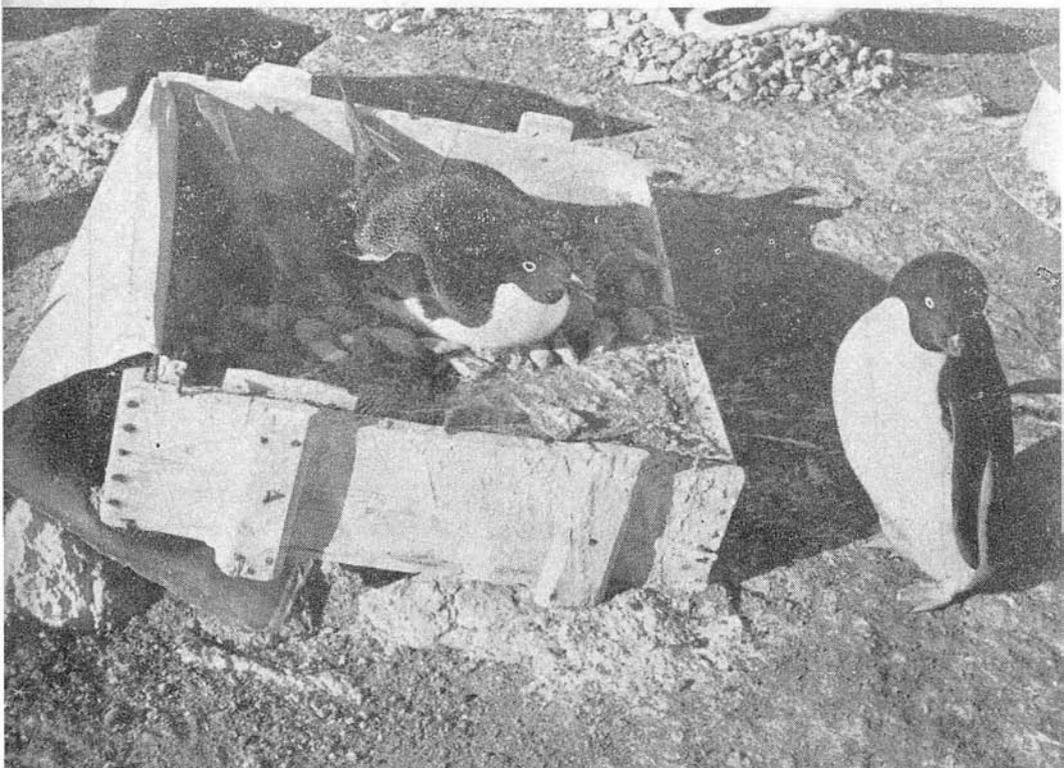


# ANTARCTIC

A NEWS BULLETIN

published quarterly by the  
NEW ZEALAND ANTARCTIC SOCIETY

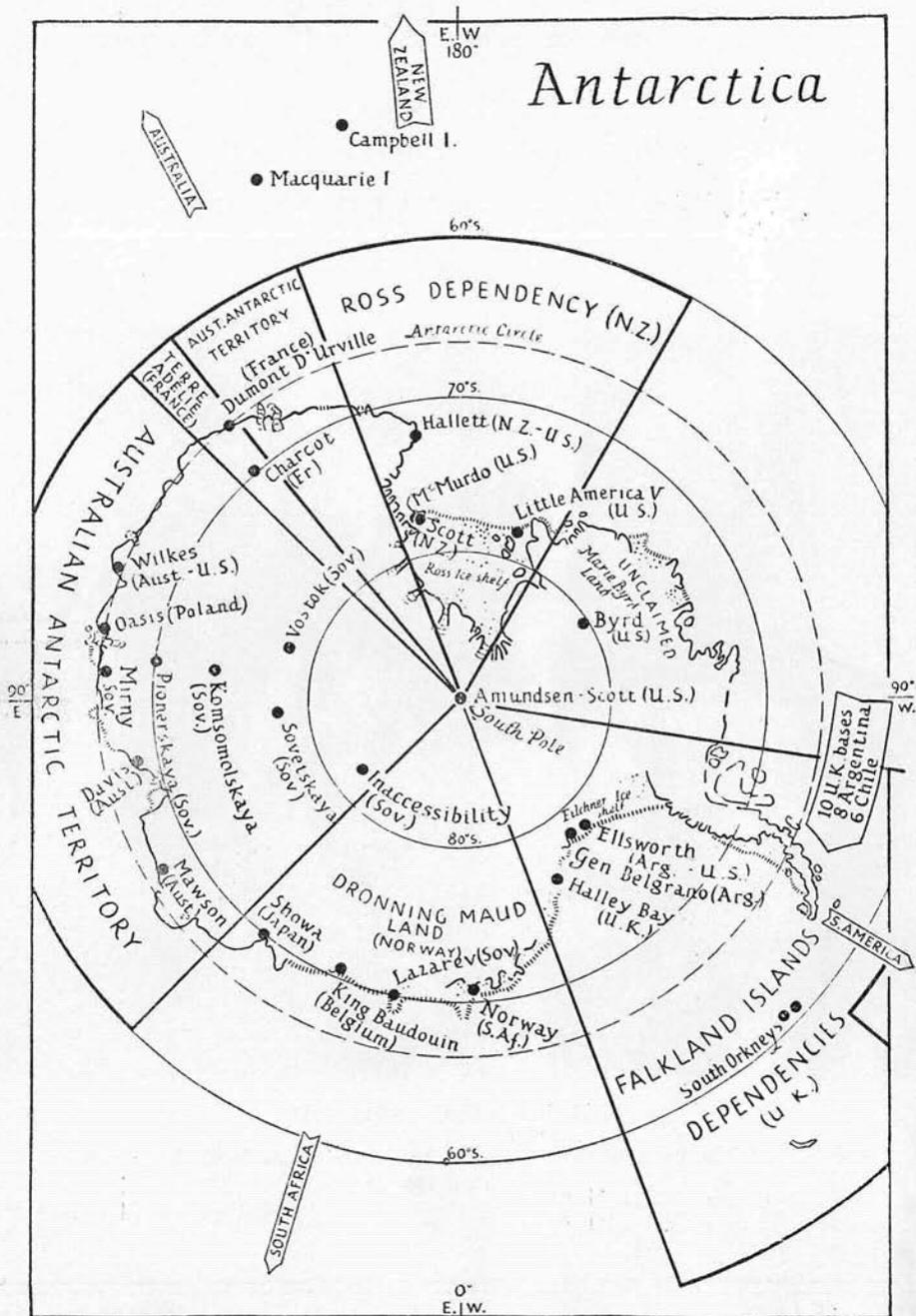


## ON HISTORIC GROUND

A pair of Adelie Penguins nest in an old box left at Cape Royds by Shackleton's expedition, 1907-09.

Photo: Dominion Museum, N.Z.

# Antarctica



# "ANTARCTIC"

(Successor to "Antarctic News Bulletin")

VOL. 2, No. 7

SEPTEMBER, 1960

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## READ THIS IF YOU WANT TO SEE THE ANTARCTIC

The Superintendent of the Antarctic Division, D.S.I.R., has invited the Council of the New Zealand Antarctic Society to nominate for selection suitable volunteers for up to

### TWO MONTHS' SERVICE IN THE ANTARCTIC.

The TWO MEN finally selected by the Superintendent will travel to McMurdo Sound by United States ship about mid-December to join the

### HUTS RESTORATION PARTY

(see page 248), and will return to New Zealand in late January.

They will **NOT** be paid, and will be expected to provide their own personal clothing. The Antarctic Division will provide food, transport and accommodation from time of leaving New Zealand to return, and special Antarctic clothing.

Selected applicants will require to undergo a medical examination. Appointees will be under the control of the Superintendent, Antarctic Division, and in Antarctica will be responsible to the Leader, Scott Base. Conditions of appointment will be supplied on application to the Secretary, New Zealand Antarctic Society, P.O. Box 2110, Wellington, to whom applications must be sent

**NOT LATER THAN OCTOBER 15**, giving age, interests, and general qualifications for work in the Antarctic.

## ANTARCTIC CONFERENCE

A conference is to be held following ratification by all twelve nations of the Antarctic treaty signed last year banning military weapons from Antarctica and providing for international co-operation in scientific research. Officials of the Australian External Affairs Department expect that the conference will be held in Canberra early next year.

Four of the twelve nations, the United Kingdom, Belgium, South Africa and the United States, have ratified the treaty. Final drafts of Australia's ratifying legislation are being prepared, New Zealand is expected to ratify the treaty shortly, and the remainder, Norway, Japan, the Soviet Union, France, Argentine, and Chile are expected to do so before the end of the year;

The United States Senate ratified the treaty by 66 to 21.

A Bill giving effect to the treaty was introduced in the New Zealand House of Representatives on August 30 by the Prime Minister, Mr. Nash, and was read a first time.

## S.C.A.R. TO MEET IN NEW ZEALAND

S.C.A.R., the special committee on Antarctic Research of the International Council of Scientific Unions, has been invited to meet next year in Wellington, New Zealand, and the invitation was accepted at the meeting held in Cambridge, England, from August 28 to September 3.

## NEW ZEALAND PREPARING FOR BUSY SUMMER PROGRAMME

Although New Zealand is not this summer mounting so many field journeys as last year, preparations are well in hand for a varied programme of exploration and research stretching from Cape Hallett in the north, as far as the Shackleton Inlet in the south.

The Scott Base wintering party will number 12, comprising:

- Lieut. **L. D. BRIDGE**: Leader.
- V. E. DONNELLY**: Administrative Officer.
- C. A. CLEMENTS**: Senior Scientist.
- R. SHANAHAN**: Scientist.
- R. S. CRANFIELD**: Technician.
- P. C. S. GRAHAM**: Technician.
- U. J. SOBIECKI**: Technician.
- L. O. DUFF**: Senior Maintenance Officer (Mechanical).
- W. R. LOGIE**: Maintenance (electrical).
- B. A. M. FOLEY**: Maintenance (buildings).
- W. H. DEVERALL**: Radio Officer.
- K. L. FAIRCLOUGH**: Cook.

In addition, two members of the Southern survey party will winter over at Scott Base:

- P. M. OTWAY**: Assistant Surveyor.
- W. H. HERBERT**: Assistant Surveyor.

During the summer months it is expected that two main groups will be doing field work; a geological and survey expedition working in the coastal area of southern Victoria Land between the Barne Inlet (80° 15' S.) and the Shackleton Inlet (82° 22' S.), and a Victoria University of Wellington expedition working in the Koettlitz Glacier region.

### SOUTHERN PARTY

The geological and survey expedition will be in two groups, led by

**Captain P. J. Hunt** and **G. J. Matterson** respectively. The purpose will be to explore the coastal area between Barne Inlet and Shackleton Inlet to a depth of 40 or 50 miles. Both leaders have wintered at Scott Base after taking part in the main southern sno-cat and dog-team expedition last year. It is expected that after moving south across the Ross Ice Shelf one team will penetrate the area adjacent to Cape Selborne (80° 20' S.) where the sno-cat crevasse accident of November, 1959, resulted in the death of Lieut. T. Couzens, and then work south. The other team will push further south over the ice-shelf, and will penetrate the coastal mountains in the area of Beaumont Bay (81° 25' S.) or Cape Wilson (82° 17' S.).

The allocation of personnel to these two teams will be decided later. Those taking part in the expedition will be, in addition to Hunt and Matterson, **W. H. Herbert** and **P. M. Otway**, assistant surveyors, who will winter over, **D. R. Goldschmidt** and **C. N. Cooper**, field assistants, and **M. G. Laird** and **D. N. B. Skinner**, geologists. Goldschmidt was with last summer's southern field party and Cooper with the New Zealand Alpine Club's expedition in the Beardmore Glacier area; while Herbert has done field work with the Falkland Islands Dependencies Survey.

—see Stop press p 248

## VICTORIA UNIVERSITY EXPEDITION

It is expected that for the third year in succession an expedition from the Victoria University of Wellington will be working in the Ross Dependency. In the coming season the area to be covered will be further south than the Dry Valley region in which Dr. Bull's party in 1958-59 and Dr. Balham's last summer were working.

This year the University team proposes to work in the lower Koettlitz Glacier area, south-west across McMurdo Sound from Cape Armitage. Parties from Scott's first ("Discovery") expedition, 1902-04, were puzzled by the apparently "decadent" nature of the Koettlitz Glacier snout. One of the major tasks which the Victoria University party is setting itself is to examine the glacial moraines in an attempt to secure definite evidence of the recession of the glacier, its nature and timing.

Details of the expedition's programme have not yet been finalised. The personnel as at present planned is — **R. H. Wheeler**, Geography Dept., V.U.W., Leader; **Dr. Colin Bull**, leader of the 1958-59 V.U.W. expedition and member of earlier Greenland expeditions, Physicist; **Dr. H. R. Black**, of the United States National Science Foundation at present studying in New Zealand, Geologist; **Ian H. G. Willis**, V.U.W. geology student and a member of last year's University party, Geologist; **Roger Cooper**, also a geology student of the University.

