

ANTARCTIC

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EMPEROR PENGUINS AND CHICKS
AT CAPE CROZIER.

Photo: Guy Mannering.

"ANTARCTIC"

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SPRING FINDS NEW ZEALAND TEAM EAGER FOR THE FIELD

At Scott Base a number of the men who have been wintering over have taken an early opportunity of getting out on preliminary field journeys in the more-than-crisp early spring temperature.

On Friday, August 12, Bartlett, Greeks, Junge and Randall took two dog-teams out to Station 81, a small insulated hut placed there by American scientists three or four years ago, and used extensively by Arnold Heine in more recent years. The station is on the Ice Shelf about 14 miles south of Scott Base and seven miles north of Black Island, not far from "Outer Williams" airstrip. The outward run took them three hours and the home-run on the 15th somewhat less.

Prebble and Porter (Leader and Chief Scientific Officer respectively) went out the same day by snotrac to Station 213 in order to note the temperatures recorded by the geophysicists' thermo-couples left there by the ice-drilling team last summer. The two men went on to Station 81 and after a short time with the other four returned to Scott Base the same day.

On the 21st Bartlett, Davidson, Greeks and Vickers took the dog-teams out to 81 again. Davidson and Vickers stopped there while the other two men sledged across to White Island and camped there. Next day they climbed Mount Nipha (2,500 ft. approx.) and returned to 81 the same day. All four men were back at Scott Base the following day, August 23.

NEW SKI-RUN

The old skiing slope west of Scott Base is now regarded as dangerous because of the ice-shelf at the end of the run, resulting from the big break-out of ice last summer. So a new area has been selected, giving a run down from the Castle Rock area to the Ice Shelf east of Scott Base. Some skiing here has already been tried, but the low temperatures, in

the vicinity of -40° F., have made the snow "holding" and the skiing correspondingly slow.

RARE CLOUDS

Rare 50-mile high luminous night clouds were observed and photographed from Scott Base on the afternoon of July 23.

The noctilucent clouds, the highest that occur in the earth's atmosphere, are thought to be composed of ice-covered particles of meteoritic dust from space. They are illuminated by the sun, and are best observed at high latitudes when the sun is between six and 16 degrees below the horizon.

The clouds are 40 miles above the zone of the earth's weather, and appear as beautiful pearly-white veils, bands or waves, in the zone between the twilight arch and the horizon.

Until 1964 there had been only three reported sightings of the clouds in the southern hemisphere.

The Scott Base clouds were first seen by meteorological observer R. Vickers. He alerted Scott Base senior scientist Dr. A. Porter, who photographed them. They appeared as three parallel bands to the northwest.

SCOUT TEAM

From some 30 applicants, the following Queen's Scouts have been selected to work with the New Zealand team at Scott Base this summer:

David S. Goulden (Southbridge), 17,

Dennis J. Hunt (Lower Hutt), 16,

Anthony G. Mort (Hastings), 17,

with Royce P. McGlashen (Richmond) as an emergency.

TO WINTER OVER AT SCOTT BASE

COLIN M. CLARK, Leader (see last issue).

GORDON B. DAWSON (36), Taupo. Senior Technical Officer. A married man with two children, Mr. Dawson is employed by Geophysics Division, D.S.I.R., principally on geothermal research and vulcanology. He was born in New York, but came to New Zealand as a boy and attended Wellington College, 1944-6. He then returned to the United States and had further schooling there. Back in New Zealand he was at Victoria University of Wellington 1951-3 and continued his professional studies at the Technical Correspondence Institute and at the Central Institute of Technology. He started work with the D.S.I.R. in 1950 and became a member of the permanent staff in 1953. Mr. Dawson is a keen yachtsman and skier.

PETER C. WHITEFORD (23), Blenheim. Scientific Officer. Mr. Whiteford holds the degrees of B.Sc. (Physics and Maths.) and B.E. (elect.) Hons. Born in Blenheim, he was at Marlborough College for seven years and at Canterbury University for five years and then spent nine months in mechanical engineering workshops and with electrical contractors. He was overseas (in Holland) when appointed to the Antarctic team and returned to New Zealand for the training course.

WARWICK N. EARL (22), Christchurch. Technician. Born in Christchurch, Mr. Earl was at Christ's College for five years (1957-61). He holds a first class certificate in Radio Technology, and has been employed as a technician with the N.Z. Broadcasting Corporation since 1962.

ROBERT H. MURDOCH (25), Linden. Technician. Mr. Murdoch was born and educated in Scotland. He came to New Zealand, after some years' service with the Marconi Company, in 1960, and joined the Union S.S. Co. He married a New Zealand girl in 1961 and has three children. He later joined the N.Z. Post Office

and spent three years in Whangarei, then transferred to the Engineer-in-Chief's office in Wellington, where he is employed as a radio inspector.

BRYAN D. GEORGE (24), Christchurch. Cook. Born in Christchurch, Mr. George was at the Christchurch Polytechnic Institute, 1956-58. He entered the Royal N.Z. Navy in 1954 and was in the Navy for seven years. During this period he served in the Far East, the United States and Australia. This will be his second period as Scott Base cook; he served in the same capacity at the base throughout 1964.

ROBERT J. SOPP (24), Kaingaroa Forest. Fitter mechanic. A Wairoa boy whose early life was spent at Lake Waikaremoana, he attended Wanganui Technical College and served his apprenticeship with the N.Z. Forest Service at Kaingaroa, where he still lives. He is married and has one child.

ROBIN KIDD (22), Palmerston North. Fitter mechanic. Mr. Kidd was born in Scotland and has only been in New Zealand for about 12 months. After four years at Oban High School he served his apprenticeship and then he worked for an agricultural and motor engineering firm in Paisley, Scotland, from 1959 till last year, and has been doing the same type of work in Palmerston North. He is well qualified in motor and diesel vehicle maintenance. He is a member of the Manawatu Tramping Club. He is single.

CHRISTOPHER M. RICKARDS (29), Palmerston North. Fitter Electrician. Born in Uruguay, Mr. Rickards went with his parents to England as a small boy and was educated at schools in England. His family came to New Zealand when he was 12 and he attended Palmerston North Boys' High School. He has been with the N.Z. Electricity Department for 10 years. He is now a power station electrician.

NORMAN C. WHITE (40), Tauranga. Radio Officer. Mr. White was born at Hawarden and was at Christchurch West High School from 1939 to 1941. He is a registered electrical serviceman and has been employed

in the Post Office and elsewhere as telegraphist, radio mechanic, serviceman, field technician, etc. During the war he served in the R.N.Z.A.F. servicing radio and radar installations. He is a married man with seven children.

TRAINING PROGRAMME

More than 40 men spent the week August 12-19 at Waiouru military camp and on Mount Ruapehu preparing to participate in the 1966-7 New Zealand Antarctic programme. On the Saturday and Sunday lectures were given at Waiouru by authorities on such subjects as Fire Protection (with demonstration), the Fauna of the Ross Sea region, United States activities in Antarctica, Antarctic Clothing and Equipment, and Personal Health and Hygiene in Antarctica. On the Monday the party moved by Army transport to the Quonset Hut area on the Desert Road side of Mount Ruapehu. Here they worked in two groups practising mountain techniques and field organisation, returning to Waiouru for a night lecture. Tuesday was spent similarly. On Wednesday and Thursday the training area was "Top of the Bruce" for skiing and mountain climbing. On Friday after breakfast and the return of gear the course dispersed.

THE MERCY FLIGHT

Some New Zealanders wondered why it was necessary to bring a plane from the United States to fly out the injured American Navy-man in June.

Air Commodore Gill, the air officer commanding the R.N.Z.A.F. operations group, said that the Air Force had only one Hercules in New Zealand when the emergency became known.

The other two were in Britain and the one in New Zealand was waiting to take troops to the Far East.

"In any case, we don't have the ski equipment to make landings in Antarctica at this time of year," he said.

"There are likely to be falls of soft snow and our planes could not have done it except at extreme risk."

The United States had not approached New Zealand to undertake the flight.

SUMMER PARTIES

Additional base personnel and members of field teams for the 1966-7 summer are as follows:

AT SCOTT BASE

- D. R. C. Lowe, Deputy Leader. Mr. Lowe was leader of the Campbell Glacier team last summer.
- D. H. Brown, Postmaster and assistant Radio Officer.
- D. N. Webb, Public Relations Officer.
- J. Caswell, Carpenter.
- R. Tatham, Assistant Maintenance Officer.
- R. G. Rae, Assistant Maintenance Officer.
- R. C. Exton, Storekeeper.
- W. R. Orchiston, Field Assistant.

GEOLOGICAL SURVEY PARTIES

- Mariner Glacier Area
 - J. E. S. Lawrence, Field Leader.
 - G. T. Hancox, Senior Geologist.
 - B. W. Riddolls, Geologist.
 - D. W. Gobey, Field Assistant.
- Aviator Glacier Area
 - R. Chisholm, Field Leader.
 - S. Nathan, Senior Geologist.
 - F. J. Schulte, Geologist.
 - I. Stewart, Field Assistant.
- Mt. Erebus
 - R. B. Willis, Field Leader.
 - Dr. Ewart, Geologist.
 - A. D. Sheppard, Field Assistant.

McMURDO ICE SHELF PROJECT

- W. R. Lucy, Leader.
- C. Hughes, Assistant Surveyor.
- R. L. Dodd, Field Assistant.

VICTORIA UNIVERSITY EXPEDITION

- Prof. H. W. Wellman, Leader.
- I. Smith, Geologist.
- A. Duncan, Geologist.
- V. Neale, Geologist.
- Dr. Christoffel, Physicist.
- I. Calheam, Physicist.

CANTERBURY UNIVERSITY BIOLOGICAL UNIT

- Dr. E. C. Young, Leader.
- I. Stirling, Zoologist.
- J. T. Darby, Photographer-Technician.
- R. East, Zoologist.
- J. Peterson, Zoologist.
- D. Proctor, Zoologist.

INTERTIDAL CREVICE FAUNA STUDY

- Dr. C. B. Kensler.

VUWAE, 1966

The 1966 Victoria University expedition to the Antarctic, VUWAE-11, is a six-man party consisting of two physicists and four geologists. There are three projects planned for this year.

The two physicists, Dr. Christoffel and Ian Calhaem, plan to cross McMurdo Sound from Hut Point Peninsula to the Blue Glacier, making measurements of the thermal gradient and the thermal conductivity of the bottom sediments. These measurements will be taken by means of core samples and a six-foot probe lowered through holes drilled in the ice shelf. The heat flow from any point can be calculated from the two measurements. A relatively motionless ice shelf has obviously a considerable advantage over a ship at the mercy of ocean currents, waves and wind in this type of work.

This party hopes to travel to Antarctica at the beginning of December. They will spend approximately two weeks in the field. Dr. Christoffel intends to return to New Zealand on the supply ship "Endeavour" in order to check magnetometer readings. Ian Calhaem will probably return by air around Christmas time.

Professor Wellman and Andrew Duncan comprise a two-man geological party which will study Pleistocene glaciation and sea levels in the Wright dry valley and in a number of other areas around McMurdo Sound. This party, and the other geological party will probably leave for Antarctica about the middle of November. Professor Wellman intends to return to New Zealand after three weeks in the field, when Andrew Duncan will join the other geological party for a further two weeks' field work.

Ian Smith and Vince Neall will spend five weeks in the Taylor Valley working on the basement rocks. This party will return to New Zealand between Christmas and the New Year.

INTERTIDAL CREVICE FAUNA

This summer **Dr. C. B. Kensler** of the Fisheries Research Division is to conduct an investigation into the

fauna inhabiting the crevices in the Antarctic shore area which lies between the points reached by high and low tides respectively, and such other possible areas as empty barnacle shells and the interstices between the grains of sand. This forms an interesting meeting place between fauna of terrestrial origin and fauna which is distinctively marine. Investigations in Europe have disclosed the existence of a distinct fauna in these crevices, including some species found nowhere else.

Dr. Kensler, an American, plans to conduct his study during January, possibly at Cape Bird. He has previously investigated the crevice fauna in the northern hemisphere, while studying in Wales for his doctorate.

THEY GET AROUND

New Zealanders who have served in the Antarctic are now scattered all over the world and can thank their selection as members of New Zealand's Antarctic teams as the springboard which launched them into experiences they would otherwise probably never have had.

Peter Otway, for example.

Peter first went south in 1960, as surveyor-doghandler and wintered over in 1961, as well as being a member of field parties south of Byrd Glacier (1960-61) and in the Beardmore-Axel Heiberg area (1961-62). He returned in 1962-63 as a member of the toboggan team which accompanied the dogs to the head of the David Glacier.

After his initial Antarctic days Peter worked at his profession in Canada, the Libyan Sahara and in Iran, spent six weeks in London instructing new recruits for the British Antarctic Survey, and between times travelled widely in the U.S.A., Austria, Switzerland, Italy, Spain, the U.K., Ireland and various S.E. Asian countries.

He then returned to the Antarctic in 1965-66 as surveyor in a U.S. geological team working east of Eights Station at the base of the Antarctic Peninsula, and is currently working up his results at the University of Wisconsin.

AURORAL SCIENTIST

New Zealand has a world leader in the field of polar aurora, Dr. Brian P. Sandford, of the D.S.I.R. Physics and Engineering Laboratory, Gracefield.

Brian was educated at Raetihi School, Wanganui Technical College and Victoria University of Wellington. In 1958, while working at the Invercargill I.G.Y. station studying auroral spectra, he was selected as senior scientist to winter over at Scott Base throughout 1959. (His brother Neil wintered at the base in 1957.) Apart from his auroral work, he engaged in two dog-sledging journeys, to Cape Crozier and to Cape Royds, and in a tractor-journey to Cape Chocolate.

He spent the following two years in the United States studying data obtained, before returning to New Zealand for further investigations. The outcome of his work was the discovery of two kinds of aurora glow.

In January 1963 he supervised the installation of aurora-observing instruments at Scott Base, checked auroral research instruments for USARP at Byrd Station and visited Cape Hallett, the South Pole and Eights Station on similar missions.

Dr. Sandford went overseas in May on a tour embracing Australia, Russia, Sweden, Austria, and North America. He was due back in New Zealand early this year, but as the result of a United States request he has been granted extended leave from his department until September.

Dr. Sandford will go to the Nato Advanced Study Institute in Staffordshire, England, and to conferences in Belgium and Munich afterwards before coming home.

During his recent European visit he spoke at the seventh international space science symposium in Vienna. He was one of seven scientists from all over the world invited to present papers at this event, which was organised in conjunction with the Committee on Space Research.

New Zealand is not a member of the organisations responsible for the symposium, but the scientific regard for Dr. Sandford's polar work re-

sulted in the New Zealand flag being run up at the meeting venue.

Dr. Sandford's particular interest has been the study of the optical effects of polar aurora. The cause of this is sun flare activity, which results in not only aurora but major magnetic storms and radio black-outs, a problem which has appeared in New Zealand lately.

In collaboration with an Australian scientist, he also established the extent of the zone of hydrogen emission in the polar region.

("Antarctic" was privileged to publish an article by Dr. Sandford in December 1963, which illustrates his unusual ability to write of his own scientific speciality in terms which the ordinary man can understand.)

ANOTHER YANKIWI

Gerald Holdsworth, a New Zealander, was Deputy Leader of the Tararua Antarctic Expedition in 1962-63, and in 1963-64 climbed Mount Erebus with George Lewis to collect samples of snow, liquid from fumaroles, etc., for laboratory examination, as well as carrying out survey work in the McMurdo Sound area.

He is now at the Ohio State University, U.S.A., and will be in the Antarctic under U.S.A.R.P. this summer as director of an alpine glacier study in the Wright Valley. It is planned to continue the ice tunnel dug into the face of the Meserve Glacier last season, and to drill down from the glacier surface into the head of the tunnel.

GOOD NEWS, GIRLS!

Mr. R. B. Thomson, Superintendent of the Antarctic Division, D.S.I.R., in a press interview on June 25, said that the Division had received many applications from qualified women for a number of research posts in the Antarctic, as well as from several nurses who sought any kind of job where special qualifications were not necessary.

"Last year I said the possibility of having women at Scott Base was for the future," added Mr. Thomson. "Now I believe we will have them there within five years."

CANTERBURY UNIVERSITY PROGRAMME FOR 1966-1967

by E. C. YOUNG*

The Antarctic unit of the Zoology Department at the University of Canterbury, known unofficially as CIA (Canterbury in Antarctica), will have six scientists working in the Ross Dependency this summer.

[Dr. Bernard Stonehouse has laid down the ice axe and whip after a five years' stint and they have been taken up by Euan Young, a freshwater entomologist specialising in insect flight musculature. Dr. Young, who will provide the administrative link for the next few years, has kindly provided us with the following outline programme. — Ed.]

Four of the party will work at the new laboratory at Cape Bird, on the northern tip of Ross Island, some 60 miles from Scott Base. This laboratory has been built at Scott Base over the winter and is expected to be erected in early summer. The unit is very grateful to D.S.I.R. and to Scott Base personnel for this great improvement in facilities. The other two men, working with seals, will live in the luxury of Scott Base.

The days of blanket studies (e.g., "The Biology of the Skua") in Antarctic terrestrial zoology, are past and we have now moved into a period in which specific problems will be investigated. This change in approach is reflected in the scientific programme of the unit set out below.

The moult, and disease, injury and healing in the Weddell Seal.

Rod East, B.Sc. Hons. Student.

Weddell seal are often badly gashed and this aspect will form the basis of the study. East will work with Ian Stirling from Scott Base on the seal colonies at the southern end of McMurdo Sound.

Relation between the cycle of endocrine activity and reproductive behaviour of penguins. Jim

Peterson, B.Sc. Hons. Student.

There have been few studies of this problem in any bird. Peterson will attempt to assay hormones circulating within the blood stream and study the changes occurring in the secretory cells with the view to correlating the hormone levels with the various breeding activities occurring in sequence during the year. The first year would be a pilot study to determine the problems involved if a full-scale enquiry was attempted.

The Adelie Penguin is eminently suitable for this sort of study because (a) blood samples can be taken from the same bird through the season and (b) the parts of the breeding cycle are precisely marked and this is no doubt a reflection of the endocrine cycle.

The mortality of skua chicks. Dennis Proctor, B.Sc. Hons. Student.

