor A. F. Nikolayev led the Third Soviet Antarctic Expedition. He is a well-known designer of machines for polar exploration and works at the Zhdanov Polytechnical Institute, Gorky.

He has strong views on the equipment required.

While I was in the Antarctic I saw the shortcomings of many machines.

For example, tractors, floundered in loose snow. What kind of machines were needed? The answer was supplied by the penguins.

These birds can travel over fluffy snow at 15 m.p.h. They slide on their bellies, propelling themselves along by their flippers.

We therefore developed a snowmobile with fin propellers, which are extended as necessary according to the density of the snow.

A hydraulic system smoothly adjusts the clearance and, like a penguin, it slides over the snow on its bottom, lined with a plastic which causes minimum friction.

Our Penguin snowmobile is undergoing trials now.

For the Antarctic we must have vehicles which will travel over wide fissures in the ice and climb steep slopes.

Machines for the Arctic should be based on the same principles.

Explorers must not lose their way, so they prefer to travel along iced-over rivers.

But that is where danger lies—open water concealed under the snow cover.

We need a machine that will not sink, does not mind broken ice and looks for open water.

Such a vehicle has long been needed by oil and gas pipeline teams, reindeer breeders and fishermen, and now it has been developed.

Designers at the Gorky institute are tesing a go-anywhere truck, with rotor-screw propellers.

Using a plastic foam filling, it can travel over water, easily negotiates bogs and crawls over ice.

It is the prototype of a series of ice-cutting machines to be tested in the near future.

Our latest designs include a tubular cutting excavator for operating in hard soils down to a depth of 20 feet.

We also have a drilling machine with a warm cabin and a fishery unit with a special body for transporting fish and a drill for fishing under the ice.

Reprinted from "Soviet News."

SOVIET ATLAS OF ANTARCTICA COMPLETED

(Refer "Antarctic," Dec. 1968, Page 185)

The second and last volume of the Soviet Atlas of Antarctica has just been published. The first appeared in 1966.

The atlas embodies information hitherto scattered over hundreds of books and papers and the researches of Soviet, British, American, Australian, New Zealand and other explorers.

Different maps show the physical structure of Antarctica, its geology, climate, and fauna and flora of the continent and its surrounding oceans.

The text includes a brief history of the discovery of the continent and an account of the historic expedition, led by Bellingshausen and Lazarev, which sailed right round the continent 150 years ago.

The job of compiling the atlas started ten years ago by the Polar Institute in Leningrad, under the general editorship of Vyacheslav Averyanov, who had headed the Soviet polar research station Vostok in 1957.

The atlas contains a vast amount of scientific material but the general reader will also find much of absorbing interest.

It is so far available only in Russian.

JAPANESE ACTIVITIES IN THE ANTARCTIC 1969-70

A traverse from Syowa Station to the South Pole and back, an aerophoto survey of the Soya Coast, Riiser-Larsen Peninsula, and the Yamato Mountains, and the launching of two sounding rockets were among the main activities of the tenth Japanese Antarctic Research Expedition, 1968-70. This review of JARE-10 covers the period from the arrival at Syowa Station on 5 January, 1969, to the official changeover to JARE-11 on 20 February, 1970.

The 40 members of JARE-10 left Tokyo on 30 November, 1968, and after calling at Fremantle, Western Australia, between December 15 and 21, the Fuji arrived at Syowa Station on 5 January, 1969. Between February 25 and March 18 this year the Fuji was trapped in the ice. She freed herself on March 18 and reached Cape Town on March 29. The JARE-10 winter party and the JARE-11 summer party arrived home by air on April 8, and the Fuji returned on May 9.

About 560 tons of cargo were sent to the station mainly by shuttle flights of Sikorsky S61A helicopters, fuel was transported directly from the ship to a 50-kilometre tank on the shore by a long temporary pipeline, and delicate scientific instruments were delivered by vehicles pulling sledges over the sea ice. Transportation of the cargo was finished on January 25.

Three huts for a rocket launching programme were erected at a site about 500 metres from the main station. A sleeping area with ten cubicles was erected in the main station, and connected, with a corridor four metres wide to the main corridor and dining hut. The vehicle garage was doubled in size and a small hut for a tide-gauge recorder was built.

RESEARCH PROGRAMMES

Research programmes during the summer of 1969 were:

An aerophoto survey with a Lockheed Lasa-60 was carried out from January 16 to 27. The survey ended when the aircraft damaged its nose and twisted a propeller in a forced landing on the sea ice runway which broke away suddenly during the flight on January 27. The area covered by the survey included Soya Coast, Riiser-Larsen Peninsula, and the Yamato Mountains. Seven flights covering about 850 kilometres were made. At the same time astronomical observations were made in the area for the purpose of making maps.

Field surveys near Syowa carried the following disciplines: geological and geomorphological studies of exposed rock area, marine biological studies, physiological studies of fishes, limnological study of fresh and salt lakes, flow rate measurement of glaciers, sampling of rock, biota, water. and ice. An aeromagnetic survey from an helicopter was made by the use of proton magnetometer.

The launching of high-altitude large balloons for observing auroral X-ray intensity was successfully accomplished between January 14 and February 14.

Ten flights were made, three of which simultaneously covered the magnetically conjugate points, Syowa and Reykjavik, Iceland. An American observer, Mr Gerard A. Roach, assisted in this programme and also took part in a field survey because he is a keen mountain climber.

Routine observations, such as synoptic and upper-air weather, vertical sounding of the ionosphere, station seismology, geomagnetism, and tide registration, were started on 1 February, 1969 under the responsibility of JARE-10 without any cessation from JARE-9.

TRAVERSE PARTY EVACUATED

On February 15 the South Pole traverse party was evacuated by helicopters when it arrived at its destination on the continental ice about 20 kilometres from Syowa. Eleven men led by Mr. Masayoshi Murayama, leader of JARE-9, covered 5182 kilometres in 141 days,

the longest journey ever made in the Antarctic.

A brief take-over ceremony was held at the station heliport when the leader, Dr. Kou Kusunoki, named the winter party in the presence of Mr Murayama, Mr Nozomi Murakoshi, acting-leader (summer party) of JARE-10, and Captain Shigeo Matsushima, commanding officer of the Fuji.

