ANTARCTIC

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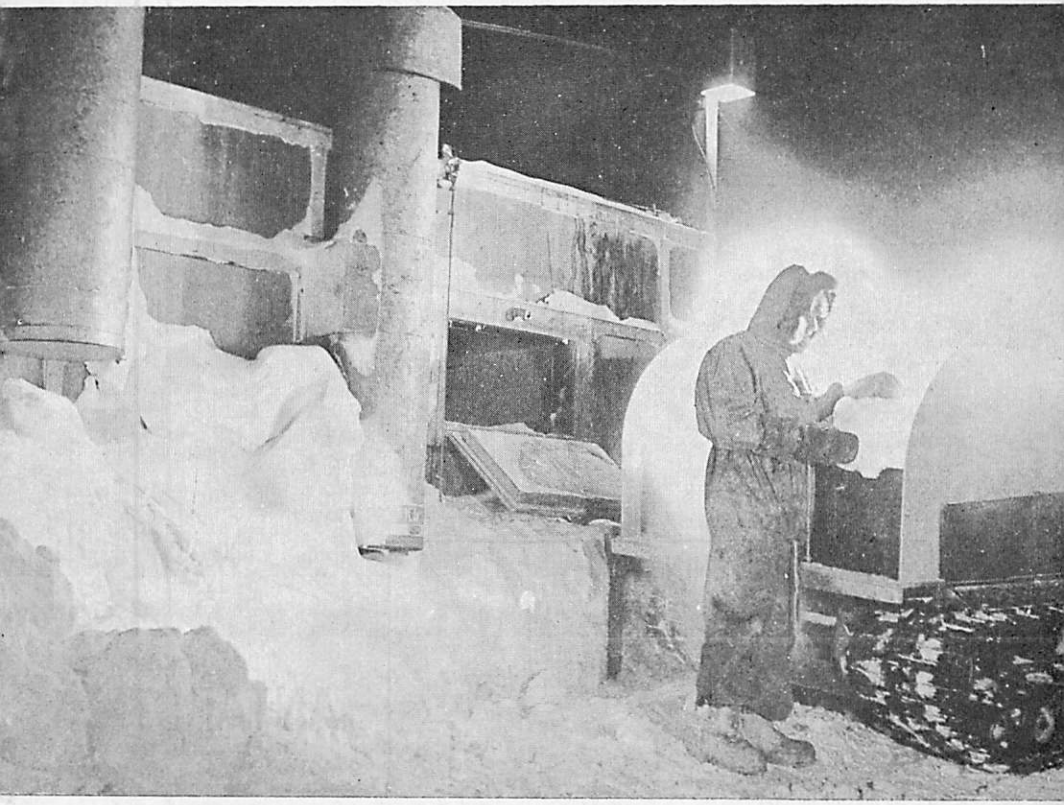

WINTER SCENE AT SCOTT BASE. IN THE DARKNESS OF THE LONG NIGHT A NEW ZEALANDER PREPARES TO FEED ONE OF THE HUNGRY SNOW MELTERS UPON WHICH THE SUPPLY OF FRESH WATER FOR THE BASE DEPENDS.

Antarctic Division, D.S.I.R. Photo

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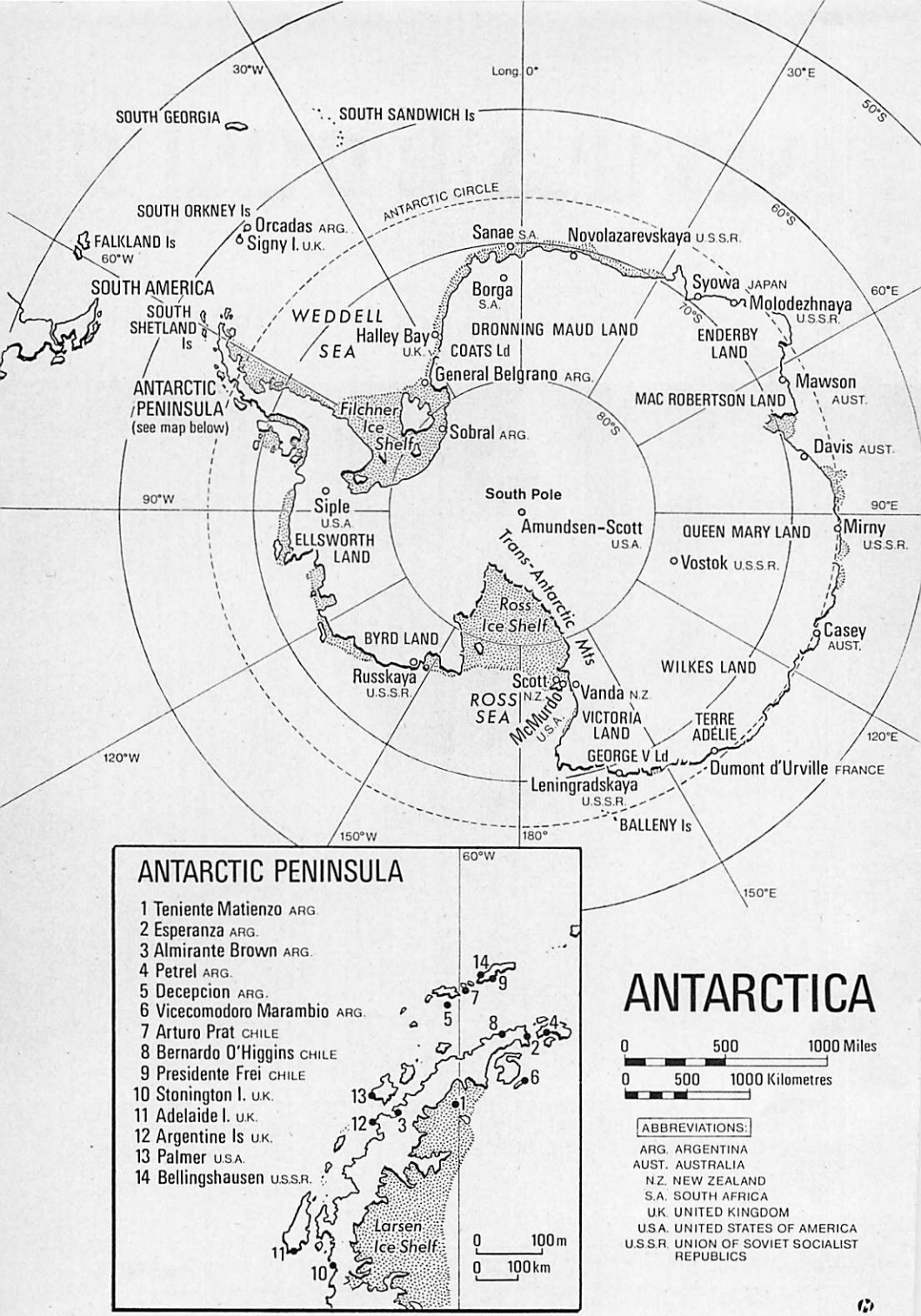

ANTARCTICA

0 500 1000 Miles

0 500 1000 Kilometres

ABBREVIATIONS:

ARG. ARGENTINA
AUST. AUSTRALIA
N.Z. NEW ZEALAND
S.A. SOUTH AFRICA
U.K. UNITED KINGDOM
U.S.A. UNITED STATES OF AMERICA
U.S.S.R. UNION OF SOVIET SOCIALIST REPUBLICS

"ANTARCTIC"

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CONTENTS

June is a significant month in Antarctica. As its days pass, the men wintering at stations on the continent begin to look forward to the sun's return. They celebrate Midwinter's Day in the cheerful knowledge that they are half-way to the end of their winter isolation.

This year June is a month of vital importance to all who want Antarctica to remain free from pollution, and the exploitation of its mineral and natural resources. The results of the meeting of Antarctic Treaty nations in Oslo this month may well decide the future of Antartica as a continent for science, the one region where men can still work together in mutual tolerance and trust, free from the pressures of economic rivalry.

NEW ZEALAND POLICY ON ANTARCTICA

Like the New Zealand Antarctic Society, the New Zealand Government firmly believes that a regime to regulate mineral exploration and exploitation in Antarctica is essential if the Antarctic Treaty is to continue to have practical meaning. This indication of New Zealand's policy has been given by the Prime Minister (Mr W. E. Rowling) in reply to a letter from the society which expressed concern at the possible consequences of uncontrolled economic development in Antarctica.

Late last year the society set up a working group to study the need for measures to control economic activities in Antarctica. The Prime Minister was asked, as Minister of Foreign Affairs, if the working group's study could be considered by the New Zealand delegation to the consultative meeting of the Antarctic Treaty nations in Oslo this month. Mr Rowling has said in his letter, written before the meeting, that the views of the Government and the society largely coincide. Therefore the society's position will be well reflected in the instructions for the New Zealand delegation.

Mr Rowling says that the Government's view does not reflect any desire on its part to see Antarctica "opened up" but, rather, is based on the conclusion, shared by the society, that mineral exploration and exploitation will inevitably occur.

"In the last 10 years man's knowledge about the mineral potential of Antarctica has increased enormously. So too, has the knowledge about techniques for extracting minerals in difficult environmental conditions. In a situation where there were proven mineral resources and the means of extracting them, it is the Government's view that it would be difficult ,indeed impossible, to prevent countries already experiencing great energy problems from exploiting them.

FRESH STRAINS

"The consequences of uncontrolled mineral exploration and exploitation could be most serious. The environment could suffer irreparable loss, and hostilities could arise over territorial claims. In short, the present highly successful period of co-operation under the Antarctic Treaty could be succeeded by a period of tension which would impose fresh strains on international relations.

"It is for these reasons that the Government is anxious that Antarctic Treaty members should resolve this issue. New Zealand took the initiative in raising this matter at the 1970 consultative meeting in Tokyo, and at the 1972 consultative meeting in Wellington it again pressed for action but with very little success.

"Since the 1972 consultative meeting we have continued to impress upon Treaty members the importance of reaching an agreement before exploitation commences so that negotiations can be conducted free from the additional political pressures that would inevitably arise. Most Treaty members now recognise that this question has become fairly urgent. At a prepatory meeting held in Oslo in October, 1974, it was agreed that the next consultative meeting should tackle the issue of mineral exploration and exploitation as a matter of priority.