Skua gulls normally lay two eggs, from which two chicks hatch, but seldom rear more than one chick. Invariably the second chick dies, often following aggression by the first, but it is not known whether this aggression is instinctive or dependent on immediate pressures, for instance, food shortage. Proctor will make a general study of this phenomenon, working on the earlier studies of Reid, Spellerberg and Young.

The population dynamics of the Weddell seal. Ian Stirling, Ph.D. Student.

Stirling will be continuing a study of some of the factors concerned in determining the size of the Weddell seal population in McMurdo Sound. He will look specifically at birth and death rates and dispersal, and will

* Dr. E. C. Young, Lecturer in Zoology, University of Canterbury.

mark a substantial proportion of the total population this summer.

The relation between skuas and penguins. Euan Young, Lecturer in Zoology.

Young will carry forward a study begun last year of the interaction between skuas and penguins at Cape Bird during the breeding season—especially skua predation on penguin and the effects of the association on the behaviour of the two birds. In his spare time he will look into the life cycles of the terrestrial Collembola and mites.

John Darby will help Young and will provide a photographic record of all studies at Cape Bird.

Darby, Stirling and Young have all worked previously in this area.

NEW ZEALANDERS AND S.C.A.R.

New Zealand plays a full part in the work of SCAR, the Scientific Committee on Antarctic Research. The SCAR Executive Committee consists of

President: Dr. L. M. Gould (U.K.)

Vice-President: Contraalmirante

R. N. M. Panzarini (Argentina)

Secretary: Dr. G. de Q. Robin (United Kingdom).

New Zealand's representative on the list of Permanent Delegates, 19 in number, is

Dr. E. I. Robertson, D.S.I.R., Wellington.

This country also has a representative on each of the permanent Working Groups, as follows:

Biology: Dr. R. A. Falla.

Communications: Mr. R. Cassey.

Geodesy and Cartography: Mr. R. P. Gough.

Geology: Dr. R. W. Willett (Chairman/Secretary of the Group).

Geomagnetism: Mr. A. L. Cullington.

Glaciology: Mr. I. C. McKellar.

Logistics: Mr. R. B. Thomson.

Meteorology: Mr. I. S. Kerr.

Oceanography: Mr. J. Brodie.

Solid Earth Geophysics: Dr. R. D. Adams (Secretary).

Upper Atmosphere Physics: Mr. W. H. Ward.

New Zealand's Antarctic Mapping Centre is the Department of Lands and Survey, Wellington.

ANTARCTIC RESEARCH

The ninth meeting of SCAR, the Scientific Committee on Antarctic Research, will be held in Santiago, Chile, from September 19 to 24 this year.

New Zealand's delegates will be Prof. G. A. Knox of Canterbury University and Dr. R. K. Dell, Director, Dominion Museum, Wellington.

In addition to the usual consideration of the reports of Working Committees and other routine matters, the delegates this year will be considering (a) the innovation of an Antarctic Day and (b) the long-term value of scientific activity in the Antarctic.

Each country participating in Antarctic Research will be asked to organise an Antarctic Day sometime during the week October 9-15, to mark the 10th anniversary of SCAR.

OCEANOGRAPHY

A Symposium on Antarctic Oceanography is to be held in Santiago from September 13 to 16, immediately before the SCAR meeting. The United States research vessel "Eltanin" should be at Valparaiso during this period, and a visit by delegates will probably be arranged.

The symposium will discuss future lines of work. The topics to be reviewed are grouped under the following heads:

- Surface and Upper Layers,
- Deep Waters,
- Ocean Floor,
- Coastal Waters,
- Pack Ice Regions,
- Productivity and the Food Chain.

EXHIBITION

In conjunction with these conferences most of the participating nations including New Zealand will stage exhibitions at the University of Chile. The Exhibition will be open from September 13 till September 30.

It is proposed to hold three half-day meetings on Antarctic Research during the Pacific Science Congress to be held in Tokyo from August 22 till September 10 this year.

SECOND WINTER FLIGHT



Hercules aircraft from Quonset Point touches down on McMurdo ski-way to evacuate critically ill American seaman to hospital in Christchurch, New Zealand. (An artist's impression.)

On June 6, Navyman Robert L. Mayfield lay in McMurdo General Hospital critically injured. Two days later he was resting comfortably in a Christchurch hospital, his condition listed as good. His "recovery" came through a chain of events paralleled only once before in the history of Operation Deep Freeze.

On Wednesday, June 1, Utility Pipefitter Second Class Mayfield fell, rupturing his bladder. He was admitted to the Naval Dispensary at McMurdo. His injury would not have been a serious one had it occurred where the usual specialist and hospital facilities are available. But it happened at McMurdo during the

six-month winter night. The McMurdo medical team did all they could with the equipment they had available, but it was not enough.

Early on the morning of Thursday, June 2, they sent a message to Operation Deep Freeze Headquarters in Washington requesting a top-level medical conference for advice. Headquarters sent their reply, advising treatment and a series of tests. The test results were flashed back, with the addition "strongly recommend air evacuation be considered".

Air evacuation meant a flight into the dark, frozen continent without adequate weather information, navigational aids, or rescue capability

should the mercy plane go down. It had been done once before, in 1964, when a seriously injured man was flown out by a ski-equipped C-130 Hercules aircraft of Air Development Squadron VX-6. Rear-Admiral Bakutis made his decision quickly.

N.Z. NAVY ASSISTS

While a Hercules was being readied for its 12,000-mile trip from Quonset Point, R.I., the New Zealand Naval Board advised that its frigate H.M.N.Z.S. "Taranaki" was proceeding into port to load fuel and await further instructions.

Back at McMurdo another problem had arisen. Williams Field was being hurriedly prepared for the Hercules' arrival, but the elements seemed to be in conspiracy against the mercy mission. A raw wind was sweeping across the field at 35 miles per hour, blowing snow until visibility was lowered to zero, and outside preparations were forced to a standstill.

Nevertheless, Hercules 321, carrying a supplemental 3,600-gallon internal fuel tank, began the flight halfway across the world. It was now Saturday, 7 a.m. McMurdo time. After picking up Admiral Bakutis, his staff meteorologists and doctor, 321, piloted by Commander Marion Morris, departed west for Christchurch and McMurdo.

At noon, weather stations at McMurdo, Australia's Macquarie Island, and New Zealand's Campbell Island began feeding information to the Christchurch Operation Deep Freeze meteorology office.

From Byrd Station, 600 miles inland from McMurdo, came word that the Byrd airstrip could be prepared in time, should the aircraft have to be diverted from McMurdo. At 10 p.m. the Royal New Zealand Air Force reported a Sunderland aircraft and a B-170 Bristol Freighter aircraft on standby at Invercargill. "Taranaki" was by this time steaming south at 20 knots, gathering weather data while en route to her rescue station halfway between McMurdo and Christchurch.

From Williams Field came good news—the storm was dying. At

12.30 p.m. on Sunday, Williams Field reported 'ready to receive aircraft'. 321 was on the next-to-last leg of her long flight, between the Fiji Islands and Christchurch. The crew had spent 29 of the last 33 hours in the air, and there were still more than 6,000 miles to go before Mayfield would be safe in Christchurch.

INTO THE NIGHT

At 9.30 on Sunday evening, 321 landed at Harewood International Airport, Christchurch. A brief rest, weather checks, hurried preparations, and at 7.19 on Monday morning the aircraft was back in the air, heading into the Antarctic night. "Taranaki" had arrived on station less than an hour before.

On board the aircraft were 14 persons, including the crew, Rear-Admiral F. E. Bakutis, commander of the United States Navy Antarctic support force, Lieutenant-Commander P. E. Tyler, a Navy surgeon, Commander A. C. Kranz, the staff meteorologist, and Commander C. A. Olds, the executive officer of Antarctic support activities, whose normal headquarters is at McMurdo Station.

As well as its normal fuel load and the specially-fitted internal tank, the Hercules carried a spare engine. There were, in addition, about 280 lb. of mail for McMurdo Station and Scott Base, 450 lb. of fresh provisions, about 50 lb. of magazines, and several tins of biscuits—a gift from the Canterbury branch of the New Zealand Antarctic Society.

IN THE ANTARCTIC

At McMurdo men and machines worked around the clock to prepare the main 8,000 ft. skiway at Williams Field, and a 6,000 ft. crossway, for the Hercules. Special lights had been strung out along the main skiway, and flaming oil drums placed at 1,000 ft. intervals illuminated the crossway. The runway lights were taken to McMurdo at the end of last summer.

According to a weather report to Christchurch shortly before the plane was due to land, there was



Mayfield is lifted aboard the Hercules at Williams Field, McMurdo.
RADM Bakutis stands in the doorway.

visibility for 50 miles, winds of about five knots and a temperature of -4° . Light snow was falling.

NEARING THE GOAL

As the aircraft winged onward, Admiral Bakutis took the opportunity to speak to his men at McMurdo and the other U.S. Antarctic stations, expressing his appreciation for the work they were doing and offering encouragement in the long winter isolation from the rest of the world.

At 4.10 p.m. McMurdo time, the burning oil drums outlining Williams Field skiway appeared. Four minutes later the aircraft was on the ice. While fresh fruit and vegetables and mail for the men at McMurdo were off-loaded, Mayfield was flown by Navy helicopter the six miles across the ice shelf from the McMurdo dispensary to the waiting aircraft. By

7.20 p.m. the "Herc" was on its way back to Christchurch, with Mayfield aboard under the care of the staff doctor.

At 2.22 a.m. on Tuesday the big aircraft settled again on to the Harewood runway, and a Navy ambulance picked up Mayfield and sped him to Christchurch General Hospital for surgery. The report came—"Patient resting well. Progress satisfactory, prognosis good."

Mayfield was all right. The air evacuation was a success. Everyone breathed a sigh of relief and relaxed, for the first time in four days. All that was left now was the long trip back to Quonset Point.

[We are indebted to U.S. Navy journalist A. K. Evans for the above slightly modified version of his press release.]

N.Z. NAVY'S PART

The Royal New Zealand Navy's frigate "Taranaki", recalled from searching for the missing ship "Kaitawa" after operations near Borneo, made a high-speed dash down the New Zealand coast when called upon to act as weather picket ship for the flight, and reached Dunedin on the night of June 4.

After loading stores and Antarctic clothing, "Taranaki" had to battle high winds and heavy seas to reach 57.45° S. Here she was in radio contact with the Deep Freeze base in Christchurch, the aircraft, and McMurdo Sound. After the flight, "Taranaki" was again battered by high winds and the deck began to ice up. She reached Dunedin four hours behind schedule, on June 8.

Rear-Admiral Bakutis, in a message of thanks to the New Zealand Navy, said that the positive, immediate and willing response to his informal enquiry regarding the possible availability of a ship for picket duty had further enhanced the highest respect the U.S. Navy held for the efficiency and readiness of the New Zealand forces.

"Specifically," he said, "I wish to cite the entire crew of H.M.N.Z.S. 'Taranaki' for an outstanding performance under most adverse sea conditions. In addition to their obvious efficiency and tenacity I could detect from the voice radio transmissions a keen interest and determination on their part to do everything possible to contribute to the successful completion of the flight. It was most reassuring to me and all other personnel on board the Hercules to know that we were being guarded by a ship and crew of the highest calibre."

"The good Lord was surely with us," said Admiral Bakutis to Christchurch pressmen after the return flight. He said he was particularly grateful to the Royal New Zealand Navy for its "tremendous" co-operation in sending H.M.N.Z.S. "Taranaki" to stand by south of New Zealand, and to the Royal New Zealand Air Force for having an aircraft standing by for search and rescue duty if necessary.

"This was a great comfort to us and I can't speak too highly of the co-operation of the New Zealand authorities," he said.

MORE WINTER FLIGHTS?

Asked if the success of the flight assured the inauguration of regular mid-winter flights to the Antarctic, the Admiral said:

"We had more or less decided to do it regularly after the first mid-winter flight. We will be able to manage it all right next year and tentatively we are planning for flights in June and August. This, of course, is partly subject to scientific projects which would make the flights worth while."

Ski-equipped Hercules aircraft would be used for both flights. Later, a C141A jet would make an experimental flight to McMurdo.

TRYGVE GRAN SALUTES AN OLD FRIEND

More than 50 years ago, the Norwegian Trygve Gran and the Englishman Raymond Priestley were fellow members of Captain Scott's last expedition. In December, 1912, they were both members of the six-man party which made the second ascent of Mount Erebus.

Recently, Sir Raymond Priestley had his 80th birthday. Major Gran celebrated the occasion at his home in Norway, by firing the three cannon in his garden. He does this annually on the anniversary of the first flight across the North Sea—his own, and also to commemorate the ascent of Erebus.

To honour his old friend he fired the guns eight times. Eighty, he said, would have made the guns too hot. Gran himself is a youngster of 76.

FRANCE WILL LAUNCH ROCKETS FROM THE ANTARCTIC CONTINENT

The first launching of upper-atmosphere rocket probes from the Antarctic Continent will be carried out this summer from France's Dumont d'Urville base in Adélie Land.

Initiated by the Ionospheric Research Group and financed by the National Centre for Space Studies, the project will have the logistic support of Expéditions Polaires Françaises.

The Antarctic lends itself better than the Arctic, in analysing observations, to the separation of phenomena linked with geographical latitude from those dependent upon magnetic latitude. This is because the south geomagnetic pole is more than 15° from the geographical pole, whereas in the Arctic the two poles are less than 10° apart. Moreover, the earth's magnetic field controls the phenomena of the upper atmosphere, and Dumont d'Urville occupies a quite exceptionally favourable position from the point of view of the earth's magnetic field. So the French base may be said to be situated in the most favourable sector of the most favourable continent. In addition, Dumont d'Urville has a geophysical observatory which has already been functioning for ten years.

Expéditions Polaires Françaises, in addition to providing logistic support for the rocket programme, will be responsible for an important section of the preparatory construction work. The preparation of the launching site was begun during the 1965-66 summer and is now well on the way to completion. Twenty technicians from the National Centre for Space Studies will finalise the construction work.

The rocket to be used is the Dragon, a two-stage rocket. The second stage and its payload should attain an altitude of about 350 kilometres. Four firings are contemplated, three of them in rapid succession, which should make it possible to estimate changes in conditions in the course of a single day.

SHIP MOVEMENTS

Because of the heavy demands of this coming summer "Thala Dan" will be chartered by the Australian expedition (A.N.A.R.E.) for one month only, instead of for the usual two months. The French authorities are grateful to the Australians for their understanding and co-operation in this respect. Moreover, "Thala Dan" will this year carry 13 instead of the usual seven French passengers on her second voyage to Terre Adélie. Altogether the vessel will make four trips between Australia and Adélie Land and will carry in all 169 passengers.

1. "Thala Dan" will carry the necessary equipment, etc., from Le Havre and 48 passengers (six to winter over, 16 summer party and 26 technicians) from Hobart. The vessel will be at Dumont d'Urville from December 10 to 24, and will be on loan to Australia from December 31. One member of the French team will return with the ship.

2. During the Australian charter, she will carry 13 men (five of them wintering over) to Dumont d'Urville, about January 10.

3. Twenty-two men (16 wintering) are due to reach Dumont d'Urville about February 8. When the ship leaves for Hobart on February 19, she will carry 36 men of the French summer party.

4. On March 4, 29 of this year's wintering team, plus 19 of the 1966-67 summer party, will leave Dumont d'Urville for Hobart.

URGENT TASKS

When "Thala Dan" arrives at L'Ile des Petrels about December 10, all hands will assist with the unloading.

The summer party dormitory and the kitchen-dining room in the new living quarters will also be constructed as soon as possible, to provide adequate accommodation for the summer party when the ship has sailed.

When these urgent and essential tasks are completed, all personnel will begin work on the preparations for the rocket-launching programme. Other tasks to be given urgency include the installation of the radar-sonde and its protective dome, the completion of the water supply system, the construction of concrete foundations for two 50-cubic-metre gas-oil containers, the placing of the piles for the future winter-party dormitory and topographical work on Lion and Gouverneur Islands.

WINTER PARTY

The wintering-over team for 1967 (TA17) will comprise 27 men. The scientific programme will be practically the same as for 1966 (TA16) except in meteorology.

NEW PLATEAU STATION PLANNED

The Scientific Council of Terres Australes et Antarctiques Françaises last year set up a working group, "Station Plateau et Raids" (traverses), to examine and co-ordinate possible scientific work on the continental icecap. At its first meeting, on April 25, this working group weighed the advantages of constructing a new station against the numerous logistic and financial problems involved.

Considering the operations already planned for EGIG (The International Glaciological Expedition in Greenland) in 1967 and 1968, and the amount of technical equipment available (especially transport) the working group came to the conclusion that a small station, housing four or five men, could be set up in 1969, 500 kilometres from the coast. In the meantime, preliminary investigations will be made into the problems of constructing such a station, and into the question of possible traverses, with a view to mounting the whole project envisaged by the Scientific Council of T.A.A.F.

PROGRAMME

- (a) **Winter Station on Antarctic Plateau.** High priority must be given to

Airglow: Simultaneous studies at Dumont d'Urville and at a station situated on the North-South axis, preferably 300-500 km. distant, during a period of maximum solar activity, e.g., 1968-9.

Human Physiology: Studies in environment and physio-pathology within the framework of the International Biological Programme.

Meteorology: Solar and actinometric studies in liaison with medical research and radio-activity.

Radio-activity: Registering of radio-active aerosols and of natural radio-activity.

- (b) **Studies in the course of over-snow traverses:**

Glaciology: The mass budget and its fluctuations, forecasts and physiochemical studies of the ice. This programme will involve the planting of beacons and measurements on a North-South axis of 1,000 km. from the coastline, deep drilling along the axis, continuous profiles of ice thickness by radar and magneto-telluric soundings of the sub-glacial rock.

Human Physiology: Elementary medical studies.

Radio-activity: Radon measurements, especially interesting in the Antarctic, the only place where these are not influenced by the continents on the same axis as the glaciology.

Geomagnetism: Re-occupation of Charcot Station (69° 22' S., 139° 01' E. occupied in 1957 and 1958 during the International Geophysical Year) at a period of **minimum** solar activity, during a short traverse: attempts to localise the surface Magnetic Pole on the axis Dumont d'Urville-Charcot.