One more member has still to be selected. A gravimeter will be carried by the party, and Wheeler, Bull and Cooper will carry out a gravity survey as well as ordinary survey work with theodolite.

## BIOLOGY

**B. E. Reid**, who last year carried out extensive biological research at Hallett Station, where he wintered, will again go south this summer. During October and November he will be at Cape Royds and he will then return to Hallett. At both places he will make re-observations of the penguin and skua rookeries in order to complete the work undertaken last year. He will be assisted by one of the present Scott Base wintering party.

## OCEANOGRAPHY

The emphasis in oceanographical work during the coming season will be on a study of water movements in McMurdo Sound, including currents from under the ice-shelf moving between Ross Island and the mainland. In late October **A. E. Gilmour** of the New Zealand Oceanographic Institute with two other members of the Institute staff, assisted by two of the scientists wintering-over at Scott Base, will study from shore-based stations the currents under the ice-shelf.

After the arrival of H.M.N.Z.S. "Endeavour" in McMurdo Sound the work will be continued from the ship.

Travelling south on "Endeavour" **G. Harlen** and another scientist of the Oceanographic Institute, assisted by two appointees to the Antarctic Division, will carry out further oceanographical work. Investigations may be made on the line Macquarie Island-Balleny Islands as planned for last year, when bad weather interrupted the programme. In McMurdo Sound they will carry out marine biological studies within a range of 100 miles from Scott Base and extend the work already undertaken by Gilmour's hydrological party, thus completing phase 3 of last summer's planned programme.

## THE OLD HUTS

During the period November-January a New Zealand party will be working at Scott's old hut at Cape Evans and at Shackleton's hut at Cape Royds, with the object of restoring them to a condition more in keeping with their historic importance.

The small hut at Cape Royds is relatively clear of ice and snow, and biologists Young and Taylor occupied it for some months last summer. The Cape Evans hut on the other hand, the home of "Scott's Last Expedition", is largely ice-filled, and even the otherwise ice-free portion has a two-foot carpet of ice on the floor. The clearing of this hut will be the party's major task. It is not intended to make the old huts "museum pieces" but to restore them as far as possible to the condition they were in when the explorers of 50 years ago were living in them, and to preserve them against further deterioration.

The huts contain innumerable relics of the "heroic age" of Antarctic exploration, and it is felt that if they are given a "lived-in" look there will be less likelihood of the thoughtless souvenir-hunter pilfering objects which can never be replaced.

The composition of the party has not yet been finalised. It will probably comprise four of the men who have been wintering at Scott Base, and, in the later stages, two volunteers nominated by the New Zealand Antarctic Society. The Superintendent of the Antarctic Division advises that the party will be led by **L. B. Quartermain**.

The United States authorities are co-operating whole-heartedly in the provision of transport and materials. Many overseas experts have given valuable advice on the techniques of excavating fragile objects from ice.

## AT THE BASE

While it is not planned to erect any new buildings at Scott Base this year, some of the existing buildings will be reconstructed so as to provide additional storage space. A covered way will also be constructed between the Base buildings proper and the future store-room.

The Otter aircraft which was purchased from the Americans will not be re-conditioned in time for use in the Antarctic this season, but the United States VX6 squadron will assist the New Zealand field parties by putting in food depots for use this season.

**Mr. G. W. Markham**, Superintendent of the Antarctic Division, will again visit the Antarctic this summer. He will make a personal study of conditions at the joint United States-New Zealand station at Cape Hallett.

Among others who will spend the summer at Scott Base are **A. R. Scott**, advisory stores officer; **J. G. Murray**, mechanic; and **R. W. Tripp**, dog-handler. **M. M. Gill** of Geophysics Division, D.S.I.R., will be making absolute magnetic observations at both Scott Base and Hallett Station, where he will supervise the installation of new equipment for this purpose.

## OPERATION HUSKY

To bring the dog population at Scott Base up to 50 in order to provide the four teams required, arrangements have been made to purchase twelve fully-grown (2-3 years old) dogs in Greenland and to fly them out to New Zealand.

The purchase and transportation arrangements are being handled for the New Zealand Government by Mr. Walter Herbert. An English surveyor, born in South Africa and brought up in Cairo, Mr. Herbert has lived an adventurous life. He served for two years with the Falkland Islands Dependencies Survey (1956-57) and was in the field

last summer with the Spitzbergen Scottish Expedition.

Mr. Herbert flew to North West Greenland early in September and will bring the dogs to New Zealand about mid-October via Thule-Sondre Stromfjord-McGuire Air Base-New Jersey-Traverse air Base-Honolulu-Canton Island and Fiji, probably the longest air journey dogs have ever made. Transport is being supplied by aircraft of the United States Military Air Transport Service coming out from Thule Base.

### BRIEFING

In preparation for the work ahead, all available prospective members of the wintering-over and summer field parties attended a briefing course at Wallis House, Lower Hutt, from September 12 to 15. Among the experienced instructors at the course were Dr. R. A. Falla and Dr. R. G. Simmers (both members of the late Sir Douglas Mawson's 1929-31 Expedition). Mr. J. H. ("Bob") Miller (deputy leader N.Z. component, Trans-Antarctic Expedition), D. Wright (the photographer who went with Sir Edmund Hillary to the South Pole), R. I. Walcott (of F.I.D.S. and last year's New Zealand summer field party) and E. S. Wedgwood (cook at Scott Base 1958-59). Another speaker was Cdr. Chester Knowles, U.S.N., a veteran of Operation High Jump and now U.S. Naval Attache in New Zealand.

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### STOP PRESS

It is now likely that the full eight-man team (see p. 246) of the southern party will penetrate the coastal area in the vicinity of Beaumont Bay. One four-man party will then move north to Barne Inlet while the other group works south as far as the Shackleton Inlet.

## N.Z. NAMES IN AUSTRALIAN ANTARCTIC

The following newly approved place-names in Australian Antarctic Territory commemorate members of the New Zealand component, Trans-Antarctic Expedition, who explored the area immediately west of the Ross Dependency during field journeys in 1957-58, and other New Zealanders concerned with Antarctic exploration.

**Mount Brooke**, 8,500 feet, dominating the country near the head of the Mackay and Mawson Glaciers. Named after Lieut.-Cdr. F. R. Brooke, R.N., leader of the 1957 Northern Survey Party.

**Odell Glacier**, draining north-east from the south-west side of Mt. Brooke into the Mawson Glacier. Named after Professor N. E. Odell, Everest climber, who was at the time on the staff of Otago (N.Z.) University.

**Allan Nunatak** in the most south-west source of the Mawson Glacier. Named after Professor R. S. Allan of the University of Canterbury.

**Mount Warren**, on the plateau edge at the south-west corner of the Skelton Névé. Named after Guyon Warren of the 1957-58 Northern Survey Party, T.A.E.

The 100-mile long glacier which discharges into the Ross Ice Shelf at Barne Inlet, explored by Ayres and Carlyon of the N.Z. component T.A.E., has been named Byrd Glacier.

### ANTARCTIC DIPLOMAT

Mr. L. V. Shcherbakov, a graduate of the High Arctic Navigation School, Moscow, arrived in Wellington on August 23 to take up duties at the Soviet Legation. He will be in charge of matters relating to the Antarctic, and, in particular, will be the legation's liaison officer with Soviet vessels going to or returning from the Antarctic.

## WINTER AT SCOTT BASE

The twelve New Zealanders who have spent the winter at Scott Base have been busily occupied with the base chores and the maintenance of the scientific programme which is the base's principal purpose.

June and the first half of July for the most part provided ideal winter weather—calm and clear, with temperatures in the minus forties. A blizzard at the end of June blew for three days at a general strength of from 55 to 65 m.p.h., reaching 87 m.p.h. at one stage. There were lesser ones on the 10th and 11th of July, of 40 to 50 m.p.h. Between them they piled up huge drifts round the Base.

The highlight of June was, of course, the Mid-winter's Day party on the 22nd. A lavish buffet meal was prepared by cook Warren, and in the decorated Mess the table was crowned with a huge iced cake. The centrepiece, beautifully executed in icing, was a massive book opened at the centre with appropriate mid-winter wording. The Commanding Officer, McMurdo, all the officers and scientists and some of the men joined in the celebration. During the evening a telegram was received from President Eisenhower sending greetings "to the men of all nations working for the advancement of man's understanding of the Antarctic" whose efforts "are daily examples to the world of co-operation among men of many nations striving towards a common goal". Those at Scott Base who heard this telegram read out comprised men from the United Kingdom, Australia, the United States, Norway, Russia and New Zealand.

### SNOW PILES UP

The extent of the snow accumulation can be gauged from the fact that at the dog lines the wire spans to which the heavy dog chains are attached were buried, after three months, three feet under

the snow. The wings of an American Dakota aircraft parked nearby were at the end of June level with the surrounding snow surface.

Two miles from Scott Base an American oceanographer had dug a hole through the sea-ice, there 12 feet thick, and constructed a hut round it so that he and his assistants could carry out their daily work in reasonable comfort. But he found the hut sinking under the weight of the accumulated snow, with the danger that the water from the hole would flood the hut. A bulldozer cleared away three feet of surface snow for a hundred feet around, and the level of the hut then rose 18 inches.

### OUTSIDE CHORES

As far as possible, work during the winter is confined to what can be done inside, but routine maintenance of various kinds has to be done outside—re-fuelling, snow supply for the melters and dog-feeding. Re-fuelling involves loading sledges by hand with 44-gallon drums of kerosene, hauling them by tractor from the fuel-dump to the re-fuelling centres and hoisting them inside to special compartments to thaw out.

The snow is so dry that it does not normally congeal—snow-balling is impossible—but in intense cold (60 to 90 degrees of frost) the snow is solidified to the consistency of cake-icing.

Feeding the dogs is comparatively simple. Mutton and seal carcasses had been cut into six-pound blocks with a circular saw before the winter set in, and each dog receives one block every second day. These blocks are stone-hard and it needs one's full strength with an axe to

chop them into chips and splinters so that the dogs can eat them.

### COLD DAYS

July and August are normally the coldest months of the Antarctic year, and this year was no exception. Temperatures were well down into the minus forties and fifties. The coldest at Scott Base till mid-August was  $-59^{\circ}\text{F}$ . On the ice-shelf below the Base temperatures were  $10^{\circ}$  lower still.

One of the inconvenient effects of these low temperatures at Scott Base was their effect on the fuel used for heaters and diesel generators. While the fuel drums lay buried in the snow which had drifted over the fuel-dump, they remained comparatively warm; but when the 44-gallon containers were exposed to the air the fuel froze down to a jelly-like consistency. It could not be pumped or poured. The drums had then to be stored in a warm compartment such as the generator room for several days to enable the fuel to thaw out. Refuelling from the dump had to be planned well ahead to allow for such delays and for frustrating weather conditions.

Fortunately, the wind during these coldest days was light. On eleven days in July the wind speed exceeded 35 miles per hour, but there was only one big blow. It started very suddenly, as all southerly blizzards do, and raged all day on July 31 from 2 a.m., reaching 86 m.p.h. Visibility was reduced to zero by the blown snow, which was so dry that it was like sand. While the men stayed inside the dogs on their spans in the open curled up and slept, almost disappearing under the drift.

During the winter the dogs were being prepared for their spring and summer sledging journeys. Four teams of nine dogs each have been brought up to a state of physical fitness. During the winter they were taken for runs of a few hours' duration whenever moon

and weather combined to make it possible. Loads of three to four hundred pounds were carried on each sledge. With regular and increasing daylight the runs became more frequent and the loads gradually increased.

### LEISURE HOURS

Even during the winter, work for the Scott Base staff started at 8.30 a.m. and for some at least was often carried on until late in the evenings. Leisure hours were well filled with a thrice-weekly film show, phone-call nights with New Zealand three times a week if radio conditions permitted, and lectures of scientific and general interest each Friday. These lectures were held alternately at Scott Base and McMurdo and were given to scientists and support staff of both bases. The lectures varied from ionospherics and astronomy through helicopter operation and field surgery to travellers' tales. Particular interest was taken in one on Russian Antarctic activities given by Sven Etveev, a Russian scientist now at McMurdo. Mr. Etveev has had several years of Arctic and Antarctic experience.

### ANTARCTIC OLYMPIC

Scott Base has its own international sporting event, carrying on a long-range chess match with the Russian Lazarev Station, almost diametrically opposite on the edge of the Antarctic Continent below South Africa. The moves are exchanged through the Russian Mirny Station and McMurdo. A great deal of interest centres round the board when a new move by the Russians is received and analysed. After deliberating all implications and the implications of corresponding moves, the one decided on is passed to McMurdo for transmission in their next weekly schedule with Mirny, who pass it on to Lazarev. As will be appreciated, the game is a fairly protracted one.

## WINTER DAYS AT HALLETT

The New Zealand members of the Hallett party next year will be:

**P. J. MARTIN**—Senior Technician.

**P. A. LOWE**—Technician.

**N. E. STENT**—Technician.

It is intended to effect the relief this summer by air.