MANY ISSUES

"You will appreciate, I am sure, that it will not be easy to reach final agreement, and that it could take some time. Many issues in addition to environmental protection, certainly one of the most important, will need to be con-

sidered, and a number of them relate to sensitive questions such as sovereignty.

"It is the Government's view that negotiations on these matters should be directed towards furthering the principles embodied in the Antarctic Treaty — preservation of Antarctica for peaceful purposes, the promotion of international co-operation in Antarctica, and the protection of the unique Antarctic environment."

In its study the working group says that the Antarctic Society recognises that economic development in Antarctica is inevitable, although not necessarily desirable. The society believes that the Antarctic Treaty does not offer sufficient protection at present for the Antarctic environment. There are no binding provisions for specific environmental standards to be observed on most of the continent, and in its adjacent waters. Also, there are no effective means of policing, maintaining, and reviewing such standards.

URGENT NEED

The working group considers that a policy to regulate environmental standards for the whole of Antarctica is needed urgently. The society suggests, therefore, that such a policy should be applied to all activities, where government or non-government, scientific, exploratory or economic.

There is scope for the establishment and management of an environmental standards policy within the framework o fthe Antarctic Treaty. This could be done by extending the present provisions for the protection of flora and fauna, and special areas. Such a policy should provide for control over all activities in oceans and coastal waters, and on land and ice shelf areas of Antarctica.

The society considers that an environmental standards policy should be established now, before specific proposals for economic exploration or development are announced. This should reduce or remove the political implications of such a policy. No single project and no single station would be challenged, establishment of environmental standards before economic development would allow any country to consider the need to meet such standards if planning development in any part of Antarctica.

Polar studies course

In October this year the Scott Polar Research Institute of Cambridge University intends to start a one-year post-graduate course leading to a Diploma in Polar Studies. No such course is given elsewhere in the world.

The objects are to provide a broad background of polar knowledge, and to enable each candidate to investigate a topic of his choice in depth. It is hoped the course will be specially appropriate for those in government, industry, and academic life, whose careers call for this kind of knowledge and training.

Lectures and seminars in the course, which will run from October to June each year, will cover the following subjects in their relation to both polar regions: natural environment, peoples, history, resources and problems of development, government and social relations. Each candidate will be required to write during the year a 10,000 to 20,000-word thesis on a particular subject.

The staff of the institute who will be principally involved in the teaching of the course will be Dr G. de Q. Robin (the director), Dr B. B. Roberts, Dr T. E. Armstrong, Dr Caroline Humphrey, and Mr H. G. R. King.

Applicants should have a first degree from a university. Other evidence of fitness to study for the diploma may be accepted, however, in special circumstances. Those interested should apply to the Board of Graduate Studies, Mill Lane, Cambridge, England, CB2, 1RZ, which will send more information and application forms.

WINTER WORLD

Neighbours share cold and darkness on Ross Island

New Zealand's winter party at Scott Base is now becoming used to perpetual winter darkness and low temperatures. Since the setting of the sun on April 24 marked the beginning of the long winter night the lowest temperature of the season has been minus 45deg Celsius.

Late last month the New Zealanders' neighbours over the hill — 53 Americans and one Russian — reported that McMurdo Station was in total darkness, the only noticeable light being provided periodically by the full moon. The sea ice in McMurdo Sound was growing thicker. Seventeen men at the new Amundsen-Scott South Pole Station 825 miles to the south reported a drop in their water supply pressure, and complained mildly that the cook's big pretzels, the usual accompaniment with beer, needed coarser salt.

There are 11 men at Scott Base this winter. Their working hours are fully occupied by the scientific programme and regular maintenance. Off duty they read, or play pool and darts in their recreation room, and on Sunday nights a group travels slightly more than two miles to visit the American neighbours at the metropolis of McMurdo Station, and play 10-pin bowling.

In his first newsletter from the south Jim Newman, the officer-in-charge, reported that temperatures — in April — were getting lower every day, with minus 40.7deg C as the lowest recorded. Men could walk round quite comfortably in normal working clothing as long as there was no wind blowing; cold weather clothing was needed for work any distance from the main block.

Activities during no-working hours were still mainly outside the base. During darkness the most popular activity was going to Arrival Heights, about three miles away, to observe the many and beautiful auroras. Craig Nickerson, whose job includes the auroral camera project, had yet to spend a night alone in his remote hut at Arrival Heights.

Daylight activities included going out with a dog team under the control of John Stevens. Many of the party had been a number of miles out on the Ross Ice Shelf with John and his dogs.

All the team recently competed in a 200yd dash. There was no winner, only first place in the drying room to get warm after a swim in the Ross Sea with the air temperature at minus 25deg C, and the water temperature minus 3degC.

Anzac Day was celebrated on April 24, the same day that the sun set for the last time until it returns late in August. All men available gathered outside the main entrance to the base, and the New Zealand flag was lowered to half-mast by Craig Nickerson. Then a short service was held in remembrance of the dead of past wars.

Afterwards Craig lowered the flag for the last time to mark the end of summer. The day ended with a mess party.

In his latest newsletter received last month, Jim Newman reports that the recreation room is back in full use after a number of major changes to make it more comfortable during the winter. Carpet has been laid around the newly-covered pool table, and new linoleum around the bar and darts area.

Other notable events included passing the half-way mark of the party's stay

on the ice, and its liking for American 10-pin bowling. More than half the New Zealanders are regular players in the bowling league at McMurdo Station.

RUSSIAN LESSONS

Ten-pin bowling, larts, providing programmes for their radio station, reading their weekly newspaper, and learning Russian, are among the winter recreations of the men at McMurdo Station. Their Russian teacher is a 50-year-old glaciologist from the Arctic and Antarctic Institute in Leningrad, Dr Martsiss Barkov, who is the exchange scientist this season.

Dr Barkov is on his fourth visit to the Antarctic, and has spent two previous winters on the continent at the Soviet stations, Mirny and Vostok. This winter he is studying ice cores from Byrd Station, the nearby Koettlitz Glacier, and the McMurdo Ice Shelf. In December and January he studied with French scientists snow accumulation at the South Pole and Dome C, the ice dome in Wilkes Land on the line between Dumont d'Urville and Vostok.

Twice a week Dr Barkov conducts his Russian classes. He has also taught his American colleagues to like traditional Russian dishes like beef and cabbage soup, and pelmeney, the equivalent of ravioli. They, in turn, have taught him to enjoy wild turkey and Italian movies.

"SNOW SNAKES"

Temperatures at the station in April were not severe. The lowest recorded was minus 28deg Fahrenheit on April 13. During the month gusts of wind up to 60 knots were recorded.

Scientific work began on March 31 when the Doppler station started its satellite tracking programme. Earlier Messrs L. Wigginton and B. Aldridge had to cope with "snow snakes", the Antarctic equivalent of "bugs" in their equipment, and when they started to operate the Doppler station it began to pick up broadcasts from the local radio station instead of satellite passes.

After the sun set for the last time this winter at 12.45 p.m. local time on April 24, there was a spell of unusually warm weather. The lowest temperature recorded was minus 20deg F on May 4, and the highest plus 3deg F on May 9. No snow fell in the first week of last month, and the wind did not exceed 48 knots. Ice conditions were unchanged. Dr Barkov took three ice cores 300 to 400 yards out from the base of VXE-6 Hill. They were 22 to 23 inches thick.

BARTER BUSINESS

Stocks of potatoes were depleted when the Americans had to help out their New Zealand neighbours. A new batch of potatoes opened at Scott Base was found to be frozen and rotting. Some bartering took place, and the New Zealanders now have enough potatoes for the rest of the year.

Towards the end of May a fall of half an inch of snow was reported. The lowest temperature recorded was minus 26deg F, and the highest plus 15deg F. A 43 knot gust of wind was recorded on May 18. Dr Barkov's sea ice cores taken in the third week of the month measured 26.1, 26.6, and 27 inches respectively.

ODD MONTH

March was an unusual month for the 17 men at the Amundsen-Scott South Pole Station. On March 22 the station was in the grip of a minimum temperature of minus 87deg Fahrenheit — the coldest day of the year. Three days later the thermometer recorded minus 16deg F — the highest March temperature for 11 years.

In the first week of May the Pole Station reported a minimum temperature of minus 57deg F on May 6, and a maximum temperature of 30deg F the next day. On May 2 the wind reached 44.9 miles an hour.

Winter arrived with a vengence on May 27. The temperature dropped to minum 100deg F, the lowest May temperature recorded in the 18 years men have wintered at the Pole.

ANARE REPORT

Survey in Enderby Land Hampered by Weather

Extensive cloud cover, whiteout, wind, and drift, all hampered the work of the Australian National Antarctic Research Expedition's survey party in Enderby Land last summer. The three Hughes 500 helicopters and the Pilatus Porter fixed wing aircraft which supported the party from its base at Knuckey Peaks about 450km west of Mawson, had good flying weather on only one day in three during operations. Nevertheless, the tellurometer traverse was extended, magnetic and gravity measurements were taken, and geological and biological surveys made.

Plans to establish by tractor train a line of glaciological markers from Sandercock Nunataks to Knuckey Peaks had to be abandoned. The party was recalled because the Pilatus Porter aircraft was damaged in blizzard at Mawson. But glaciologists were able to obtain gravity and barometric readings along the Sandercock Nunataks-Mawson route.

The 1974-75 season began differently last summer for the Antarctic Division. Because of delays in the Northern Hemisphere, the Nella Dan would not have arrived in Melbourne until December. After allowing time for the voyage to and from Macquarie Island, this would have meant too late a start for her Antarctic relief voyages.

Therefore the 21 members of the Macquarie Island expedition, led by the officer-in-charge, Mr Ivan G. Hawthorn (Geelong, Victoria), and a limited amount of supplies, were flown to New Zealand. The party joined the Nella Dan at Lyttelton, and sailed for Macquarie Island on November 20.

The work at Macquarie Island for 1975 includes measurements in meteorology, ozone, geo-magnetism and seismology; and upper atmosphere research into aurora, micropulsations, diometry, ionospheric absorption and VLF emissions.