1966 PROGRAMME

The programme of activities at Dumont d'Urville for the current year comprises work in Biology (further bird studies at Pointe Geologie), geomagnetism, gravimetry, meteorology, ozone, seismology, ionosphere, aurora, cosmic rays, radio activity and medical research, on much the same scale as previously.

FRENCH-SOVIET CO-OPERATION

During a visit by Prof. P. A. Shumsky to France a meeting took place at Expéditions Polaires Françaises on May 18. It was agreed that the work done by the glaciological group EAS-EPF during the 1963-64 summer (see "Antarctic", 3:8, Dec. 1963, p. 340; 3:9, March 1964, p. 392; and 3:10, June 1964, p. 444) should be reviewed after a period of five years, in order to determine the rate of deformation of the surface layer of the ice-cap. Further collaboration, the possibility of reviewing the 1967-68 operation and the investigations requiring attention, were also discussed.

PENGUIN POPULATION

During last year a careful population study of the bird-life in the Pointe Géologie archipelago (on which Dumont d'Urville Base is built) was undertaken by Pierre Le Morvan assisted by other members of TA15. 238 Emperor penguin pairs were ringed and 411 chicks. Abandoned eggs and dead chicks during the breeding period totalled 1,558. On December 4 a count of living chicks gave a total of 3,438. The total adult breeding population was estimated to be approximately 10,000.

Banding of Adélie penguins, Cape pigeons, Wilson petrels, Antarctic fulmars and giant petrels was also carried out.

TEMPERATURES

During the 83 days of summer activity at Dumont d'Urville the mean temperature was -2.1°C . (28.2°F .); maximum $+5.3^{\circ}\text{C}$. (41.5°F .); minimum -9.1°C . (15.6°F .). The mean wind speed was 10 m/s, the maximum 54 m/s, say 195 km./h. or 120 miles an hour.

By way of contrast, June temperatures this year were: mean -19.3°C . (2.7°F .); maximum, -10°C . (14°F .); minimum, -32°C . (-25.6°F .). In May this year a wind speed of 212 km./h. was recorded: that is approximately 131 miles per hour.

TRIBUTE

On April 26 at Le Havre, on board of "Thala Dan" M. Paul-Emile Victor, in the name of the President of the

French Republic, conferred the Cross of Chevalier du Mérite Maritime upon **Captain Wilhelm Pedersen**. Captain Pedersen commanded "Thala Dan" for six consecutive years during the reliefs of the French expeditions in Terre Adélie. He took the initiative from the first voyage, of mooring his vessel between L'Île des Petrels and L'Île Jean Rostand, thus considerably facilitating unloading operations. He has always displayed the most complete collaboration in all the scientific and technical activities of Expéditions Polaires Françaises.

AT DUMONT D'URVILLE INTO WINTER

If April was unusually mild, May brought very unfavourable weather, interrupting for nearly 20 days all outside activities. June was helped by moderate winds as light as 28 km./h., notwithstanding that the evening of Midwinter's Day distinguished itself by presenting a blizzard of 205 km./h. and a -32°C . temperature (-27.6°F .). Nevertheless, the planned programme was carried out in a satisfactory manner.

Outside, the channelling of seawater for 325 metres from the pumping station to the generator house was completed. This water is to be distilled.

Rocks on the area set aside for the sounding rockets firing-site have been got rid of by explosives.

Interior work has been concentrated on the fitting up of the new communal building erected during last year's summer season. This work included —

Fitting up the furnace room and the walls enclosing it.

Setting up the partitions for living-room and discotheque.

Brickwork of the boiler-room.

Plumbing for the hot-water system. Heating and electrical cable installations.

The lack of snow has made it necessary to collect the ice required for domestic needs at a considerable distance from the buildings. A particularly appetising iceberg has been the target for systematic pilfering.

NARROW ESCAPE

An accident which could have had serious consequences occurred on June 18. A weasel was making its way across the sea-ice when the ice broke beneath its weight. The vehicle sank at once, but very fortunately the scout preceding it and the driver managed to get clear in time and returned to base safe and sound.

BASE ROI BAUDOUIN

Expéditions Antarctiques Belgo-Néerlandaises reported from Brussels on August 12: After an absence of two months and three weeks, the six members of the trail party returned to Base Roi Baudouin on May 25.

At 12 km. from the base, the team had to camp for three days because of a violent blizzard; so the six men arrived quite rested.

All the programme of the party was fulfilled notwithstanding 18 days in all of heavy blizzard during which they stayed under the tents.

As in every Antarctic base, Mid-winter's Day was also celebrated at Base Roi Baudouin. The men received many cables from all over the world, and the members of the expedition had the surprise to read a message sent by President Johnson of the United States and one by the Prime Minister of Japan.

The radio-phone calls between Base Roi Baudouin and Belgium-Holland are again becoming better.

SEALS' TALK

Two New York Zoological Society men who have been listening-in on Antarctic Weddell seals claim to have "clearly demonstrated" that seals do talk under water. From their specially constructed chamber beneath the ice they made 50 yards of tape recordings to study and analyse.

SOUTH AFRICAN PLANS

The stations at SANAE, Marion Island (46° 52' S., 37° 51' E.) and Gough Island (40° 21' S., 9° 52' W.) are again being occupied during 1966.

A survey support of the glaciological research programme by measurement of ice movement in the vicinity of SANAE base, in the "hinge" area south of the base and between the base and the ice-front, as well as the re-fixing of the position of the base and the determination of certain azimuths required for geomagnetic and meteorological observations, are to be carried out during this year.

ANTARCTICA—THEN THE MOON

Similarities in hostile environments and in the logistic problems of supporting life in both Antarctica and the moon have led the head of America's lunar rocket project to exile one of his aerospace engineers to Plateau Station. The engineer, Mr. Leonard Yarbrough, will there investigate the hostile environment and see whether it seems possible that human life could be maintained for more than the 24 hours at present considered the maximum for a stay on the moon. It is possible that the Antarctic may be able to provide the best known conditions in which to test the vehicles and stations that have been designed for lunar work, particularly, it is conjectured, in its Dry Valleys. Plateau Station is similar to the lunar bases designed in the advanced systems office of the Marshall Space Flight Centre of the National Aeronautics and Space Administration in Huntsville, Alabama. As a systems engineer, said Mr Yarbrough, he works with scientists to try and translate their desires into hardware before somebody else looks at his translations and works out their cost.

JAPANESE PREPARE THEIR EIGHTH ANTARCTIC EXPEDITION

JARE VIII is composed of 40 personnel led by Dr. Tetsuya Torii (Professor at Chiba Institute of Technology) who was leader of the wintering party of the 4th JARE.

The icebreaker "Fuji" will cover the following routes: December 1, 1966 (Tokyo); December 16-22 (Fremantle); January 6, 1967-February 27 (in the vicinity of Syowa Station); March 8-14 (Cape Town); March 30-April 3 (Colombo, Ceylon); April 19 (Tokyo).

Mailing addresses at the ports of call:

Icebreaker "Fuji", c/o Wigmore's Ltd., P.O. Box 228, Fremantle, Australia.

Icebreaker "Fuji", c/o Ellerman & Bucknall Propr. Ltd., P.O. Box 812, Cape Town, South Africa.

Icebreaker "Fuji", c/o Embassy of Japan, No. 10 Ward Place, Colombo 7, Ceylon.

Members of the Expedition are:

Wintering Party (24)

Leader (T. Torii), 5 upper atmosphere physicists, 3 meteorologists, 2 glaciologists, 2 biologists, a geophysicist, a surgeon, 2 radio operators, a cook, 3 mechanics, an electric fitter/mechanic, and 2 logistics supporters.

Summer Party (16)

Deputy leader (K. Kusunoki), 4 oceanographers, 2 marine geophysicists, 2 upper atmosphere physicists, a radio engineer, 3 civil engineers and carpenters, and 3 logistics supporters.

SCIENTIFIC PROGRAMME

Research will be carried out at Syowa Station on cosmic rays, aurora and airglow, auroral radar observation, auroral radio noise, ionosphere, VLF emission and whistlers, atmospheric, geomagnetism,

meteorology, seismology, geomorphology, glaciology, tide (ocean), biology, and geochemistry.

During the cruise of "Fuji" (Captain Mitsutoshi Matsuura), oceanographic stations will be occupied according to the weather and ice conditions. Seaborne magnetic (proton magnetometer) and gravimetric surveys will be made. Continuous recordings of airglow intensity and ionospheric soundings will be made. VLF emission and whistler, radio wave propagation, atmospheric spectrum, and electrostatic potential will also be continuously recorded during the cruises.

About 400 tons of cargo will be airlifted by helicopter to Syowa Station, unless the ship can approach to the shore of Ongul Island. Four buildings (mess hall, aeronomy lab., balloon inflation shelter, air traffic control shed) will be built. Four oversnow-vehicles and two motor vehicles will be delivered.

An orientation and training course for expedition members will be held "in a place remote from Tokyo" from September 5 to 8. The only substantial change is the increase of wintering personnel from 18 to 24. Captain Matsuura, who was second in command of "Fuji", is the new skipper of "Fuji" in place of Captain Honda, who has become Head of the Antarctic Support Office, Japanese Navy.

NEWS FROM SYOWA

According to the latest news from Syowa Station the sea ice between Syowa and the continent, a distance of about 5 km, deteriorated greatly during last summer, so that the KD-60 diesel snow-vehicle (cap. 9 tons) has not yet crossed over the ice in the channel. Troubles were

experienced with other snow-vehicles, which led to the abandonment of the programme of oversnow travel across the continental ice for the coming season (October-December).

Late in 1967, an oversnow traverse party will be sent into the inland area for glaciological research. Dr. T. Ishida and Y. Yoshida will work on this programme. The period will be between October 1967 and January 1968.

JAPANESE DEPARTMENT OF POLAR RESEARCH

In conjunction with the progress of polar research in Japan, especially with the planning and execution of the Japanese Antarctic Research Expedition (JARE), Kyokuchigakka (Polar Section), a governmental organisation, was established in the National Science Museum on April 1, 1962.

Three full-time members were in the Section under Dr. S. Murauchi who had held the position of chief as an additional post. On April 1, 1963, the number was increased to six. In September 1963, Special Committee for Antarctic Expeditions (Chairman: Prof. Takeshi Nagata) was organised as an advisory committee for the Director of the National Science Museum, Dr. Yo K. Okada. Dr. H. Ozaki succeeded Dr. Murauchi, still holding the position of chief as an additional post.

On April 1, 1964, the number of the Section increased to seven and Mr. Masayoshi Murayama was appointed as the first full-time chief.

On April 1, 1965, the Section was designated Kyokuchibu (Division) which has two sections (First and Second) composed of 11 personnel.

Dr. Yo K. Okada, Director of the Museum, has been holding the position of the Chief of Division. Mr. Murayama took the position of Chief of the Second Section, holding an additional post of the Chief of the First Section. On January 1, 1966, Dr. Kou Kusunoki was transferred

from the Institute of Low Temperature Science, Hokkaido University, to be Chief of the First Section.

On April 1, 1966, in accordance with the change in the administrative system of the Museum, the Kyokuchibu changed its name into Kyokuchikenkyubu (Department of Polar Research). The Japanese Government is expecting to establish a Polar Research Institute with a membership of about 60 under the jurisdiction of the Ministry of Education. The Department of Polar Research is assumed to be an embryo of the Japan Polar Research Institute.

PUBLICATIONS

The Department of Polar Research has published the following:

1. NANKYOKUSHIRYO (Antarctic Record)

Articles are written in Japanese with English abstract, or in English with Japanese abstract. Twenty-six numbers have been issued between 1957 and 1966.

2. Scientific Reports of the Japanese Antarctic Research Expedition

Aeronomy (3).
Meteorology.
Geology, Geography, Glaciology, Seismology, Geodesy.
Geochemistry (6).
Oceanography No. 1 (1964) plus.
Biology (28)*.
Logistics.

* Nos. 1-17 were published by Seto Marine Biological Laboratory.

Exchange of information and publications is greatly appreciated.

Mailing address: Department of Polar Research, National Science Museum, Ueno Park, Tokyo, Japan.

IF THE ICE MELTED

Dr. L. A. Kivioja of Purdue University, Indiana, told the last annual meeting of the American Geophysical Union that if all the land-supported ice caps melted, the ocean waters of the world would rise about 30 to 60 feet, not the 150 to 300 feet formerly calculated.

RUSSIANS AT FOUR STATIONS BUSY AND WELL

Soviet wintering-over teams at Mirny, Novolazarevskaya, Molodezhnaya and "inland" Vostok seem to be keeping themselves too fully occupied to succumb to boredom.

WINTER IN ANTARCTICA

In Molodezhnaya and Novolazarevskaya, which are situated near the coast, winter announced itself with a drop of temperature to -25°C . (-15°F .), accompanied by hurricane force winds reaching 40 metres per second, while at Vostok the temperature dropped to -77°C (-108.6°F .). The lowest temperature ever recorded by Soviet scientists on the Sixth Continent was -88°C . (-126.9°F .) six years ago.

In spite of all this, scientific work goes on, and thanks to good medical attention, all members appear to be in excellent health. The geophysicists in Mirny recorded several interesting phenomena in connection with flares observed on the sun during March and April: unusual absorption of radiowaves—severe magnetic storms and aurorae. Several members of the Mirny staff are getting ready a weasel-sledge transport which will take them to Vostok.

The storm damaged several aerials in Molodezhnaya, while Mirny seems to have disappeared under the snow.

RADIO INTERVIEW

On July 18 a radio interview was carried out between "Pravda" in Moscow and Mirny in Antarctica for the benefit of the public who wanted to know how the men there were getting along now that the winter was at its worst.

The director of Mirny, L. I. Dubrovnikov, apologised for the bad reception which, he said, was due to the sun's flares, which increased cosmic radiation and consequently interfered with radio waves. He went on to describe the weather conditions: in Mirny a -20°C . temperature accompanied by snowstorms had damaged some radar antennae used in observing aurorae and radio-

sondes. But in no time at all, he said, the staff had repaired the damage.

With regard to the work carried out by his staff, he said everything was going according to plan. Zaharov from Novolazarevskaya is studying one of the lakes, a unique phenomenon in the Antarctic, in the vicinity of the Schirmacher Oasis. Biologist Kamenev spends most of his time observing a colony of about 15 000 Emperor penguins settled about four miles from the Mirny observatory. He reports the arrival of the first Emperor penguin chicks. The appropriate scientific observations are being carried out.

Co-operation among foreign scientists is rewarding. There are naturalists from 12 foreign countries in Antarctica, but it seems that the Japanese from Showa Base and the Australians from Mawson and Wilkes are on closer terms with the Soviet members than any others.

With regard to various pastimes, there are poets, singers and even football players among the members. A match was held recently on an ice-field between the Moscow and Leningrad teams. Leningrad won 6:0. Fishing contests are also organised. A team of three radio operators won the contest by catching 250 exotic specimens in 1½ hours through a hole in the ice. These were used for making fish soup.

By this time the conversation became almost inaudible and had to be terminated.

THE "OB" RETURNS

On May 16 the "Ob", carrying aboard 130 members of the 10th Antarctic Expedition, was due to dock on Vasiliev Island, the port of Leningrad. The members of the expedition were returning home after having completed their task in the Antarctic.

NEW SHIP

Towards the end of the five-year plan a new ship will be added to the existing fleet operating in Arctic and Antarctic waters. The new ship will be a combined icebreaker and cargo vessel patterned after the "Amguem" design, and it will replace the "Ob" on long trips. Vessels of the "Amguem" series have a better design, extremely long hulls, and are good icebreakers. The vessel will be able to lead a convoy. The huge ship has four engines together producing 7,200 h.p., high carrying capacity, and her speed in clear waters is 15 knots. A number of laboratories will be installed aboard.

VEGETABLE GARDENS IN ANTARCTICA

In spite of the severe winter conditions predominating in Antarctica, several members of the Russian Polar Expedition wintering-over in Mirny and Novolazarevskaya have managed to grow vegetables on soil imported from Leningrad. All vegetables were grown in room conditions and produced quite a substantial crop. In Novolazarevskaya radiotechnician Ivan Titovsky harvested 8-10 cucumbers, weighing 80-200 g each, per plant, while each tomato plant yielded about 12 tomatoes, 60-110 g each. In Mirny, too, it is not unusual to have fresh vegetables served during meals: tomatoes, cucumbers, radishes, green peas and spring onions. It seems, however, that cucumbers here are prone to producing infertile flowers, so much so that D. Kirilov asked a horticultural expert in Leningrad for advice on this problem.

Prior to planting seeds the boxed soil is thoroughly soaked with a solution of potassium permanganate, while during fruiting a solution of potassium salt is applied.

The general opinion appears to be that fruit trees could also be grown there, and this does not seem improbable at all.

Other pastimes of the staff include an aquarium. In their spare time the members of the expedition listen to lectures on Antarctic nature and learn foreign languages.

MASCOT

Soviet Antarctic explorers at Mirny have a mosquito for a mascot, according to the official news agency, Tass.

Tass described the mosquito as the first one on the Antarctic continent, and said no one knew how it got there or what was its country of origin. But it hums around Russian scientists in their heated dining-room while the winter winds howl outside — and it is granted immunity from swats. No one would dream of killing it. It is the only mosquito in the world which is protected by "diplomatic immunity".

OCEAN FLOOR

On June 8 Mirny reported that Soviet aqualung divers had made 164 descents to the ocean bed off the Russian base and had collected over 3,000 specimens representing 500 different species of Antarctic marine fauna. Among them were many previously unknown types, including "bearded" fish. Underwater photographs were taken.

Vostok, reporting on June 14, said that the temperature at the time was -75°C . (-103°F). Thanks to effective face masks and other protective clothing, the men had not suffered from frost-bite.

On the 15th Molodezh Station radioed that scientists there this summer would be studying the dispersal of meteoric trails by radar for the first time. Radar methods will also be used to measure ice thickness.

MELTING THE ARCTIC

Soviet scientists have examined several projects of melting Arctic ice, including the most feasible: the construction of a gigantic dam across the Bering Straits and the bringing of warm waters from the Pacific to the Arctic Ocean. However, scientists warn that the melting of Arctic ice may lead to a change in the climate of the northern hemisphere which may be detrimental to the economy and especially agriculture based on centuries-old experi-

ence. Therefore, scientists say, in the nearest decade it is necessary to make a detailed analysis of how the climate may change and how this change will affect the life of peoples inhabiting northern Europe, Asia and America.