Bob Thomson, the New Zealander who is chief scientist at Hallett Station this year, writes in light-hearted vein about the rigours of winter in "the Banana Belt of the Antarctic".

"Photography remains the main hobby, bright auroral displays during the month providing good material. The weather in June proved surprisingly good with approximately 90 per cent. clear skies. Even on the 21st a red glow was visible on the north horizon, providing a short period of welcome semi-light.

Meanwhile the scientists are engaged on other deep moves too—after eventually digging through twelve feet of ice for the tide gauge, they installed instruments to measure the electric current in the sea-water. Experiments indicated that three more holes through the ice would be required, about a mile from the Base. This time an American explosives team from McMurdo gave great assistance. By using directional blast from shaped charges one hole was successfully excavated, but the others were obdurate.

Webster carried on a winter-long fight to get the auroral station operating as it should. It meant a number of trips to Arrival Heights (always with at least one other man) in the Landrover, but the little vehicle has done marvelously well and has always made the trip successfully, even if snowshovelling was needed at times.

"Reconstruction of our boudoir by Ray Brown is nearing completion, but the necessary sound-proofing to eliminate the odd snores has yet to be done. All are now awaiting the return of the sun next month. It is difficult to realise that we have passed mi-winter. We believe, however, that possibly the Antarctic has been kind to us, as the stories told of some extremes have not as yet been experienced here.

"July started with a bang on the 4th when both Americans and Kiwis celebrated American Independence Day. At mid-day explosives and a bonfire, lit out on the Bay ice, gave a temporary sun, but did not increase the temperature from  $-38^{\circ}$  F. A special supper was followed by a most enjoyable social evening which somehow drifted on into the late hours of the following morning. The Cape Hallett tennis championship was won by New Zealander Ray Brown.

"With the increase in twilight some short hikes across the bay ice, including the climbing of large icebergs, brought relief to those who enjoy exercise and cool fresh air. Except for an odd seal, animal life had been non-existent during the past two months and the quietness of the camp was only broken by the noise of generators and an occasional human voice.

"A clear day and a 3-minute glimpse of the tip of the sun peeping over the horizon on July 31st climaxed many days of speculation as to whether a sun still existed and reminded us that our dark Antarctic winter was now over."

The new barracks at Byrd Station may well be the show places of the Antarctic. In order to give life and colour to their drab surroundings, Navy men have painted the interiors of the buildings a multi-coloured assortment of 32 colours.

## IN ADELIE LAND

The new French team for Adélie Land is to leave le Havre on October 15 on the "Norsel". The nineteen men will relieve the fourteen members of the present expedition, who will have been at Dumont d'Urville for twelve months when the relief ship arrives at the base. Meanwhile the scientific programme has been proceeding according to plan.

On March 26 an "iono-antenna" was destroyed by a wind of over 125 m.p.h.

On April 11 Chief-Mechanician Jean Morin had his left shoulder dislocated by a fall. The dislocation was successfully reduced by Dr. Dumas the following day.

Sea-ice made its appearance about the archipelago from March 8. Stretching before long to the horizon, it was broken up and scattered as the result of a violent storm at the end of the month. On the contrary, most of April was free of storms.

Claude Lorius, who was the French representative with the Victoria Land traverse last summer, describes in a letter published in T.A.A.F. (II: April-June 1960) the three sno-cats' arrival at "Terma Sud" on Christmas Day.

"On the stake planted a year before by Gaston Rouillon's team the Ovalmaltine tin was still in place. The Americans left a second message, but when will the second find take place?"

### LUCKY BOYS

At "La Foire de Paris" this year, the Ministry of Overseas Territories organised a competition for young people between the ages of 18 and 25. Two questions were put to the competitors, "Why do you want to go to the South Pole?" "What is the name of the famous person whom you most admire?" The panel of judges, presided over by M. Rolland, Chief Administrator

of Terres Australes et Antarctiques Françaises, on May 26 selected from the 19 finalists two winners:

Michel Brun (23), a law student, will leave in November on the "Gallieni" for Kerguelen, and will return to France a month later with the team being relieved.

Martial Monbeig-Andrieu (21), an Arts student, will leave on the "Norsel" with the 11th French expedition to Adélie Land. He will return to France after a month's stay at Dumont d'Urville Base.

## NORWAY'S FINAL YEAR

As previously reported, Norway Station, in Dronning Maud Land, 70° 30' S 2° 32' W, has been taken over since the beginning of the year by the South African National Antarctic Expedition.

In July, Norsk Polarinstittutt published an outline of the work carried out at the station during last year. This included both station and field observations in geomagnetism. An all-sky camera for the photography of aurorae operated from February 24 to October 27. In glaciology, snow accumulation and ablation measurements were taken, snow temperature measured, and movement of the ice shelf recorded. In January 1960 snow accumulation studies were also made at Maudheim, the site of the Norwegian-British-Swedish Expedition, 1949-1952. General geological reconnaissance was carried out at various locations in the area 71° 20' S, 8° to 12° E. Regular meteorological observations were also recorded.

Cartography and oblique air photographs were obtained of the mountains in the area 70° to 73° S, 0° to 31° E, of some mountains west of 0°, and of the ice front from Kapp Norvegia to 13° E. Maps will be published by Norsk Polarinstittutt.

## EIGHT SCIENTISTS PERISH IN FIRE AT RUSSIAN BASE

The sincere sympathy of all the nations co-operating in Antarctic exploration and research will be extended to the Soviet Union in the tragic loss of eight lives in a disastrous fire at Mirny Base.

The fire, which occurred on August 3, destroyed a meteorological building. Of the eight who lost their lives, six were Russians, one a Czech and one a German. They were all trapped in the burning building.

The Russians who died were O. G. Krichak, chief of the aerological-meteorological section at Mirny; Visamushkov (no initials available), aerologist; A. L. Ergach, meteorologist; I. A. Popov, aerologist; A. M. Belilikov, aerographer; and A. Z. Smirnov, aerologist. The name of the Czech was reported as A. Kostka, and of the German as C. Popp, both meteorologists.

The fire started at a time when there was a wind storm, with gusts reaching 126 miles an hour. The winds frustrated rescue attempts, says the Sydney "Sun-Herald". The base members who made rescue bids were paralysed by the freezing winds. They were helpless to quench the flames, which ripped through the wooden flat-roofed base buildings fanned by the roaring blast.

The eight men, all in the weather observatory section of Mirny, lived in insulated double-walled timber buildings heated by fuel stoves. They were trapped inside the building while the whole base was battered down to withstand the blizzard.

The double-walled timber buildings are heated by fuel stoves. It is thought that the fire may have been started by an explosion in one of the stoves while the men were asleep.

Other men of the base, unable to go outside in the wind, did not learn of their plight immediately. Then, despite Mirny's modern equipment, they were helpless to take effective action.

Members of the base fought the blaze in a paralysing temperature of 50 degrees below zero Fahrenheit. The screaming wind knocked fire-fighters off their feet. Sharp blizzard-borne snow crystals blinded and cut them. Tracked motor vehicles with fire-fighting gear were practically immobile in the snow and wind.

The Russians report that all their records were destroyed except for those of some smaller satellite research stations. The four survivors of the aerometeorology section will continue their surface and upper air research programme.

Mirny, the main Soviet scientific base in Antarctica, is believed to comprise about 80 buildings used for storage, equipment, and housing for support of exploration work.

McMurdo has a Russian scientist wintering over this year, Sveneldt Evteev. Mr. Evteev's wife, residing in Moscow, recently gave birth to a baby girl, the first child for the young couple. The commander decided that a celebration was in order. The party consisted of a special cake, a small buffet, refreshments, and good music. The cake was a masterpiece of decorating skill. It presented two pink baby shoes in a nest of rosebuds with green leaves and across the cake written in Russian with pink icing were the words "We congratulate you, Sven".

Later in the evening all the Americans present honoured Mr. Evteev by singing the song "There is a Tavern in the Town", in Russian. LCDR Dale had previously translated the English words into Russian and made mimeographed song sheets so that all could join in.

## Work at the Russian Bases

After completing the pre-winter operations in Queen Maud Land the Aviation Section under A. N. Pimevov returned to Lazarev Station. They were then transported by air to Mirny.

The first harbingers of winter to arrive at Haswell Island were four Emperor penguins. Four days after this advance guard the first large group of the main body arrived, and soon there were 20,000 birds.

A four-day blizzard covered Mirny with nearly two feet of snow.

The tractor-sledge train supplying the Komsomolskaya inland station, headed by B. A. Krasnikov, arrived back at Mirny after a 43-day journey which covered over 1050 miles, with frosts as heavy as 67 degrees. With three heavy tractors drawing sledges the train took fuel to Komsomolskaya for the spring and summer trips further into the interior. Scientific observations were carried out en route.

May Day was celebrated at Mirny in the midst of a fierce blizzard.

A group of geodesists was still working on the ice cap. Along a 30-mile traverse they studied the displacement of the ice cover of the continent.

At Vostok (the South Geomagnetic Pole) the wintering-over team had recorded a frost of 79.7 degrees. The average temperature for March was -79°F. Planes from Mirny had delivered food, fuel and miscellaneous supplies and equipment during March.

In February an aircraft arrived from the Belgian King Baudouin Station. On board was Prince de Ligne, a member of the group of Belgians rescued last year by the aircraft crew of Pilot Perov.

### NEXT YEAR'S WORK

Next year's expedition will be led by Valentin Driatsky, who comman-

ded a Soviet North Pole drifting station. It was announced last month that the expedition will leave Lenin-grad on board the motorship "Ob" about the end of October.

Field surveys will be made of central Antarctica and aircraft will be used to help explore the mountain region in the eastern part of Queen Maud Land.

Moscow announced on August 31 that Lazarev Station will be moved from the shelf ice on Princess Astrid Coast to "a new site between 60 and 125 miles from the coast."

Between September 25 and October 10 three tractors under Krasikov and Ikov will set out on a new route from Mirny to Vostok, crossing the old trail at Komsomolskaya. Gravity, magnetic and glaciological observations will be made on this route. Traverse-leader Korotkevich and two seismologists will join the team at Vostok, where the new tractors now at Vostok will take over the hauling. This traverse will proceed to the Pole of Inaccessibility, then on to Lazarev, making seismic soundings every 50 km and gravity observations every 10 km.

A western party led by Chief Glaciologist Ivanov will head southeast around the east end of the Wohlthat Mountains, then in a direction which may make possible a meeting with the eastern party.

Right from the first days of their stay in the Antarctic members of the 5th Expedition began to prepare for these treks into the interior. The eastern sledge-tractor train left for Komsomolskaya Station, where it delivered fuel for this trek.

The western cross-country sledge train was winterised on February 10 at a point 70° 24' 5" S., 12° 44' E. The crew were transferred to Lazarev Station.

It is expected that "Ob" will arrive at Lazarev Station about December 10.

At the new inland station an airfield is planned which will take heavy wheeled aircraft. Several geological and photogrammetric teams will spend the summer at the new base.

Plans for the autumn and winter field work at Mirny have been revised.

In August glaciological pit studies, three seismic profiles and approximately 15 gravity points will be made on Pobeda Island. Between September 25 and October 10 three tractors will take a new route to Vostok, crossing the old trail at Komsomolskaya. Gravity, magnetic and glaciological observations will be made on this route. Traverse leader Korotkevich and two seismologists will join the train at Vostok where two new tractors now at Vostok will take over the hauling. This traverse will proceed to the Pole of Inaccessibility, then toward Lazarev station making seismic soundings every 50 km and gravity observations every 10 km.

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#### (STOP PRESS)

The three weather stations referred to in the following columns have now ceased operation. Deruzhba operated from April 28 and Mir from May 20, till the beginning of August, and Pobeda from May 9 till the end of August.

They were all three automatic and were installed as far as 1,000 k.m. from the coast. On Pobeda the automatic radio meteorological station operated most successfully. Further plans are not quite settled.

Contradictory reports received concerning Pimenov's IL-14 flight from Lazarev to Mirny were due to the fact that the distance in one case was measured along the coast. The time was 11 hours 30 minutes. The altitude was 5,000m.

### WEATHER STATIONS

Further details are to hand concerning the three temporary weather stations the setting up of which was announced in our last (June) issue, p. 217. The new stations have been established in both coastal and interior regions as part of an extensive programme of detailed study of the circulation of the atmosphere.

#### "DERUZHBA"

An article in "Pravda" on May 27 stated that at Deruzhba, set up at the end of April on Zavodovski Island, the meteorologist A. Dergach, with a radio operator and a Czechoslovak aerologist, had already been making observations at the station for three weeks. L1-2 flights were necessary to carry in radiosondes and chemicals for the production of hydrogen.

#### "MIR"

Mir, which is situated about 55 miles north of Mirny on Drygalski Island, was established on May 20. Personnel and equipment were flown in and three men remained at the station, an aerologist, a radio operator and an East German meteorologist.

At all three stations, meteorological, actinometric and aerological observations were made, including radiosondes. The results were transmitted by radio to Mirny and incorporated in the general synoptic summaries disseminated throughout the world.