For the first time a professional film cameraman was attached to the wintering party. He was Mr Yukio Kimura, of NHK (Nippon Hoso Kyokai, Japan Broadcasting Corporatione), who took 16mm colour film and sent reports for release from JARE headquarters in Tokyo once or twice a month. He also joined the traverse party in the sustral summer of 1969-70.

Twenty-eight expedition members, one press reporter, and two huskies, one of which died on April 12, occupied Syowa Station in 1969.

Scientific results obtained at the station and in the field have not been published because most of the data was brought by the Fuji which returned to Tokyo on 9 May, 1970. However, our programmes were carried out satisfactorily.

The weather at the station was mild until mid-winter and the accumulation of snow was less than in a normal winter. The maximum wind gust was experienced on August 15 recording 46.8m/sec. The minimum air temperature was —36.2°C. The minimum air pressure of 929.6mb of this winter was registered on September 7, indicating the lowest value at Syowa since its establishment in 1957. However, no severe gale was experienced at this time.

Little accumulation of snow favoured outdoor activities, especially the transport of fresh water from the pond using a car equipped with a water tank. Water transportation ended in the middle of August, because of salt concentration in the pond water, ice cover growth and thea effect of cold upon the car. Fresh water was then obtained by chopping icebergs near the station.

FIELD TRIPS

Originally, it was planned to send a traverse party inland before the dark season. At Syowa the sun is below the horizon between May 30 and July 14. As the sea ice in Ongul Strait between the station and the continent did not freeze until the middle of May, mainly because of several storms the original plan was abandoned.

A five-day trip from August 21 to 25, was made to test scientific equipment and vehicles. A depot-setting trip was made between September 5 and 25, reaching 71 deg. South and 43 deg. E.

The traverse between 1 November, 1969 and 29 January, 1970 covered the following routes: Syowa Station—(71S, 43E)—(72S, 43E)—Yamato Mountains (Jan. 1-12)—71S, 43E)—Syowa. Traverse glaciology was the main task, and the laborious work of making a strain grid band along the parallel of 72 deg. South between 43E and 36E (Yamato Mts.) was accomplished by all the members of the party, measuring triangle nets extending 250 kilometres.

The ten-man party, which was led by Mr Hisao Ando (geologist), used two new KD-60 vehicles, the same type used in the South Pole traverse by JARE-9, and two new KC-20 small gasoline-engine driven vehicles pulling sledges, and a caboose with six beds and a kitchen. Mechanical failure in two KC-20 vehicles occurred early in January and spare parts were airdropped from the Lockheed Lasa.

A group of moraine deposits, the largest one 200 by 460 metres, was found at 69°–37′S and 43°–20′E, which suggested the existence of rugged sub-ice structure and thin ice cover. Reduction of data on navigation, gravity, seismic shooting, geomagnetism, glaciology, radio echo sounding, geology, geomorphology, is now being evaluated. Many accumulation stakes, strain grid, and strain grid band in 72 deg. parallel will be remeasured within a few years will be remeasured within a few years, possibly by the JARE-13 (1972).

Research programmes at Syowa Station were continued. Two new programmes were the observation of atmospheric electricity and infrasonic sound waves. The former covered the measurements of electric field intensity, conductivity, air-earth electric current, and other related items. The latter was to locate teh source of sound, presumably related to auroral activities, and to record the intensities and periods of various waves. An array of very sensi-

tive microphones was set near the station and continuous measurement was carried out except in storm periods when there was too much noise.

A rather active year in terms of the sun and its related fields, was expected in the International Active Sun Year. However, so far as the preliminary results at Syowa are concerned, it might be said that 1969 was rather quiet with respect to upper-atmosphere physics and cosmic rays.

MEMBERS ENJOY FRENCH COOKING

Mid-winter's Day on June 21 was observed with many festivities, including an authentic Japanese tea ceremony, a Haiku (short poem with 17 letters) contest and go-go dancing at midnight after a typical French dinner.

It is difficult to make really good Japanese dishes because they require fresh and raw foods, tedious cooking, and a large variety of tableware. But sukiyaki, sushi, tempura, and yakitori wer enjoyed several times.

To celebrate the return of the sun in the Southern Hemisphere a soccer game was held on July 14. The game was played on the sea ice and the air temperature was 20 below zero.

December was a busy month. On December 10 a Soviet IL-14 flew over thea station and dropped fresh fruit the next day. The Soviet expedition also gave us a sea ice chart. It was used for the navigation of the Fuji which left Fremantle on December 16 and arrived on 5 January, 1970.

RELIEF PARTY ARRIVES

A relief party arrived by helicopter on January 2 led by Dr. Tatsuro Matsuda, a biologist at the National Science Museum. He has a winter team of 30 men. The acting leader is Mr Sadao Kawaguchi, a meteorologist at the National Science Museum, leading the summer party of 10 men. The commaynder of the Fuji is Captain Hideo Isobe.

The main programmes of JARE-11 are the launching of sounding rockets, aerophotogrammetry in the summer, biological research in the winter, completion of rocket facilities, micrometeorology, glaciological research in inland areas and station research.

On February 10, the first sounding rocket was successfully launched, and the second was fired on February 17. They reached a height of about 90 kilometres, measuring the electron density and ozone concentration. They are designated S160JA1 and S160JA2, and are solid propellant rockets with a diameter of 160 mm and a length of about 4 metres.

Dr Garth Morgan, an Australian oceanographer, and Mr Herman Friis, chief of the Polar Archives Centre, National Archives, Washington, joined the summer party of JARE-11, embarking on the Fuji at Fremantle and disembarking at Cape Town. Dr. Morgan tried to measure the oceanic tide by means of a self-recording tide gauge, but unfortunately the equipment was not retrieved becausea of the movement of sea ice and icebergs near Syowa.

Mr Friis was interested in the geography of the station area and made a number of air reconnaissances from helicopters, inspecting East Ongul Island where the station is located.

Dr. Morgan also installed a self-recording magnetometer at a site about 20 miles south of Syowa and obtained a record for about two weeks.

On February 20, an official change-over of teams was held at the station and members of JARE-10 and the JARE-11 summer party returned to the Fuji by helicopter.