Could all this be applicable to the Antarctic? Or are there insuperable obstacles in the southern hemisphere?

THE NEXT DECADE

Concluding a summary of the years January 1956 to January 1966, "A DECADE OF SOVIET GEOGRAPHICAL EXPLORATION IN THE ANTARCTIC", in No. 57 (1966) of the Information Bulletin of the Soviet Antarctic Expedition, the Soviet scientist **K. K. Markov** speaks of the work which still remains to be done.

"As can be seen from the whole of the above, Soviet research in Antarctica has opened up new horizons for Soviet geography and has enabled wide universal generalisations.

"In spite of the fact that the achievements of Soviet geographical science in Antarctica have been considerable, there still remains much to be done in the way of geographic research on the sixth continent. For a continent practically devoid of life, biogeographic research and a study of the land processes are extremely important both practically and theoretically. The lakes of Antarctica have hardly been studied at all, although their temperatures are unique, and their hydrochemical diversity extremely great.

"A second decade of Soviet research is now beginning in the Antarctic and new problems are arising. The main problems with regard to the geographical sciences are: (1) filling in the remaining blanks; (2) the subordination of geographic research to the main theme — studying and evaluating the natural potential of Antarctica. Solving these will require the co-operation of naturalists from many different branches of science, including geographers. Antarctic research will then have a goal, and will scientifically prepare this continent for peaceful human activity."

FEARS ON DDT

DDT, the most familiar of the chemical insecticides developed since the war, may be polluting the oceans and harming fish and other useful marine life.

The British research ship "John Biscoe" has brought back blubber and fat samples from penguins which are to be studied to see if they contain DDT.

Both the household and the agricultural use of DDT has increased enormously in recent years and there has been some concern that the chemical may have been carried into the oceans from the world's rivers.

In 1964, another Antarctic survey party discovered traces of DDT in penguins about 2,000 miles from the "John Biscoe's" current scene of operations.

NOW NORTH?

We have several times mentioned the projected Antarctic forays of Dr. Karl Herrligkoffer of Munich, Germany. As often, we have had to record "but nothing happened". See "Antarctic" 1 (271, 299, 383), 2 (175), 3 (247, 534).

In December, reports "Ice Cap News", the journal of the American Society of Polar Philatelists, Dr. Herrligkoffer announced that he would be leaving Germany in February, 1966, on a **North Pole** expedition! His plan, it seems, is to establish a base camp in North East Greenland, after the expedition has been flown in by a Hercules C-130. In the following summer, March-April, 1967, five or six Swedish tracked vehicles will, it is hoped, make the traverse to the North Pole.

In 1959, collectors were invited to purchase four labels depicting former German Antarctic expeditions. Now Dr. Herrligkoffer has postcards for sale, signed by expedition members, at a cost of 6 marks.

We have not heard whether Dr. Herrligkoffer has at last got off the ground.

Glaciological Journeys Planned From Mawson Station*

This year the Mawson glaciologist is a Japanese, Dr. Koshiro Kizaki. He was geologist with the Fourth Japanese Antarctic Research Expedition, 1959-61, at Syowa station and was working as a research assistant at the Geology Department of the University of Hokkaido when he applied for the position of glaciologist with the ANARE. Dr. Kizaki had had experience as a glaciologist at the Institute of Low Temperature Science and in the Yamoto Mountains area in Antarctica. He graduated D.Sc. at the University of Hokkaido in 1951. During 1966, field trips will be directed towards two objectives. A surveyor is to extend an accurate survey grid a further one hundred miles south of Mawson, into the northern range of the Prince Charles Mountains, using electronic distance-measuring equipment; and Dr. Kizaki is to carry out a variety of tasks on the ice plateau south of Mawson.

THREE MONTHS IN THE FIELD

The survey trip will be an elaborate affair and will take place in the spring. Two D4 tractors will haul two trains comprising cargo sledges and living caravans, and they will be preceded by light snow vehicles that will seek a route free of crevasses for the trains. The journey to the Prince Charles Mountains and back, totalling five hundred miles over the plateau, will take three months. However, in the autumn, a fuel-depotting trip was made to lay down dumps over the first half of the route.

Dr. Kizaki's work will be both local and in the field. On the plateau ice, about a quarter of a mile behind Mawson, a fibreglass insulated caravan has been set up.

To it are connected a variety of instruments whose recording heads are inside the caravan. One series of recording thermometers is sunk into the ice at various depths down to eleven metres; another set is erected in the free air above the ice to a height of four metres. Detectors to measure solar radiation are also installed beneath and above the ice. From recordings of these instruments the flow of heat through this top layer of ice can be determined. The final result is a balance between heat coming up from the rock beneath the ice, heat coming from the sun's rays above, and heat being lost upwards to the cold surface air. Dr. Kizaki will spend some time on most days of the year at this caravan.

TO THE CASEY RANGE

Fifteen miles south-west of Mawson is the northern end of the Casey Range. Past its rocky sides the continental ice flows rapidly, glacier-fashion, the ice being distorted into extensive patterns of severe crevassing where its flow is retarded by the mountain rock. Dr. Kizaki must make three journeys to this area. In March he planned to set up a number of stakes in the shape of square grids across the flow direction of this moving ice; in August and December he will revisit these stakes and measure the distortion of the grids. These measurements will define the strain due to the shearing forces on the ice. At each visit Dr. Kizaki will take samples of the ice from each grid and, back at Mawson, examine the crystal structure of the samples beneath a polarising microscope. He will study the relationship between the sheer stress in the ice and the orientation of the major axes of the ice crystals.

* Condensed and adapted from an article by Dr. Phillip Law in *Hemisphere*, June 1966.

To visit the Casey Range, Dr. Kizaki must travel either by dog sledge or by a motor-driven toboggan. Two such systems will be used and three men will form the party. The terrain is too highly crevassed for heavier vehicles and route-finding will take a lot of time. The safe route, when found, will be marked with bamboos carrying pennants so that it can be easily followed on the return trip.

In mid-January 1967, the relief ship will drop anchor in Mawson Harbour.

Back at the University of Melbourne Dr. Kizaki will spend twelve months analysing his observations and writing the scientific papers.

WILKES

During May the field party arrived back after surveying the dome in previously unvisited parts, suffering ten weeks of frustratingly slow progress when blizzards prevented travel or whiteouts and refraction prevented survey. Their last fix was done for the past season's ice movement. They romped home in glorious weather, doing thirty miles daily.

May was mild, with no real blizzards. The average temperature was 7°F, with a maximum of 29° and a minimum of -13°. The maximum wind gust was 67 m.p.h.

AUSTRALIAN ANTARCTIC STAMPS

Ten new Australian Antarctic Territory stamps will be issued on September 28, but not at post offices in Australia. The stamps, one cent to \$1 in value, are intended for use in Australian Antarctic Territory and at Macquarie Island.

Each illustrates one aspect of important scientific research being carried out by Australians in the Antarctic.

Collectors may purchase the stamps at the Postal Department's philatelic sales sections from September 28.

Values and designs are: One cent, aurora and camera dome; two cents, banding penguins; four cents, ship and iceberg; seven cents, wind

gauges; 15 cents, weather balloon; 20 cents, helicopter; 25 cents, radio communication; 50 cents, ice compression; \$1, parahelion ("mock sun").

SOME TIPS

"Dill Reports the News" (874 Bad Neustadt/Fraenk Sale, Martin Luther-Str. 28, West Germany) gives these hints to collectors of first-day covers.

FD mails will be postmarked with special FD postmarks at the Antarctic Stations Mawson, Wilkes and Macquarie Island as soon as the relief ships deliver the new stamps at these stations. Addressed FD mails must reach before **October 28** Australian Agency (Philatelic Bureau, 664 Bourke Street, Melbourne, C.I, Victoria) where the mails will be stamped and forwarded to the Antarctic Stations. Service charge per cover is 2c if not more than four stamps are to be affixed on the cover, 5c if five or more stamps are to be affixed. I suggest to forward three covers per set and to mention on each cover by pencil which values are to be affixed on the cover. Official FD envelopes (general design) are available from the agency for 2c each and will be addressed for an additional 2c each. Affixing the stamps will cost once more 2c. Mention on the front of each of your covers from which base you wish it mailed with FD postmark. (1 U.S. \$ about 88c; 1 IRC equals 7c.)

NEW ZEALAND NAMES

Among features recently named by the Australian Antarctic Names Committee are two mountain formations in Australian Antarctic Territory which are named after New Zealanders who have served with Australian expeditions. They are:

CLAGUE RIDGE (71° 14' S., 65° 41' E.) S.E. of Mt. Hicks. E. L. Clague was weather observer at Wilkes Station in 1962 after having served on Campbell Island in 1958 and 1960.

THOMSON MASSIF (70° 35' S., 70° 48' E.) in Aramis Range, Prince Charles Mountains, named after R. B. Thomson, officer-in-charge at Wilkes in 1962 and now Superintendent of the N.Z. Antarctic Division.

BRITISH ANTARCTIC SURVEY

TRAGEDY AT STONINGTON ISLAND

Tom Allan and John Noel left the B.A.S. base on Stonington Island in Marguerite Bay after lunch on May 23 with two dog teams and sledges. They intended to be out about ten days to keep the dogs in trim for the sledging season and had food and fuel for 30 days. Twenty miles was the farthest from base they expected to go. On the evening of May 24 they reported for the first and last time by radio from their camp at the east end of Butson Ridge (68° 05' S.) at a height of 2,000 feet. At this point they had travelled 15 miles since leaving base.

Bad weather affected the area for the next two days with winds gusting between 80 and 100 knots and heavy drift snow. Since this sort of weather is not unusual and radio communication is uncertain, no concern was felt about their safety until they failed to return to base on time. A search party then set out from base and found their bodies and those of their dogs some three and a half miles beyond their camp of the 24th.

The bare facts were reported by radio and at first it was thought their camp had been destroyed by wind and blown rock chips, of which many were found in the vicinity. It was not until the search party returned to base that their evidence revealed a very different situation. It is still too early to draw conclusions and the full story may never be known, but at least they were not let down by their tents because they never pitched them.

The search party found the body of John Noel buried up to his armpits in hard-packed snow with the bodies of five dogs lying nearby. Lying on the surface and about 100 yards away was the fully clothed body of Tom Allan. Near him was a small shovel. It took many days to excavate the area of the supposed camp site. They found that John

was upright in a shaft above a snow cave in which were sleeping bags, cooking gear and food. Five feet down and on the original surface they found a sledge on its side with a tent bag and a small tent stuffed into it. At right angles to this was a low wall of dog food cartons. Nearby was a line of dogs buried at the same level.

Clearly all was well on the morning of the 25th when they struck camp and headed north through a col but it can only have been a short time before they were caught by a sudden change of weather. At this point the plateau rises sharply to 5,000 feet in the east, but falling away to the north and west there are two wide glaciers and there is likely to be much turbulence as the wind pours down off the plateau and is channelled off by the two glaciers lying at right angles. In the lee of Blow-me-down Bluff, as the nearby heights are aptly called, the wind will also deposit a large amount of drift snow coming off the plateau. All they could do, it seems, was to stop and try to make camp. By the time they had unlashd the load it was too bad to erect the tent and so they made a temporary wind break with the sledge and dog food cartons. Sheltered by this they then dug a hole in the snow and got inside it with their sleeping bags, a food box and cooking gear, blocking the entrance with a personal bag. The cave was 8 ft. in diameter and their unrolled sleeping bags and ice in a pot on the primus stove shows they were in a position to survive.

What made them relinquish this position is hard to say, but five feet of snow had accumulated over their original entrance before they did so. This means that snow was no longer drifting or was very slight. The bag with five feet of snow on top would stop them digging out the way they got in so they dug a fresh shaft to the surface. Tom Allan got out

through it and John Noel remained in it with his head above the surface. The former was clothed to go outside, the latter had his anorak, snow goggles and gloves on but only indoor trousers and felt slippers below the waist.

Those who read this will tend to form conclusions but it would be wrong to do so until the diagrams and photographs can be studied and the search party questioned. An inquest will be held in Port Stanley when the latter come up from south early next year.

The Antarctic takes its toll from those who strive hardest. These men were no exceptions.

THOMAS JOHN ALLAN

Thomas John Allan, son of Mr. and Mrs. J. Allan of Inner Leithen, was 26 years old. He was educated at St. Ronan's Secondary School, Inner Leithen, from 1945 to 1955. He served an apprenticeship from 1956 to 1961 as a joiner and during this period he obtained his City and Guilds full technological first class certificate in carpentry and joinery. In August 1964 he joined the Edinburgh Education Committee as a teacher in carpentry and joinery in the Technical College. Mr. Allan joined the British Antarctic Survey as a General Assistant/Carpenter in the autumn of 1965 and sailed for Stonington on board the R.R.S. "John Biscoe" on October 29, 1965.

JOHN FRASER NOEL

John Fraser Noel, son of Mr. and Mrs. V. Q. Noel of Cardiff, was 24 years old. He attended the Viriamu Jones County Secondary School from 1954 to 1957 and then he commenced an apprenticeship in radio and television engineering. During his apprenticeship he attended the Newport and Monmouth College of Technology and also the Cardiff Technical College. He gained his City and Guilds telecommunication qualifications and also his Postmaster-General's Certificate. He joined the

British Antarctic Survey in the autumn of 1964 and sailed on the R.R.S. "John Biscoe" on October 22, 1964. During his first year he served at the Survey's base on Adelaide Island and moved to Stonington Island in his second year. John was a keen scout and was a representative at the World's Rover Scout Jamboree. In 1961 he was awarded the Scout Gilt Cross for bravery after rescuing an injured climber on Ben Nevis.

WHY ?

People still ask, "Why do you spend all this money going to such a barren, useless waste as the Antarctic?"

In a recent article in the London "Times" Dr G. de Q. Robin, Director of the Scott Polar Research Institute, Cambridge, gives a striking answer from which we cull a few pertinent sentences.

"The major reason for the continuing research remains the need to add to the basic knowledge of man's environment. To meet this need, and the expanding demand for food, we must know more about the factors affecting plant and animal growth on land and in the sea, under as wide a range of physical conditions as possible."

Dr Robin points out that to discover, for example, why the plant and animal content of Antarctic seas is more concentrated than in the oceans of temperate and tropical regions, studies are needed embracing solar radiation and its absorption, the mineral content and temperature of the sea, and a whole range of biological and biochemical problems. Such studies in Antarctica, he says, will form an important contribution to the international biological programme.

Relief Plans Announced For Chilean Antarctic Bases

The difficult task of preparing for the next change-over of personnel at the three Chilean stations at present manned in the Antarctic Peninsula area begins as soon as the previous team has been relieved.

This work goes on throughout the twelve months of the year and places a heavy responsibility upon those concerned in its implementation. It must be remembered that once the ships have left Chile there is no possibility of adding to the stores carried, even the most essential of items.

Detailed planning of the 1966-67 relief operation began four months before the relief is due to take place. El Comandante de Escuadrilla don Mario Jahn, Head of the Antarctic Department of the Chilean Air Force, spoke to the press recently about the forthcoming relief of Presidente Aguirre Cerda Base on Deception Island. Commandant Jahn was himself Leader at this base during 1965, and his considerable experience fits him to carry out his responsible task. He must have the whole operation completely planned by the first fortnight in December.

The Air Force must plan the whole process of supply, repair and construction which it will be necessary to carry out at the base as also the training of the new personnel who will be wintering over there during 1967.

Commandant Jahn pointed out that the preparations involve the three principal tasks of relief, repair and construction in addition to the scientific function which the Aguirre Cerda Base fulfils, which is that of being an Antarctic weather centre of comparative importance with the American McMurdo Base and the Russian Mirny.

TEAM FOR 1966-67

The first of these phases in the preparations, that of the relief of the bases, began with the selection of the new personnel fitted to carry out the tasks assigned to them for a whole year in an inhospitable environment of which it is necessary to anticipate the worst consequences.

When the selection by the Chilean Air Force began, more than 160 men presented themselves, attracted principally by the economic stimulus of a 600 per cent. "zone rate" over and above the basic salary, equivalent to two and a half or three times the total salary received in Chile. From this number 16 airmen were appointed after consideration of their service records and personal suitability, and after medical, dental, psychological and psychiatric examinations.

Commandant Jahn indicated that the men selected are regarded as in every way qualified to begin their specialised training, comprising courses in fire-fighting, ski-ing, survival, meteorology, seismology, vulcanology, etc.

Leader at Pedro Aguirre Cerda Base will be Capitan de Bandada don Jorge Iturriaga Moreira, and his deputy will be Capitan de Bandada don Luis Puebla Leiva. The former will undergo special courses preparatory to his taking charge of the seismological and vulcanological station, while Captain Leiva will make himself familiar with the programme in marine biology.

In addition, five radio-operators have been selected to maintain the

24-hours-a-day radio schedules, two mechanics to maintain the motors supplying the electrical power, and an electrician to make any necessary repairs. Two civilian meteorologists and a meteorological assistant have been selected. These three men will co-ordinate the information supplied by the instruments, to produce the weather charts and forecasts, in addition to the production of meteorological statistics.

Also engaged is a medical orderly with experience in the treatment of injuries, dentistry and general health problems, a cook (always the key man) and a handyman experienced in carpentry and plumbing, whose job it will be throughout the year to maintain in good working order the pipes and mains necessary for the supply of water and petrol and for sewage disposal.

During the 1965-66 season a group of ten scientists under the auspices of INACH (the Chilean Antarctic Institute) initiated a research programme directed to work in ecology, lichenology, vulcanology, seismology and a seal census. The terrestrial ecology and lichenological programmes have involved the study, both quantitatively and qualitatively, of terrestrial invertebrate fauna and their peculiarly important associations in Antarctica so as to obtain a complete bio-geographical sequence over the whole country and the "Antarctic territory" in which Chile is interested. As well as purely academic studies these investigations are aimed at exploring the nutritional possibilities of Antarctic and sub-Antarctic soils and the potential utilization of certain elements for medicinal purposes.

ARGENTINA

The scientific programme for the current year is essentially the same as in 1964 and 1965. The following stations are operating: Deception, Orcadas, General Belgrano, Teniente Matienzo, Esperanza, Sobral and Almirante Brown.

The same ships, aircraft and organisations are expected to be operative in the 1966-67 summer as were working in 1965-66.