#### "POBEDA"

Pobeda is on an immense ice-berg approximately 200 miles north-east of Mirny and north of the Shackleton Ice Shelf. The equipment was flown in during May on two transport planes. The colossal berg on which the station stands was discovered in 1957 by Russian explorers on an aerial ice reconnaissance. Several thousand square miles in extent, it is apparently aground on

a shoal. Four Soviet specialists worked at the station, where it was proposed to make glaciological pit studies, three seismic profiles, and approximately 15 gravity points during August.

The newspaper "Water Transport" on May 19 gave an interesting account of the setting-up of "Pobeda" by L1-2 aircraft.

"The main task today has been landing colleagues of another temporary station on a gigantic iceberg, situated north of the Shackleton ice shelf.

"The weather favoured our flight eastward from Mirny. There lies the Shackleton shelf, extending 150 kilometres into the Indian Ocean and nearly 500 along the coastline. Further to the north we see frozen sea and individual icebergs merged into the ice.

"Beneath the wing of the aeroplane there lies a colossal iceberg. In places its snow-covered surface is intersected by small tracks. The edges of the iceberg are heavily snowed under, and in a number of places smooth slopes descend to the sea ice. Obviously, many years ago, this giant tore itself away from the Shackleton ice shelf and, drifting away, struck a submerged elevation. Here it remained grounded.

"Choosing a suitable space, Pilot A. Pimenov landed the heavy transport plane. The gangway was lowered, and the first people landed on the surface of this ice giant. Swiftly we unload stores, and then welcome A. Barabanov's aircrew. Within an hour a sturdy winter tent has been set up and all stores collected around it.

"When the aircraft departed for Mirny it left behind on the iceberg Meteorologist B. Deryugin, Aerologist M. Kalikhman, Astronomer V. Maltsev, and Wireless Operator V. Skripko. They have before them nearly two months of scientific observations at the station, which we have named Pobeda."

### THE ICE SLOPE

Four geodesists and a tractor-driver during May were conducting research into the glacial slope extending north from the shores of the Davis Sea. In severe winter conditions, they studied the movement of the glacier along the 30-mile route. In 1957 glaciologists set up landmarks here and determined their co-ordination. The last spot was situated 2750 feet above sea-level. The new team discovered nearly all the marks. They were replaced and fresh co-ordinates determined. This work will provide important data concerning the movement of the glacier during the last three years along the 30 miles from Mirny, stretching into the depths of the continent. Provided Mirny stands firm on the ice, held between the rock mounds outcropping from below, the ice on the "outskirts" of the settlement will move with a velocity of up to 100 feet per year.

### CZECHOSLOVAK SCIENTISTS WITH RUSSIANS

One of the men who lost their lives in the tragic fire at Mirny was Dr. Oldrich Kostka of the Hydro-meteorological Institute of Prague, Czechoslovakia. Dr. Kostka, one of two Czechoslovak scientists who flew to Russia on November 21 to join the Fifth Soviet Antarctic Expedition, was attached to the Synoptic and Meteorological section. His task was to take samples of rainfall during the voyage of the "Kooperatzia" and of ice-crystals in the Antarctic, where he was concerned also with ice temperature measurements, aerological soundings and the problems of air-circulation.

The other Czechoslovak with the Russians is Oldrich Prauss of the Geophysical Institute, Prague. His principal study is the variations of the electromagnetic field of the earth. He is also studying whistlers with the help of apparatus constructed at the Institute.

# RUSSIAN ANTARCTIC VESSEL'S FIVE MONTHS' CRUISE

When the diesel-electric vessel "Ob" arrived back in Leningrad in April, the ship had been at sea for over five months. She had covered more than 29,000 miles, nearly 2,000 of them through ice-fields, and had circumnavigated the Antarctic Continent.

Most of the scientists and sailors were no newcomers to the Antarctic. Out of 77 men only 16 were completing their first Antarctic voyage, while 33 had taken part in three or more.

## INTO THE PACK

Ice was encountered at an unusually early stage in the journey. On the way to Lazarev Station from Capetown "Ob" had to navigate several hundred miles of ice. The last 150 miles were particularly difficult. There seemed to be an impasse. The heavy hummocky ice was so tightly packed, that the vessel was often trapped by it, and a lot of time was spent freeing her.

On December 19 came the joyful meeting with friends at Lazarev. "We had abandoned them to the winter nearly ten months ago," writes Captain Dubinin in a Soviet newspaper, "at the newly organised station in Queen Maud Land. All looked cheerful and well. The splendid quarters at the station were spotlessly clean. We unloaded over 800 tons of cargo and delivered it to the station." The cargo included two heavy tractors and two "Penguin" cross-country vehicles, which will be used in the proposed traverse from Lazarev to the Pole of Relative Inaccessibility for the purpose of glaciological research.

Next port of call was the Japanese station, Showa, which the Japanese ice-breaker "Soya" had unsuccessfully tried to reach. In the ship's path lay huge fields of broken, but practically motionless pack ice. The Japanese under Captain Akita had

shown a great degree of skill. However, 40 miles from the station the Japanese vessels were brought to a halt by a completely unbroken pack of ice, which it would have required a great deal of time to break through. "Ob" hove to hard by a suitable glacier, and the Russians began to transport their stores to the station by helicopter. After completing unloading operations they set sail for the Australian station, Mawson.

## MAIL FOR MAWSON

The Russians were the first to arrive at Mawson, as the Australian expedition's ship "Thala Dan" had left Melbourne only that day. The "Ob" was enthusiastically greeted by the Australians, who now received their first mail sent via Capetown.

In the Mirny region on January 13 the "Ob" encountered the "Koopratsiya". It took 12 days to make a channel through the ice from the edge of the floe to the unloading depot off Haswell Island, and to pilot the "Koopratsiya" there. On the evening of January 31, after her men had said goodbye to the wintering party and those who were returning home on the "Koopratsiya", "Ob" set sail for the north.

She now received new orders to proceed to a rendezvous with the two whaling flotillas "Sovietskaya Ukraina" and "Slava". They were encountered on February 9 in the Southern Ocean. Loading operations here were not so simple in the open sea. The vessels, moored side by side, tossed in the swell. There were moments when one ship found

itself on the crest of a wave while the other wallowed in the trough; then the positions would be reversed. This wild dance continued for hour after hour, day after day. As shock absorbers between the vessels, "Ob's" crew used whale carcasses and special inflatable rubber balloons. Sometimes the balloons, unable to withstand the pressure exerted by the ships, would burst with an explosion like gunfire, and the sound of grinding metal. Even the strongest capron cables snapped like thread. The ships had to disengage for a while, and then renew loading operations.

#### PETER I ISLAND

"Finally," says Captain Dubinin, "we finished. Once again it is farewell. We head eastwards continuing our voyage round the sixth continent. We traverse the Ross and Amundsen Seas. At last, we approach

Peter 1st Island in excellent visibility of the west shore, gloomy in their wild splendour, the white peaks vanishing into the clouds, the glaciers on the east shore evenly descending towards the sea, all combine to make an unforgettable picture."

When the "Ob" circumnavigated Peter 1st Island in excellent visibility, on March 10, and navigators Zatonsky and Barinov entered the results obtained by radio-location survey on the map of the island, it was found that the measurements, configuration and topography of the island differed from those shown on the map. In particular, the length of the island is 9.5 miles, whereas the most recent surveys show it as 14.2 miles.

Scientific work en route was carried out by a group of nine scientists.

## THIS IS LAZAREV STATION

**The Russian Lazarev Station was built in February 1959, on the western coast of a shallow glacier of the same name, six miles from its junction with the main ice sea-board of the Princess Astrid Coast, Queen Maud Land.**

The approximate co-ordinates of the station are 69° 58' S., 12° 55' E.; its altitude above sea level is about 80 feet. The normal winter party comprises six scientists and five support personnel.

The station consists of three main structures: (1) The main building, housing the radio-meteorological centre, messroom, galley, living quarters, stores, bath-house, laundry and electric-generating plant; (2) an aerological pavilion; and (3) a reserve building with emergency wireless sets and a small generating plant. Apart from these, there are meteorological and glaciological areas close to the station. All the station structures are approximately a mile from the coastal barrier, which has a height of about 20 feet

and is covered in places with dense snowdrifts which make for easier access to the station from the surface of the sea ice.

The shallow Lazarev glacier has the shape of a tongue, projecting northward away from the main coastline for 45 miles. The breadth of the "tongue" is between 13° and 16° E., equal to approximately 50 miles. On previous maps this glacier has been incorrectly shown as lying between 11° and 14° E.

A fairly broad zone of shore ice from 9° to 13° E. is under observation. Its breadth varies from 12 to 43 miles.

The ice barrier in the same sector is broken by wedge-shaped bays several miles long, bounded by old sea ice more than 9 feet in

thickness. The thickness of the fixed ice on the near approaches to the station in February, 1959, was approximately 6 feet.

The "tongue" of the Lazarev glacier rests upon a ridge of submarine shoals and possibly even islands, now buried beneath the accumulations of shore ice. Such areas are marked by domes, projections and zones of intensive cracking on the surface of the glacier. However, on the whole this surface is level and covered with snow. Its absolute altitude varies between 80 and 180 feet.

The depth of the ocean at the western coast of the Lazarev glacier varies from 2,000 feet in the vicinity of the station to 500 feet 18 miles to the north of it. Apparently such variation in depth indicates the existence in the neighbourhood of the Lazarev station of a deep submarine trough, which here cuts the continental shelf of the mainland. It is probable that it forms part of a single gigantic trench which borders the ocean coast of Eastern Antarctica, and is marked by a series of coastal breaks in the continent.

The coastal zone of shore ice extends as far as the border of the Schirmmacher Oasis, where it gives way to mighty accumulations of continental ice. Immediately beyond the oasis the altitude of the ice cap rapidly begins to increase, and already at a distance of three miles to the south of it it rises to 1600 feet and over.

The northern foothills of the Wohlthat mountain massif, 93 miles from the coast, have an ice cap ranging from 3,000 to 5,000 feet in height, and on the southern slopes of the same massif from 8,000 to 10,000 feet. Further to the south stretches the level surface of the interior glacial plateau of Antarctica, which ascends evenly in the direction of the Pole of Relative Inaccessibility.

The Schirmmacher Oasis is situated 55 miles south-south-west of Lazarev station. It is a replica in miniature of the now well-studied Banger Oasis. It is just such a craggy, shapeless group of hills with numerous lakes of melted snow and, possibly, residual water.

The mountain massifs of Wohlthat, Alexander Humboldt and others within the research area reach maximum altitudes of 11,000 feet. Their bases are often concealed by slips and vast moraine fields.

To the north and east of the Wohlthat massif there are solitary mountain peaks with maximum altitudes of from 2,500 to 10,000 feet. A large group of such peaks was discovered in the vicinity of 72° S., 18° E. This group of newly discovered peaks was named the Russian Mountains.

During the year the station accumulates an average of 3 feet of snow, but in the course of two blizzards during the period of construction the height of the snowdrifts by the station buildings reached roof-level.

According to the figures of neighbouring Norwegian and Belgian stations, situated west and east of Lazarev station respectively, in July (winter) the average monthly temperature to be expected here is about  $-13^{\circ}$ , and in January (summer) approximately  $23^{\circ}$ F.

Vegetation in the area described consists of blue-green algae, found in the lakes of the Schirmmacher Oasis, and various lichens found at altitudes of up to 5000 feet on the northern and western slopes of the pinnacles and mountain massif of Wohlthat. At the Schirmmacher Oasis and in crevices of the rocks nearby mosses have been found.

Storm petrels and gulls are seen in the mountains, and in the coastal zone individual Adelie and Emperor penguins, seals, whales and a few other representatives of the animal world.

# Australian Antarctic Activities

Plans were announced on September 6 for the 1961 Australian National Antarctic Research Expedition.

Work at the four Australian stations will continue at approximately the same level. In 1961 there will be 37 men at Mawson, 23 at Wilkes, 9 at Davis and 14 at Macquarie Island.

Exploration and mapping in the Mawson-Davis region will be continued, using a Dakota aircraft and a Beaver. Tractors, weasels and Snowtracs will be used by surface field parties.

From Wilkes a tractor train will proceed 300 miles inland to measure ice depths on the Antarctic plateau by seismic methods. Three United States meteorologists and a geologist will join the Australian scientists at Wilkes for 1961.

Major weather investigations will continue at all four stations. Biological research will be expanded in 1961, with two biologists at Macquarie Island and two at Wilkes. Glaciologists will conduct new studies at Wilkes and Mawson. Auroral research at Mawson will be developed and a new cosmic ray recorder will be installed at Wilkes. Geomagnetism and seismology will be studied at Mawson, Wilkes and Macquarie Island, and ionospheric soundings will proceed at Mawson and Wilkes.

Improved radio facilities will be developed at Mawson and Wilkes to cope with the expanding traffic demands at both stations.