In addition, biological studies are being made into the interactions between the rabbit, cat, rat, mice and small nesting bird populations, and general data is being obtained about giant petrels, light-mantled and wandering albatrosses, Royal penguins, and elephant and fur seals.

Medical research involves the study of human adaptation to a cold environment. A tide recorder continues in operation.

Renovations to sleeping quarters and the ablutions area will be carried out, in addition to routine maintenance and updating of the station's electrical supply and plumbing facilities.

The Nella Dan left Melbourne on her first continental voyage of the season on December 7. The official farewell for this expedition was given by the Minister for Science (Mr W. Morrison). On board were some members of the 1975 Mawson winter party, the 1975 Davis party, and members of the Enderby Land summer survey party, led by Graeme McKinnon, the Antarctic Division's geographic officer.

SUMMER TRAVERSE

Men from the 1974 Mawson expedition made a tractor train traverse during the spring to establish fuel and supply depots for the Enderby Land summer

field operation from the base camp at Knuckey Peaks.

Apart from the leader, the survey party comprised two glaciologists, a medical officer and a biologist from the Antarctic Division; two geologists from the Bureau of Mineral Resources, Geology and Geophysics; five surveyors from the Division of National Mapping, Department of Minerals and Energy; some members of both the 1974 and 1975 Mawson expeditions; and seven members of a civil air component to fly and maintain the helicopters and fixed-wing aircraft.

While the Enderby Land survey party was in the field the Nella Dan continued on to Davis where the annual change-over of men and equipment was carried out. She then called at Fremantle, Western Australia.

This year's scientific programme at Davis includes meteorology, auroral observations, riometry, magnetometer and micropulsation records, VLF emissions, and absolute magnetic measurements. The recording of routine scientific data will be facilitated by the installation of central data logging equipment.

NEW LABORATORY

A new laboratory has been built for the biology programme which includes studies on elephant seals, giant petrels and Weddell seals. The main project, however, will be the continued long-term study of the ecology of Deep Lake. National research at Davis continues the study of human adaptation.

There are 14 men in the Davis 1975 expedition. The officer-in-charge is Mr Graeme C. Colback, of Thornlie, Western Australia.

The Casey relief expedition sailed from Melbourne on January 10 aboard the Thala Dan. The winter party of 26 at Casey, whose officer-in-charge is Mr Albert C. Jagger, of Lane Cove, New South Wales, includes one American. He is taking measurements as part of the United States' programme of geodetic mapping of the continent.

Geodesy and cartography are part of the programme at Casey, and also upper atmospheric physics and meteorology. Glaciological traverses will remeasure and resurvey previously established points, and it is planned to establish new ones.

A study of ice sheet anisotropy has been initiated this year. It involves observation of the polarisation of radio-echo sounding waves through the ice.

During the voyage to Casey, a short visit was paid to Commonwealth Bay and a small team was put ashore to assess what would be needed to restore the historic hut which housed Sir Douglas Mawson's Australasian Antarctic Expedition, 1911-14.

On her last voyage of the season the Nella Dan left on January 25. The main tasks of this expedition were to complete the changeover at Mawson, collect the members of the Enderby Land summer party, and resupply Macquarie Island with the main bulk of general stores and equipment.

MAWSON ANNIVERSARY

The Nella Dan also called at Davis and Casey. This enabled the Antarctic Division's director, Dr Raymond I. Garrod, who accompanied the expedition, to visit all four of Australia's southernmost research stations.

On February 13, Mawson Station had been in continuous operation for 21 years. The 21st birthday was celebrated in appropriate style. Dr Garrod, the 1975 Mawson party, most of the 1974 Mawson party, some 1974 Davis members and the Enderby Land party were all present.

Mr L. E. (Lem) Macey, of North Sydney, the officer-in-charge at Mawson for 1975, was also a member of the first team to winter at Mawson.

There are 27 men wintering at Mawson this year. Their programme includes meteorology, geo-magnetism, seismology, auroral studies, VLF measurements (in conjunction with the University of Otago), ionospheric soundings, cosmic radiation, and biological observations.

Australia's future role in Antarctic research

Australia's role in Antarctic research, and the present and future administration of the scientific programme, have been the subject of controversy in recent months. The Government is in favour of continuing the Antarctic programme; the Minister for Science (Mr W. Morrison) has been highly critical of the way in which the annual budget of about $3.6 million is being spent, and of the results achieved.

The Opposition, through its science spokesman, has criticised the Government for inadequate administration of the Antarctic programme, and particularly for the decision — made early last year —to transfer the Antarctic Division of the Department of Science to Hobart from Melbourne, where it has operated for more than 20 years. Scientists, inside and outside the division, support the criticism. They say the decision has seriously affected the morale of the division, and will reduce the effectiveness of the Antarctic research programme.

While the Opposition agrees with the move to Hobart, it does not approve of the way in which the Antarctic programme is being administered. The Liberal and Country Parties consider that Australia's long-term national interests require an active scientific programme in the Antarctic. Their joint policy on national science and technology suggests that the most appropriate way to do so is to establish an Australian Antarctic Institute.

CLOSING STATION

There has been no public criticism of the establishment last year of an advisory committee on Antarctic programmes. Its report to the Minister for Science at the end of the year suggested greater university participation in the Antarctic programme, the formation of a planning committee, consideration of the closing of one Antarctic station, and a review of the organisation of the Antarctic Division, and the salaries of its professional staff.

This report on Australia's Antarctic research programme has been summarised from Ministerial statements, Parliamentary reports, and newspaper reports and special articles. The opinions expressed are not those of the New Zealand Antarctic Society.

Since then the committee's report has been tabled in Parliament as a contribution to scientific discussion of Australia's Antarctic activities. In addition the Minister has tabled a discussion paper entitled "Towards New Perspectives for Australian Research in Antarctica." This Green Paper will be distributed in the community to encourage individuals and institutions to come forward with opinions on Australia's role in Antarctic research.

Last year's decision to transfer the Antarctic Division to Hobart did not attract much public attention. Only now have the implications of the move been discussed in detail. The Minister claims the move is a sound piece of decentralisation and administrative logic. Scientists say the decision was political, and that the expertise and facilities in Hobart are inadequate for the Australian Antarctic programme.

A site has been bought at Kingston, south of Hobart, and plans are in hand form a new multi-million dollar complex to house Australia's entire Antarctic operation by 1978. Mr Morrison says that decentralisation is one of the main reasons for the move; he hopes also to develop co-ordination between the

Antarctic Division and the glaciology department of the University of Tasmania. The possible loss of key scientists as a result of the move has left the Minister unmoved. He says that opposition to the move is a repetition of arguments against the establishment of Canberra.

One of the most outspoken critics of the changes proposed has been Dr Phillip Law, who was director of the Antarctic Division from 1949 until 1966, when he resigned to become head of the Victoria Institute of Colleges. He says that the division is suffering from a deep malaise, a sickness bred over a number of years from frustration, bureaucratic procedures, and lack of department sympathy and understanding.

During his 18 years as director Dr Law built up a team of highly experienced, understanding, and dedicated men. Officers of the division made visits to the Antarctic to acquire knowledge of its environment, and the needs of the men at the stations on the continent.

MORE DELAYS

When Dr Law resigned in 1966 the position of director of the Antarctic Division was not filled for nearly four years. He says that over this period most of the autonomy he had guarded for 18 years was whittled away. More and more matters had to be referred to Canberra for approval, the delays grew, and the frustrations increased.

After Dr Law's resignation the division was moved from the then Department of External Affairs to the Department of Supply. Later it was moved again to the Department of Education and Science, and when Labour came to power it was included in the new Department of Science. Parallel with the erosion of the division's independence, there has been a weakening of financial strength. Annual appropriations have remained virtually static, and inflation has taken a growing percentage of the budget.

POLITICAL MOVE

Dr Law says the decision to move to Hobart was made for political reasons against the advice of everybody who had Antarctic service or administrative experience. He says emphatically that the Antarctic Division cannot function efficiently from Hobart.

The report of the advisory committee on Antarctic programmes will be a very valuable guide for developing future scientific programmes, according to Dr Law. But he says it does not bear upon the question of matters of administration in the Antarctic Division in relation to central departmental control from Canberra.

Dr Law believes that the only really effective way to run an Antarctic research programme is to set up an Antarctic Institute responsible to the Minister for Science but not through his department. The director of such an institute should have the responsibility of running it, and be given a board of governors to control the overall operation.

Scott Base to politics

A former leader at Scott Base will be one of the three opponents the New Zealand Prime Minister (Mr W. E. Rowling) will face in the contest for his Tasman seat at the general election this year. Mr Adrian Hayter, leader in the 1964-65 season, has announced he will be an independent candidate.

Mr Hayter was a British Army officer for 15 years, and served in India, Burma, Malaya, and on the North-West Frontier. He resigned his commission in 1950 and sailed a 32ft yawl, Sheila II, single-handed from England to New Zealand. Between 1960 and 1962 he repeated the voyage by a different route.

After his service at Scott Base Mr Hayter wrote a record of his experiences, "The Year of the Quiet Sun."

Dogs and men rest on the approach to the crevassed margin of the Crary Ice Rise. Last December two New Zealand scientists, Dr P. J. Barrett and Mr R. D. Powell, of the Victoria University of Wellington expedition, discovered sea water beneath the Ross Ice Shelf in a rift on the Crary Ice Rise 770 kilometres from the South Pole. Here the ice is about 1500ft thick.

Hundreds seek jobs in Antarctic

Several hundred men—and 15 women, mostly scientists—want to work in the Antarctic next season with the New Zealand research programme. Many applications have been received from overseas by the Antarctic Division, Department of Scientific and Industrial Research, and some applicants are prepared to travel 12,000 miles at their own expense to be interviewed, and take a chance on being selected.

About 130 to 140 men and women will go south from New Zealand to work in the Antarctic next season. They will be selected from a record number of applicants. About 10 per cent of the applications are from overseas, including Britain, Canada, Australia, and the United States. There are also about a dozen from mountains in Switzerland or of Swiss descent.

There has been intense interest for some jobs, and one position has attracted 100 applicants. Many of the applicants want to work as field assistants.

Overseas applicants who travel to New Zealand for interviews need not be too pessimistic. Last year three men, including one from Britain and one from Canada, came to New Zealand in the hope of obtaining a job. The Canadian was successful; the Englishman was unlucky.