THE ANTARCTIC POINTS THE WAY

In a leading article on Space Research a leading Australian newspaper refers to the "historic proposal" of the President of the United States calling for "a comprehensive treaty to keep celestial bodies free for exploration and use by all countries, guarantee freedom of scientific investigation, and urge international co-operation in activities relating to outer space bodies, seek to avoid their harmful contaminations, ban their use as sites for mass destruction, weapons, weapon tests and military manoeuvres, and assure assistance by astronauts of one country to other astronauts".

The paper adds, "The pattern of the President's proposal harks back to the treaty which pledges the 12 countries conducting Antarctic research to use the southernmost continent solely for peaceful purposes and to co-operate in scientific exploration there."

THESE WOMEN!

His attention arrested by an advertisement for Antarctic staff, a "Waikato Times" staff writer muses:

"It sounds a wonderful way to get away from it all, whatever all may be, until you see the cloud no bigger than a woman's hand forming on the horizon. For it is reported by an unimpeachable source, Reuter, that 17 Arctic explorers who are hoping to leave Britain later this year will be women. They are going to do field work in the wild mountainous region of the something or other 100 miles inside the Arctic Circle.

"Before you break into hoots, and ask what has the fact of 17 women going to the Arctic got to do with the 17-odd dinkum Kiwis being sought to go to the Antarctic, consider for a moment the nature of the pretty little things.

"Do you know a woman who knows the difference between the Arctic and the Antarctic? Odds on they won't realise until they get to the spot 100 miles within the Arctic Circle all prettied up in the parkas, that they've gone to the wrong pole."

United States Continues Extensive Antarctic Programme

The U.S. Navy Operation Deep Freeze 67 will be supporting the 1966-67 United States Antarctic Research Program (USARP) at six stations, Byrd, McMurdo, Palmer, Plateau and Pole, as well as the seasonal Hallett Station.

The U.S. ships taking part in operations in the Ross Sea area in the coming summer will be:

U.S.C.G.C. "Glacier"
U.S.C.G.C. "Eastwind"
U.S.C.G.C. "Staten Island"
U.S.N.S. "Towle"
U.S.N.S. "Wyandot"

and either "Alatna" or "Chattahoochee".

First due to arrive in New Zealand is the picket ship U.S.S. "Mills", which will support the first fly-ins in late September and early October. "Mills" will be relieved by "Thomas J. Gary" at intervals, beginning in October.

The relief of Palmer Station on the Antarctic Peninsula will be carried out by the "Staten Island", the U.S.C.G.C. "Westwind" and the "Wyandot".

Three major research programmes are planned for the summer:

- (1) A broad-based scientific survey of the Byrd coast, using helicopters.
- (2) A paleontological survey in the northern Sentinel and Ohio Ranges.
- (3) A geological survey near the head of the Beardmore Glacier.

These three projects comprise a large number of special investigations to be carried out by groups of scientists from various American universities and other institutions. There will be in addition some score or so of other special projects.

"ELTANIN"

U.S.N.S. "Eltanin" in May this year completed her twenty-third cruise as an Antarctic research vessel since her conversion to a floating laboratory in 1961-62.

The only vessel functioning exclusively for Antarctic research, "Eltanin" represents a significant departure from the established pattern of research activity in Antarctica and permits the study of many disciplines in the waters surrounding that continent. Formerly an Arctic supply vessel, "Eltanin" was well suited for the duties that the National Science Foundation planned for her. Extensive modifications, including the conversion of hold space to laboratories, scientific workshops and scientists' staterooms, the installation of anti-roll tanks and protective bulwarks to enable work on deck in bad weather, were made to "Eltanin" and after two shakedown cruises, she left on her first cruise in May 1962.

Some 20 U.S. agencies and institutions have had scientific programmes aboard "Eltanin" in the four years since that time, with a number of foreign representatives accommodated as well. In 1965 she had installed a prototype of a new satellite navigation which allows for her position to be determined at frequent intervals and in any type of weather, with an accuracy not before known.

Twenty of her 23 cruises have been in Antarctic waters, involving her in 1,135 days at sea, covering a distance of more than 150,000 nautical miles. She has penetrated the fringes of the pack-ice several times and worked stations as far south as 70° 26' S. Her systematic survey of southern seas is expected to have covered all the seas surrounding the Antarctic continent within the next ten years.

Principal programmes have been marine biology and geology, physical oceanography, meteorology, and upper atmosphere physics.

The "Eltanin's" cruises 24 and 25 will be between Auckland, New Zealand, and Valparaiso, Chile, from July to November this year.

Cruise 26, scheduled to leave New Zealand early in December, will be a short cruise in the Tasman Sea followed by a longer cruise in the Ross Sea.

WOMEN SCIENTISTS

On board "Eltanin" when she was in New Zealand waters in May were two women scientists. Dr. Nancy Walls is a marine bacteriologist and a professor of research at Georgia Institute of Technology, Atlanta. Mrs. Dorothy De Foor, also from Atlanta, is her research assistant.

Their task was to examine sediments taken from the bottom of the Antarctic Ocean. "We have been studying bacteria," said Dr. Walls, "looking for kinds, total numbers and growth under Antarctic conditions." The two women took their turn on the three-hour watch in the electronical laboratory, attending the precision depth-recording instruments, and also helped other scientists with mechanical aspects of their work.

Both thoroughly enjoyed their work and would like to go back again. Neither had been at sea before.

VARIETY

The lowest temperature ever recorded by U.S. scientists at an American Antarctic base hit Plateau Station on June 13 last with an all-time low of -116° F. Three days later came the warmest day of the week, a banana-belt -71.6° .

Plateau Station expected to out-chill the sub-continent's lowest temperature, -127° registered at Vostok in 1960, during the next few weeks.

At about the same time as Plateau was undergoing a record low in temperature, scientists at Palmer Station had home-grown salad. Palmer's first crop, a solitary lettuce of 20 small leaves, was reported as being "very good".

THE NEXT FIVE YEARS

With so much achieved, and still being achieved, in the Antarctic, both scientifically and exploration-wise, the question may well be asked, What next?

The answer lies in the outline of the objectives of the United States Antarctic Research Program, as developed by the National Science Foundation and approved by the Antarctic Policy Group in February this year, objectives for the years 1965-70.

The plan proposed is for research and other activities in and around the Antarctic, and is divided into three major sections—scientific plans, which cover a continuation and updating of earlier schemes reflecting the interests of American scientists; other activities, concerned with matters not purely scientific and in some cases as yet problematical; and finally the development of facilities and techniques, concentrating on the means and methods of support of U.S. activities.

SCIENTIFIC

Terrestrial and marine studies will be pursued both from Christchurch, New Zealand, and the Antarctic stations. McMurdo, Byrd, South Pole and Palmer stations will be the main scientific bases, and, as staging areas for continental operations, will be concerned primarily with mapping most of the inland and coastal ice-free areas and with glaciological and geophysical traverses which will cover all important inland-ice areas. With the completion of these programmes the major exploratory phase of Antarctic scientific work should end by 1970.

Thereafter there will be a gradual change-over from the collection of general knowledge of the continent to a scientific exploitation of the knowledge gained, by means of such things as space and satellite programmes, long-wire antenna, deep-drilling operations and the sub-ice chamber. Each year some 50 projects in various disciplines are expected, involving up to 150 scientists. Biological reconnaissance of inland ice-

free areas, installation of laboratory facilities at Palmer Station, terrestrial and marine research in both the east and west coasts of the Antarctic Peninsula are envisaged, with transport, communication and research all being assisted by the Palmer Peninsula Trawler. Submarine techniques will add to man's knowledge of life under sea and fast ice, while the USARP research vessel "Eltanin" will continue to carry out marine biological research.

Cartography, by means of aerial photography, surface geodetic control and compilation of maps, will continue in three-year phases. First, any specific area will be covered by aerial reconnaissance photo flights; the next year will see the photographs taken and the third year will allow for surface geodetic control. Helicopters will be used in many of the areas where ice-free features may be widely separated and surface surveys across the snow area are needed.

Geological research also will continue to make use of helicopters, turbine helicopters which have already proved their inestimable value in this type of work. Specialised geological studies are expected on the continent itself and its offshore islands. Exposed rocks in the general area of McMurdo illustrate a long span of geological history and are within easy reach. The Antarctic Peninsula and the Scotia Arc should receive increased attention.

Glaciological programmes include the South Pole-Queen Maud Land Traverses, deep-drilling, the study of inland ice movement and concentrated work on local glaciers in the McMurdo area. Airborne radar soundings are expected to give ice-thickness measurements where the ice is not covered by oversnow traverses. If a suitable aircraft is available, an airborne laboratory will be inaugurated in the 1966-67 summer for the collection of a wide variety of data such as ice thickness soundings, magnetic measurements and other aerially-gathered points. Satellite photography, anticipated in the Antarctic for several years, will contribute to the investigation of

sea-ice deformation and movement. Solid-earth geophysics, finding out about the earth's crust and mantle, will be conducted by means of gravity and magnetic data collecting, possibly from an aircraft which would allow for world-wide series of flights similar to those now being conducted by a special airplane for the Navy's Project Magnet. Seismic exploration at sea will be effected by using "Eltanin" and an ice-breaker.

Meteorology, oceanography and upper atmosphere physics are also planned for the years up to 1970.

OTHER ACTIVITIES

Non-scientific goals are becoming increasingly interesting to organisations and individuals in the United States and elsewhere. Utilization of Antarctic material, concrete or abstract, is expected to take, in part at least, the place of the exploratory and descriptive efforts that have been occupying the Antarctic programmes. New means of living more comfortably, supporting life more effectively, have already been the subject of research, while scientific findings have raised questions as to the quality and potential of coal and fossil fuel, of minerals, the possibility of predicting earthquakes, the compilation of better weather forecasts. Above all, biological resources of the Antarctic are under special study for their adaptability elsewhere.

Investigations into the possibility of the Antarctic helping to alleviate shortages of many kinds is expected to follow the completion of the explorative phase of Antarctic research. Marine biological products may well be acquired from whales, plankton and seals, and antibiotic substances from Antarctic marine microflora, perhaps even by means of mass culturing or laboratory synthesis. Minerals are not expected to be worth the costs of exploitation, but there remains a persistent interest in the possibilities of using icebergs to supply fresh water in rain-deficient regions.

The communication network established all over the Antarctic con-

continent and linking it with adjacent land areas may come to be used to relay commercial traffic among the population centres of the southern hemisphere, as well as providing refuelling points for commercial aircraft flying austral polar routes, communication paths, weather data and navigational guidance.

Food storage in an age becoming more and more conscious of atmosphere chemical pollution and nuclear radiation may, in the future, have to rely on the low temperatures and comparative freedom from pollution of the Antarctic air. Relatively stagnant glacial ice near the coasts may provide the safest storage areas.

Tourism too is a likely feature of the Antarctic in the next five years, with mountaineering on a private non-commercial basis also expected to appear.

Non-scientific activities are even now sometimes requested by agencies of the Federal Government, to accomplish specific missions or to amplify Antarctic Treaty obligations. Lunar programmes and man-in-space projects could well be fostered by an Antarctic laboratory, and, whatever the future may bring, present-day publication and exchange of information gathered in the continent will continue, as well as publicising of U.S. activities for the Americans at home.

FACILITIES AND TECHNIQUES

Need will remain for construction and rehabilitation advances at the four permanent U.S. Antarctic stations, McMurdo, Byrd, Pole and Palmer stations. McMurdo originated solely for logistic support purposes, for a temporary four-year period. Additions and amendments have been made post-IGY and even further ones are planned for the 1965-70 years, including laboratories, facilities and housing for men and women. Similar plans are afoot for the other three stations and it is hoped that logistic requirements of the more inland stations will be reduced by further attention to station design and construction.

Plateau Station buildings may be resited at the South Pole in 1968, thus allowing the wintering party to use smaller and less expensive, maintenance-wise, buildings for living quarters. Palmer Station is listed for a consolidated building to house 15 to 20 scientists and support personnel, which will be of a permanent nature, needing no further attention other than routine maintenance for many years.

Winter intercontinental flights, the introduction of manned and unmanned submersibles and other new projects are also under consideration.

AT 12,000 FEET

Results of medical research on the eight men wintering over at the new Plateau Station are already being received.

In an attempt to accommodate to the low oxygen content of the air at nearly 12,000 feet, man's body has increased the red blood cell count, as well as the oxygen-carrying component of the same red blood cells.

Studies by the Russians at Vostok, only a few hundred feet lower in altitude than the Plateau, showed extremely low blood pressures in personnel there; but at Plateau blood pressures are now generally stable after an initial noticeable high.

PERSONAL

The retirement in Washington is announced of former friend and associate of Admiral Byrd, Dr. James E. Mooney, whose association with Antarctic matters has been active for many years. Formerly an educator and editor, Dr. Mooney joined Admiral Byrd's staff as a consultant, in which capacity he remained with Rear Admiral George J. Dufek when Dufek succeeded Byrd as U.S. Antarctic Projects Officer. In 1959, Dr. Mooney became Deputy Projects Officer and held that office until its abolition in April 1965, when he moved to the Pentagon as Special Assistant to the Assistant Secretary of Defense for Antarctic Matters.

Dr. James Elliott Mooney, on his retirement, was the recipient of a commendation "relative to expressing the gratitude of the members of the committee on Interior and Insular Affairs . . . for his distinguished public service and contributions to the U.S. policy and international co-operation in Antarctica".

HERE COME THE TOURISTS

Commander W. H. Withrow, U.S. Navy, speaking to the Southland branch of the Ex-Royal Navalmen's Association on June 15, said that constant enquiries were being received by Operation Deep Freeze from airlines and travel agents on the possibility of taking tourists to the Antarctic. "We are not ready to receive women or tourists down there yet," he said, "but the time will surely come when facilities exist for them. When the tourist industry gets to Antarctica, New Zealand will be the natural jumping-off place."

Operation Deep Freeze had already contributed much to New Zealand's tourist industry, Commander Withrow said. Not only the 2,000-odd servicemen and scientists passing through, but influential American visitors to the project had taken the opportunity of seeing much of New Zealand. They all returned home with the same story, praising the beauty of the land and the hospitality of the people. This was the best type of publicity any country could get.

ANTARCTICAN SOCIETY

The United States counterpart of the New Zealand Antarctic Society, publishers of "Antarctic", is a flourishing body of some 250 members which was organised in 1959, "to facilitate the exchange of friendly and informal views about the Antarctic".

Four or five meetings are held each year in Washington, the programme usually consisting of an address or a film, followed by a coffee hour to facilitate discussion and an opportunity for members to meet the speaker.

At the January meeting the address was given by Dr Richard L. Penney who spoke on "Penguin Navigation". Dr Penney, who began his studies of penguin behaviour at Wilkes Station in 1959, illustrated his talk with colour slides and motion pictures.

Lady members of our own Society will be interested to learn that Antarctic Society scarves have been produced. They are described as "beautiful and distinctive pieces of apparel" and cost \$10.00 per scarf.

Officers for the current year elected in May are:

President: Dr. A. P. Crary.

Vice-President: Dr. H. M. Dater.

Secretary-Historian: G. A. Doumani.

DEEP FREEZE AND THE MOSQUITOES

During the war, to deceive enemy agents, tropical equipment was often issued to servicemen going to cold climates. Recently, a large supply of mosquito nets was somehow included in stores for Operation Deep Freeze.

The supply staff at the Christchurch U.S. Support Force Headquarters thought of the Lepers' Trust Board as likely to have more use for the mosquito nets. The Board agreed, accepted the gift gladly, and shipped them to the New Hebrides and Solomons. One very grateful recipient, the Sister in Charge of the Presbyterian Vaemali Hospital in the New Hebrides, which is supported by the New Zealand Church, explained that the actual hospital block has screened doors and windows, but there were two lepers (a married couple and child) living in a native hut in the grounds, so she gave two of the nets to them. She found it very difficult indeed to know which of her 40 out-patients should get the remainder, so she gave them away on the basis of first come, first served, as they arrived to renew their medical supplies.

Whaling Conference Makes Very Modest Cut

When whaling industry experts from 16 countries met in London for their annual conference in July, one of their first tasks was to set a maximum target for the number of whales allowed to be caught in the Antarctic.

The International Whaling Commission, whose chairman this year is Mr. M. Sukhoruchenko, of the Soviet Union, was faced at the outset of its meeting with a report that Japan and the Soviet Union, the two biggest whaling nations, had failed in a pre-conference attempt to reach agreement on their catch targets.

PRIVATE MEETING

During the previous week representatives of Japan, Russia and Norway had met privately in London in an effort to find a way of meeting a Soviet request that she should be given a bigger quota of the catch than she had at the moment.

Japan, which had 52 per cent., offered to surrender some to the Soviet Union, which was limited to 20 per cent., if Norway would surrender some of her 28 per cent.

Behind the offer, and the attempts to reach agreement, there was a feeling that unless Russia could be placated there was a danger of a free-for-all competition for the whale catch between Japan, Russia and Norway.

The commission announced on July 5 that it would reduce the permitted catch by factory ships, in 1966-67, from the present 4,500 units to a new maximum of 3,500.

The commission warned of a possible further cut the following season. Whalers operating from land bases are being asked to continue voluntary restriction on catches they agreed to last year.

NON-MEMBERS

The commission expressed concern at the number of whales being caught by land stations in countries not members of the international commission. These will be asked to support the commission's measures.

The communique did not mention any countries by name, but it is understood that operations by Chile and Peru were specifically discussed.

SCIENTISTS ALARMED

The commission's decision has been attacked by scientists. They say this limit will not help keep the species in existence. A maximum of 2,000 would be more realistic.

Scientists claim that the commission bowed under pressure from Japan and Norway, who see extensive catching as the only solution to their recent large investments in whaling factory vessels.

Before talks began in London, the World Wild-life Fund said that a 30,000 strong prewar blue whale colony in the Antarctic had shrunk to a mere 600.

EXTERMINATION

Britain and Russia were against the 3,500 catch proposal, and scientists say that even if the commission had decided there should be no blue whale catch this year, the extermination of other species — fin and sei — is well under way.

A blue whale unit is equal to two fin whales or six sei.

The commission was urged by Britain and Russia to keep a 2,000 blue whale unit limit.