During the relief voyages the expedition leaders plan to carry out the following work:—

The Director of the Antarctic Division of the Department of External Affairs, Mr. P. G. Law, will relieve Wilkes Station, using M.V. "Magga Dan" (Captain W. Pedersen). He will establish a new automatic weather station at Chick Island (near Cape Southard, Wilkes

Land) and overhaul the existing automatic weather station at Lewis Island. Further exploration of the coasts of Wilkes Land and Oates Land will be carried out. A Beaver aircraft and possibly two helicopters will be carried.

"Magga Dan" is scheduled to leave Melbourne on December 1 for the Macquarie relief, and on December 24 for the relief of Wilkes. She will then head for Perth, leaving Perth for Mawson on January 28.

The Assistant Director of the Division, Mr. D. F. Styles, will relieve Mawson and Davis Stations using M.V. "Thala Dan" (Captain H. C. Petersen) and carry out coastal exploration of Enderby Land in the vicinity of Casey Bay. This ship will call at the Russian station at Mirny and the French station at Kerguelen during the voyage.

"Thala Dan" is to leave Melbourne on January 3, arriving at Mirny on January 18, Davis on January 27 and Mawson on January 30.

## MAWSON

From reports received from Hec. Geysen, leader at Mawson, it would appear that the Dakota aircraft was twice during the winter the focus of attention. The first was on May 12, when in the course of being pulled by tractor from the plateau to sea level it overran the tractor and despite all efforts to avoid a collision serious damage was done to a wing. Valiant efforts by all Antarctic Flight, combating the worst of Antarctic conditions, eventually repaired the damage and history was made just after midday on June 14, when with the sun just below the horizon the Dakota took off from Mawson Harbour, and at last was airborne. Celebrations were such on this occasion that when midwinter

came one week later, Mawson records the quietest midwinter's day in history.

### VISIT TO DAVIS

The medical officer at Mawson, Dr. Geoff. Newton, was flown by Kichenside and Carne on May 17 to carry out a medical check up on the Davis party. The party from Mawson stayed for 5 days being forced to return by the fast approach of winter. Field activities continued at Mawson throughout the entire winter, with trips to the penguin rookeries at Taylor, Foldoya, and Kloa, and trips to check the stake lines between Mount Henderson and David Range. Trips were made by weasel and by truck and even by man-hauling. On two occasions when the field parties were unable to move further the Beaver aircraft flew out and brought in the parties or rendered assistance. The man-hauling attempt of Kakharoff, Dyer and Dick to reach a small colony of Emperor penguins only twice before sighted deserved more success than the weather allowed, but the party stranded in deep snow two miles from their goal, after several days of blizzard. However a weasel trip by Newton, Jennings, and Merrick on July 23 took them the 53 miles to Taylor Glacier in one day in time to see the first Emperor chicks hatch.

Throughout the winter a series of lectures on aspects of the scientific programme and on navigation profitably passed the time.

### TIME MARCHES ON

Castleberg, a huge iceberg about five miles off Mawson and two miles from the coast and which has been grounded since the foundation of Mawson has shown some movement. Part of it has overturned and appears to be afloat. It is possible that during the coming summer the whole berg may go out.

### DAVIS

In the early winter the arrival of the Mawson doctor and party provided a welcome interlude to those at Davis station. During the visit of this party by Beaver the aircraft was put to good use by flying a party of Davis people to the Amanda penguin rookery 50-odd miles to the south. A count of three thousand birds was made with approximately half that number carrying eggs.

The remainder of the winter appears to have passed without incident, the one highlight being the celebration of mid-winter day. Temperatures ranged from minus 25 to plus 21 Fahrenheit, with a mean temperature of minus 3.2 degrees Fahr. The maximum wind speed was 69 knots with three blizzard periods all during the month of June.

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### WILKES STATION

Harry Black's news from the Australia-U.S. station at Wilkes is mostly of the scientific programme.

The meteorologists at Wilkes attained the greatest radiosonde balloon heights of all Antarctic stations during May with an average height of 84,638 feet and a maximum of 109,796 feet. Field trips in the early winter were restricted by the long hours of darkness although some weasel trips were made to the Plateau.

The first Emperor penguins came ashore on May 6, giving plenty of scope for the photographers of the party.

Midwinter celebrations at Wilkes stretched over two days, during which a four-way radio-telephone hook-up between the four Australian Antarctic bases, Mawson, Macquarie, Davis, and Wilkes was arranged. Following a seven-course meal with appropriate toasts to Her Majesty and to the President, the revelries of the "Wilkes Players" and the "Mohawks", saw the sun over the hump.

July at Wilkes was notable for extremes of weather with a blizzard gusting to 103 miles per hour and a record low temperature of minus 36 F.

Richard Penney, one of the American members of the Wilkes party, is carrying out a two-year study of the behaviour and numbers of the Adelie penguins, some 75,000 of whom are scattered in rookeries on this part of the coast of Antarctica.

The Met. staff have been busy during July on short field trips of ten miles to the remote weather station on the ice-cap.

On July 7 the first anniversary of the death of Hartley Robinson, a pilgrimage was made to his grave by all members of the Wilkes party. Hartley Robinson was accidentally killed at Wilkes on July 7, 1959.

An Australian newspaperman who phoned Wilkes station on Tuesday, August 9, was told by Harry Black, officer in charge, "We're quite snug inside. It's blowing about 100 m.p.h. outside, but it's a comparatively mild night . . . only 14 below freezing. Usually at this time of the year we're down to anything up to 60 below."

## AUSTRALIANS AND RUSSIANS TRACE GREAT VALLEY

**Soviet scientists believe that the central land mass of the Antarctic is cleft by a tremendous depression, the northern portion of which has already been mapped by Australian explorers.**

The Russians have named the depression the International Geophysical Year Valley in acknowledgement of the role played by Australians, Britons and Americans in progressively bringing it to light.

Where the depression reaches the Indian Ocean, it is filled by what is probably the world's largest glacier.

Australians have charted this mountain-flanked river of ice for more than 200 miles, and have named it the Lambert Glacier, in honour of Mr. P. B. Lambert, Director of the Australian Mapping Division, Canberra.

If the valley, or the down-faulting of which it is a part, extends to the South Pole, it will be more than 1,300 miles long.

The view that the feature extends far inland is based primarily on soundings of the ice sheet by a Soviet tractor party travelling to the Pole of Inaccessibility. On the way, the Russians passed 10,000-foot mountains buried under 3,300 feet of ice.

However, as the Russians reached the Pole of Inaccessibility the ice sloped down slightly and the land beneath it dropped radically.

Sir Vivian Fuchs and his men on their trans-Antarctic journey in 1957-58 observed a similar drop at the South Pole.

Twenty-five miles on either side of the Pole, the ice-buried land is 7,000 to 8,000 feet above sea level, but at the Pole its level drops about 6,000 feet.

The ice-buried trough reported by the Russian scientists is the second to have emerged from the exploration of Antarctica during the International Geophysical Year of 1957-58.

The first, discovered by a series of American tractor journeys, is thought to link the Ross Sea and the Bellingshausen Sea.

A trough has also been found running along at least part of the northern side of Antarctica's main mountain system, the great Antarctic horst.

## News from Base Roi Baudouin

We have received through the courtesy of the Belgian National Centre for Polar Research the following additional notes on activities at the Belgian Roi Baudouin Base before and during the winter.

Major Derom, the Base Leader, reported in late May the satisfactory carrying out of "Operation Winter Garden", in which eight men with three dog-teams and a sno-cat brought in the seals earlier stored at depots between Base Roi Baudouin and Glacier Bay. The operation was completed in almost one week. Glaciological observations were carried out en route.

During the winter months, as in previous years, radio propagation was "capricious", but a distinct improvement was anticipated within a couple of months. The Base weather men celebrated the 200th successful balloon-launching.

The Base corridors became a lively kindergarten following the birth of nine splendid puppies, who enjoyed themselves whole heartedly among the reserve food stocks. Little Ginette, at ten weeks old, was already the Base mascot.

The ceiling and walls of the base living-room have been repainted in bright colours.

### ACCUMULATION

In April the glaciologists set up lines of aluminium stakes a mile and a half south of the Base: eleven stakes on a north-south axis at intervals of 200 metres and eleven on an east-west axis at the same intervals. All the stakes stood eight feet above snow-level, the then level being clearly marked with red paint. In addition, stakes were erected at the corners of a 68-foot square, and connected by a cord. There was no significant accumulation up to the

end of April, but in May there was an accumulation of four inches.

The stakes set up in 1958 were not recovered.

On April 11 the new generator broke down, but repairs were soon effected.

### GEOLOGICAL SURVEY

A geological laboratory was set up during May, and this enabled considerable work to be done on the geological specimens brought back from the over-snow traverse of October 22-May 1. This was the first geological survey ever carried out in the western part of the Sor Rondane Mountains. The travelling was done with dog-teams, with the aid of aircraft and mechanised vehicles to establish depots.

In a journey of over 1240 miles, an area of some 8,000 square miles was roughly mapped between Lunc-kerygge and a nunatak at 72° 10' S, 20° 20' E. The furthest nunataks visited were situated 18 miles west of Blacklettane: the nunataks sighted extended as far as 37 miles west of Blacklettane. More than 1,000 k.g. of geological specimens were brought back to the Base, and examined over the winter in the base laboratory.

Lichens and mosses were also collected. Petrel nesting sites were observed on granitic peaks.

At the most westerly nunatak considerable exposures of marble were noted. No extensive mineral traces were observed, but iron oxide, sulphides, malachite and graphite were found in small quantities.

A general recession of glaciation was noted. Glacial deposits were found on all outcrops today free of

ice. Aeolian erosion was very extensive.

During this reconnaissance journey in the mountain area, aircraft were maintained in constant readiness. This involved shifting their position every day to prevent their snowing-up. On the return of the party on May 1 the planes were winterised.

The relief vessel "Erika Dan" returned to Antwerp on March 11.

### PLANS FOR 1960-61

The Belgians have decided against a South African suggestion that one vessel should be used to re-supply both Belgian and South African stations, on the grounds that the presence of the relief-vessel at Base Roi Baudouin is required for a considerable length of time. It is probable that "Erika Dan" will again be utilised, as in 1959-60. The employment of a ship-based helicopter is under consideration.

It is proposed to renew the mechanical transport every two years. Four sno-cats, a muskeg and eight heavy sledges were brought back to Belgium after the 1959 winter. Replacement of electric generators will take place annually.

Work at the base will include the reconstruction of corridors and annexes, the re-covering of roofs, and general reorganisation of the base lay-out. There are at present three prefabricated buildings with a covered way 160 feet long. The whole base is under six feet of snow. This threatens the collapse of the covered way and immediate reconstruction is imperative. A construction team of twenty men—carpenters, electricians, etc.—will have not more than a fortnight in January to carry out the work. Several bulldozers or caterpillar tractors will be required, and the ice thickness of only nine feet necessarily restricts the weight to not more than 13 tons.

## JAPAN'S EFFORT

The pattern of future Japanese activity in the Antarctic is still not clear. The Science Council of Japan urged that Showa Base should be maintained for two more years. The Head Office of Antarctic Research, however, after discussion of the Science Council's proposals, decided on August 22 that next year's wintering party will be the last. The budget for this has been passed but with some pruning, and details have yet to be finalised.

The expedition vessel "Soya" is at present scheduled to leave Tokyo on November 5 and to reach the ice edge about January 2, 1961. The ship is due to leave the Antarctic on February 26 and to arrive back in Japan on April 30.

Members of the expedition are at present being selected. The wintering over team will consist of 16 men, including for the first time a biologist. The leader will be Mr. Masami Murayama, who was leader of the winter party in 1959. In the scientific programme emphasis will be laid on upper-air meteorology and glaciology.

The team which has wintered at Showa has been carrying out the routine programme successfully. The party is now busy preparing for the inland journey scheduled for the spring.

## POLISH EXPEDITION POSTPONED

The Polish press agency reports that the departure of the scientific expedition of the Academy of Sciences of the Polish People's Republic has been postponed until next year. This decision was taken on account of the State budget for 1959. The Polish expedition will set out for the Antarctic in November 1960.

## S. AFRICAN PLANS

South Africa will next year maintain the former Norwegian base, now known as SANAE, 70° 30' S., 2° 52' W, with a scientific programme in geomagnetism, auroral physics, glaciology, geology, meteorology, gravity and medical research.

The wintering team at SANAE, which is 180 feet above sea level, will number 13.

Magnetic traverses are planned in the area from the ice front to the mountains between roughly 0° and 5° W., using a Proton magnetometer. The deformation and movement of the ice-shelf will be observed over an area of several hundred miles around the station. Limited geological reconnaissance and sample collection will be undertaken in the mountain region to the south.

Preparations have also been made for a dog-sledging expedition to be undertaken immediately after the winter to the nearest rock outcrop, approximately 50 miles south of the station.

### NEWS FROM SANAE

An April news report indicated that the South Africans, mostly novices in Antarctic conditions, but with an experienced leader in "Hannes" La Grange, were settling down happily at their "icy Karoo". The routine work of the expedition was going ahead well and a good deal of original work was being tackled, e.g., intensive micrometeorological measurements.