BRITISH SURVEY NEWS

Major discoveries made in glaciological programme

Discoveries of major geological interest, particularly on Alexander Island, were made during the British Antarctic Survey's glaciological programme last season. The continuation of Dr Charles Swithinbank's programme covered an area from the South Shetlands to the Ellsworth Mountains, and combined radio echo-sounding and ice core drilling.

This programme, which was carried out during the Survey's very successful field season, concentrated mainly on the southern part of the Antarctic Peninsula. Radio echo-sounding was carried out from one of the Survey's two Twin Otter aircraft, and ice core drilling was done at selected points over the whole area from the South Shetlands to the Ellsworth Mountains (62deg to 80deg S).

Thanks to an extraordinary run of good weather, flights were made on 32 days out of the 44-day season, averaging 6 to 7 hours a day, and the distance covered exceeded the combined total of the three previous echo-sounding seasons.

Coverage of new areas was made possible by the supply of extra fuel by the United States Antarctic Research Programme at Siple Station and the Instituto Antartico Argentino at Matienzo and Marambio Stations. An Argentine glaciologist accompanied the air party.

Soundings of all ice shelves and ice rises in Latitude 66deg/73degS were completed, together with plateau soundings in Latitudes 66deg/75degS.

Rock samples were collected for the first time from the only known nunatak in the key area between the base of the Antarctic Peninsula and the Ellsworth Mountains. These are now being analysed.

ICE DEPTH

Ice depth sounding at Siple Station for the Americans failed to find bottom, but the sub-ice coastline of the south-western Filchner Ice Shelf was located and found to be more than 100 km. from the position indicated on the latest maps.

The aircraft were flown back to Canada at the beginning of March and one is now in Greenland for five weeks, assisting in an ice cap survey for the United States National Science Foundation.

Geologists and geomorphologists also had a very good season. Those at South Georgia remained in the field until the Royal Research Ship Bransfield's last visit at the end of April. The geomorphologists, who were from Aberdeen University, were continuing work started some years ago by their leader, Dr Chalmers Clapperton, formerly of the Survey. Geologists and geophysicists were also active on a number of the South Shetland Islands, as part of a long-term investigation of the Scotia Arc.

GRAVITY WAVES

In the Antarctic Peninsula area H.F. Doppler techniques for monitoring gravity waves at ionospheric levels were successfully tested, in preparation for the international magetosphere study scheduled for 1977-78. This involved equipment at the Adelaide Island and Argentine Islands bases, at Palmer Station and on board the Bransfield. The experiment will be extended to the Argentine Almirante Brown Station next season.

ECHO-SOUNDING

A fourth season of airborne radio echo-sounding in Antarctica was conducted by the Scott Polar Research Institute in logistic collaboration with the United States National Science Foundation's Office of Polar Programmes and this year, for the first time, with the Technical University of Denmark. New 60 MHz and 300 MHz radio echo systems, built by the T.U.D. were operated alongside the S.P.R.I. 60 MHz system, modified this season to record maximum echo strengths from ice-water and ice-rock interfaces.

Fifty missions were flown, in a specially configured United States Navy Hercules, representing 332 flying hours and equivalent to about 135,000 km. of profiling. Principal areas of investigation included Marie Byrd Land, George V Coast and Adelie Land, Dome C of the central East Antarctic ice-sheet, the Polar Plateau near the South Pole, and adjacent sectors of the Transantarctic Mountains, and the Ross Ice Shelf.

SHIP MOVEMENTS

The Royal Research Ship John Biscoe completed the relief of Adelaide Island and picked up the summer field parties from the area in early March. She then returned to the United Kingdom by way of the Falkland Islands and Montevideo, and arrived at Southampton on April 18.

Meanwhile, after relieving Halley Bay, the R.R.S. Bransfield returned to the South Orkney Islands. Both the outward and return journeys were comparatively ice-free and it was possible to run parallel magnetometer traverses across the Weddell Sea.

The Bransfield then made a mid-season visit to Mar del Plata where the director and senior staff of the Instituto Antarctico Argentino were welcomed on board. She then visited field parties in the South Shetland Islands.

On her way down the west coast of the Antarctic Peninsula the Bransfield called at Palmer and Almirante Brown Stations before making a final visit to Adelaide Island. The Stonington Island base which had been closed on February 23, was inspected and found to be in good order, ready for use by future summer parties.

MAN INJURED

Returning north in early April, the Bransfield picked up the South Shetlands field parties and returned to the Falklands. News was then received that a member of the Argentine Islands base had been injured while ski-ing.

The Bransfield had to return south to pick the man up before making a final call at Signy Island and South Georgia at the end of the month. She reached Southampton at the end of last month.

In the Marguerite Bay area, the completion of the field work, the closure of Stonington Island base, and the change to summer-only field programmes, has accelerated the change-over from dog ieams to vehicles. It had become impossible to maintain the large dog population and, to everyone's sorrow, 100 animals had to be destroyed.

A small stock were, however, sent to Adelaide Island. A few will be shipped to the United Kingdom for breeding.

GRYTVIKEN STATION

Dangerous explosives at the old Grytviken whaling station in South Georgia were successfully dealt with by naval experts during last summer. They had been a source of anxiety for some time as they had become very unstable, and were uncomfortably near the British base on King Edward Point.

At Signy Island, two biologists diving reported a close encounter with a leopard seal and a bottle-nosed whale. They did not wait to find out who was chasing whom, especially as another biologist had just been badly bitten by an elephant seal on land.

NEW BUILDING

Work on the new B.A.S. building at Cambridge is progessing. One of the three wings is now structurally complete, and a second is well-advanced. The third wing and store/garage are also taking shape. The complex should be ready for occupation in about a year's time.

SOUTH AFRICA

Summer research work by parties from Grunehogna

Heavy vehicles designed for the use of the 16th South African National Antarctic Expedtion (SANAE 16) this season had to be brought back to Cape Town by the relief ship RSA at the end of February. When the RSA arrived off Sanae Base with the 21 men of the expedition, led by Mr E. P. Morkel, the wall of the Fimbul Ice Shelf was found to be too high for the vehicles to be offloaded. The rest of the cargo was brought ashore, the take-over ran smoothly, and the SANAE 15 team returned to Cape Town on March 1.

The field programme for 1975 will consist only of geological work in the Kirwanveggen, which is some 200km south of Grunehogna, the geological base in the Ahlmann Ridge mountain range. All the geophysical and radio echo-sounding equipment was returned to South Africa at the beginning of the year for overhaul and calibration. No geophysical or glaciological field work will then be done.

Last year a field team of six men wintered at Grunehogna (72deg 02min S/02deg 48min W) which is about 215km inland from Sanae Base. This team managed to complete its year's work successfully only through consistent perseverance. The team consisted of two geologists, a surveyor, an electronics technician who operated the radio echo-sounder, and two mechanics.

After careful preparation the team left Sanae Base in the middle of February and arrived safely at Grunehogna early in March. In the next six weeks the men prepared for the coming winter, and did geological work such as collecting palaeomagnetic samples in the mountains around the base. A start was also made on the surveying of glaciological ice-flow markers and strain networks.

When the winter ended the geological party—two geologists and one mechanic—left the base in the middle of August. The party arrived at its working area at Neumayerskarvet in the Kirwanveggen a month later and started work immediately.

Geologically the area consists of predominantly high-grade metamorphics—gneisses, schists, and migmatites showing multiple-phase folding. The area was mapped in some detail, and about a ton of samples for petrological, geochronological, geochemical, and palaeomagnetic purposes was collected.

Because of problems with the radio echo sounding equipment, the geophysical-glaciological party did not get away from Grunehogna before early October. This party—surveyor, electronics technician, and mechanic—made a 500km traverse through the Ahlmann Ridge area.

Continuous radio echo-sounding was done; gravity and the earth's magnetic field were measured at 3km intervals; and glaciological observations, such as description of snow stratigraphy, were made. A stake line for ice-flow measurements was also established and surveyed across the mouth of the Viddalen, one of the large tributary glaciers of the Jutulstraumen, the major ice stream in the area.

DEPOTS RESTOCKED

Both field parties returned to Grunehogna in December and left for Sanae shortly afterwards.

Snow accumulation measurement was continued at Sanae throughout the year,

and a three-component, short period seismography station was operated. In November a well-planned operation for the replenishment of emergency depots was executed.

The route to Grunehogna essentially goes across a treacherous crevasse area which was crossed numerous times without detrimental results. At the same time a depot between Grunehogna and Borga Base (72deg 50min S/03deg 48min W), which is 350km south of Sanae, was stocked with fresh supplies in case of any emergencies which might threaten the returning geological team.

UPPER AIR PHYSICS

The Antarctic geomagnetic and aurora programme of the department of physics, Potchefstroom University, is responsible for recording the geomagnetic field at Sanae and Marion Island. In addition photographic and photometric recording of aurora is carried out at Sanae.

An automatic compensating magnetometer at Sanae records the magnetic field in analogue form on a chart recorder and in digital form at one-minute intervals on punched paper tape. At Sanae and Marion Island normal run La Cour variometer systems are operated; at Sanae this serves as a standby for the automatic system. At both stations quartz horizontal magnetometers (QHM), zero balance magnetometers (BMZ), and a declinometer (Sanae only), are used for baseline control.

At present a SCAR pattern all-sky camera is used for auroral photography. However, in 1976, this will be replaced by a system consisting essentially of a Nikon 35mm camera fitted with fish-eye lens and motor drive.

For the last two years a photometer for recording the total intensity and pulsations of the 4278 Å N_2+ line has been in operation. Recordings are made at three fixed elevations in the magnetic meridian. As from this year photometric work will be supplemented by an HB tilting filter meridian scanning photometer for the study of proton aurora.

COSMIC RAYS

Early in 1974 the moderated neutron detector at Sanae was enlarged from one to four BP28 neutron counters of the Chalk River design. The consequent fourfold increase in counting rate reduced the statistical fluctuations considerably. The data from the single counter which operated since 1971 at Sanae showed that the moderated neutron detector is more sensitive to primary cosmic ray particles of lower energy than the neutron monitor.