LATE NEWS

As we go to press comes the news that an early spring flight via Christchurch to McMurdo and Byrd Stations has been successfully completed on September 14 by a United States Hercules aircraft, to evacuate a scientist from Byrd for an appendicitis operation.



Not much of SANAE remains above the snow.

ANTARCTIC STATIONS

7

SANAE

70° 18' S. — 2° 21' W.

The Republic of South Africa took over the Norwegian base at Queen Maud Land in the Antarctic on January 12, 1960, and established its own base known as "Sanae".

During 1960 and 1961 the South Africans used the base established by the Norwegians. The buildings were, however, covered by some 18 ft. of snow. As a result the timber supports were cracking and the roofs were caving in.

The Department of Transport, which administers Antarctic research, commissioned the Department of Public Works to design and construct suitable buildings for erection at Sanae. This was no mean task as South Africa, with its sunshine, has very limited experience in regard to the construction of buildings under such adverse conditions. Fortunately Great Britain, America, New Zealand and Belgium came to her assistance.

The site selected for the new base is situated at 70° 18' 32" S. and 2° 21' 30" W. and some 12 miles from the edge of the ice front. The buildings were constructed in South Africa and conveyed to Sanae by the M.V. "R.S.A." on its maiden voyage at the end of 1961. During 1962 the buildings were assembled at Sanae and positioned on the new site.

The following buildings were erected in such a way that a snow wall separated each building from the other. The snow wall was considered essential to minimise the hazard of fire spreading from one building to the other:

- Auxiliary engine room, 8 ft. by 8 ft. by 8 ft.
- Technical building, 40 ft. by 20 ft. by 8 ft.
- Toilets, 12 ft. by 8 ft. by 8 ft.
- Sleeping quarters, 72 ft. by 20 ft. by 8 ft.
- Living and dining room, 40 ft. by 20 ft. by 8 ft.
- Power shack, 40 ft. by 20 ft. by 8 ft.
- Balloon hut, 12 ft. by 8 ft. by 8 ft.
- Animal laboratory, 16 ft. by 8 ft. by 8 ft.



But Mid Winter Festivity reigns below.

Garage, 16 ft. by 12 ft. by 8 ft.
Variometer hut, 16 ft. by 8 ft. by 8 ft.

Apart from these buildings the huts housing the instruments used in connection with the various scientific programmes are situated close to the main buildings and, in contrast to the main buildings, are not covered by snow.

The technical building houses the various laboratories and also provides office accommodation for the scientists. The laboratories are self-contained units and they are on a par with others on the Antarctic continent. They are fully equipped to allow scientists to carry out research work and to disseminate and correlate scientific specimens and data.

The sleeping quarters can accommodate 22 persons. This unit also includes a surgery and a hospital. The sleeping cubicles provide for privacy and the unit is properly fitted with the necessary facilities. The well-stocked library, containing an excellent selection of scientific volumes as well as fiction, is also

situated in this building and it is within easy reach from both the sleeping and the living quarters. The "wanson" heating plant, for the interior heating of the building, is also placed here. The watchword in this building is "silence" in order to enable the men off duty to have a proper rest.

The living quarters combine kitchen and dining room. The dining room is also the focal point for recreational purposes. A small snooker table is available for those who require a bit of physical exercise, and a radiogram and records provide mental relaxation for the homesick and the weary.

Provisions are stored in a snow passage which is approximately 300 feet long. The storage space provided is ample and can accommodate at least two years' supplies. A supply for two years is carried in order to cope with an emergency in the event of a relief ship being unable to force a passage to the Antarctic.

Electricity is provided by two powerful diesel engines and a third

is used as a standby. Two diesel mechanics are in attendance and are responsible to keep the engines going. Adequate spares are stocked, and a well-equipped workshop is available.

South Africa does not include building artisans in its expeditions. Routine maintenance work to the building is the responsibility of the expedition members, and major maintenance work is carried out by artisans from the Public Works Department during relief voyages. South African expeditions have attained a remarkable feat in doing routine maintenance so well that no major maintenance has been necessary so far.

All the good maintenance work cannot, however, save the fate of this base. The writing is on the wall and it is evident that a new base will have to be erected within the next few years. At present the base is covered by some 20 feet of snow and the foundations of some of the buildings appear to be sinking. This is mainly noticeable in the kitchen and the power shack where heat and vibrations are causing the melting of the snow. This will in the meantime be countered by filling the hollows with snow and by introducing cold air in order to solidify the snow.

When planning the erection of a new base the weaknesses of the present system will be taken into consideration. The Republic has also embarked on a rigorous training system for expedition members before they are sent to the Antarctic. In order to enable them to maintain their physical fitness whilst in the Antarctic consideration will have to be given to the erection of a recreational room where they can enjoy the necessary facilities.

LA ANTARTIDA DE HOY

The Society has available a few copies of the **Spanish** edition of **The Antarctic Today**. Apply to the Editor.

AMUNDSEN'S LETTER TO CAPTAIN SCOTT?

An Auckland, New Zealand, barber possesses a manuscript which on the surface appears to be the letter to which Scott in his diary refers:

"A note from Amundsen, which I keep, asks me to forward a letter to King Haakon."

If genuine, this is the note dated December 15, 1911, which Scott found on January 18, 1912, inside the Norwegians' tent, their last camp before the Pole. It is being sent to Norway for verification of the handwriting as Amundsen's.

Two Scandinavians living in New Zealand have expressed to the "New Zealand Herald", which published a facsimile of the letter, their opinion that it was not written by a Norwegian. Their doubt is based upon the formation of certain letters. Another Scandinavian says he feels sure it is genuine.

The note reads:

Polheim 15:12:11

Dear Captain Scott,

As you probably are the first to reach this area after us I will kindly ask you to forward this letter to King Haakon VII.

If you can use any of the articles in the tent, please do not hesitate to do so. The sledge left outside may be of use to you. With kind regard, I wish you a safe return.

Your

Raold Amundsen.

PRICE RISE

We regret that a considerable rise in printing costs makes an increase in the subscription to **Antarctic** unavoidable. From January 1, 1967, the annual subscription for non-members of the Society will be £1 5s. (\$2.50 N.Z.). Back issues, when available, will be sold as before at 5s. (50c) per copy, for the time being. Copies of **Antarctic News Bulletin** will now be also 5s. per copy. Arrangements are being made to reprint out of print issues. All indexes will be 3s. (30c) per copy.

Around the Sub-Antarctic Islands

KERGUELEN

(France)

The 1965-66 relief was carried out during the first fortnight in April. The tanker "Lucien Desmarais" was able on April 10 to re-supply in bulk the fuel storage station at Kerguelen. Since then life at the southern and Antarctic stations has taken on its "ordinary cruising rhythm".

Winter began as early as May, after a very cool April, with a severe and almost continuous frost which lasted into June. Outside work was hindered without being completely interrupted. Among the more important tasks were:

Completion of the lead-in of the water supplying the hydrogen generator from the fire cistern.

New access road to the plateau, now open to traffic. It has necessitated, during the quarter, 1,400 cubic metres of filling.

Construction of an agglomerate shelter for the water tanks supplying Port-aux-Français.

Fitting up of a centre for the distribution of H.T. current on the plateau.

Construction of a new shelter for the inflation of weather balloons at the wind-break walls (5×5×8 m).

During a violent storm on April 6-7 the barge "L'Oiseau" ran aground at the head of Port-aux-Français inlet after having broken its mooring chain. More frightened than hurt! The transmitting rhombic aerial on Paris was also broken on the same date and for the same cause. It was repaired and put back into service on May 25 after some modification of the aerial supports.

During May a reconnaissance team in the Ross area returned to Port Jeanne-d'Arc after five days of particularly atrocious weather.

CROZET

(France)

Crozet weather this quarter has been like that of Brittany, relatively mild, going down in June to a mini-

mum of -2°C . (28.4°F .) and rising to a maximum of $+14^{\circ}\text{C}$. (57.2°F .)

As is the custom with storms, that of May 10, 1966, distinguished itself by extraordinary violence, carrying off the temporary wharf being used for unloading.

Work has carried on normally. The 5-ton cable railway has been completely repainted. A shelter has been constructed for the refrigerating chambers. A pylon has been erected for the "Zeppelin" antennae. The foundation of the hangar destined to shelter the crane on the beach has been completed.

Our ornithologist with some kindly assistants has been prospecting on the Plateau des Petrels, the Branboires valley and Mounts Alouette and J. Verne.

All the French stations celebrated Midwinter's Day on June 21 with due éclat and good humour.

MACQUARIE ISLAND

(Australia)

Leader Rivers at Macquarie Island, in a late May message, leaves no doubt about the good spirits of the Macquarie team.

"The days are getting much shorter and lengthy dark hours have given those on night work cat's eyes so that they can avoid walking into elephant seals as they do their rounds across the island isthmus. Morale at this time of the year is generally at its lowest ebb but, on looking in at the mess on a Saturday night, the whole party seems to be in high spirits. The music is both lively, plentiful and loud, good accompaniments for way-out dances during the long nights. Many games are played, the regular ones being billiards, snooker pool, bowls, darts, monopoly, squatter chess and many card games. The midwinter magazine is being produced for June 22. Duncan Mackenzie, in between seal work, is magazine editor and is busy chasing up articles from all the fellows. These are rolling in. Another busy group are the Macquarie

Players who are keenly rehearsing a play based on the fairy tale, 'Cinderella'."

Certainly there are moans and groans as tired and aching muscles push their bulk with 5BX exercises and judo. Queer sounds still issue from all parts of the station as various people practise instruments: clarinet, guitar, piano, trombone and cornet.

It may appear that there would not be any time left for work, but all is well. Normal duties go on as usual plus the extra duty of painting the interior of all buildings. Street lights have been erected up the auroral serpentine.

Weather during May has been normal—wet, cold, windy and foggy with heavy snowfalls. Now we have a rival to the meteorologists! This amateur simplifies with the forecasting: he says that if you can see the plateau it is going to rain; if not, it is raining.

NO DODGING THE CENSUS

Australians wintering on Macquarie Island were included in the Commonwealth Census on June 30.

Macquarie Island is part of the Tasmanian Federal Electorate of Franklin, and as such had to be included in the census.

The last supply ship for the season left for the island in February—before the census forms were printed, but householders' schedules to cover everyone on the island were sent to the staff clerk of the Antarctic Division in Melbourne. By means of direct radio contact with the base on Macquarie Island, he acted as the island's householder and filled in the schedules.

CAMPBELL ISLAND

(New Zealand)

Don Nightingale, Officer in Charge, Campbell Island, sends this report.

With the winter behind us and ten months of our year on Campbell Island completed, the going-home fever has struck. Drawers and wardrobes are being spring-cleaned and boxes and packing cases unwanted previously have been spirited away and owners' names painted on to

prove ownership. The arrival of the U.S.S. "Mills" on September 27 is anxiously awaited and all hands are looking forward to seeing some new faces and receiving their first mail since February 4. The U.S.S. "Mills" is an old friend of the island, having done picket duties in the 1964-65 season. Likewise, many old friends are expected on the U.S.S. "Calcaterra" which is also doing a second tour.

It has been a rather quiet and uneventful year on Campbell Island although the time has flown by. All members of the expedition have maintained a high standard in their daily work and the scientific and meteorological programmes have been completed with no major snags encountered.

The "Met" staff carried out two special night flights in July to assist with the evacuation of a sick man from McMurdo Sound.

Some excitement occurred when the hostel chimney caught fire, but this was soon brought under control and no damage was caused. The 1966 winter on Campbell has been one of the mildest on record, 27° F. being the lowest temperature recorded. Some fine sunny days were enjoyed, but for the main it has been overcast with light rain and little sunshine, four hours only being recorded in June.

The annual chess game with Macquarie Island is still being closely contested on the twice-weekly radio sked and it could still go to either island. The station movie projector has been of great value and the "Gratis" cinema has played to capacity audiences. We are grateful to the various Embassies, the National Film Library and Sir Robert Kerridge for the films they have made available to us. Midwinter Day celebrations were a rip-roaring success. Chef Gordon Surrey reached new heights and turned on a magnificent repast, climaxed by the arrival of a three-tier cake.

The expedition has been adopted by a red-billed gull by the name of Napoleon. He waits at the door of the hostel to greet each man in the morning; his day is spent on a walk-

ing inspection of the station carried out to a rigid timetable. He rarely flies and then only down hill to the wharf shed, the return journey is made on foot at the side of the road; his antics have given much enjoyment over the past few months.

RABBITS

Surprisingly perhaps to most readers, two references to rabbits are made in recent reports from the sub-Antarctic islands.

Giant rabbits "as big as dogs" are causing major problems on Macquarie Island, 600 miles south of Tasmania. Rabbits weighing up to six pounds — three times the normal wild rabbit weight — have infested the island, part of which has been denuded by their grazing. This is not thought by Tasmanian Department of Agriculture officials who spent three months on the island to be creating major soil erosion, but they stressed that the rabbit population must be kept within reasonable limits.

During the Auckland Islands expedition R. G. Ordish, Dominion Museum ornithologist, saw as many as 28 blue-furred rabbits on one small patch of clear ground on one of the northern islands of the group. These brightly coloured rabbits, said Mr. Ordish, were able to survive in large numbers because wild cattle left on the island kept down the long grass and scrub and prevented regeneration of the stunted forest.

TAKEOVER

The 12-man wintering team at Scott Base this year includes two Irishmen, Terry McGough and Jerry Ternahan.

The team selected to winter over during 1967 includes two Scots, Bob Murdoch and Robin Kidd.

Comparative results will be studied with interest.

THE VETERANS PASS

H. R. YOUNG

The death occurred in Auckland on January 21 of Harry Richard (Bob) Young, aged 72, who served on Admiral Byrd's first two expeditions to the Antarctic. In February 1930 he was a crew member on the "City of New York" when she left Dunedin to relieve the expedition after the 1929 winter. Byrd was so impressed during the homeward voyage by his work and character that on his second expedition, 1933-35, he retained Young as a member of the wintering party.

The young New Zealander (born in England) had been a Petty Officer (Diver) in the Royal Navy and was in the Battle of Jutland. After discharge from the Navy he worked as a diver on the Sydney Harbour Bridge project and then engaged in farming in New Zealand before joining the first Byrd expedition. At its conclusion he purchased a small holding but readily accepted Byrd's invitation to go south again.

He was one of the men attached to Dr. Perkins' biological unit during much of its field work. Byrd describes him as "quick with the practical knowledge of a first class seaman . . . one of the squarest men I have ever known". And he was tough: "I saw Bob Young and several others stripped bare to the waist all complaining of the heat, though the breath freezing on their whiskers had formed miniature ice-falls". The temperature was -30°.

After this expedition he went on to the United States and stayed with Admiral Byrd and his family. Back in New Zealand he bought a farm near Auckland, and apart from three short trips to England to visit his relations in Surrey he remained in New Zealand until his death from an acute coronary thrombosis. He left no descendants, his next of kin being a sister in England.

JOHN HARRISON

Antarctic men were among the many who were saddened by the death on June 23 of John Harrison, who was buried under an avalanche on Mount Rolleston in the Arthur's Pass region while trying to locate and rescue four missing climbers. Before critical avalanche conditions and the decision that there was no possible chance of the missing men having survived led to the abandonment of the search, an avalanche buried the 5,500 ft. camp of eight men of the high-climbing search team. The seven others survived.

Mr. Harrison was one of New Zealand's most experienced mountaineers. He twice accompanied Sir Edmund Hillary to the Himalayas. Sir Edmund speaks of him as "an ideal man to have on an expedition". When Peter Mulgrew was badly frostbitten in the Himalayas, John Harrison, he says, "played a very great part in my rescue. In many ways I owe my life to him."

ANTARCTIC SERVICE

John Harrison was twice in the Antarctic with New Zealand parties. He was a member of a New Zealand team instructing United States scientists in search and rescue techniques and was greatly admired by the Americans to whom he passed on something of his own great knowledge of mountain-craft. Philip M. Smith says of him: "What I knew was absolutely fine. He had a keen interest in others, their help, instruction and safety being paramount. Not many like this nowadays."

As expected, his wit, enthusiasm and competence made him a very popular instructor.

An appeal launched by the New Zealand Alpine Club on behalf of Mr. Harrison's widow and two young children met with immediate heartfelt response, and within a very few weeks a sum of over £17,000 had been subscribed.

We are indebted to one of his Antarctic associates (who wishes to remain anonymous) for the following tribute.

In Memoriam JOHN HARRISON

1932-1966

"They tell me thou art dead, Telemachus."

In the late 'forties and early 'fifties a large group of young men emerged from the Canterbury-Westland mountains as fine climbers and close friends, tested and hardened, self-reliant and fun-loving. They were a diverse group, religious and agnostic, introvert and extrovert, intellectual or superficially profane and earthy; but in their various ways all were struggling for quality in their living, and they found that quality in their occupations, mountaineering and friendships.

John Harrison was one of the most respected members of the group. He was tall and dark, handsome, and slightly reserved in public. In private he emerged as a centre of good judgement, wit and laughter, gales of laughter and happy life. Everyone felt the better for his company, whether for hours, days or weeks.

He enhanced his reputation by his performance on the C.M.C. Expedition to Masherbrum in 1955 and by many new climbs in New Zealand (Black Tower, Tasman by the Bal-four rib, and others), so that he was a natural choice for a position as artist and mountaineer-assistant with the N.Z. Geological and Survey Antarctic Expedition 1958-59.

That party was to be landed near Wood Bay, but damage to an ice-breaker meant that new plans had to be made suddenly to spend the season in the McMurdo Sound district. John's energy, reliability, good humour, and skill in human relations helped to turn a potentially dismal situation into a vital, enjoyable and productive summer. Harrison Creek at Cape Bird was named after him.

He was a member of the first party to climb Mt. Discovery at the head of McMurdo Sound, and, after a cold day of 32 hours he still had sufficient resilience to sit outside for another four hours to make a crayon drawing of the camp and the mountain.

It took time to realise his toughness, and the mental and physical powers that he kept in reserve. On another occasion he sat for two hours at a survey station in a temperature of -12° F. and a wind of 30 knots sketching a full panorama in pencil, while his fingers were protected only by silk gloves. His sensitive and professional drawings were evocative of the mystic qualities of mountains and the human situation, as seen by an experienced mountaineer. Some of them are scattered through the pages of New Zealand mountaineering journals along with his photographs and articles.