Hard work had transformed "a dismal little hovel" into a neat bathroom, and a drying-room and a woodwork room had been constructed: "unfortunately it is rather cold there."

Dr. M. M. Somov recently announced a new Antarctic temperature "low" of  $-88.4^{\circ}\text{C}$ . ( $-127.1^{\circ}\text{F}$ ).

## FUR SEALS RETURN

Owing to extensive and ruthless hunting, says Torger Oritsland in "Norsk Hvalfangst-Tidende", the fur seals were practically exterminated throughout the islands groups of the Falkland Islands Dependencies (south of South America) during the nineteenth century. The "Antarctic Pilot" (1948) states that the fur seals "appear to be extinct" in the South Orkneys.

But an observer in 1958 wrote that "fur seals have been sighted on all main islands of this group, the largest number of records coming from Signy Island". Mr. Oritsland visited Powell Island in the South Orkney group on three occasions during the 1959-60 season. The first landing was made on November 28, but no fur seals were sighted. On the second visit, on December 6, a fur seal rookery of one bull, one cow and a pup, was found on Michelsen Island. Two other fur seals were seen on the island on the same day.

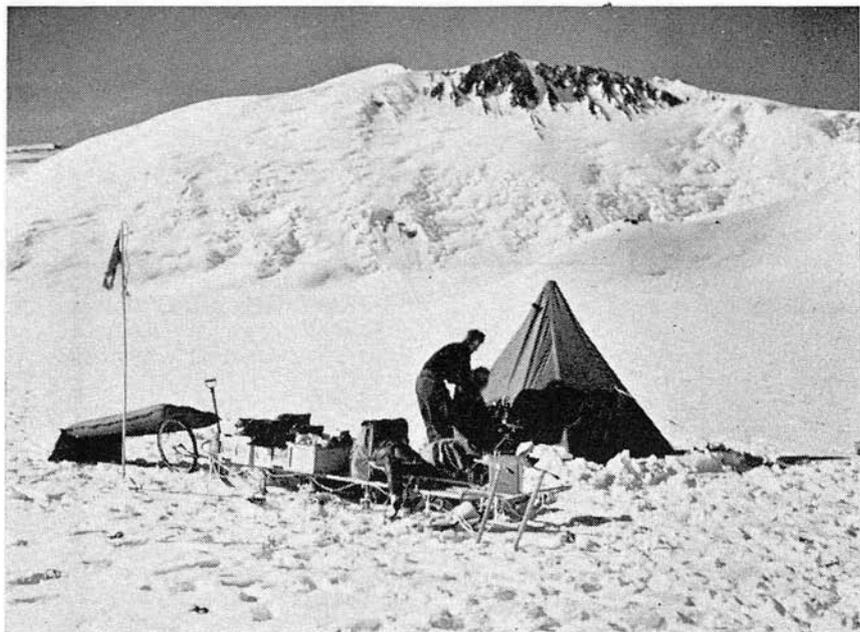
On February 17 the rookery was found to contain one bull and 11 cows with pups. Next to the harem five adult bulls were idling and a few bulls were playing in the water just below the rookery. Eventually, no fewer than 111 fur seals were sighted on the by then snowless beaches. The fur seals seemed to prefer gravel and rocky ground, and none were found in the muddy holes frequented by the elephant seals. The majority of them were males.

Time will show whether the seals observed constitute a foundation for future seal population in the South Orkneys.

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Dr. G. de Q. Robin, Director of the Scott Polar Research Institute, states that the maximum ice thickness measurement in the Antarctic to date is 14,000 feet, over two and a half miles.

**WITH THE NEW ZEALAND ALPINE CLUB EXPEDITION  
IN THE BEARDMORE GLACIER AREA.**



**Preparing to break camp on the Hood Glacier.**



**Lowering a sledge down a steep slope near the Hood Glacier.**

## BRITISH BASES IN THE FALKLAND ISLANDS DEPENDENCIES

Further details are now available to supplement those published in our June issue concerning the annual relief of the Falkland Islands Dependencies Survey bases.

Base Y (Horseshoe Island) was eventually relieved by the Otter aircraft which took off from the sea ice five miles south of the Argentine Islands. The relief was completed on March 29 and the two ships, R.S.S. "John Biscoe" and M.V. "Kista Dan", which had been standing by, then returned to the Argentine Islands. The old Base F hut on Winter Island was temporarily re-opened as winter quarters for the six men who were to have established the new Base T on Adelaide Island. These six men are to be flown south in the spring by the Beaver and Otter aircraft which are wintering at Deception Island.

The "Biscoe" then visited the main Base F hut on Galindez Island and continued northwards to Bases A (Port Lockroy), B (Deception Island), G (King George Island) and H (Signy Island), taking gravity and magnetic readings en route. A brief call was made at South Georgia on April 14-15 and the ship returned to the Falklands on the 18th. She left five days later for Montevideo where she disembarked three men and collected a new wing for the Beaver, to replace one which had been torn off in a storm shortly before the relief of Base Y. The new wing was delivered at Deception Island on May 6 to be fitted to the aircraft during the winter. The ship returned to Stanley to pick up sixteen men who had been brought out from the bases, and sailed home via Montevideo, arriving at Southampton on June 12.

### News from the Bases, March-May 1960.

Nine of the bases are manned this

year by a total wintering party of 87 men. Routine meteorological, sea ice and auroral observations have been continued at all of them.

Base A (wintering party, 5) continues its ionospheric and radio research.

Base B (normal wintering party, 5) is also housing the six men who will fly the two aircraft south in the spring and re-open Base E (Stonington Island). The American icebreaker U.S.S. "Glacier", called at the base on March 10.

Base D (wintering party, 17); several sledge parties from Base have occupied the View Point hut during the period March to May, and have visited Eagle Island in the Crown Prince Gustav Channel. In addition, two surveyors have worked at Contact Point, Hope Bay, and a four-man geological party went to the East Russell Glacier in mid-May.

The magnetometer survey was continued in the vicinity of Mount Bransfield (Trinity Peninsula) from mid-March to mid-May, but unfortunately had to be abandoned as the magnetometer was irreparably damaged when the sledge carrying it overturned.

Base F, Galindez Island (wintering party, 14). The full programme of geophysical observations has been continued without interruption.

Base F, Winter Island. The old Base F hut was re-opened temporarily to house the six man Adelaide Island party.

Base G (wintering party, 8). Gales throughout March and wet and windy weather in April restricted field work, but in spite of this geological work was carried out on the Keller Peninsula, and glaciological

work on two glaciers near base. Collections of diatoms and mosses were made. Gravity readings were recorded by Dr. Griffiths using a Worden gravimeter, when the "Biscoe" called at base on April 9.

Base H (wintering party, 6). Seal population counts are being undertaken this year, and to facilitate this work a small hut was constructed on the west coast of Signy Island in April. Ornithological activities have included the ringing of more than twelve hundred giant petrels and two hundred sheathbills during March and April.

Base Y (wintering party, 4). As the base was relieved by air, only a small wintering party was taken in and the programme of work has consequently been curtailed. Nevertheless some field trips have been undertaken. In April, a two-man geological party spent a week working in Square Bay (a few miles east of Horseshoe Island), and another two-man party spent a week at the unoccupied Base E making an inventory of stores and equipment. Additional supplies were taken to Base E at the beginning of May and two men then spent nine days there carrying out repairs to the hut in preparation for the arrival of the party from Deception.

Base Z (wintering party, 16). The full programme of geophysical and ionospheric work has been maintained. Work on emperor penguins also continues.

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### ALL ALL ALONE

The British Antarctic explorer Duncan Carse announces that he will spend 18 months alone on the island of South Georgia. Mr. Carse who is 47, plans to reach the island in about six months' time.

### WHAT IS ANTARCTICA?

The long-standing question—what really is the shape of Antarctica?—has not been finally answered yet. But the gap between theories is narrowing. Here are two recent answers:

"Antarctica is not a single continent, but a large part of it consists of islands, welded together by a general ice cover."

"Antarctica is not an archipelago, but a continent with numerous mountain systems and depressions, covered by a heavy ice cap."

There is a continent somewhere, but its exact size and shape are not yet known. It is certain, however, that the customary maps give no real indication of the extent of the land above sea level.

### NOTHING NEW

But as long ago as 1876, Sir C. Wyville Thomson of the "Challenger" in a lecture at Glasgow said, referring to the region south of the 70° parallel, "We have no evidence that this space which includes an area of about 4,500,000 miles, nearly double that of Australia, is continuous land. The presumption would seem rather to be that it is at all events greatly broken up, a large portion of it probably consisting of groups of low islands united and combined by an extension of the ice sheet."

And Henryk Artowski anticipated the I.G.Y. by over half a century. In a report to the Brussels Conference on the Study of the Polar Regions in 1906 he wrote, "The solution of certain scientific problems indeed demands a great number of simultaneous expeditions. This could only be brought about by worldwide co-operation and this co-operation must be obtained."

# THE READER WRITES

## Sidelights of Antarctic Research

We commence in this issue a new feature which we trust will be of value. Readers who have observed some little-known feature of the Antarctic scene or who have arrived at conclusions which they would like to have considered, are invited to present their ideas in a short "Letter to the Editor", of approximately 500-600 words. Letters should deal with topics of general interest and should be couched in non-technical language.

### DEAD SEALS INLAND

Sir,—Readers of Antarctic literature will be familiar with the fact that bodies of crab-eater seals (*Lobodon carcinophagus*) are often found many miles from the sea in the ice free valleys of the Victoria Land coast, Ross Sea. There are two main opinions as to how they got there. One holds that the seals travelled up the valley from the sea over the rock and moraine to where they are now found. The other rejects this idea on the grounds that a seal adapted to movement in the water or over smooth ice could not travel far over rough rock without being severely injured. They must therefore have travelled up the valley over ice when a glacier was there, to be subsequently deposited as the glacier retreated.

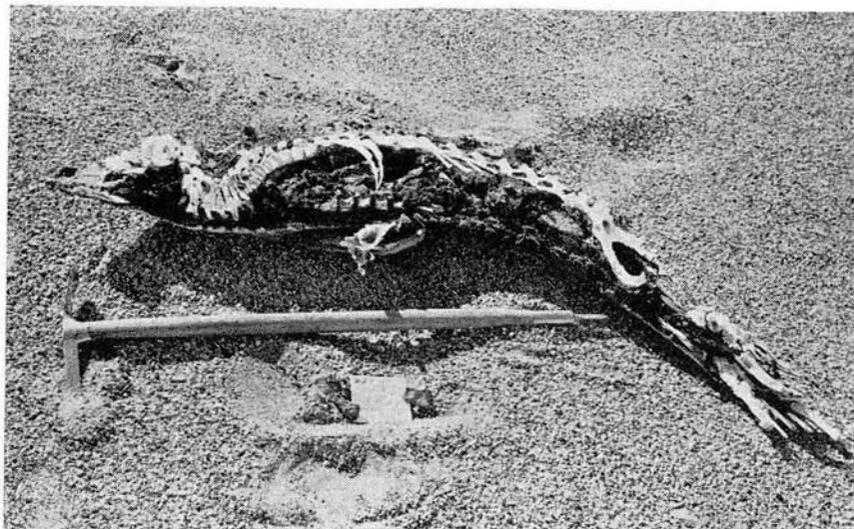
In November 1958, a couple of days were spent in the Taylor Dry Valley at Lake Bonny, fifteen miles from the sea. As 28 seals were found within three miles of the lake it was a good place to investigate this problem.

Although the moraine left by the retreating glacier extended several hundred feet up the sides of the valley, no seals were found weathering out of this deposit. On the contrary, all the seals were found either on an old lake deposit in the valley bottom or were not more than twenty-five feet above the valley floor. Those on the lake deposit showed no evidence of having been laid down with it but rather appear-

ed to be superimposed on it. In fact, one of the seals was lying on wind ripples in the sand and in the opinion of Dr. W. Hamilton of the U.S. Geological Survey had clearly arrived there after the ripples had been formed. Seven of the seals were on the permanently frozen surface of Lake Bonny, a lake formed after the Taylor Glacier had retreated from the area. Unless they had weathered up through the ice, this is inconsistent with their having been deposited by the glacier. The evidence strongly suggests that all the seals I examined travelled up the valley and died at places where they are now found. There is no evidence here of glacial deposition.

The carcasses were at different stages of disintegration suggesting that they died at different times. The finding of a fresh seal track in the lower valley (Claridge, in mss.) suggests that these journeys may still occur.

Why did the seals go there? I see no need to invoke special explanations. Most animals have an instinct to travel away from their place of birth, and this usually happens when the young animals become independent of their parents (e.g. Blair, 1950). That this may have also been the case with these seals is suggested by the fact that none of those measured reached the minimum length for sexual maturity (Bertram, 1940), and that the ends of the flipper bones were never fused to the shafts, another sign of



Crab-eater seal 15 miles from the sea. Taylor Valley, Victoria Land.

immaturity. The carcasses we see in the dry valleys could well be the remains of young dispersing seals which were unfortunate enough to have their noses pointed in the wrong direction at the beginning of their journey.