The change in rigidity dependence during short-term or long-term variations of primary cosmic rays entering the atmosphere above Sanae is followed in time by comparing the intensity variations recorded by the moderated neutron detector and the neutron monitor. This is of particular interest for rigidities above the atmospheric cut off (about 1 GV for protons).

Two new riometers were put into operation in August, 1974, at Sanae. They replaced the old type of 30 MHz riometer and feature fast response times of less than one second and very low power consumption. Their purpose is to observe aurora pulsations, and they could possibly be used in a field station in the future.

BALLOON LAUNCHINGS

Several of the light-weight geiger counter balloon instruments were launched during the last months of 1974. Half were launched during quiet magnetic activity while others were launched during active periods, detecting X-rays from precipitating electrons.

A new ultra light-weight instrument using latest technology and operating at 439 MHz transmitting frequency was developed in 1974. This instrument will be launched with smaller balloons. It is expected to produce better resuts in 1975 because the balloons can also be launched in strong winds.

A noteworthy change in the ionospheric programme (conducted by Rhodes University, of Grahamstown) is that the Cossor model 7262 C pulse ionosonde was replaced by a Barry research VOS 1 vertical/oblique chirp-sounder.

Changes in map of Antarctica

A new map of Antarctica, which appears in this issue, has been prepared to show the changes that have taken place since the map it replaces was first printed six years ago. The 1969 map showed the boundaries of territorial claims by several nations, the new map, in keeping with the terms of the Antarctic Treaty, gives no recognition to any claims.

Antarctica was shown on the old map in relation to Australia and New Zealand. The removal of these two countries has enabled the cartographer to show in greater detail the bases in the area of the Antarctic Peninsula, and to identify them more clearly by name and nation.

In the last six years some bases have been closed, and several new ones have been established. The United States now has only two inland bases, and the Soviet Union has added two more coastal bases. Two nations, Norway and Belgium, which were among the 12 signatories to the Antarctic Treaty, no longer have bases in Antarctica.

Some readers of "Antarctica" may wonder why the Antarctica Continent has now been turned upside down. Here it seems only natural to look south from New Zealand.

Polar Programme Director

A veteran Antarctic scientist who began his work there by man-hauling a sledge around the shores of McMurdo Sound in 1959 has been appointed head of the United States National Science Foundation's Office of Polar Programmes. Dr Robert Rutford, a 42-year-old geologist at the University of Nebraska, was, until his appointment, director of the Ross Ice Shelf Project, the international research project designed to find out more about the shelf.

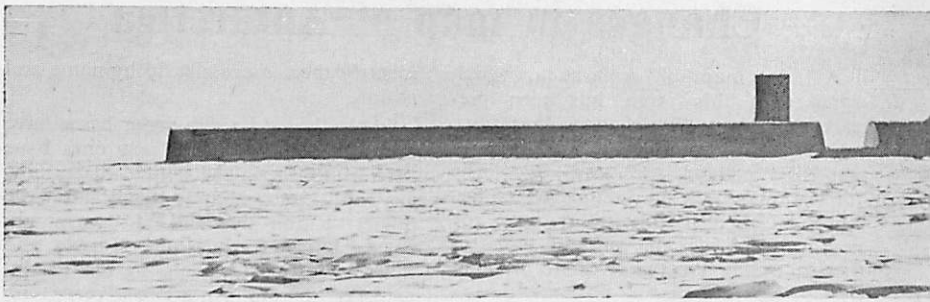
Dr Rutford gained his doctorate at the University of Minnesota, where he also served as a research assistant and research fellow. He was leader of the university's reearch team to the Antarctic in 1963, after having taken part in two previous Antarctic expeditions. He became an assistant professor of geology at the University of South Dakota in 1967, and associate professor in 1970. From 1969 until he went to the University of Nebraska in 1972, he was chairman of the department of geology, and later the department of geology and physics.

New Ice Wharf Needed

Antarctica's man-made iceberg, which has served successfully as an improved wharf in Winter Quarters Bay for United State supply ships and an oil tanker, has broken up and drifted into McMurdo Sound. Now members of the winter party at McMurdo Station are seeking official permission to build a new ice-shelf in readiness for the arrival of the ships next season.

Last month the ice wharf broke into three large chunks, 10ft to 16ft apart, but held together by wire ropes. The wharf was roped together last summer when cracks first appeared in the structure, which is 600ft long, 150ft wide, and 25ft thick.

Chief Petty Officer J. Wallace, who supervised the construction of the first wharf, believes that with a crew of six there is no reason why another artificial iceberg cannot be built. All the materials necessary for construction — miles of plastic "sausages", and six small petrol-driven pumps, are already at McMurdo Station.



Strung out along the desolate and flat polar landscape, the buildings of the new Antarctic city. This miniature city, which took four years to build, has a winter

DAMAGED AIRCRAFT WILL BE SALVAGED IN WILKES LAND

Plans to salvage two Hercules ski-equipped aircraft damaged in take-off accidents on January 15 near Dome C, an ice dome in Wilkes Land, are being made by the United States Navy's Antarctic support force. In the coming season it is intended to repair the two aircraft — worth about $17 million — at Dome C and fly them back to New Zealand or the United States for a complete overhaul.

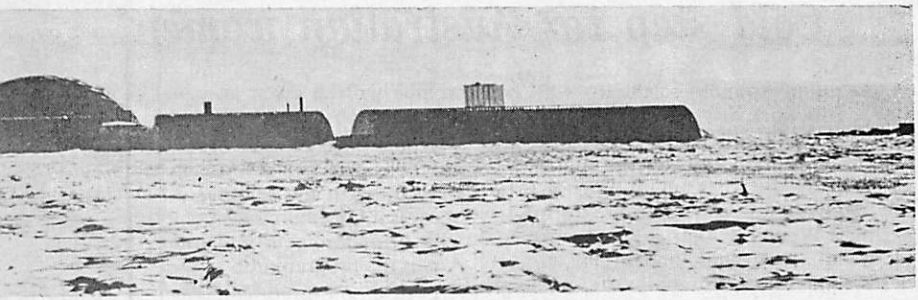
A salvage camp and a skiway will have to be built at Dome C for the salvage operation. Men, supplies, and equipment, will probably be flown to the area from McMurdo Station, 683 miles away. Because of the nature of the terrain it had been suggested earlier that a French party might make a traverse from Dumont d'Urville to Dome C to prepare the skiway so that aircraft from McMurdo Station could operate more safely.

The two aircraft were damaged in an air support operation for French glaciological research in East Antarctica last season ("Antarctic," March, 1975). Late last year a camp was established at Dome C, and French, American, and Russian scientists were flown there on December 6 to collect shallow snow samples. The Hercules sent to pick up the field party was damaged during take-off, and another, which picked up the passengers and crew, was also damaged when its nose ski collapsed.

Present plans are for the salvage camp and skiway to be built by public works staff of the National Science Foundation. The Lockheed company, which makes the Hercules at Marietta, Georgia, will be assisted by the National Science Foundation, the Navy's VXE-6 Squadron, and the Naval Air Systems Command, to make the necessary repairs to the damaged aircraft.

A United States Navy helicopter pilot will return to the Antarctic next season after an absence of 20 years. Commander Gerald L. Glade, who has been assigned as executive officer and deputy commander, United States naval support force, was in charge of a helicopter squadron detachment in Antarctica between 1955 and 1957.

Commander Glade replaces Commander Robert C. Balchunas, who has been transferred to duty as executive officer of the Naval Aviation Engineering Command, Lakehurst, New Jersey. He is a graduate of the University of Utah, where he was a nationally ranked tennis player, and has a degree in international relations from the United States Naval Post-graduate School.



Amundsen-Scott South Pole Station rise above the ice like the beginnings of an population of 17 men.

U.S. Navy Photo

ICEBREAKER POLAR STAR MAY WORK IN ANTARCTIC WATERS

The United States Coast Guard's newest icebreaker Polar Star is likely to be working in Antarctic waters during the research season next summer. First of the new Polar class icebreakers, the Polar Star is expected to be ready for delivery to the Coast Guard by the end of August. Her sister ship, Polar Sea, is also under construction at the Lockheed Shipbuilding and Construction Company's yards in Seattle, Washington.

After builders' trials next month, the 12,000-ton Polar Star will make her first shakedown cruise about October in the waters off the coast of the State of Washington. Her first test in the ice will be in the Rand Straits area of the Bering Sea. After a survey in Seattle her first operational mission is planned for the west Arctic.

In fast ice a Wind class icebreaker like those used in Antarctic operations can break through using the "back and ram" method. The Polar Star, however, has been designed to crack the ice while moving forward at three knots. She has ample power for the task. Her diesel-electric engines can produce up to 18,000 shaft horsepower for cruising and light icebreaking, and her gas turbine engines can produce 60,000 shaft horsepower.

The Polar Star's bow design will enable her to ride up on the ice and break down through it, making the best use of gravity. Her construction is rugged. She has an ice belt of special low temperature steel 1¾ inches thick at her bow and stern 1¼ inches thick amidships. Her three propellers are designed to mill ice like the blades of a food blender.

Included in the Polar Star's modern equipment are four computers—one to monitor engineering machinery, one for processing oceanographic data, and two for navigational and tracking purposes. These will make it possible to cut down on the number of men needed to run the 399ft vessel.

A conning station more than 100ft above the water-line will extend the vision of officers seeking the best route through concentrated icefields. To help offset the notorious icebraker roll in the open sea the ship has a passive roll stabilising system.

Cold step for Australian women

Australian women scientists will be allowed to work at one Antarctic base as soon as facilities have been constructed for them. But the change in policy announced by the Minister of Science (Mr Morrison) as a contribution to International Women's Year, restricts women to Macquarie Island, one of the minor bases, and for four months in summer. The mainland bases of Davis, Mawson, and Casey, will still be all-male preserves.

Not all of the 20 men at Macquarie Island are scientists. Doctors, weather observers, drivers, mechanics, and cooks are all employed at the base. In future women will be given an equal chance to do these jobs.

Women scientists have worked at Macquarie Island before—two biologists were there in the summer a few seasons ago. But the announcement this month will bring women into the Australian Antarctic programme.