During some mid-season transport delays he was leader of the third party to climb Mt. Erebus by a new all-snow route direct from the Ross Ice Shelf, via a camp established at 5,000 feet by man-hauling. A fast ski run at 8,000 feet on a changing surface from the summit back to the camp was one of the joys of his life. On the return to Scott Base the party sat on the sledge, pointed it at Castle Ridge, and let it go. Having arrived safely at the ridge they hoisted a sail (improvised from a tent floor), fixed red and green balloons to a spar to mark port and starboard, revised some sea chanties, and finally bounced down the slopes into the base bubbling with enthusiasm, a day before they were expected. Later in the season John used vehicles, and took dogs on a surveying trip, but continued to talk nostalgically of the delights of the old days of sailing sledges and their hard-driven crews.

In the following year he was a member of the 1960-61 Himalayan Scientific and Mountaineering Expedition, narrowly missing the summit attempt on Mt. Makalu (near Mt. Everest). His character and strength were both needed desperately when several climbers and porters were disabled high on a mountain, and he had to spend ten days at over 24,000 feet organising the rescue of another ex-Antarctican, Peter Mulgrew, who had suffered partial paralysis. Later, he continued his New Zealand mountaineering and was a member of several rescue parties.

He died under a soft-snow avalanche while engaged on a hopeless rescue attempt on Mt. Rolleston in winter. He must have known, with an awful clarity, that the rescue attempt was highly dangerous, but his skill and judgement were needed, and were given. The gods still play tragedies with those whom they love.

"BUD" WAITE RETIRES

American polar man Amory H. Waite first hit the headlines as radioman in the group of three men who travelled for 72 hours in 70° below zero weather to rescue Admiral Byrd from his "Advance Base" in 1934.

Recognition came to him later as explorer, inventor, electronics engineer, lecturer, author, participant in 14 nuclear bomb tests, and as a member of various joint Federal agency scientific expeditions. Included in his polar experience are 11 Antarctic expeditions and participation in 12 Arctic research programmes over a period of 31 years.

In February 1962, in recognition of his achievements as an electronics engineer, including invention of an accurate polar altimeter and ice-depth system for icecap aviators which he later described in visits to numerous European countries, he was awarded the Veteran Wireless Association's Marconi Gold Medal.

His later Antarctic trips included Operation Highjump in 1947.

"Bud" retired recently after 24 years of service in the Department of the Army.

The United States is spending \$27 million this year on what must be the biggest nothing on earth—Antarctica. Why?

If there is a one-word answer, it must be PROMISE. It is not today that is thought of in Antarctica, but tomorrow. (U.P.I.)

Inertial Navigation Finds South Pole

by David Burke*

[Inertial Navigation, which was originally developed for military aircraft, nuclear submarines and missiles, is a method of guidance — based on the use of the gyro and accelerometer and electronic computer — which provides guidance without any reference to ground stations, celestial fixes, radio beacons or any other equipment. — Ed.]

The historic "twin poles" flight of a Flying Tigers' cargoliner which took place late last year was also memorable for another reason — it was the first-ever to be guided by inertial navigation across both the North and South Poles.

The Flying Tigers' Boeing 707 — "Polecat" — was specially fitted with a Litton LN-3 inertial navigation system for the 26,000-mile Arctic-Antarctic journey which set eight world records.

The flight was believed to be the first across the South Pole itself by the inertial navigation method. Normally the Litton LN-3 system is used in the F-104G Starfighters of the Royal Canadian and NATO air forces.

Aviation experts on the flight commented that the inertial system demonstrated the global capacity of this new form of navigation equipment for commercial airlines — especially for trans-polar routes of the future, above the desolate Antarctic ice cap.

In fact, the LN-3 system on Flying Tigers' "Polecat" enabled the aircraft to home directly on the South Pole when other, more traditional, navigation aids, which were simultaneously in use, had resulted in an error in course. (The omni beacon at the South Pole was not transmitting and, in all, the Boeing 707 would have missed the Pole by some 40 miles if the inertial navigation readings had not been available.)

Installed at short notice in only one and a half days, and positioned on a shelf in the cabin, the Litton LN-3 system provided a display of

instantaneous aircraft position, heading, ground speed, ground track and range and course to the next destination.

"The inertial system supplied by Litton provided us with a flight course that crossed the South Pole within one mile of dead centre," said Fred Austin, co-commander of the polar flight. "The accuracy of the system over the seven hour 35 minute flight from Buenos Aires to Antarctica reflected a tremendous technological achievement."

Significant advantages of the inertial navigation system on its unique North Pole-South Pole flight were demonstrated as the aircraft approached the polar regions. Other navigation systems which rely on magnetic heading are inoperable over the poles and those which depend on radio reception are unreliable at those points, being frequently disrupted by the phenomena associated with the aurora.

When the Flying Tigers' aircraft landed at Christchurch, after the long trans-polar flight from Honolulu, it was determined that after biases were set in the LN-3 inertial navigation system gyros, the error in the equipment's reading was not more than one nautical mile per hour.

During the same 51 hour 20 minute journey, the Boeing 707 also carried a Litton laser rangefinder, which was operated as an altimeter, and measured altitudes in excess of 30,000 feet to within an accuracy of five feet at ground level. (These estimates were based on previous-known surface-level calibrations.)

The aircraft also carried U.S. Weather Bureau carbon dioxide and

* Mosman, N.S.W., Australia.

SEAL MARKING IN McMURDO SOUND

by Ian Stirling*

INTRODUCTION

This article reports the number of Weddell seals that have been tagged and branded in McMurdo Sound from 1963 to 1966. The purpose is to describe the appearance of each of the tags and brands so that casual observers will know what to look for, and, I hope, report.

The Weddell seals in McMurdo Sound are being marked to assist in defining the population parameters. By this I mean the following characteristics: birth rate, death rate, longevity, life expectancy of various age classes, and daily and seasonal movements.

This work is of value because of the growing interest in the harvest of seals throughout the world. It is quite conceivable that within a few years more extensive sealing may begin on the Antarctic continent. As virtually nothing is known of the population dynamics of any of the Antarctic seals it is important to assess the parameters of this accessible population and try to calculate the depletion a stock could withstand.

TAGGING AND MARKING

From 1963 to 1965 the Canterbury University Antarctic Biology Unit branded seal pups. This was to provide known age animals to study survival of pups. A summary of the number of pups branded and the symbol used is as follows:

Year	Pups	Symbol
1963-64	85	VL
1964-65	284	IV
1965	94	ZX
1965	247	H
Total	710	

These brands were put on the pup's back in the region of the rump.

The following number of seals were tagged by U.S.A.R.P. The numbers include pups, sub-adults, and adults.

Year	Number of Seals Tagged
1963-64	186
1964-65	625
Total	811

These seals were tagged with silver coloured tags put into the webbing of the hind flipper. Each tag has a number on it. The number has the prefix "MCM" which stands for McMurdo. The whole number (e.g., MCM 356) should be recorded. Eight hundred of these tags will be used in the 1966-67 season.

Two hundred and fifty-two Weddell seals were tagged by the author during January and February, 1966. (Seventeen crabeater seals were also tagged.) These seals were tagged with coloured plastic tags in their hind flippers. The positions of the tags in the seal's hind flipper are illustrated in Fig. 1. The combination of locations of each coloured tag denotes a number in a predetermined code. Thus it is very important with this system to ensure the flipper is flat, check which is the left and right side of the seal, and record the exact position of each tag. As many as possible of the following details would complete the record of a seal siting: the seal's number or coding, sex, length, location of siting, numbers of other seals present, and general comments, if any. Several hundred seals will be tagged using this method in 1966-67.

ozone samplers, New York University radiation and cosmic ray detectors, Douglas aircraft cameras for recording cloud characteristics, and a Collins long-range single sideband two-way voice and teletype communications system.

The importance of the flight should be very obvious to the international airlines which serve both Australia and New Zealand and, of course, South Africa and South America.

* Zoology Department, Canterbury University, Christchurch, New Zealand.

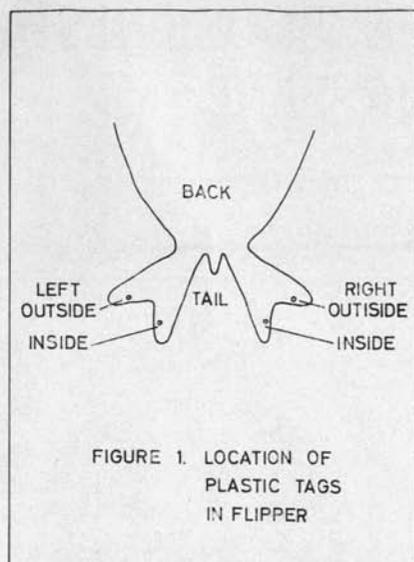


FIGURE 1. LOCATION OF
PLASTIC TAGS
IN FLIPPER

Observations made by anyone in the field who sees marked seals are extremely valuable as they give information on movements and survival. All records should be sent to I. Stirling, Zoology Department, Canterbury University, Christchurch. I will be pleased to tell anyone who sends in such information where the seal he saw has been previously.

ACKNOWLEDGEMENTS

I am extremely grateful to the Antarctic Division of the D.S.I.R., Wellington, the Zoology Department, Canterbury University, the University Grants Committee, Wellington, and the United States Navy Squadron VX-6 for co-operation and support. I thank Mr. G. J. Kooyman, University of Arizona, for the data on tagging done by U.S.A.R.P.

U.N., ANTARCTICA

The Mayor of Oamaru, in a jovial mood after a talk by Colonel F. H. Halgreen, U.S. Army, to the Ex-Royal Navalmen's Association, said that the Antarctic appeared to him to be a most suitable site for the United Nations.

It was designated for "peaceful purposes" only and would provide the right atmosphere.

"THE SOUTHERN OCEAN IS A VOLCANO AREA"

Associates of the Geography Institute, U.S.S.R. Academy of Sciences, headed by Zhivago, M.Sc. (Geography), have fathomed the depths of the ocean bottom at a distance of 70,000 miles on the Soviet diesel-electric ship "Ob". Soviet oceanographer Alexandr Zhivago, who is the author of the geomorphological map of the South Ocean's bottom, the first such map in the world, says that an uninterrupted belt of deep-water cauldrons covered with a thick layer of sediments encircles the Antarctic. The bottom is seemingly sagging there. Hills in the form of a circle tower beyond the cauldrons. Part of them is a continuation of the system of median oceanic ridges which stretch in all oceans for thousands of kilometres.

In actual fact this is a complicated agglomeration of parallel ridges and hollows with a definitely outlined central valley having a narrow and flat bed. Apart from median ridges, this circle of upheavals includes also billows whose structure is similar. These are seemingly peculiar rises of the basalt layer of the crust, flooded with volcanic lavas.

Submarine ridges and billows located on the northern border of the Southern Ocean emerged mainly as a result of tectonic processes and volcanism.

EARTHQUAKE AREA

The northern boundaries of the cauldrons are littered with gigantic blocks of submarine cliffs. Earthquakes in the area of the ridges are rather common. Not only new rocks can be met on the bottom, but also ancient ones. Zhivago speculates that the clumpy relief of the bottom testifies to the renovation of certain ancient structures which is seemingly a regular process of evolution of the oceanic bed.

Huge cones and volcano clusters were spotted on the South Ocean's bottom. The expedition discovered summits which are 250-300 metres below the ocean's surface. They were named the Ob Bank and the Lena Bank in honour of the Soviet Antarctic ships.

EMPEROR PENGUIN ROOKERIES OF VICTORIA LAND

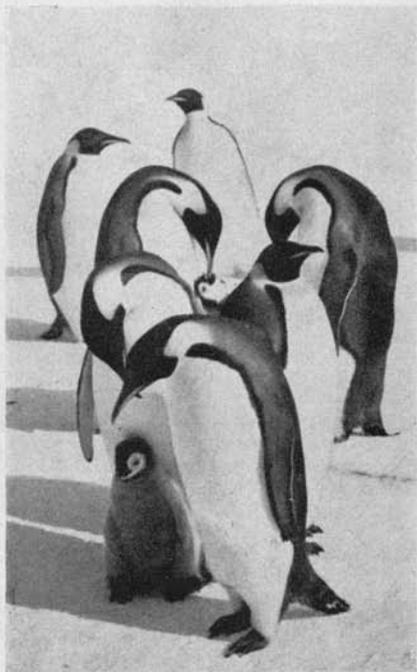
by H. J. Cranfield*

Two previously unrecorded Emperor penguin rookeries were found on the Victoria Land coast in 1964 and 1965. The sighting of these rookeries at Cape Roget in November 1964 and Cape Washington in October 1965 is reported here, and censuses made of the Coulman Island and Cape Roget rookeries, both of which were visited by helicopter in November 1964, are also given.

Despite the number of expeditions along the Victoria Land coast, the first Emperor penguin rookery was not discovered there until 1958. It was sighted on sea ice between Coulman Island and the coast, from a helicopter of the U.S. Navy ice-breaker "Glacier".¹ Later on the same cruise 100 Emperor penguins were observed on sea ice close to where the Cape Washington rookery was subsequently discovered.¹ The many sightings of small groups of Emperors on sea ice farther south along the coast suggest that further Emperor rookeries may occur there. Low altitude flights early in the season appear to be the only satisfactory technique of establishing this (cf. 2).

The rookery at Cape Roget was first sighted from a helicopter flying low across the Moubay Piedmont. The rookery was on sea ice in the angle between the cliffs of the Moubay Piedmont and the volcanic cliffs of Cape Roget. On November 9, 1964, adult Emperors and chicks were scattered in several groups over a triangular area a mile and a half along the cliffs and three-quarters of a mile across smooth sea ice. Abandoned eggs and very young dead chicks close to the ice cliffs suggest that the Emperors had spent most of the winter under their shelter and had only recently dispersed from them. All adults and chicks present

were counted: the census figures are given in the table on p366.



In centre, an Emperor feeds its chick.

Coulman Island rookery was visited on November 7, 1964, and closely resembled the description of it in 1958.¹ Emperor penguins were spread in several arcs over four miles of sea ice along the north-west coast of the island to the cliffs. Though the ice on which most of the birds were scattered was flat, the northernmost colonies were dispersed among low pressure ridges; the ice under these colonies had broken up since it had formed. Adults and chicks in three-quarters of the rookery were counted. In the remainder, the more scattered nor-

* Fisheries Research Division, Wellington.

Rookery	First Record	Adult Penguins	Chicks
Cape Roget	1964	10,100 (1964)	11,700 (1964)
Coulman Island	Harrington, 1959	20,000 (1964)	21,000 (1964)
Cape Washington ...	1965	4,000-6,000 (1965)	4,000-6,000 (1965)

thern colonies, numbers were accurately estimated.

On October 29, 1965, low cloud and poor visibility forced the U.S. Navy aircraft, in which I was travelling to Hallett Station, to fly low. During the flight, which followed the coastline closely, an Emperor penguin rookery was seen on sea ice on the south side of Cape Washington, a mile from the tip of the cape. The estimation of the size of this rookery is at best very approximate; from the brief view it appeared to be about half the size of the Cape Roget rookery.

When visited in 1964 both the Cape Roget and Coulman Island rookeries had large open leads to the north. The nearest at Cape Roget was 15 to 20 miles along the coast, between Cape MacCormick and Possession Island. At Coulman Island open water was only two miles from the northernmost colonies and extended from Cape Wadsworth almost to the Tucker Glacier. Large congregations of adults were observed at the edge of the water in both areas. At Cape Roget some adults were feeding in a crack in the sea ice a mile southeast of the rookery, but more were observed on the edge of the water at Cape MacCormick. Open water was not seen near Cape Washington in 1965, but visibility was too restricted to enable the area to be viewed adequately.

Snow accumulation during winter appeared to have been minimal at the Cape Roget rookery. The surface was heavily stained and trampled and there were no layers of droppings below it. Both abandoned eggs and the very youngest dead chicks had remained exposed on the surface. Away from the cliffs, wind had kept the sea ice bare of snow. Conditions appeared very different at Coulman Island, where snow under penguins was only lightly stained and compacted and no eggs or young dead chicks were exposed on the surface. Exposed bodies were the same size as living chicks. At Coul-

man Island in 1958 numerous alternative layers of snow and droppings were found under the surface.¹ Snow accumulation at Coulman Island was considerably greater than at Cape Roget, possibly because the higher cliffs of the island provided a wider area of shelter to their windward in the predominantly southerly storms of the region. The rookery at Cape Washington would similarly be well protected from southerly winds.

The Cape Roget rookery, being situated on fast ice in an angle almost surrounded by the Moubray Piedmont ice cliffs and Cape Roget, is protected from early break-up during winter and early summer. Lady Newnes Ice Shelf and Coulman Island must also protect the Coulman rookery from such break-up. In 1964, however, winter break-up of the northern sections at Coulman Island may have been responsible for considerable egg or chick mortality. The population of 21,000 chicks was very much smaller than that estimated in 1958. Dearborn estimated the population at 33,000 breeding pairs (reported in 1) and Harrington estimated it at 50,000 chicks.¹

The exposed nature of the rookery at Cape Washington suggests that it would also be subject to a similar risk of premature break-up.

Budd² considered safety from premature dispersal was one of the most important factors determining Emperor rookery sites. In this respect Coulman Island is far less satisfactory than Cape Roget. The Coulman rookery appears to be better protected from strong winds, also an important consideration.³ This factor and presumably better availability of food may account for the existence of the very much larger rookery in the apparently less propitious area.

- (1) Harrington, H. J., 1959: *Notornis*, 8: 127-132.
- (2) Korotkevich, Ye. S., 1962: *Sov. Ant. Exp. Inf. Bull.*, 42: 371-374.
- (3) Budd, G. M., 1961: *Emu*, 61:171-189.

THE READER WRITES

Sidelights of Antarctic Research

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

A SKUA AT VOSTOK

Sir,

I read with interest in your June issue of "Antarctic" the article by V. Petrov and B. Chemov in which they reported a sighting of a skua at Vostok on December 15, 1964. The question is, "How did it fly so far inland (900 miles) and locate Vostok Station, a mere dot in the icy, featureless wasteland?"

I offer the following possibility. During the last phase of our ANARE Vostok Traverse we were nearly 200 miles south of Wilkes Station on January 6, 1963, when we sighted a bird flying low and following our flagged trail southwards. When it came closer it was recognised to be a great skua and it spent some time with us before flying off in a southerly direction, still following our old trail and marker flags.