The seals I saw in the valley were all crab-eaters. However, other Antarctic animals make similar journeys. Both Adelie penguins and a leopard seal have been reported far inland (Péwé et al, 1959), and I have seen one weddell seal three miles out on the Ross Ice-shelf and another alive in the Cape Royds crater where it appeared quite healthy although it had crossed half a mile of vesicular basalt with an initial climb of 200ft. up a 30° slope. In January 1959 I found two moulting juvenile emperor penguins on the ice shelf between Ross and White Islands, 49 miles from Cape Crozier rookery. As they cannot enter the water when moulting, they must have walked all the way

Because of records such as these, I am inclined to doubt the many ingenious theories accounting for the presence of dead seals inland (sickness, hunger, over-population, predation, excessive salinity, glacial deposition) and to suspect until more compelling evidence is produced to the contrary that it is the result of quite normal dispersal.

GRAEME CAUGHLEY,

Forest Service, Wellington, N.Z.

Bertram, G. C. L., 1940, *The Biology of the Weddell and Crab-eater Seals; with a study of the Comparative Behaviour of the Pinnipedia*. "Brit. Graham Id. Exped., 1934-37, Sci. Rep. 1:1-39.

Blair, W. F., 1950, *Ecological Factors in Speciation of "Peromyscus, Evolution"* 4:253-75.

Péwé, T. R., N. R. Rivard, and G. A. Llano, 1959, *Mummified Seal Carcasses in the McMurdo Sound Region, Antarctica*. "Science" 130 (3377):716.

### DRIFTING SNOW

Sir,—Attempts at measuring the amount of snow transported by the wind go back to the first Polar Year in Spitzbergen (S. A. Andree, 1882-3), but the methods used for trapping the snow on that and later occasions disturbed the free air flow and hence gave uncertain results. These early studies culminated in the work of F. Loewe, in Adelie Land (1951), who estimated the drift snow transport through a vertical strip 1m wide by 300m high as 240 tons/day in a 70 knot wind.

In 1957 M. Mellor, one of Loewe's pupils and A.N.A.R.E. glaciologist at Mawson, developed new "aerodynamic" drift snow traps. These are shaped like rockets and follow changes in the direction of the wind. The air stream passes through a narrow inlet duct and is then slowed down by expansion; this permits the snow particles to settle out before the air reaches the trap exit. With careful streamlining about 70% of the air in line with the inlet actually enters the trap. This "efficiency" was determined through ingenious wind tunnel tests by T. Pound at the Aeronautical Research Laboratories in Melbourne. For earlier trap designs with baffles or trap doors the efficiency presumably had been much lower.

Measurements with Mellor's traps at 10 levels between 3cm and 400cm above the surface in over 30 blizzards with winds up to 60 knots were made last year at Wilkes by R. Dingle. The analysis of his results showed for the first time that, as predicted by turbulence theory, the drift snow content of the air decreases exponentially with altitude. The theory predicted furthermore that at a given level the drift snow content should be a certain complicated function of the wind velocity, and this was also confirmed from Dingle's observations. In some cases the weight of the air near the ground was found to be almost

doubled by the drift snow suspended in it.

The drift snow transport was found to double every time the wind increases by 6 knots. In a 70 knot wind the average amount of drift snow passing at Wilkes through Loewe's vertical strip 1m wide by 300m high was just under 6000 tons in 24 hours—25 times the earlier estimate. Assuming the drift and wind conditions at Wilkes or Mawson to be about average for the Antarctic circumference one is led to a total drift snow loss of over 100,000 million tons a year.

These colossal figures raise serious problems since it is not easy to see where all the snow is coming from. Further measurements and surveys of local drift variations are required; the drift snow amount at higher levels, where no direct drift measurements are possible, and in the interior of the continent are also in need of study. But the first step at any rate has now been taken towards understanding one of Antarctica's basic processes.

UWE RADOK,

Department of Meteorology,  
University of Melbourne,  
Parkville, N.Z.,  
Victoria, Australia.

### SEALS AT WHITE ISLAND

Sir,—During the 1958-59 summer some of us visited White Island across from Scott Base. While we were there we noticed two live seals lying among the pressure ridges around the north-eastern end of the island. At the time we did not think this unusual and did not actually go to them from our camp about a mile or so away. The point is, how did the seals get there? I doubt very much that they travelled over the ice shelf from the nearest open water at Scott Base 15 miles away. The other alternative is that they swam under the ice. Now the ice between Scott Base is up to 200

feet thick and there seems little likelihood of any air holes through to the surface. Another interesting point is this: if their air supply is limited they must have a good navigation system to reach the tide-crack around White Island. During the winter when the tide crack holes become frozen over, it would be unfortunate if a seal swam across to the island, found he could not get out and then had to swim back to open water. Dead seals have been reported on the beaches of Black Island (which is surrounded by ice shelf) and one wonders whether the seals there were prevented from getting back into the water and so died of starvation.

I have checked back through my books and find two interesting references. The first from Armitage's "Two years in the Antarctic" refers to a journey he, Wilson, and Heald made up the Koettlitz glacier late in November 1903. They apparently went up as far as Heald Island about 30 miles from open water. Several miles from their final camp Armitage records that he found a live Weddell seal, apparently very old and ill. Armitage also mentions finding a dead crabeater seal up the Ferrar at an altitude "between 2,000 and 3,000 feet" and at least 30 miles from open water. He comes to the conclusion that "this seal apparently knowing of its approaching dissolution, crawls painfully and wearily up and ever upwards, until death overtakes it." Strangely enough a little later he found a dead cow seal and not far from it the skeleton of a young one.

I then read Griffith Taylor's "With Scott—The Silver Lining" and found that his party up the Koettlitz glacier in February 1911 had also found some live seals in much the same place as the one found by Armitage's party. Taylor says, "When I reached camp I found that Wright and Debenham had both met parties of (live) seals. We all thought of the constant stream along the tide

crack to our last depot and came to the conclusion that this was largely fresh water and formed the main drainage of the upper Koettlitz. By this sub-glacial stream the seals penetrated nearly 30 miles inland up the Koettlitz glacier."

Here we have two cases; the first where the seals may have swum under the ice, and the second where they most certainly could not. Well what about White Island? Until someone travels under the ice shelf (by atomic submarine?) we cannot say just what the under side of the ice is like. It is hard to imagine pockets of air there.

Perhaps some of your readers might have comments on these rather curious aspects of Antarctic life.

ARNOLD J. HEINE,  
Institute of Polar Studies,  
Columbus, U.S.A.

### ANTARCTIC INSECTS

Considerable interest was aroused by the report that the New Zealand Alpine Club expedition last summer, working far to the south of Scott Base in the Beardmore Glacier area, had discovered insects. Mr. C. H. Tyndale-Biscoe, the party's zoologist, now in Western Australia, supplies us with these details:

"Collembola, possibly two species, were found at four sites—two in lichen, one in moss and one on bare granitic gravel. Mites were found at four other sites, one in lichen and three on bare rock or 'soil'.

"All these sites were on the coastal ranges east of the Beardmore, and none were found south of latitude 85° 54' although all bare rock was examined to 84° 20'. This is not to suggest that they do not occur further south but only that we were travelling inland and they seem to be restricted to the coast. Lichens, however, occurred inland and were even found at 7,000 feet on the summits of Mt. Patrick and Wedge Peak."

# CHILEAN ANTARCTIC ACTIVITIES

We are indebted to a series of articles on "The Development and Future of Chile's Antarctic Programme" published by the Instituto de Geofísica y Sismología, Universidad de Chile, for the outline which follows.

Chile maintains four fully-manned bases, all in the sector to the south of the South American continent.

## ARTURO PRAT (NAVAL BASE)

62° 30' S, 60° 38' W, Bahia Chile, Greenwich Island, opened February 1947. Personnel 8. Comprises officers' quarters with individual bedrooms and non-commissioned officers' quarters with four double bedrooms. This is Chile's largest Antarctic base.

There is a flock of 30 sheep, and 100 fowls all adequately housed.

There are emergency shelters at Copper Mine (Robert Island), Yankee Bay (Greenwich Island) and one for eight persons near the Base, stocked for three months' use.

## O'HIGGINS (ARMY BASE)

63° 19' S, 57° 54' W, Bahia Covadonga, Graham Land. Opened February 1948. Personnel 8.

Conditions at the base are relatively poor as a result of the fire which destroyed the sleeping quarters in 1958. At present there are one bedroom for the commander, one for the two other officers, and a dormitory for the five N.C.O.s. The radio operator occupies the radio room.

There is an emergency shelter near the base, stocked for nine persons for three months. There is also a shelter on the Graham Land Plateau between the base and Hope Bay.

The base itself is built on solid rock on a small peninsula. A seismological station has been maintained here by the Seismological Institute of the University of Chile since 1954.

## GABRIEL GONZALEZ VIDELA (AIR FORCE BASE)

64° 49' S, 62° 52' W, Bahia Paraiso, Graham Land. Opened May 1951. Personnel, 7. There are separate bedrooms for the Commander and the second-in-command. Living and dining room are common but of a good size for the staff. An emergency shelter near the base has food for eight men for three months.

## PRESIDENTE AGUIRRE CERDA (AIR FORCE BASE)

62° 56' S, 60° 36' W, Caletto Pendulo, Deception Island. Opened February 1955. Personnel 8.

Officers' quarters were built this year, each having his own bedroom. The N.C.O.s use the old living-dining room. There are 30 sheep and 100 fowls at the base.

Emergency shelters have been erected at Bahia Telefono (for eight men) and at Caletto Buen Tiempo. There is also a shelter for eight men near the base.

The base was enlarged during the 1959-60 summer, and there is a well-protected underground cellar.

## PERSONNEL

At each of the bases there is a cook, one or two radio operators, a motor mechanic, and a male nurse. The staff, selected by rigorous physical and psychological examinations, get prior mountain training at Favellones, as well as technical courses.

There is accommodation for up to six summer personnel in emergency shelters. The question of the replacement of military personnel by civilian scientists is apparently still under discussion. At present, the only scientist in each wintering party is a meteorologist, generally

the second in command of the base. Little work appears to have been done in geology or glaciology, and the authors add, "The Antarctic in summer provides a ready field of activity for the zoologist, the botanist and the marine biologist. These fields are all fruitful and require no great investment or prior preparation."

In the field of seismology there is a certain amount of equipment at O'Higgins Base.

### COMMUNICATIONS

Communication by sea with the continent is possible in summer from all four bases. At Arturo Prat ice conditions vary considerably from year to year. There is a pier for small vessels and the base has a plywood boat and two outboard motors. Seal hunting is carried out from boats. There is a dog population of seven, which makes it possible to visit the emergency shelter at Yankee Bay with the two cargo sledges at the base.

At O'Higgins too ice conditions are variable. The bay is open and difficult to operate in, but there is a pier for small craft. The base has 23 dogs and two 9-foot sledges. Here also there is a plywood boat and two outboard motors. Two tractors and eight long sledges have been ordered for future field work.

The bay at Gabriel Gonzalez Videla is notorious for bad ice conditions, currents carrying ice both ways through Pedro Aguirre Cerda Channel. There is a boat and outboard motors, but no equipment for field work.

President Aguirre Cerda is on a well-sheltered port, and there is an excellent landing area for seaplanes. A radio beacon is installed to aid navigation by sea and air, but "only one flight has been made in 1955 (December), landing on the water at Deception." Apart from a single boat with outboard motor, there is no equipment for exploration work.

At O'Higgins and Gabriel Gonzalez Videla the only water supply is from ice, but at Arturo Prat there is also a pumping system to utilise melt water, while at Aguirre Cerda in summer there is natural melt water, for which a catchment has been built. This is the centre for watering Chilean ships in the Antarctic. In winter, of course, ice or snow has to be collected and melted.

A lighter note! The Olympic Games have begun at the Chilean Bases. The sports scheduled include "bars", ping-pong, draughts and chess. The prizes are to be chocolate bars.

### BYRD MEMORIAL FOR NEW ZEALAND

A group of New Zealand friends of the late Admiral Byrd is making plans for the erection of a suitable memorial to be erected in the capital city, Wellington.

Known as the Richard E. Byrd Fellowship, they have already been granted by the City Council a commanding site on Mount Victoria (700 feet) in the city area. The memorial will thus be seen from all parts of the city and the airport suburbs.

To so symbolise the long-standing co-operation between America and New Zealand on matters Antarctic, will meet with the unqualified appreciation of New Zealand citizens.

It is envisaged that, when erected and floodlit at night, this will be a dramatic reminder of the importance of "The Great White Continent of Peace" as a neutral meeting ground of nations.

Readers who are interested in further information on this project may get in touch with the Convener, Mr. Tracey M. Simpson, 24 Treiisick Crescent, Wellington; phone 36-635.

# UNITED STATES PLANNING WIDE PROGRAMME FOR 1961

The United States Antarctic Research Programme, now largely concentrated in the McMurdo Sound area, includes a series of major over-snow traverses in areas at present very little known.