Last season three New Zealand women worked at Cape Bird, on Ross Island, and a woman librarian worked at Scott Base. The United States had eight women scientists and assistants working directly with scientific projects, the Navy had three women officers, and four women were employed at McMurdo Station by civilian contractors.

Ashes scattered at North Pole

In 1959 the ashes of Sir Hubert Wilkins, one of the pioneers in Arctic and Antarctic exploration and photography, were scattered at the North Pole from the United States submarine Skate. This was an appropriate tribute to a great adventurer who made the first submarine trip under the Arctic ice in 1931.

Now the ashes of his widow, Lady Suzanne Wilkins, have been scattered at the North Pole. This was done recently by the commanding officer of the American nuclear attack submarine Bluefish, which was the first United States Antarctic Fleet submarine to surface at the Pole since 1970.

Sir Hubert Wilkins, who died in 1958, had his first polar experience with Stefansson's expedition to the Canadian Arctic in 1913. Most of his polar experience, however, was gained in the Antarctic. He went south for the first time as second-in-command of the abortive and rather grandly named British Imperial Expedition of 1920-22 led by J. L. Cope, who had been a member of the Ross Sea party in Shackleton's 1914-16 expedition.

When Wilkins abandoned this expedition and returned to England, he was appointed naturalist in the Shackleton-Rowett Quest expedition of 1921-22. Then in 1928 he led an expedition to Graham Land, and made the first extended flight in the Antarctic—600 miles south from Deception Island—on December 20. An experimental flight on November 16 was actually the first ever made in Antarctica.

After his exploration of the waters between the North Pole and the Canadian Arctic in the submarine Nautilus, Wilkins returned to the Antarctic. Between 1933 and 1939 he accompanied Lincoln Ellsworth on four expeditions. His last visit to the Antarctic was in 1957 as an adviser to the United States Army on Arctic and Antarctic clothing and survival problems.

Anton left his overcoat behind at Cape Evans

When Anton Omelchenko went home after his first winter in the Antarctic he left his overcoat behind in Scott's hut at Cape Evans. It remained there a long time — 63 years, to be exact. In December last year the Russian groom's coat, marked with the name Anton, was found by two caretakers from the New Zealand Antarctic Society who spent several weeks at Cape Royds and Cape Evans.

Archaelogy has become one of the duties of the caretakers who have been going south each summer to care for the three historic huts on Ross Island, which are maintained by the Antarctic Division, Department of Scientific and Industrial Research. Each summer since 1969 the caretakers have searched patiently and carefully in the ice-encoated debris of the huts for material to fill gaps in the story of how men lived and worked in the Antarctic before the days of radio, television, films, and electric lights.

In the 1973-74 summer the caretakers, Messrs L. E. Kerr and G. E. Madgwick, reported that a wealth of undiscovered expedition relics might still be found in the stable areas of the huts, both at Cape Royds and Cape Evans. Last season's caretakers, Messrs K. Smith, of the Canterbury branch of the Antarctic Society, and G. D. Sylvester, of the Wellington branch, confirmed this belief. They uncovered many more relics — aided by the mild season — inside and outside the huts, and particularly in the stable areas.

SPARE WHEEL

More discoveries were made outside the huts last season because there was scarcely any snow or ice at the time of the caretakers' visit. Pony Lake, at Cape Royds, was almost completely free of ice, and yielded all kinds of items from a spare wooden wheel belonging to Shackleton's Arrol-Johnston motor-car — the first in Antarctica — to the remains of one of the barrels of New Zealand beer included in the expedition's supplies.

Identification of some of these relics was not always easy after they had been buried in the ice for so long. Anton Omelchenko's overcoat was easily identified — the name Anton was on the collar But who owned the rust-stained shirt, made, according to the label, by "A. W. Gamage Ltd, 128 Holburn, makers of Viaduct shirts?"

Anton Lukich Omelchenko, owner of the 65-year-old coat, is mentioned several times by Scott in his story of the last expedition. His devoted care of the ponies under the direction of Oates is praised; little is said about the man himself.

NOTED JOCKEY

Scott refers to Anton and his fellow countryman, Demitri Gerof, who was the dog driver, as boys. But Anton was 27 and Demitri 22 when they went south. Anton is described as a groom or stableman — he was actually a noted jockey in Russia and Europe before he met Scott's brother-in-law, Wilfred Bruce, in Vladivostok in 1909, and helped him to buy the expedition's Manchurian ponies.

Various reasons have been given for Anton's return home after his first winter. Cherry-Garrard says his work with the ponies was done. In his Terra Nova diary, however, Wilson says that the Russian had not been happy as he was terribly superstitious and the winter darkness got on his nerves. He wanted to return, and Scott felt it was best.

Anton fought in the First World War, and then joined the Red Army. He later helped to set up a collective farm in his birthplace, Bat'ki, and was killed by a lightning stroke in 1932.

RICH SOURCE

Pony Lake was the richest source of relics at Cape Royds, but none were of a personal nature. Snow boots and socks were retrieved from the permafrost in the stable area of Shackleton's hut. Two wooden sledge runners with steel attachments were dragged from the the lake, and are believed to belong to the rear of Shackleton's motor tractor. Also found in the lake were a wooden wheel and a collection of wooden blocks belonging to the Arrol-Johnston motor-car.

Several more green wine bottles were recovered from both Pony Lake and the stable area. They were added to the collection in the pantry area of the hut New Zealand beer in the Nimrod's cargo proved to have been brewed in Dunedin. Iron hoops and barrel staves were recovered from Pony Lake and nearby mud; one stave still has a steel bung marked: "J. Speight and Co., Dunedin."

Other items found in the lake or the mud included a steel spike and dog chain; a bamboo-handled shovel, four steel sledge runners, enamel cooking dishes, soda syphon bulbs, and a stone jar in three pieces. These matched the top piece already in the hut.

SHUTTER FOUND

All the windows of Shackleton's hut can now be closed. A missing shutter—the original—was found in the Pony Lake area and placed in position by Messrs Smith and Sylvester. They spent much time in the stable area, and they were able to excavate down to a wooden beam which appeared to be at floor level. In the process they freed several boxes of snow boots from the permafrost, and also discovered pony harness and several socks.

One of the most interesting discoveries was a portion of ship's sail measuring 21ft 6in by 13ft 4in wide a length of 2in manilla rope and an unidentified wooden strut. This was retrieved near the Arrival Bay entrance to the penguin rookery below Flagstaff Point, and may have come from the Nimrod or the Aurora.

When Messrs Smith and Sylvester reached Cape Evans they concentrated on clearing ice and permafrost from the stables, and snow from the food annex on the south side of the hut. Their task was made easier because of the mild weather, and in the centre stable they were able to remove the ice to floor level.

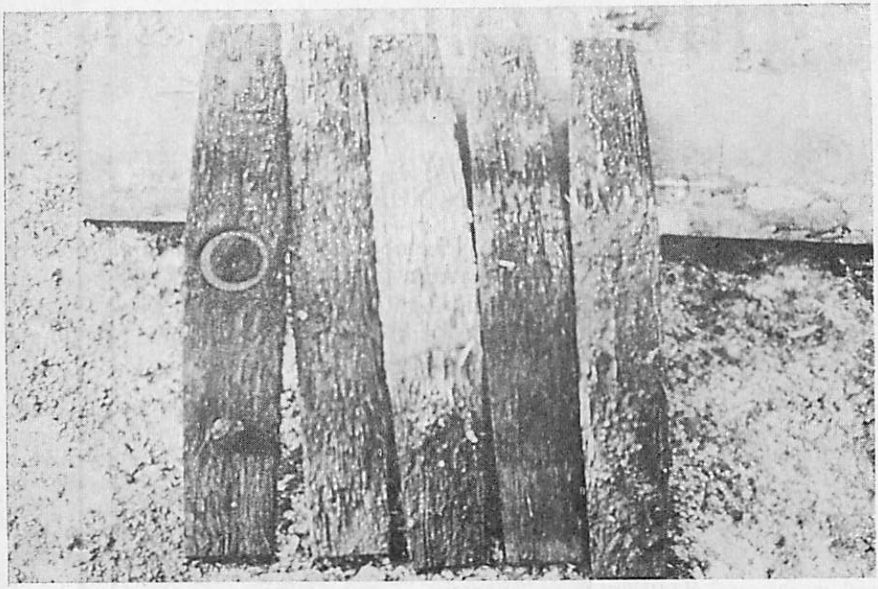
MULES' NAMES

During their excavations in the stable they found several items of harness, a pony snow shoe, and a feed box. Inside the box was part of a copy of "The Times" of August 25, 1911. Because of the amount of ice removed, three names stencilled on the back walls of the stables were revealed.

These names were Abdullah, Gulab and Begum, three of the seven mules given to the expedition by the Indian Government, and sent south for use in the second season. Oates had suggested that mules might be a better form of transport on the Barrier than ponies. The other four were Lal Khan, Ranee, Pyaree, and Khan Sahib.

After the winter of 1912 the mules carried loads from Cape Evans to Hut Point. Then they were used by the search party which found the bodies of Scott and his companions. Two of the seven had to be shot on the return journey because they refused all food, and were in very bad condition. They were used as food for the two dog teams. The remaining five were shot before the expedition returned to New Zealand.

Relics of Scott's motor transport, which was not as successful as expected were recovered from an area near the petrol dump and dog lines south-west of the hut. They were a collection of steel plates, bolts, and wooden cleats — apparently fittings from one of the motor sledges.



Beer barrel staves recovered from Pony Lake, Cape Royds, by historic hut caretakers from the New Zealand Antarctic Society last season. On the left-hand stave is a bung bearing the name of J. Speight, the Dunedin brewer who supplied New Zealand beer to Shackleton's 1908-1909 expedition.

Photo: G. D. Sylvester

RECIPE LIST

Many small items, some of them personal, were recovered both inside and outside the hut. Among them were boots, socks, and gloves, a leather tobacco pouch, a damaged Fry's Cocoa postcard (unused) with the postage rates given as one farthing inland and one penny foreign, and a tube of watercolour paint used by Wilson.

Tom Clissold, whose cooking and general handiness were highly praised by Scott, apparently did much of his work in the kitchen with Hugon's Atora brand beef suet. The evidence was found on a sheet of paper picked out of debris cleared from the south side of the hut. It contained recipes for puddings, rock buns, roly poly, sultana cake etc., to be made with that particular brand.