These flags on 10 ft. poles we had placed every 2½ miles during our 900-mile traverse from Wilkes to Vostok. In addition to the flags we left behind numerous drums, cairns and other trail markers which should still be plainly visible for many miles.

A skua has good eyesight and will investigate any strange markings or material on the snow surface. As indicated, one followed our trail 200 miles inland and continued to follow it further inland. Thus it is conceivable that a skua could follow our trail markers all the way to Vostok: perhaps the one that appeared at Vostok on December 15, 1964, did just that!

R. B. THOMSON

NEVER TOO LATE TO TRAVEL

Mr. G. W. Allsop, who made a spirited plea in our last issue for New Zealand initiative in promoting Antarctic tourism, assures us that he

is indeed "over 90 years of age". In fact, he was 94 last January. He apologises for using a stick when outside of the house and adds:

"On the 20th (of July) I am leaving on a holiday to Australia, Japan, Hong Kong and Bangkok and arrive home November 26."

In a final plea he writes, "Surely it is nicer to be a leader than a follower."

We are sure all our readers will wish Mr. Allsop a happy journey.

TIRELESS VETERAN

Only one man, says a Canadian writer, bridges the gap between the explorers of the Antarctic half a century ago and the new teams working there today.

He is Sir Charles Wright, 78 years old. Sir Charles recently returned from his fourth journey to the Antarctic in the last five years.

As C. S. Wright, he was the physicist of Captain Scott's Last Expedition, 1910-13. It was Wright who led one section of the search party, and who sighted the mound covering the tent in which lay the bodies of Scott, Wilson and Bowers.

During World War I, Sir Charles served with the British Engineers and Intelligence. Research work between the wars, with the British Admiralty, heading the Royal Naval Scientific Service, equipped him for a war-time job directing 600 scientists looking for ways to counteract new German weapons.

He "retired" three times (the first time in 1947) but then a chance to study disturbances in the earth's magnetic field drew him back to the Antarctic about five years ago. He is now "considering" retirement again.

ANTARCTIC BOOKSHELF



PETER MULGREW MAN AND AUTHOR

New Zealanders, remembering Peter Mulgrew's notable part in our country's contribution to the Trans-Antarctic Expedition as well as his later Himalayan exploits, will read with pleasure this extract from a review by Nigel Tangye of his book "NO PLACE FOR MEN" in the latest issue of the *Geographical Journal* (English edition: London, Nicholas Vane, 1965).

"The photograph of Peter Mulgrew, down from the mountain, which forms the cover of his remarkable book, is enough to warn the reader that the pages that follow will be harrowing. Its fabric of pain, anguish and disappointment is, however, shot through by the bright thread of the author's character, and it is his stoicism, his astonishing good humour and his sheer guts while suffering in the most appalling manner that combine to make this work inspiring. The memory left in the reader's mind of the failure on Makalu is one of inspiration and strength.

"... The account of their time on the mountain is enhanced by the author's instinct for understatement. Men of action often make a feature of this, and unless skilfully treated it becomes laboured and a bore to the reader. Mr. Mulgrew, however, is an author who writes what he feels, and he feels what he writes. His sincerity in this respect transmits to the reader a strong sense of participation and sympathy."

"Dill Reports the News" announces that a catalogue of Arctic and Antarctic postmarks and cachets is available from Gerhard Troegel, Keiserstrs, 27/29, 509 Leverkusen, West Germany. It is in German but "is nearly all dates, geographical facts and names of operations". The single sheets cost 15 pfgs (about 4 U.S. c) per sheet.

WILSON'S DIARY

The English publishers, Blandford Press, announce the forthcoming publication of Edward Wilson's "Diary of the Discovery Expedition to the Antarctic Regions 1901-1904." The 440-page volume, costing (U.K.) £6 6s., will include 47 watercolours in four-colour offset litho, as well as many monochrome illustrations. There are 300,000 words of Wilson's own writing. There is a special chapter dealing with New Zealand, written on the way home. Publication is scheduled for October 3, 1966.

OF WHALES AND MEN

Dr. R. B. Robertson is an adventure-seeking Scottish doctor who, after peace-and-war experiences in such widely-scattered lands as Abyssinia, India, Palestine and Italy, spent the 1950-51 season as senior Medical Officer with a whaling fleet in the far-South Atlantic. He then wrote a vivid and hard-hitting book, "Of Whales and Men". In 1957 he was again in the Antarctic, this time with Operation Deep Freeze in McMurdo Sound and at Little America on the Ross Ice Shelf. Dr. Robertson is now in New Zealand, on the staff of the Westland Hospital, Hokitika. He has been approached by an American firm which wants to make a film based on his whaling book.

PUBLISHED IN NEW ZEALAND

The Adélie Penguin (*Pygoscelis Adeliae*) Egg, by Brian Reid. *N.Z. Jnl. Science*, 8 (4), December 1965, 503-14.

The Growth and Development of the South Polar Skua (*Catharacta maccormicki*), by Brian E. Reid. *Notornis*, XIII (2), June 1966.

The Value of the York Reserve in Adélie Penguin Chicks, by Brian E. Reid and Colin Bailey. *Records Dom. Museum*, 5 (10), July 1966: 185-193.

A Sequence of Soils from a Penguin Rookery, Inexpressible Island, Antarctica, by I. B. Campbell and G. G. C. Claridge. *N.Z. Jnl. Science*, 9 (2), June 1966: 361-72.

COMING UP

Several men who have served with New Zealand Antarctic teams are writing books in which they draw on their experiences in the Ross Dependency and other Antarctic areas.

Philip Temple's book on the South Indian Ocean Expedition to sub-Antarctic Heard Island, reported in our issues for March 1965 (p. 43), June 1965 (p. 98) and June 1966 (p. 300), is about to be published by Cassels, and should be available in New Zealand this month. It is entitled "**THE SEA AND THE SNOW**". The author, one of the three New Zealanders who took part in this daring and successful adventure, was responsible for the collection of insects and arthropods for the B. P. Bishop Museum, Honolulu, and participated in the epic first ascent of Big Ben, which dominates the island.

L. B. (Les.) Quartermain has written the early history of the Ross Sea sector from the time of Cook up to the beginning of the "Byrd era". The author has had access to a great deal of previously unused material, including manuscript diaries, to produce the first full-scale history of any one sector of the Antarctic. Publication of this 450-page book, "**SOUTH TO THE POLE**", by the Oxford University Press is expected early next year.

A. G. (George) Lewis, who was senior technical officer at Scott Base for two successive years, 1963 and 1964, and who had previously served for two years with British Antarctic teams, is drawing on his unusually long and varied experience to produce a book, primarily for young people, on the Antarctic scene.

W. W. (Wally) Herbert also an experienced F.I.D.S. man (1955-59) and, after wintering at Scott Base in 1961, leader of the New Zealand party which re-traced Amundsen's journey down the Axel Heiberg Glacier, is attempting to capture the spirit of the Antarctic explorer, to demonstrate "what makes him tick". His own Antarctic experiences plus a period in Spitzbergen and wide travel should qualify him for this difficult and interesting task.

"DOWN TO THE ICE"

The latest issue of the Post-Primary Bulletins published by the Department of Education's School Publications Branch is an Antarctic number. "**Down to the Ice**" by L. B. Quartermain gives in its 48 pages the impressions of three Queen's Scouts who spent the summer months with the New Zealand Antarctic team at Scott Base, one or other of them visiting and working at Cape Royds and the Dry Valleys, and accompanying a relief flight further south.

Though this Bulletin does not describe the actual experience of any one Scout-Boys' Brigade team, it does attempt to see the activities of an Antarctic summer through the eyes of three keen and intelligent boys who are having the opportunity to see the Antarctic as working members of a New Zealand summer party, as three such boys have done during each of the past few years.

The Bulletin is well illustrated and its production reflects credit on the editorial staff concerned and the Government Printer.

JOURNAL DES VOYAGES

The Belgian monthly geographical magazine "Journal des Voyages" devoted its September 1965 issue to Belgian activities in the Antarctic. The 56 pages of text comprise authoritative articles on such subjects as "**L'Effort Antarctique Belge**" by Baron G. de Gerlache, "**Political Cooperation in the Antarctic**" by A. Van der Essen, "**Geological Exploration of the Sor-Rondane**" by T. Van Autenboer (Expedition Leader 1966), and articles on penguins and Antarctic oceanography. The journal is beautifully produced and the copious illustrations, many in colour, are relevant, informative, and in many cases splendid examples of Antarctic photography. Even the advertisements, in many cases, are of considerable Antarctic interest. Altogether a highly commendable production.

Our copy by courtesy of the Belgian Embassy in Wellington.

"GEOLOGY AND PALEONTOLOGY"

Dr. Colin Bull, Director of the Ohio State University Institute of Polar Studies, has kindly pointed out a number of misprints in our review of "Geology and Paleontology" in the March, 1966, issue of *Antarctic*. We regret that these were not corrected.

The article on tillite in the Ohio Range was written by William E. LONG, the "discoverer" of the Buckeye Tillite. The review refers to him as Lang. The man who wrote up the igneous rocks of the Ohio Range and who also helped with the Mount Gran paper, is Samuel B. TREVES. The main author of the Mount Gran paper was Arthur MIRSKY. George A. Doumani is given an incorrect initial. "Halpeen's" correct name is Martin HALPERN, and Anderson is J. J. Anderson.

Some of the fossil names also suffer: Brachiopoda, Bryozoa, Vertebraria, and cricoconarida all are misspelled.

FOR THE SPECIALIST

The *Dictionary Catalog of The Stefansson Collection on the Polar Regions*, Dartmouth College Library, will be published in eight volumes by G. K. Hall & Co., of Boston.

The Stefansson Collection, a monument to the collecting energies and acumen of the Arctic explorer Dr. Vilhjalmur Stefansson, existed as a private collection for a quarter of a century before its transfer in 1951 to Baker Library at Dartmouth.

Historical coverage is the main emphasis of the collection, with primary concern for the history of Polar explorations. Resources on the Arctic and Antarctic are available within specified chronological and geographical limits, while documentation of the international-relations aspect of the Polar regions is included without regard to period.

This catalogue will be available at the prepublication price of \$380; after January 31, 1967, the price will be \$470. These prices apply only in the United States; there is an additional charge of 10 per cent. on orders shipped elsewhere.

Inquiries and orders may be sent to the publisher, G. K. Hall & Co., 70 Lincoln Street, Boston, Massachusetts, U.S.A., 02111.

50 YEARS AGO

1916. *The world was at war. But Shackleton had been ordered to carry on with his Trans-Antarctic Expedition. "Endurance" with the proposed crossing party had penetrated the Weddell Sea while "Aurora" had made for the Ross Sea with the men who were to lay the depots across the Ice Shelf for the last stage of the trans-Antarctic journey.*

"Endurance", trapped in the ice, had eventually sunk and her 28 men had reached Elephant Island. Shackleton and five others had set out on the perilous voyage to South Georgia to seek help, leaving 22 men on the barren island—hoping against hope that help would come.

"Aurora" had been carried out to sea but after drifting helplessly, ice-bound, for ten months had been freed and reached New Zealand. It was then too late to send a ship south to rescue the ten men who had been marooned, so no relief could take place until the 1916-17 summer.

ON ELEPHANT ISLAND*

The story of August 30, 1916

"August 30, 1916, is described in their diaries as 'a day of wonders'. Food was very short, only two days' seal and penguin meat being left, and no prospect of any more arriving. The whole party had been collecting limpets and seaweed to eat with the stewed seal bones."

(and on August 30 as lunch was being served)

"the mist opened and revealed the ship for which they had been waiting and longing and hoping for over four months."

(from one of the diaries)

"Marston was the first to notice it and immediately yelled out 'Ship O!' The inmates of the hut mistook it for a call for 'Lunch O!' so took no notice at first. Soon, however, we heard him pattering along the snow as fast as he could run, and in a gasping, anxious voice, hoarse with

* From Shackleton: "South".

excitement he shouted, 'Wild, there's a ship! Hadn't we better light a flare?' We all made one dive for our narrow door. Those who could not get through tore down the canvas walls in their hurry and excitement. The hoosh-pot with our precious limpets and seaweed was kicked over in the rush. There, just rounding the island which had previously hidden her from our sight, we saw a little ship flying the Chilean flag.

"We tried to cheer, but excitement had gripped our vocal chords. Macklin had made a rush for the flagstaff, previously placed in the most conspicuous position on the ice-slope. The running-gear would not work and the flag was frozen into a solid compact mass; so he tied his jersey to the top of the pole for a signal.

"Wild put a pick through our last remaining tin of petrol, and soaking coats, mitts and socks with it carried them to the top of Penguin Hill at the end of our spit, and soon they were ablaze.

"Meanwhile most of us had gathered on the foreshore watching with anxious eyes for any signs that the ship had seen us, or for any answering signals. As we stood and gazed she seemed to turn away as if she had not seen us . . . suddenly she stopped, a boat was lowered, and we could recognize Sir Ernest's figure as he climbed down the ladder. Simultaneously we burst into a cheer and then one said to the other 'Thank God, the Boss is safe!'"

IN McMURDO SOUND

On the other side of Antarctica, seven of the ten marooned men were still alive, two of them incapacitated. Some extracts from Joyce's Diary.*

In these later months the diary was not written up daily but is a more or less continuous narrative.

"On August 20th decided to take a trip to Cape Royds to try and find some matches, etc., . . . started at 9 o'clock with 2 companions & dog team arrived there at 11, in the meantime the temperature going down to -45. Found the hut snowed up but soon had the door clear. . . .

It was like going on board of a man o' war out of a collier everything being so clean. The first thing to meet the eyes on going into the hut was Joyce & Wild Printers. The old hut brought back pleasant memories of the last expedition 1907-9. It is small and compact quite different to Scott's big hut. We then started to dig out cases. I had a good idea where the matches were stowed. After digging down about 4 feet came on them. There was a big case about 1 cwt. so if the relief does not arrive these will be a godsend. We then found cases of Salmon, Haddock and butter all in splendid condition although they had been there 8 years, but unfortunately found no tobacco which to my mind would have been better than the food. We loaded up the sledge and after taking stock found there would be sufficient food there for 2 years. We arrive back about 3 o'clock. At 7 o'clock we sat down to a royal banquet, Stevens being the chef. The scientists found some hops and malt and brewed beer, or it tasted something like it, but the after effects was something awful, but Wild thoroughly enjoyed it.

"Now we have to look forward to being relieved, but if the war is still on we can only expect relief from America if she is not in it. I am killing all seals for fuel and meat all parts of the seal we are now utilizing. Brains, tongue, heart, kidney and liver all make a good change.

. . . Each skin will last 4 to 5 days for fuel. The way we use same it is cut in about 8 inch squares and put into the stove. The warmth from it gives the hut a good temperature but the worst part we have to contend with is the fumes, the sides of the hut and everything you put your fingers on is greasy. . . .

"In September I went to Cape Royds with Gaze and Wild to study the Penguins as there is a rookery there. Richards is still in bed but otherwise everyone is in good spirits."

* Transcript by Joyce himself, in Turnbull Library, Wellington, N.Z.

SOCIETY OFFICERS

The new President of the New Zealand Antarctic Society is **Mr. Eric R. Gibbs** of Taihape. Mr. Gibbs has given long and loyal service to the Society and will be remembered as a member of the Huts Restoration Party 1960-61, and leader of the 1964 and 1965 teams. He has won wide acclaim for his collection of Antarctic stamps and covers, and has corresponded with Antarctic veterans and enthusiasts in many parts of the world.

Secretary of the Society is V. E. Donnelly.

Wellington Branch

Chairman: W. Hopper.

Secretary: W. Prebble.

Treasurer: A. H. Newton.

Mr. Hopper is succeeded as Publicity Officer by Mr. I. McMillan.

Canterbury Branch

Chairman: R. Heke.

Secretary: Mrs. E. F. Cross.

Treasurer: J. Cross.

SOCIETY BADGE

The Annual Meeting of the New Zealand Antarctic Society in August authorised the production of a lapel badge for Society members. The design will resemble the penguin crest on Society stationery. Supplies should be available by the end of the year.

ANTARCTIC CENTRE

FOR CANTERBURY MUSEUM

To celebrate its 100th anniversary, which falls in 1970, the Canterbury Museum Trust Board plans to erect a substantial Commemorative Wing, to incorporate a National Antarctic Centre comprising:

1. A large display hall for a permanent display on Antarctic exploration (particularly the Scott-Amundsen-Shackleton period, but with room for large exhibits of the mechanised phase) and also Natural History (Zoology, Geology, Physiography, Meteorology, etc.).

2. A Polar Reference Library (emphasising the Antarctic but including Arctic material) with Archive and Map Repository and Office for staff and public use.
3. A storeroom for housing a reserve collection of historical relics and equipment and natural specimens.

The Hundredth Anniversary Wing, of which the Antarctic Centre comprises a substantial part, will cost probably in excess of £100,000, but with the Museum's policy of funding income, the Board aims to have £40,000 in hand when the appeal is launched in 1970, and is confident that public donations and a Government subsidy will make up the balance.

The immediate purpose of this notice is to bring the scheme to the attention of people or institutions who may be able to assist by providing collections of Antarctic material; books and archives (including letters, diaries, photographs and sketches); historical relics of any type, and natural history material.

In deciding what theme to feature in its Centennial extensions the Trust Board considered that New Zealand should have an Antarctic Centre and that Christchurch (whose sea port served the Scott, Shackleton and Amundsen expeditions of the decade 1901-1911 as its airport serves the current Deep Freeze operations) has unique claims by history and location. The Board formally adopted the project in February 1965.

The chief point the Board wishes to convey to potential benefactors is that the Antarctic Centre proposals are firm and will be achieved. Because of interim storage problems it is preferred, in general, that potential benefactors state what they might wish to donate and hold their gifts until the Museum is able to receive them. Write to Dr. R. Duff, Director, Canterbury Museum, Christchurch.

The New Zealand Antarctic Society

is a group of New Zealanders and others, many of whom have seen Antarctica for themselves, and all of whom are vitally interested in some phase of Antarctic exploration, development, or research.

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

Wellington: Mr. W. Prebble, P.O. Box 2110, Wellington.

Canterbury: Mrs. E. F. Cross, 34 Clissold St., Christchurch 1.

"ANTARCTIC"

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