The Fuji was not able to pass a very consolidated pack ice and broke her starboard propellors on February 25. The Japanese Government asked for American and Russian help. On March 7 thea Russian ship Ob arrived near the Fuji but was unable to penetrate the pack.

The Fuji freed herself on March 18 and reached Cape Town on March 29th. The JARE-10 winter party reached Tokyo by air on April 8, via Pretoria, Paris and the North Polar route. The ship left Cape Town on April 4 and returned to Tokyo on May 9.

A WHALE OF A STORY!

The Australian Federal Department of Health issued a licence last March to land 1900 tons of whale meat from the Antarctic. It's wanted for pet food and is kept in cold storage in Melbourne.

MORE NEWS FROM JAPAN

JARE XI (1969-71)

On February 20 the JARE XI wintering team of 30 men, the leader of which is Dr T. Matsuda, relieved the predecessor team of 28 men led by Dr. K. Kusunoki, and the Fuji left her anchorage at the edge of the fast-ice. The supply programmes were implemented so smoothly that the scientific work was able to be carried out at the same time, this included twice shooting observation rockets (S160 type) on February 10 and 17 aerial surveying flights of over 52 hours in total.

The Fuji then undertook oceanographical work along Prince Olaf Coast, but unfortunately on February 25 her port screw was badly broken by very close pack ice at 68° 24′S., 38° 51′E. Despite all her efforts to escape, she remained fast in the pack. The Japanese Government asked the U.S.S.R. and U.S.A. governments to assist her and actually the Soviet ship Ob made the long voyage to her relief but without success. In the meantime, ice conditions eased, and the Fuji escaped from her ice prison on March 18 after 22 days. She steamed home via Capetown, where Dr. Kusunoki and the JARE X wintering team disembarked (they returned home on April 8 by air). She reached Tokyo on May 9 carrying the JARE XI summer team led by Mr S. Kawaguchi.

Japanese Polar Research Centre

The Polar Research Division of the National Science Museum was raised to the status of a research centre on April 1. The Antarctic veteran, Mr M. Murayama leader of JARE III, V, and IX, was appointed director. The staff has been augmented, and will take charge of affairs concerning the Japanese Antarctic Research Expedition, keeping in contact with the Special Committee for Antarctic Research organised by the Japanese Science Congress.

JARE XII (1970-72)

A meeting of the Special Committee was held on February 13, April 4 and May 8 respectively. Though the final decision will be made by the Cabinet Council and the meeting of JARE Headquarters shortly, plans for JARE XII will be as follows:

The wintering team will consist of 30 men, the leader of which will be Dr. T. Oguchi, assistant professor of geophysics (University of Tokyo); and the summer party of 10 men will be led by Mr N. Murakoshi, meteorologist.

The main items of the scientific programme, excluding routine work, will be observations of the stratosphere and the ionosphere by rocket, glaciological deep drilling of the inland ice, and a geological and geographical research trip to Enderby Land.

MINERAL RESOURCES IN THE ANTARCTIC

In Parliament on April 14, the Prime Minister, Sir Keith Holyoake, was asked if he had seen a newspaper reference to Mr R. B. Thomson's statement: "The Antarctic Treaty is curiously silent on the subject of exploitation of minerals and natural resources". Since New Zealand was a signatory to the Treaty, would he initiate discussions with other signatories with the view to provision being made to cover this aspect?

The Prime Minister said that New Zealand had already taken the initiative in the matter and had initiated preliminary discussions among all the Antarctic Treaty powers with a view to seeing if we could find some way to anticipate problems that might arise from the exploitation of mineral resources in Antarctica. "I used the same language, actually, as was used by Mr Thomson," said the Prime Minister, "that the Treaty is silent. There is no review. I am bound to say I do not think an early or easy decision will be come to, but I think it will have to be unanimous."

URUGUAY TO JOIN TREATY NATIONS

Uruguay has held its first national Antarctic convention in Montevideo. An Antarctic Institute has been established, and the Government will be asked to initiate negotiations for the accession of Uruguay to the Antarctic Treaty.

The convention has agreed that top priority should be given to the installation of an Antarctic scientific station in Uruguay in the Department of Maldonado. It has also decided that the installation of a Uruguayan scientific station on the Antarctic Continent should be deferred until the 1971-72 season.

A project for a first Uruguayan flight to the Antarctic in October-December this season has been approved by the convention. It sees the flight as a demonstration of Uruguay's scientific and pacific interest in Antarctica.

The Uruguayan Antarctic Institute will seek official status by a Government decree, and plans to send a delegation to the conference of the Special Committee on Antarctic Research, which will be held in Oslo in August

Uruguayan affiliation to four international organisations has been approved by the convention. The organisations are the International Astronomical Union, the International Union of Geodesy and Geophysics, the International Whaling Conference, and the International Astronomical Federation.

Delegates from the Antarctic Institute appointed to these organisations are: Professor Gladys Vergara (I.A.U.); Professor Hector Comasafia (I.U.G.G.); Professor Julio C. Musso and Professor Julio H. Jahn (I.W.C.) and Captain Roquea Aita (I.A.F.). S.C.A.R. delegates will be Professor Musso and Captain Ruben Arela.

All the working groups at the convention have been incorporated in the Antarctic Institute. Members of the institute's directive council are: Chairman, Professor Julio C. Musso; vice-chairman, Colonel Hebert Pampillon; secretary, Professor Gladys Vergara; members, Professor Jorge Chebataroff and Captain Ruben Varela; alternate members, Professor Julion H. Jahn, Captain Roque Aita, Professor Hector Comasafia Professor Adheman Pigni, Colonel Rolando Laguarda Trias.

MAGGA DAN CHANGES OWNERS

In October 1969 the J. Lauritzen line sold the Magga Dan to a foreign buyer.

The Magga Dan was built in 1956, and was named by Lady Fuchs. On her maiden voyage she carried to the Halley Bay and Shackleton bases on the Weddell Sea the British Trans-Antarctic and the Royal Society Expeditions, plus equipment and supplies for Sir Vivian Fuch's famous trek across the Antarctic via the South Pole.