After their work at Cape Evans, Messrs Smith and Sylvester returned to Scott Base. Then they spent a short time at Hut Point. There they cleared snow and ice from the rear of the Discovery hut, and also chipped out ice and drifted snow from the ceiling of the main part.

PENGUIN COUNTS

Two penguin counts were made during the caretakers' stay. The first on December 12 showed 1206 nesting birds, and about 100 birds wandering around the rookery. Thirty birds were observed on the sea ice.

Because of high winds the second count on December 15 could not be taken accurately, but many more nests were occupied. About 100 chicks were sighted, and 1520 nests were counted. Birds were coming and going in increasing numbers from the front of the rookery and the Arrival Bay entrance. Apart from the 1570 nests counted there were many other birds in the rookery, and the total number was probably about 2000.

THEY CAME BACK TO LYTTELTON

BY
BADEN NORRIS

Since the Discovery arrived on November 29, 1901, the small port of Lyttelton has been a point of departure for most Antarctic expeditions to the Ross Sea area. And even today United States icebreakers and supply ships depart from Lyttelton for McMurdo Sound each season as they have done for the last 20 years.

Lyttelton has a small population of 3500 to 4000, and most of its work force is drawn from Christchurch on the other side of the Port Hills. But, surprisingly, it has been both cradle and refuge for a number of Antarcticans over the last 70 years.

Some were Lyttelton-born, others came from England, Scotland, Ireland, and Australia. Most of them were seamen, one was a scientist. Several came back from the Antarctic and chose Lyttelton as their home and place of work. Thus the port become one of the few places where men from all the expeditions of the Heroic Age could be seen working together.

MORNING'S CREW

Although no Lyttelton-born man went south in the Discovery, two were members of the crew of the relief ship Morning. Arthur Beaumont served as an able seaman. He joined the ship at Lyttelton for the second voyage on September 21, 1903, and took his discharge at Plymouth on October 18, 1904. He came back to live in Lyttelton in 1911, and served as a hulk master and waterside worker.

In 1916 Arthur answered the call of the sea again. Some years later he swallowed the anchor finally when he joined the Lyttelton Harbour Board as a crane driver. He died at Diamond Harbour across the water in February, 1957.

John B. Partridge was the other Lyttelton man who went south in the Morning as a seaman. He was discharged at Lyttelton on June 7, 1904. In 1907 he went south again in Shackleton's Nimrod. Then he joined the Lyttelton Harbour Board as a fireman on the dredge Te Whaka, and served aboard her until his retirement.

THREE VOYAGES

Charles Williams served as an able seaman on all three Antarctic voyages of the Terra Nova, and was the third Lyttelton-born seafarer to go south. After his return he served with distinction in the Royal Navy during the First World War. He died soon after his return to civilian life when the small coastal steamer Tainui was destroyed by fire off the North Canterbury coast in 1919.

Eric Norman Webb, who was born and educated in Lyttelton, was a 22-year-old Canterbury University College graduate when he was appointed chief magnetician to Sir Douglas Mawson's Australasian Antarctic Expedition in 1911. He was a member of the main base party on Cape Denison in Commonwealth Bay, Adelie Land, and made a detailed survey of terrestrial magnetic force to within 50 miles of the South Magnetic Pole, thus providing the first precise location of the pole.

In the First World War Eric Webb served in Egypt and France with the Australian Imperial Forces. He was

awarded the Distinguished Service Order and the Military Cross, and was mentioned in dispatches. Later he became a world authority on hydro-electric power development. He now lives in retirement in North Wales.

Thomas Meyrick is believed to be the fifth Lyttelton man to go south. He served aboard the Nimrod in 1908, but little is known of him.

NOT KNIGHTED

In the sledging diary he kept on the southern journey with Wilson and Shackleton in 1902-1903 Scott wrote on January 28, 1903: All the news seems to be good . . . Blissett has discovered an Emperor penguin's egg and his messmates expected him to be knighted." The news came in the mail picked up at one of the depots on the return to Hut Point.

Lance Corporal A. H. Blissett, Royal Marine Light Infantry, was not knighted, but he has a place in Antarctic history as the first man to find an Emperor penguin's egg. And Harry Blissett also has a place in Lyttelton's history — he was a waterside worker at the port for many years, although he lived at Heathcote on the other side of the Port Hills.

Blissett was a Lincolnshire man, and he was 23 when he volunteered to go to the Antarctic with the Discovery expedition. He went south as a steward but he and his fellow private, Gilbert Scott, did much more than act as stewards.

FIRST EGG

During his two years in the Antarctic Blissett made two sledging journeys to Cape Crozier. On the first, led by Lieutenant Charles Royds, he took a look at the spot where the Emperor penguins had reared their young. Then he called Royds's attention to a rounded object almost buried in the snow, which on being dug out, proved to be an egg — the first that had been found.

Because of Blissett's discovery Royds returned to Cape Crozier in the spring of 1903. Wilson was with him, and Blissett was one of four lower deck men in the party which went to the rookery to bring back more eggs.

The party found 17 eggs, but experienced very low temperatures — minus 60 to 62deg Fahrenheit. Blissett was the chief sufferer — one side of his face was very severely frostbitten.

Blissett spent 16 years in the Royal Marine Light Infantry. He served in the First World War, and was in the prison service before and after the war. Then he settled in New Zealand.

MANY STORIES

It is a great pity that the stories Harry Blissett could tell were never recorded. He was a hard man with a rough tongue at times, but once he had warmed to you he was a mine of information about his Antarctic experiences.

Once, when he was 76, Harry Blissett was interviewed on his birthday as one of the few remaining Discovery veterans. He recalled then how he and Frank Plumley, one of the Discovery's stokers, went looking for penguins' eggs.

Between them the pair ate 34 eggs. Harry Blissett's score was 15 — all raw — and the egg hunt earned him another dose of frostbite.

Harry Blissett believed that he was one of the few members of the expedition who did not suffer from scurvy. He attributed this to a good constitution, and the large amount of pickles he ate.

NIMROD MEN

After Shackleton's 1907-1909 expedition a father and stepson, Hugh McGowan and Felix Rooney, of the engine-room staff of the Nimrod, settled in Lyttelton. The family still treasure a letter from Lady Shackleton in which she expressed her delight at two members of one family serving in her husband's expedition.

Hugh McGowan worked as an engineer for the Lyttelton Harbour Board. Felix Rooney, born in Glasgow, was 21 when he went south in the Nimrod.

After the Nimrod returned to New Zealand Rooney served in coastal and trans-Tasman ships. He served with the 1st N.Z.E.F. in the First World War, and then joined the Union Steam Ship

Company's bunkering staff. After 25 years with the company he retired in 1946 to live in Lyttelton. Later he lived in Wellington, and died in 1965.

The tracing of these two men was complicated by the presence of another Rooney on the crew list of the Nimrod. But J. Rooney did not make a polar voyage. He joined the Nimrod in Lyttelton in 1909 for the voyage to England, and was discharged at Sydney on May 1 of that year.

MOST EXPERIENCED

Perhaps the best-remembered voyager, and to many the most experienced polar seaman was the Lyttelton resident, James Paton. He made the incredible number of nine trips to the ice.

"Scotty" Paton had two daughters but they saw little of their father. He must have had very little time at home beween two voyages in the Morning (1902-04), two in the Nimrod (1907-09), three in the Terra Nova (1910-13), and two in the Aurora (1914-17).

The career of this Antarctic seaman "extraordinary" ended in 1917 when the Aurora disappeared on a voyage to Chile.

James Paton kept a diary during the Morning's voyage from Hobart to the Antarctic in 1904. It was located in Canterbury recently, and efforts will be made to secure it for the Canterbury Museum's Antarctic Centre.

W. W. Knowles, an A.B. in the Terra Nova, also found Lyttelton to his liking, and he spent his later life there as a waterside worker. Some of his polar equipment is displayed in the Canterbury Merchant Navy Centre at the port.

Of all the polar seamen none earned more respect, and was so well known as Mortimer McCarthy, an Irishman, from Kinsale, County Cork. who came to New Zealand in 1906, and sailed from Lyttelton as an able seaman aboard the Terra Nova in November, 1910. When the Terra Nova was in the Bay of Whales "Jack" was the first to sight Amundsen's Fram from the rigging.

Mortimer McCarthy raised a family of three sons in Lyttelton, and was a waterside worker and seaman. He served in many New Zealand ships between 1920 and 1962, and was well known as a member of the crew of the inter-island steamer express ships Rangatira and Wahine in the 1930s and 1940s.

Flags were at half-mast in Lyttelton when Mortimer McCarthy died after an accident in his home there on August 4, 1967. He was 89, and his seafaring career ended only when he was 84. In 1963 he went back to the Antarctic with two Terra Nova shipmates, W. Burton and W. McDonald, as the guests of the United States Navy. He became the oldest man to visit the continent.

With his long, handlebar moustache and mop of silver hair, Mortimer McCarthy was an imposing figure aboard ships and in port. Many a young seaman, including the writer, has ample reason to remember his quiet, fatherly advice.

Tasmanian-born Tasman Young links the Ross Sea whaling era with Lyttelton. He served with C. A. Larsen's fleet in 1923-24, and came back to work on the waterfront as a hulk master and stevedore.

LOVE OF SEA

Lyttelton still retains its attraction for men who have crossed the Antarctic Circle. The modern whaling fleets of South Georgia Co. Ltd., and Christian Salvesen are a long way from the port. But in recent years they have provided four waterside workers on the Lyttelton scene. And one man from the United States Navy's Antarctic support force has remained in the port instead of returning to his home town.

These men, and those who preceded them in the days of Scott and Shackleton, have all perceived something in Lyttelton that they could not find elsewhere. The only common denominator, apart from polar experience, that can be found, is that they nearly all shared a great love of the sea. Working and living in Lyttelton went a long way towards satisfying that love.

SUB-ANTARCTIC

Gough Island now refuge for Kerguelen fur seal

Once hunted almost to extinction by Antarctic sealers in the nineteenth century, the Kerguelen fur seal (Arctocephalus tropicalis) has successfully re-established itself on Gough Island. The island is now probably the most popular refuge for the Kerguelen fur seal of all the islands in the proximity of the Antarctic Convergence. Gough Island also supports a small breeding colony of another protected species, the southern elephant seal (Mirounga loonina), which was also nearly exterminated last century.