Under the JL-flag the Magga Dan passed the life of a migrant. Each year she made the long passage from the Arctic to the Antarctic and back. For eleven seasons the Magga Dan forced the Antarctic icefields with vital supplies for British, Australian and Belgian-Dutch scientific stations on the Antarctic continent. In 1968 she carried a party of tourists from New Zealand to McMurdo Sound. During the northern summer she transported supplies to the townships and weather stations of North-East Greenland. On her last voyage for the Company the Magga Dan became the floating headquarters of the Greenland Geological Survey's Scoresby Sound Expedition.

Parting with the Magga Dan was a melancholy event for the company, but the evacuation of the Expédition Antarctique Belgo-Néerlandaise from its Antarctic base two years ago meant the disappearance of the complementary operations in the Arctic and Antarctic on which such specialised ships must rely.

NEWS FROM CAMPBELL ISLAND

Peter Julius Reports—

"Diamonds are a girl's best friend" runs the familiar line, but here on Campbell Island the attractions in this sphere are more appropriate for the male gender. Rock hunting is definitely the "in thing" as far as our wild Aussie mechanic is concerned, and although the Kimberley fields in South Africa are in no danger of being priced off the market by a diamond strike here, hopes of at least some mediocre zircon or other semi-precious stones run high. With a Health Robinson type tumble polisher constructed it is felt that the programme of the station will soon come to a standstill if there are any more adherents to the new craze. Fortunately nothing of value has been found to date.

Best laugh so far this year was to a telegram from the G.P.O., requesting the numbers of learner motor-cycle labels held here. It took courage of the highest order not to reply with the obvious.

Since the last bulletin, action has ben the watchword and work in copious quantities has been completed. A further 140 feet of new walkways constructed, and two of the large aerial masts were lowered (dropped) for painting and new stays and halyards fitted. The C4 aerial also was lowered for replacing and only those who have served sentence under the shadow of that great red thing at the top of the hill will appreciate the 6½ hours of peace that we received from its blip bleep burp which effectively blocks out all conversations, radio transmission, etc., for 20 seconds on each ¼ hour. Phil Owens, our ionosphere observer, suggested a 5-minute programme to make up for lost time and it was only his fleetness of foot that prevented a lynching.

All fuel stocks were shifted to the dump near the power house and we took advantage of a few fine days in April to get cracking on the painting of the wharf buildings. The helicopter pad was dismantled and has been replaced by a far bigger one to enable the large type helicopters now used by the United States Coast Guard in the Antarctic to land in safety.

Weather has been about normal, the exception being 90 knots plus of wind on April 11 which took the pen right off the charts and for good measure, put a 45-degree lean on the Askania Hut; four days of snow at the end of May and the remainder of the time wet and bleak.

Wild life work too has been prominent in our activities and the enthusiasts work at it regardless of the weather and conditions. Two thousand mollyhawk chicks have been banded and about 300 Royal albatrosses. It is hoped to have a blitz (banding wise) on the remaining Royal chicks and a comprehensive programme to cover the rest of the island has been arranged. The Sorenson Hut has really proved a boon, especially for work in the mollyhawk colonies and the addition of toilet facilities brings its grading up to 3 star plus (with reservations). Whales in increasing numbers have been sighted in the western bays and at least one tramping party has complained about being kept awake by their snortings, etc. The wild life ranger has noted that the snorting capabilities of this particular party are well known and although not completely discrediting the report, suspects that it should be taken with a grain of salt (or two).

Saddest note of the year was to hear on April 21 that the fishing vessel Tua Tea was lost after a fire off the coast of Otago. Although Captain Rae and his crew were all saved, the regret by the whole party at the loss of this fine vessel was keenly felt and indeed many of the happiest memories of the Island, that we will take away will be those of the Tua Tea's February visit, and the comradeship that existed between our two crews.

Socially, the situation has been quiet. Regular film evenings each Saturday are well attended aned under the social headings must come the releasing of the water rationing on March 30 after 10 days of meagre supplies. It was great

WILL NUCLEAR GIANT REPLACE ANTARCTIC MEN?

This question was posed in a Press Association despatch from Christchurch recently, which stated that New Zealand and the United States may share in a nuclear-powered machine crammed with scientific instruments and being developed at a cost of at least $7,000,000 for use in Antarctica.

It is an automatic geophysical station —a giant tripod (about 30ft) with 4ft diameter egg-shaped top housing the instruments—which would collect data and transmit it to various parts of the world via satellite.

It would do the work of sevral men, Mr R. B. Thomson, superintendent of thea Antarctic division of the Department of Scientific and Industrial Research, said in Christchurch.

Mr Thomson said such a station could replace some New Zealanders wintering over on the continent.

But he stressed that it would be at least five years before the cost had been lowered enough to interest this country in paying to get the information.

At present this country spends only about $250,000 on its yearly Antarctic programme and the U.S. Antarctic research programme and the U.S. Navy spends about $23,000,000 a year.

It costs about $140,000 for an American scientist to spend a year in Antarctica and there are about 25 there now.

LUNAR MACHINE

Mr Thomson said some machines which had been placed on the lunar surface were similar to the automatic stations planned for Antarctica.

"Last season the United States took the hardware of one of these stations to Antarctica to see how it would withstand the weather and if all is well they might pack it with the equipment and test it this season," he said.

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to get together again smelling like nine out of 10 (Piggy was the exception) Hollywood Stars. Regular weekly schedules with Macquarie Island has become the main feature and we look forward to our liaison with John Bennett and his merry men. Results of the inter-island chess matches however, are not for publication. A terrific evening on April 17 to mark the passing of the half-way mark and naturally the compliments go to our chef Bryan George, who can tell the number of wives in the future whose near failures in the culinary field will be greeted by "It's not like Bryan used to make".

On May 15 an Orion of the RNZAF made several passes over the island and dropped a packet of newspapers which unfortunately sank in Perseverance Harbour and were not recovered. At the time of writing, all hands are looking forward to an air drop of mail, fresh supplies and some urgently required parts for the generators. Until then (and we hope it will be soon), we will continue our vigil in the southern Ocean and be grateful to being a part of an international team sharing our work and our pleasures in an aura of co-operation.

IN THE BEGINNNING

The English firm of David and Charles Reprints have followed up their edition of Ross's Voyage with a still earlier Antarctic classic:

"A Voyage towards the South Pole performed in the years 1823-24, containing an examination of the Antarctic Sea (1827), by James Weddell."

Sir Vivian Fuchs contributes an introduction to this volume of 324 pages with charts and illustrations.

Three Nations Claim First Sighting of Continent

Who first sighted Antarctica? The question has been the subject of controversy for many years. There have been bitter arguments, at times, about the respective claims of an Englishman, Edward Bransfield and an American, Nathaniel Palmer. In the course of these the claim of the Russian Thaddeus Bellingshausen has been overlooked.

In this article L. B. Quartermain gives his assessment. It is based on an unbiassed study of the arguments put forward by each side.

Three expeditions from three nations have been credited with the first sighting of the Antarctic Continent, all in the year 1820, 150 years ago. Some authorities in each of the three countries concerned still fiercely maintain that their men were right and the others wrong. Here are the facts.

28 JANUARY, 1820.

The Russian naval captain, **THADDEUS BELLINGSHAUSEN** commander of the Russian Antarctic Expedition of 1819-1821, wrote in his report.*

"We could see for but a short distance . . . on a south-east course . . . we observed that there was a solid stretch of ice running from east through south to west. Our course was leading us straight into this field, which was covered with ice hillocks . . . We turned north-west by west in the hope that in this direction we should find no ice."

The date given, January 16, is that in teh Julian Calendar. Russia did not adopt the Gregorian Calendar till 1923. So the corresponding English date, 12 days ahead of the Russian date, would be January 28.

Commenting on this entry, Debenham says: "On the 16th he was so close to the land that had the weather been clear he must have recognised it as such." In a footnote he says "they must have been within a few miles, not more than 20 at most, off the coast of what is now called Princess Martha land." The nearest prior position given is 69°21′28″S, 2°14′50″W. The coastline hereabouts is in approximately 72°S.

Bellingshausen may possibly have seen ice-covered land but did not recognise it as such.

30 JANUARY, 1820.

The English naval officer **EDWARD BRANSFIELD,** following up the earlier discovery (by sealing captain William Smith) of the South Shetlands, sailed south in the same ship, the Williams, and after sighting Deception Island sailed on across what is now Bransfield Strait. At noon on January 30, according to an account, apparently written by one of the officers on the Williams, in the "Literary Gazette" for November, 1821, the ship was in 63°16′S. 60°28′W., and sailing south. "At three o'clock in the afternoon", the report proceeds, "... the haze clearing, they very unexpectedly saw land to the S.W.; and at four o'clock were encompassed by islands, spreading from N.E. to E. Land was undoubtedly seen in latitude 64°, and trending to the eastward.... A round island was called Tower Island, latitude 63°29′, longitude 60°34′." The Williams now sailed north-east to the discovery of more land and islands.

Tower Island on modern maps is almost exactly in this latitude, but about 23 miles to the west, not a surprising error 150 years ago.

Two contemporary charts in the Hydrographic Office, London, confirm the sighting of land in approximately the position of what is now the Danco Coast of the Antarctic Peninsula.

Bransfield sighted land which was probably the portion of the Antarctic Peninsula which lies in about 60°W. and east of that longitude.

* In the English translation edited by Profesor F. Debenham, published in 1945.

17-18 FEBRUARY, 1821.

Bellingshausen, later in his great voyage, wrote on February 17 (February 5, Old Style), "The ice . . . surface sloped upwards towards the south to a distance so far that its end was out of sight." And next day, "In the further distance we saw ice-covered mountains similar to those mentioned above." The Russian ships were at this time about 50 miles from the coast of Princess Ragnhild Land in approximately 69°S., 15° 50'E.

Bellingshausen undoubtedly sighted the "mainland" of the Antarctic Continent.

16 NOVEMBER, 1820.

The American sealing captain **NATHANIEL PALMER** after sailing his little sloop "Hero" south from Deception Island, either on this day or the next pushed somewhat further south than Bransfield had done over nine months earlier. According to his log, Palmer "got over under the Land" and discovered a strait "trending SSW and NNE . . . literally filled with ice . . . The latitude of the mouth of the strait was 63°45'S." If this position is correct the strait could only have been Orleans Channel betwen Trinity Island and the mainland.

Palmer sighted a portion of the Antarctic Peninsula somewhat to the west of that seen by Bransfield the previous January.

For many years controversy raged, bitterly at times, over the respective claims of Bransfield and Palmer to have ben the first to sight the Antarctic Continent itself. Until Bellingshausen's narrative was made readily available by the publication in 1945 of the English translation edited by Professor Debenham, the Russiean admiral's claim was overlooked.

For some eight years the claims of both Bransfield and Palmer were regarded as irrelevant because on 20 December, 1928, Hubert Wilkins flew south from Deception Island and at 71°S. saw what appeared to be a series of through channels, one a major channel which he named Stefansson Strait. So in his "The Conquest of the South Pole", 1932, J. Gordon Hayes says, "Graham Land, as now made known, . . . is a remarkable island." So, it was thought, neither Bransfield nor Palmer had discovered the continent.

Some doubt was thrown on this conclusion in the course of a flight by Lincoln Elisworth in November, 1935. But there was no definite rebuttal of the "island" theory till 1936, when in September-October Stephenson, Fleming and Bertram of the British Graham Land Expedition sledged south to 72°S. and "there was no sign of Stefansson Strait". So Bransfield and Palmer came into the picture again.

What then must be our verdict? Clearly "Not Proven". It may in fact be that some long forgotten sealer discovered a mainland coast, rich in seals, and said nothing of his discovery lest some other sealer should get in before him and amass a fortune. Let us then give honour to three brave and able men and to their crews and let us give thanks that controversy has given way to the friendship and co-operation which today are such outstanding features of life and work in the Antarctic.

WALLY HERBERT HONOURED

Mr W. W. Herbert, leader of the four-man British team which made the first surface crossing of the frozen Arctic Ocean in 1968-69 has been awarded the Founder's Medal of the Royal Geographical Society.

The expedition, which covered 3800 miles and took 16 months, was described by the society as a feat of determination, of endurance and of navigation in conditions as arduous and perplexing as any explorer could experience.

Mr Herbert has also mapped large areas of Antarctic glaciers. He was with the New Zealand Antarctic research team in 1961, when he led a sledge party down the Axel Heiberg Glacier, following Amundsen's return route from the South Pole.