Last season the South African meteorological team sent to Gough Island included for the first time a zoologist who was to conduct a research programme on the island's seals. Mr Marthan N. Bester, of the Mammal Research Institute of the University of Pretoria, was able to study population dynamics and animal behaviour patterns during the six months of the summer season. Because of the migration of the seals, he returned to South Africa by one of the crayfishing trawlers which operate in the Gough Island area.

A summary of Mr Bester's report, supplied by the Department of Transport, which administers the South African research programme, says that Gough Island (40deg 21min S/9deg 52min W) supports a lush vegetation and varied bird life within its 35 square miles, bounded by precipitous cliffs. It lies on the South Atlantic Ridge about 200 miles south of Tristan da Cunha.

SMALL COLONY

Mr Bester says that from the mammalogist's point of view Gough Island is important since it provides a sanctuary for the Kerguelen fur seals which congegate on its rocky beaches during the breeding season in summer. The island also supports a small breeding colony of the southern elephant seal.

Both species are now protected and recovering from near extermination to such an extent that Gough Island is now probably the most popular refuge for the Kerguelen fur seal of all the islands near the Antarctic Convergence.

The terrestrial phase of the Kerguelen fur seal's yearly cycle begins in October when an increase in the number of seals hauled out becomes evident. The maximum number present is attained by middle December. There is a distinct hauling out pattern with sub-adult animals predominating initially, but with adult males in the majority at the peak period.

COMPETING MALES

Amongst the adult males two groups can be distinguished. The idle males occupy the open, flat parts of the rocky beaches, and the definite territorial males stay close to the waterline on topographic units consisting of larger rocks. These afford sufficient cover against environmental factors, of which high ambient temperatures are an important one.

These territories are vigorously guarded against encroachment by competing males. Moreover, serious wounds are inflicted in the ensuing combats. It became evident, however, that most confrontations never result in actual fighting, but that threat displays and vocalisations play an important role in determining the victor and loser in a territorial dispute.

Into these established territories adult females are taken up on their arrival during the last week of November. A few days after these events pupping begins

and occurs throughout December as females haul out.

Females that have pupped are impregnated a few days later by their harem males which guard them jealously. It has been found, however, that although the harem male presides over all these events, he nevertheless spends on the average, at least 83 per cent of his time lying down with no apparent interest in the activity around him.

This feature of behaviour can be appreciated if one realises that the territorial male fasts throughout the breeding season, and any excess activity will draw upon his energy reserves. Furthermore, the dense fur, and ample subcutaneous fat deposits, which insulate him so well in the water, become a burden on land. They afford a thermoregulatory problem which can be partly solved by a behaviour response such as inactivity.

Middle January brings a reduction in seal numbers, and especially adult males, which leave on feeding trips. Female numbers also fluctuate, indicating that the females also leave their pups for longer periods while the latter congregate at the back of the beach.

After reaching a low at the end of this month the population increases once more when seals absent start to return for their moult throughout February. They finally leave the rookery for the duration of the winter months and take to the high seas although some may frequent the shores at this time.

The foregoing pattern was established during an investigation executed on the east coast of Gough Island. By far the majority of seals hauling out here are males, and subsequently the birth rate is very low. In contrast the south coast population has a more favourable sex ratio and birth rate.

The fact that the east coast lies in the lee of the island, and relative higher ambient temperatures prevail, may be a contributing factor to this greater success of the south coast as a breeding site. It lies exposed to the cooling effect of the south-west wind.

Further research will reveal more about the Kerguelen fur seal. It is clear that this once-persecuted marine mammal has successfully re-established itself at Gough Island.

Captain Henry was veteran of many Antarctic voyages

A veteran Antarctic shipmaster, Captain Clifford D. Henry, died at sea towards the end of February aboard the United States Navy supply ship, Private John R. Towle. Captain Henry, who was 56, was homeward bound for Port Hueneme, California, after his 14th season in Antarctic waters. He had a long experience of polar operations, having made at least 22 voyages into Arctic waters.

Captain Henry, of Lakewood, New Jersey, who took command of the Private John R. Towle two years ago, knew the waters between the New Zealand port of Lyttelton and McMurdo Sound like the back of his hand. And he was well known to Lyttelton shipping officials and waterfront workers first as master of the Wyandot in the earlier years of United States Antarctic operations, and then in command of the Private John R. Towle, a veteran supply ship — built in 1944 — which carried cargo to the Antarctic way back in 1957.

In 1957 Captain Henry made his first voyage to the Antarctic as master of the cargo ship Mizar. When he left New Zealand at the end of each season he sailed north to the Arctic, and Greenland.

Need to protect all aspects of Antarctic environment

Protection of all aspects of the Antarctic environment will now be one of the major interests of the New Zealand Antarctic Society. Its policy was defined in a resolution adopted at the annual meeting in Christchurch on March 22.

Delegates agreed on the need to direct public attention to the dangers of commercial exploitation of Antarctica, and the dumping of nuclear waste on the continent's ice-cap. The meeting decided to publicise these questions when necessary, and to continue to bring them to the Government's attention.

Maintenance and preservation of the historic huts on Ross Island have concerned the society since 1969 when it began sending caretakers south to assist the Antarctic Division, Department of Scientific and Industrial Research, in the work. The care of three huts, and seven other historic monuments in the Ross Dependency is the responsibility of New Zealand under the Antarctic Treaty.

Two members of the society represent it on a special sub-committee of the Ross Dependency Research Committee, which was established to consider the future policy on the three Ross Island huts, and Borchgrevink's hut at Cape Adare. The society's representatives are Mr R. M. Heke, of the Wellington branch, and Mr H. Burson, of the Canterbury branch.

REPORT ON HUTS

Last year the society asked Mr Heke to prepare a report and make recommendations for the continued maintenance and preservation of the Ross Island huts, and the safeguarding of their contents. His report, prepared after meetings with previous caretakers, was presented at the annual meeting.

Mr Heke said that the presence of caretakers in the huts should continue as long as possible because only by attention to maintenance would the huts and the surrounding environment be preserved. The meeting adopted his recommendation that a caretakers' committee should be formed to decide on a policy and list of duties to be done at the huts each year. The recommendation will be forwarded to the Antarctic Division.

With the establishment of an Antarctic centre in the Canterbury Museum's new wing there could be a demand for historic material in the huts to be brought back to New Zealand, according to Mr Heke. He said that most of the caretakers who had been in the huts believed that the contents should remain in the Antarctic, but it was agreed that only material which could add to museum displays and their authenticity should be removed.

MANAGEMENT PLAN

Who should give approval to such requests? asked Mr Heke. If some measure of control was to be exercised, the superintendent of the Antarctic Division should have the authority or alternatively the Ross Dependency Research Committee's special sub-committee. This sub-committee represented several interested organisations.

A managemnt plan will be prepared for the care of the historic huts. This was one of the decisions of the special sub-committee, Mr Heke told the meeting. The plan will cover such subjects as an appreciation of historic and natural values of the huts, and notes on what is to be preserved, the relationship of wildlife to the sites, an inventory of articles in the huts, including those at locations outside Antarctica, and aerial photographs and large-scale plans of each area.

In his report the president (Mr J. A. Cross) referred to the approach made to the Canterbury Museum Trust Board for representation of the society on the boad. This was done because a national Antarctic centre would be the heart of the museum's new wing, and the society could assist the board with its knowledge of Antarctic matters.

Mr Cross said the objects of the society and the ways in which it might assist the board had been outlined to members. But representation of the society would involve a revision of the Canterbury Museum Trust Board Act. However, the board had now set up a special committee to deal with the Antarctic centre. This would comprise board members and representatives of the Antarctic Division, D.S.I.R., the United States National Science Foundation, and the society. It was felt that this type of committee would enable the society to help the board with advice on Antarctic matters.

Mr V. E. Donnelly, of Wellington, was appointed president, and Mr J. A. Cross, of Christchurch, vice-president. Other officers of the society are: Secretary, Miss J. Kerr; treasurer, Mr H. Burson; editor of "Antarctic," Mr J. M. Caffin; bulletin secretary, Mrs L. E. Kerr; representative on Museum Trust Board committee, Mr J. M. Caffin; honorary solicitor, Mr R. G. McElrea; honorary auditor, Miss I. O. Orchard.

The Prime Minister (Mr W. E. Rowling) and Dr R. G. Simmers have accepted office as patrons of the society.

BRANCH REPORT

A book which will record the names of all New Zealanders who have wintered in the Antarctic since 1957 will be produced by the Canterbury branch this year. The book will be presented to the Canterbury Museum, and kept in the Antarctic centre of the new wing.

The idea of a permanent record of the winter teams in the Antarctic came from Mr J. A. Newman, leader at Scott Base this winter. The book will contain the names of men who have wintered at Scott Base, Vanda Station, and the United States-New Zealand base at Cape Hallett, which was closed in the 1972-73 summer. Names of winter parties will be added each year.

In his report to the annual meeting of the branch the chairman (Mr S. W. Smith) reported to the provision of amenities and Christmas cheer for New Zealanders in the Antarctic. These included a donation of $50 from the Canterbury and Wellington branches for the purchase of new books for the Scott Base library, and the sending of 140 dozen biscuits and five fruit cakes to Scott Base and field parties.

Membership of the branch is now nearly 300. Last year's programme included addresses about work at Vanda Station, the activities of hut caretakers at Cape Royds and Cape Evans, and the logistics of United States Antarctic operations. Officers of the branch are: Chairman, Mr J. M. Caffin; vice-chairmen, Messrs R. G. McElrea and H. Burson; honorary secretary, Mrs E. F. Cross; honorary treasurer, Mr J. A. Coss; immediate past chairman, Mr S. W. M. Smith; committee, Messrs A. Burton, B. Duffell, J. Fenwick, L. Kerr, K. Lefever, B. N. Norris, K. Smith, D. Spence, Mesdames E. Smith, J. Kerr, and B. Hale.

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The New Zealand Antarctic Society (Inc.)

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

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

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

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

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