An account of this journey appears in his book "A World of Men" which was reviewed in "Antarctic", March 1969.

ANTARCTIC BOOKSHELF

A GLOOMY PROPHET

We quote below an extract from a rare little booklet which has come into the Editor's hands. It is called 'On the conditions of Antarctic Regions'—being the reprint of a lecture delivered in the City Hall, Glasgow on 23 November, 1876 by Sir C. Wyville Thomson.

Thomson was the Director of the Civilian Scientific Staff of the 'Challenge' Expedition of 1872-76 which carried out a great deal of scientific and oceanographical work in Antarctic waters, but the voyage was not noted for land discoveries.

This is how Thomson concluded his lecture:—

"The curious question naturally arises, shall we ever be able to reach the South Pole? With our present methods and appliances I should think that the answer must be an unhesitating negative. Except possibly somewhere in the region where Ross penetrated, in 1842, to the parallel of 78° to the south of New Zealaned; or about Graham Land, where Captain Dallman, in 1873 continued the exploration of Captain Biscoe, there seems to be no accessible lead of land; and Ross's southernmost point is upwards of 700 and Graham Land 1,200 miles from the Pole. The remainder of the outline of the Antarctic Continent appears to be a perpendicular cliff 200 to 250 feet in height, without shelter, and with a heavy pack broken up and kept in motion by frequent gales moving outside it during the greater part of the year; bounding a vast expanse of glacier surface, a great part of it subject, probably, to high winds and to almost incessant falls of snow.

We have now learned that the South Pole, if not actually inaccessible, is much more difficult of access than we had imagined even with the long roll before us of the gallant men who have strained through many years the resources of human skill and bravery to the utmost in fruitless attempts to attain the barren issue; and we can only anticipate disasters multiplied a hundredfold should the South Pole ever become a goal of rivalry among the nations."

History has supplied the answer to his question!

THE PLEISTOCENE CALCAREOUS NANNOPLANKTON OF THE SUB-ANTARCTIC PACIFIC OCEAN. Ph.D. dissertation presented at the Department of Geology, Florida State University. Kurt R. Geitzenauer, 1969. Sedimentological Research Laboratory, Florida State University, Contribution No. 32, 115 pp., 5 pls., 18 text-figs.

This contribution is a thorough and well conceived study of the Quaternary coccolith and discoaster fossils in twelve U.S.N.S. Eltanin cores from the South Pacific Ocean between latitudes 39°S and 57°S. Nineteen species are listed from the cores and the most important thirteen of them (ten coccoliths and three discoasters) are described and illustrated. The reproductions of optical microscope photographs are poor, but those of electron microscope photographs are much better. Non-reversible faunal changes provide four biostratigraphic zones within the Quaternary which are correlated with the four zones previously recognised by Hay and others in North America and the Caribbean. Reversible faunal changes and variations in relative abundances of warm-water species indicate six climatic events within the last half million years. Dating is based partly on a 300,000 year isochron determined in each core by the excess thorium^{230} method using gamma-ray spectroscopy; and partly on paleomagnetic reversal stratigraphy in a limited number of cores. The latter technique was not possible in most of the cores because the sediments are predominantly limy and have low magnetic susceptibility. Because the dating is not definitive the correlation of the inferred climatic events with glacial and interglacial stages is uncertain.

P. Vella,
Associate Professor,
Department of Geology,
Victoria University of Wellington.

MID-WINTER'S DAY CELEBRATED

CHRISTCHURCH

In five years time, New Zealand scientific parties may not be needed to work at Scott Base during the Antarctic winter, according to Mr R. B. Thomson, superintendent of the Antarctic Division of the Department of Scientific and Industrial Research.

Mr Thomson—who was the guest speaker at the annual Mid-winter's Day dinner of the Canterbury branch of the New Zealand Antarctic Society—told members that in future there could be an automatic station at Scott Base transmitting scienific data. It was also very unlikely that small parties would be stationed in remote areas of Antarctica.

"This year, we will have the biggest scientific programme New Zealand has ever had in the Antarctic, and the most interesting," said Mr Thomson. "Much of the programme is concerned with special investigations.

"Seventy-five per cent of the work done by New Zealand in the Antarctic is in the geophysical sciences. This work is associated with global coverage and is important to our understanding of the world and the air above us.

Special Problems

"We know a lot about the land mass of Antarctica and the geology of the continent. We have discovered a lot, and have associated ourselves with space research and other questions. Now we are sending specialists back to the Antarctic to look at special problems. Five years ago we had 47 people there. Now 115 are going for a shorter time."

Mr Thomson said that this year young women scientists would be going to the Antarctic. This was a good thing, because they were specialists in their field of science. He was sure they would make a valuable contribution to the research New Zealand was doing.

Referring to reports that minerals or diamonds might be discovered in Antarctica, Mr Thomson said there was a likelihood that something might be found worth while to bring out. But two years ago, a company which was asked to investigate the future of the Antarctic continent had reported that the only thing of immediate value was tourism.

Many Tourists

Mr Thomson said that the organisations which had taken tourists from New Zealand to the Antarctic had learned a lot. "We also learned a lot, because we were not completely prepared for tourists," he said.

"In January-February next year, there will be many tourists visiting the Antarctic. We cannot provide facilities for them all at Scott Base, and we will have to decide whether we can have them there, and how many at one time. They might even have to draw lots for those who can go to Scott Base."

"I don't think we should think of Antarctica as a place other people should not visit," said Mr Thomson. "We should not deny anyone the right to visit the continent. But we have to guide tourists along the right channels, and see that they do not interfere too much with the scientific work.

"This is something we have to be very careful about. We do not want to leave the place wide open to all sorts of problems.

"We have tighter agreements for the conservation of flora and fauna in the Antarctic than in any part of the world. The nations have come to an agreement that this is one place man is not going to pollute."

"Tremendous Co-operation"

Mr Thomson said that there was tremendous co-operation between the countries represented in the Antarctic. This spirit of mutual international goodwill was important, and should be preserved.

Guests at the dinner, who were welcomed by the president (the Rev. J. F. B. Keith) included the Mayor (Mr A. R. Guthrey) and Mrs Guthrey, and Mr B. Porter, of Auckland, who will be the leader at Scott Base for 1970-71. Mr Porter replied to the toast of the winter parties, proposed by the vice-president (Mr A. Anderson). The Dominion president (Mr H. F. Griffiths) replied to the toast of the society, proposed by the Mayor.

Telegrams of good wishes were received from the men at Scott Base and Campbell Island. There was also one from Katmandu, capital of Nepal. The sender was a former vice-president (Mr J. R. Claydon), who has a post there with an Asian Development Bank technical-aid mission.

SCOTT BASE

Midwinter's Day was celebrated on Saturday for convenience, although today—Monday, June 22—is actually Midwinter Day, with about 50 minutes of nautical twilight—when the sun is more than 12deg. below the horizon at its zenith.

Far from being among the darkest days of the year, Saturday was almost daylight bright from the full moon. And as if to indicate its impending return, the sun produced a brilliant orange-red glow on clouds on the northern horizon at midday.

The midwinter celebration took the form of a formal dinner, with many of the men appearineg in ties and jackets for the first time since they have been in Antarctica to participate in this traditional function.

Messages were received from many other Antarctic stations, and from several O.A.E.s (Old Antarctic Explorers) from as far afield as South Africa and Fiji. There was even a message from President Nixon.

On Captain R. F. Scott's first expedition in 1901-04, each of his men was given a bottle of beer on midwinter day. Their appreciation of this could not have been greater than that of the men at Scott Base this year when they had the luxury of bottled New Zealand beer for the first time for six months.

AUSTRALIAN BASES

Members of the Australian National Antarctic Research Expeditions, spending the winter at Australia's Antarctic bases, celebrated Mid-Winter's Day with the traditional dinner last weekend.

The shortest day and the longest night fell on June 21, but some of the 75 Australians at Mawson, Davis and Casey on the Antarctic mainland and at the Macquarie Island base had their dinners on Saturday night.

Others celebrated on Sunday.

In addition, members of ANARE clubs throughout Australia—past expeditioners—held Mid-Winter's Day dinners over the weekend.

The Minister for Supply, Senator Sir Kenneth Anderson, over the weekend sent the following message to the men at the Antarctic bases:

"We join all those stationed at the Australian Antarctic bases in celebrating 1970 Mid-Winter's Day."

"Wherever you are, our best wishes are with you for this occasion and the remaining half of the year."

Field activity at the mainland bases has beaen restricted recently by the severe weather, the temperature at Mawson being about 40 degrees Fahrenheit below freezing point.

The last field trip before the period of continual night set in was a 205-mile motor toboggan ride by four members of the Mawson team over four days to Fold Island, 102 miles along the coast west of Mawson.

Expeditioners at present are seeing only two hours of twilight each day at Mawson, which is inside the Antarctic Circle.

The Mid-Winter's Day dinner is the traditional way for expeditioners wintering over in the Antarctic to celebrate the half-way mark, when they look forward to seeing the sun appear again over the horizon in a few days.

CAMPBELL ISLAND

Members of the New Zealand Station held the traditional mid-winter's day dinner on Sunday June 21, the cook, Bryan George, excelling himself in providing a grand bill of fare.

During the afternoon six people—and a dog—enjoyed? a dip in the ocean with the water temperature a cool 39 degrees!

TOURISTS WILL INVADE McMURDO THIS SUMMER

Christchurch can expect at least 200 Antarctic tourists to visit the city on their way to the Ross Sea area in February next year. Most of the tourists will be Americans, and they will pay anything from $2900 to $4100 for their Antarctic cruise in the Lindblad Explorer, a ship specially built for the Lindblad Travel Company, which has organised about a dozen tourist cruises to the Antarctic Peninsula and Ross Sea areas since 1965.

The first group of about 100 due in the city will arrive on February 3. After visiting Mount Cook this group will embark at Bluff in the Lindblad Explorer.

The second group will reach Christchurch on February 5, having completed the company's first 1970 cruise in the Ross Sea area. They will have joined the ship at Hobart on January 15.

In Christchurch both groups will have cocktails and dinner with members of the Canterbury branch of the New Zealand Antarctic Society.

The Lindblad Explorer's officers includes Mr Peter Scott, son of Captain Scott, and Captain E. C. MacDonald, a former deputy-commander of the United States Navy Antarctic Support force.

In 1965 the Lindblad Travel Company took 58 Americans to the Antarctic Peninsula region on board the Argentine naval vessel Lapataia. In 1967 there were two more voyages with 87 passengers to the same region using the same ship.

The company ran four cruises in 1968 —two with the Chilean vessel Navarino carrying about 100 persons to the Antarctic Peninsula, and two with the small Danish vessel Magga Dan, which carried 39 tourists from New Zealand to the Ross Sea area.

Last year 112 passengers were taken to the Antarctic Peninsula in the Chilean ship Aquiles; earlier this year the Lindblad Explorer carried more than 200 passengers on two cruises to the same area.

AUSTRALIANS TO JOIN TOUR

So far only six Australians have applied for passages on the Lindblad Explorer. The Australian agent handling bookings for the expeditions, Mr N. P. Peters-Snow, says the tours are very expensive, and the tourists will have to make a deposit of $800.

The Australian tourists will pay from $2599 to $3684 for the trip. They will leave Hobart on January 14 aboard the Lindblad Explorer, and return to Auckland on February 8.

Mr Peters-Snow says that so far there have been no applications from young people, and none are effected. Prospective tourists are likely to be older people or those with a scientific background.

THERE ARE TWO SIDES

OUTSIDE

"Plateau Station had to be air-lifted to the high polar plateau; these huts are basically insulated boxes or vans of plywood covered with aluminium and constructed in units so that they can be joined together with covered passages . . . and well anchored to withstand the elements."

INSIDE

"The van units of Plateau Station provide curtained bunks with spring mattresses . . . and have colour combinations carefully selected to create a pleasant, unobtrusive atmosphere."

MINERALS AND TOURISM

PROBLEMS OF FUTURE

As one of the Antarctic Treaty nations New Zealand will have to consider in the future the possible commercial exploitation of Antarctica. The presence of mineral deposits in the Ross Dependency, and the growth of tourism—at least 200 tourists are expected to visit McMurdo Sound this season—are questions which already concern the New Zealand Government.

Some indication of the Government's thinking on these subjects is given in the following extract from the "Foreign Affairs Review," issued by the Ministry of Foreign Affairs.

As visits to Antarctica become more frequent, the likelihood of commercial exploitation of the continent looms larger. Tourism and the exploitation of mineral deposits are both issues with wide ramifications, particularly in sectors of the continent where there have been long standing conflicting territorial claims; complex questions of jurisdiction and sovereignty are involved. While the Antarctic Treaty has provisions touching on both these questions, it does not deal with some major issues that would arise out of proposals for other than scientific activities in Antarctica.

For example, if a mining enterprise should wish to apply for prospecting or mining rights in an area where there are competing national claims to sovereignty, it is by no means clear to whom the enterprising should apply. The Antarctic Treaty is silent on this question. It seems probable that each of the claimant countries would take a different legal view of the ownership of the mineral resources. Even if this is not yet a practical problem, the fact is that recent developments in mineral-exploitation techniques in the Arctic are stimulating interest in prospecting for, and the development of, economic mineral deposits in Antarctica.

In these circumstances, proposals by foreign commercial organisations to explore, prospect, and develop the mineral potential of the Ross Dependency are of close interest to the New Zealand Government. The Government has already consulted its Antarctic Treaty partners informally on various aspects of these questions. There may, for example, be little difference in the data obtained from certain scientific activities and the data obtained from mineral prospecting. The treaty provides for the exchange of scientific observations and results amongst all the Treaty governments. It also sets up provisions for inspection of activities. It might well be that any commercial organisations interested would find it necessary to amend extensively plans for exploration or exploitation which they might have, to accord with the relevant provisions of the Antarctic Treaty.

WILSON'S TERRA NOVA DIARY FOR PUBLICATION

Four years ago Ann Savours, curator of manuscripts at the Scott Polar Research Institute, edited for publication Edward Wilson's diary of the British National Antarctic Expedition, 1901-1904, popularly known as the Discovery expedition. Wilson's detailed and personal record, and the water colours which illustrated it, were widely acclaimed when the book was published by the Blandford Press.

Some time in 1971-72 we can look forward to the publication of Wilson's diary of the Terra Nova expedition, again by the Blandford Press. This time the editor will be H. G. R. King, librarian of the Polar Research Institute, and author of "The Antarctic." He plans to edit the diary rather on the lines of the Discovery diary.

CONSERVATION OF ANTARCTIC WILDLIFE AND PLANTS

Amending legislation to provide for the conservation of Antarctic fauna and flora was introduced into Parliament recently by New Zealand's acting Minister of Foreign Affairs (Mr Talboys).

The Antarctic Amendment Bill, which was given a first reading, will enable effect to be given by regulation to a recommendation of representatives of the Antarctic Treaty Powers containing agreed measures for the conservation of Antarctic fauna and flora.

AS TREATY POWERS WISH

Mr Talboys said the Antarctic Treaty representatives of the treaty Powers, including New Zealand, met from time to time to recommend measures in the furtherance of the aims of the treaty.

The agreed measures for the conservation of Antarctic fauna and flora, which were adopted at a meeting in 1964 and amplified and amended in 1966 and 1968, were the most significant recommendation yet adopted.

"They are intended to provide a code for the protection and conservation of the living resources of the Antarctic," the Minister said. "To this end States are required by the agreed measures to prohibit certain specified activities which could disrupt the natural ecological balance of the area and interfere with scientific investigation being carried out in the Antarctic."

The authority to make regulations given by the Bill included the power to give effect to any future amendments to the agreed measures.

ALREADY IN LINE

Mr Talboys said New Zealand played an important part in the elaboration of the agreed measures and the rules laid down were already being observed in practice by the New Zealand Antarctic team.

The Bill will allow the Government to pass regulations prohibiting the wilful killing, injuring molesting, or taking of any native mammal or native bird in Antarctica, unless a permit has been obtained.

Native plants will be protected in prescribed areas, vehicles and aircraft will be barred from these places, and the importation of most animals and plants will be banned.

The regulations will apply to New Zealanders in the Antarctic as members of an expedition, aircraft, or ship crews; or merely visiting citizens.

Please Note !

In the light of the above, this item in a New Zealand newspaper of 21 January, 1970, may serve as a reminder of the need for such regulations.

May Bring Back Penguins

The Deputy Mayor of Wellington, Cr R. L. Archibald, will leave Wellington on Sunday for a week's stay in Antarctica.

Cr Archibald will be one of a party of 22 people, which will probably include a group of 12 visitors from the United States.

He hopes to be able to make arrangements to bring a pair of Adelie penguins back from Antarctica for the Wellington Zoo.

POINT OF VIEW

McMURDO

"In summer . . . a dry, dusty American frontier town, with saloons containing full length nudes in the best Wild West style."

SCOTT BASE

" . . . merely a suburb and tourist attraction on the seven-mile road to Williams airfield."

BUT—

"Somehow the Kiwis continue to make their living quarters much more liveable, more human, than the Americans."

From the correspondent of an Australian newspaper.

"ANTARCTIC"

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Out of Print:	Very few left:
Volume 1 numbers 1, 2, 9	number 8
Volume 2, numbers 1, 2, 3, 4, 7, 9	number 8
Volume 3, number 7	number 5

Some other issues are in very short supply. Copies of available issues may be obtained from the Secretary of the Society, P.O. Box 2110, Wellington, at a cost of 50c per copy meanwhile. Indexes for volumes 1, 2 and 3 are also available, 30c each.

Copies of our predecessor, the Antarctic News Bulletin, are available at 50c per copy, except for numbers 9 and 10. The copies of numbers 1, 2, 3, 4, 7, 11, 17 and 18 are authorised reprints.

The New Zealand Antarctic Society

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 currently two branches of the Society and functions are arranged throughout the year.

You are invited to become a member. **South Island** residents should contact the Canterbury secretary, **North Islanders** should contact the Wellington secretary, and **overseas** residents the secretary of the New Zealand Society. For addresses see below. The membership fee includes subscription to "Antarctic".

New Zealand Secretary

Mr. V. E. Donnelly, P.O. Box 2110, Wellington.

Branch Secretaries

Canterbury: Miss J. Garraway, P.O. Box 404, Christchurch.

Wellington: Mr. P. Wilson, P.O. Box 2110, Wellington.