The last traverse of Operation Deep Freeze 60 was to investigate an area of the Ross Ice Shelf known as "Discovery Deep". This is an area on the sea floor, under the ice shelf, discovered by Dr. Albert Crary and the Victoria Land traverse party of Deep Freeze 111 (1957-58). The area was to be re-visited to determine the shape and depth of this 4,590-foot depression—more than 1000 ft. deeper than the area surrounding it—and to find out if it was a basin or part of a trough.

During the entire trip the party carried on a scientific programme. Four major stations were made where glaciological pits were dug and seismic reflection and refraction shots were made. In addition, gravity, magnetic, glaciological, altimetric, and meteorological data were gathered at regular intervals.

Preliminary results show that the "Deep" is probably a 4,300 foot trough, trending south-south-westerly but closer to the coastal mountains on the west than had been expected. Further investigation in crevassed areas will be needed to complete the profile of the undersea features.

## McMURDO-POLE TRAVERSE

The University of Wisconsin will stage a traverse from McMurdo to the South Pole. The eight man party, led by Dr. A. P. Crary, will include a Soviet glaciologist. Three sno-cats will leave McMurdo in mid-October, ascend the Skelton Glacier (the Hillary route) to the Plateau Depot, strike roughly south-west to 83° 30' S, 131° E, and then south-east towards the head of the Beardmore Glacier, eastward along the south side of the mountain rim of the

polar plateau, and on to the South Pole.

Instead of cargo-sledges, the sno-cats will each draw two Rolli-Trailers. The Rolli-Trailer consists of two pairs of 500 gallon fuel-carrying tyres with a cargo-carrying surface slung between them. The vehicles will be left at the Pole Station for the winter.

## ON THE ICE SHELF

A five man party from the University of Michigan under C. W. M. Swithinbank with two motor sledges is to carry out glaciological work on the Ross Ice Shelf. Stations of approximately a week each are planned at Mulock Inlet, Barne Inlet, and the Nimrod, Beardmore, and Shackleton Glaciers, and a four week station on the Amundsen Glacier. The party will be carried by air between stations. Movement stakes will be set up, and similar stakes placed last year will be re-surveyed.

## BYRD TRAVERSES

C. R. Bentley, like Crary an experienced traverse leader, will head a team of seven scientists which will leave Byrd Station this year and strike inland. The party, comprising seismologists, glaciologists, and a magnetician, will travel in three sno-cats, and will have a Rolli-Trailer. They will use a mechanical sled-mounted drill for seismic-shooting purposes.

The proposed route is Byrd Station—79° S, 100° W—77° 30' S, 99° W. Here, where the new traverse will intersect that of 1957-58, a week's work is planned. The subsequent route is to the south end of the Hudson Mountains (approximately

75° 30' S, 98° W)—Mount Peterson (75° S, 82° W)—the Eights Coast at about 73° S, 95° W, and east along the coast as far as possible before the personnel are returned to Byrd by air. The sno-cats will be cached.

A further traverse from Byrd Station will head for the South Pole. The primary purpose of this traverse which will get under way in December is to move D-8 tractors and some heavy equipment to the Pole Station, where it is needed for air operations and construction purposes.

Other work based on Byrd Station includes: geological work in the Horlick Mountains, in the range south of the Eights Coast, and in the Sentinel Mountains.

#### SHIP OPERATIONS

The deputy commander of Task Force 43, Captain Edwin C. McDonald, USN, will command the ship group, consisting of four icebreakers, a tanker and three cargo ships.

Captain McDonald's Task Group will carry most of the supplies necessary to maintain the four American stations for the next year, and will position supplies at McMurdo for the aerial resupply of interior stations during Deep Freeze 62.

#### Ship Schedules

##### Icebreakers:

USS "Staten Island": From Lyttelton will undertake oceanographic work in the Ross Sea commencing December 14.

USS "Glacier": Arrives Lyttelton November 21, and McMurdo December 5. The "Staten Island" and the "Glacier" will rendezvous off the Thurston Peninsula on January 27, and in February enter the Amundsen Sea.

USCG "Eastwind": Arrives Lyttelton November 23, and arrives at McMurdo on December 5.

USS "Edisto": Arrives at McMurdo via Lyttelton on December 5.

##### Cargo Ships:

USS "Arneb": Arrives at Cape Hallett on February 16.

USNS "Private John R. Towle": Arrives at McMurdo December 26.

USNS "Greenville Victory": Arrives at McMurdo January 24.

##### Tanker:

USNS "Alatna": Arrives Lyttelton January 6 and McMurdo January 16.

The "Alatna" will return twice to Lyttelton for more fuel and two further trips to McMurdo, arriving approximately February 6 and February 27.

Dates for ship operations are tentative, depending on ice conditions, unloading difficulties and changes in operating requirements.

#### AMUNDSEN SEA

Also scheduled is a penetration of the Amundsen Sea. Two ice-breakers with scientists representing the fields of oceanography, ornithology, seismology, geology and other geographical sciences, will proceed in February 1961 to this heavily ice-clogged area, which is bisected by 115° W on the South American side of the continent.

The ships assigned are USS "Glacier" and USS "Staten Island". The two icebreakers will form a task group under the command of Captain Edwin A. McDonald. This sea's rugged ice pack has so far repulsed all attempts to reach the coastline by ship in the area. The Amundsen Sea coast remains one of the unexplored parts of the Antarctic continent.

#### PROJECT MAGNET

The U.S. Navy Hydrographic Office has planned an extensive series of flights by a specially-fitted WV-Z (Constellation) aircraft under the code-word "Project Magnet".

The aircraft crew will conduct gravity recordings during the flights. From Washington the plane will fly via Mexico and Honolulu to Christchurch, and from there to McMurdo; then to Hobart, Tasmania, and across the Tasman Sea to Christchurch again. The next stage is Christchurch - McMurdo-Perth (Western Australia) - Sydney, and again

Christchurch - McMurdo - the South Pole-Punta Arenas (Chile)-San Diego and back to Washington.

**Scientific Work Planned Includes:**

1. Sampling for the study of thermoluminescence of carbonate rocks at Marble Point, the Beardmore Glacier and the Horlick Mountains. Analysis will this year be attempted at McMurdo itself.

2. Glaciation studies in the Taylor, Wright, University and Barwick Valleys and in the dry valleys north of Mt. Gran.

3. Observations of patterned ground in the McMurdo Sound area, with the men wintering over to continue observations of temperatures and ice-wedge fabrics.

4. Investigation of fish metabolism and growth studies of the fish of McMurdo Sound. Three marine biologists will winter over.

5. Collection of microbiota from air, water, snow and soil. A new impinging device will be used on Neptune aircraft to collect samples from altitude. Trapping devices will also be used on ships and aircraft between New Zealand and the Antarctic.

6. It is planned to establish a temporary camp at the top of the Beardmore Glacier for scientists working in this area.

### AIR OPERATIONS

Supporting the ship group will be the Navy's VX6 squadron. This squadron will have 22 aircraft, and will fly light cargo and men to the Antarctic. It will also make reconnaissance flights and undertake photographic missions. It will arrive at Christchurch in September.

The squadron's aircraft are four Hercules, three Neptunes, four Skytrains, five Otters, all ski-equipped, one Super Constellation, one Sky-master and four helicopters. Eight helicopters will be carried aboard icebreakers for sea, ice, and scientific reconnaissance.

Seven Globemasters of the Mili-

tary Air Transport Service 9th Troop Carrier Squadron will drop supplies at Byrd station and the South Pole station and make any emergency drops required. The Globemasters will carry about 1000 tons of high priority cargo to the Pole and Byrd stations. They will complete the operation by early December or before the ice runways become unusable for heavy wheeled aircraft.

The Hercules, which will ski-land in resupplying inland stations, can land on snow as well as on ice runways. The use of the C130 is expected to save the U.S. hundreds of thousands of dollars in parachutes alone and eliminate the damages previously experienced in parachute dropping. Capable of hauling 10 tons at about 350 m.p.h., the Hercules will eventually replace the present R4D cargo planes. The R4D can carry only two tons at 160 m.p.h.

The Navy will fly the Ski-C130 Lockheed Hercules. Last year, with the support of the Air Force, seven Hercules were not only tested in Antarctica, but successfully used in moving material and men to the South Pole and Byrd station.

Admiral Tyree is scheduled to arrive on September 15 in Christchurch.

New Zealand-based aircraft of the Navy's Air Development Squadron Six (VX6) and MAT'S Ninth Troop Carrier Squadron will begin flying from Christchurch to the McMurdo ice strip about October 1.

The radar picket escort vessel USS "Wilhoite" will take station midway between New Zealand and Antarctica to support the round trips of aircraft. Air Force SC54 Rescuemasters will be stationed in Christchurch for search and rescue coverage of the northern half of the flight route to Antarctica. Air Development Squadron Six (VX6) planes will be available in Antarctica for SAR coverage of the southern half of the hazardous flight route and for coverage within the Antarctic continent.

## NEW BYRD

Following an "on the site" inspection of Byrd Station, it was decided that a completely new station would be preferable to an expensive rehabilitation of the existing facilities. At its best, the old station, with repairs, would last only a few more years.

Based on Antarctic and Greenland experiences in construction, it has been decided that under-snow facilities, based on the Greenland "Cape Century" concept, be built.

Using the "Peter Snow Milling Machine", it is planned to excavate a tunnel 20 feet wide, 2000 feet long, and 25 feet deep, as a main tunnel. This would be covered with heavy-gauge metal arches to support the snow load that will be both placed and which will accumulate on top of it.

At right angles to the main tunnel, on both sides of it, additional tunnels will be excavated, in which various buildings and facilities will be constructed. One tunnel will house the barracks buildings, another the power house and workshops, another the sick bay, administration, and some scientific quarters. Three structures only will be above the surface, namely the balloon inflation and release building, the aurora tower, and the Rawin Dome. These will be elevated on aluminium columns which will initially protrude some 15 feet above the snow level, with built-in provisions for raising them when and if the snow accumulation requires additional height.

The tunnels will be equipped with ventilating fans and air intakes so that the air will remain fresh. Instead of the older, more conventional way of providing water, by melting snow, a new system, using steam to "drill" a shaft 500 feet deep, will be utilised. At the bottom of this shaft, steam jets of expanding size will form a reservoir approximately 50 feet in diameter and 30 feet deep. During the entire process,

water is formed and retained in the reservoir. A deep-well pump raises the water to the surface, where it is stored in heated tanks.

A nuclear power plant is under consideration. If installed, temperatures would be controlled by radiant-type electric heaters. The galley and mess hall would be provided with electric facilities. These innovations are an earnest attempt to make the Antarctic a more habitable place in which to spend a year or more. The site for the new station will probably be within five or ten miles of the present station.

The air drop at Byrd will begin in mid-October. McMurdo-based Globemasters will drop approximately 600 tons of supplies, fuel and provisions.

## SOUTH POLE

Two quonset huts, one for emergency shelter and one line shack are to be built at the Pole station. A T5 building will be delivered by air for construction during the coming season. Approximately 400 tons of equipment, drummed fuel and provisions will be dropped by Globemasters in October and November.

## McMURDO

During this summer, the foundation for a nuclear power plant is to be prepared at the McMurdo base. The plant itself will probably be installed the following year, and in the spring of 1962 should be providing power for heat and light at McMurdo. All buildings at the station will be heated electrically. There will be no need of diesel oil to generate power, thus drastically reducing transport costs. Any radioactive waste will be removed from Antarctica.

Other projects include the completion of a communications centre, the erection of a transmitter building and the construction of three new roadways. An aircraft maintenance hangar will be erected and a

complete camp site, housing 160 men, will be constructed on the ice alongside the ice runway several miles from the main station.

Two auxiliary air support facilities, manned by Navy personnel, will be reopened: at the Beardmore Glacier and at the halfway point between McMurdo and Byrd, Little Rockford.

### WINTER WORK McMURDO

There were a surprisingly large number of clear days during June and even on the darkest day of winter a bright mid-day glow could be seen along the northern horizon.

Weekly voice conferences with Mirny continued but similar attempts with Soya Base were not successful.

A new all-time temperature record for the McMurdo area was made on July 8:  $-59^{\circ}\text{F}$ .

### BYRD

Repeated blizzards and continuous high winds made June the windiest and warmest in the station's history. Radio conditions were generally unfavourable and resulted in a large backlog of radio messages.

The mechanical work on the seismic sno-cat was completed in June except for the installation of two new pontoons. Bread was baked for traverse use.

A wind-speed of 72 miles per hour on July 28 was an all-time recorded maximum for the station. For one day an average wind speed of 39 knots was registered.

### SOUTH POLE

June was marked with frequent storms and abnormal cloudiness and drifting. Only 23 of the 51 available snow stakes could be located by the end of June. These 23 showed an accumulation of 2.7 c.m. (approximately an inch). In July a new accumulation stake network was set up 200 feet west of the old stakes. A

few broken timbers have indicated the increasing snow load on the camp. The tunnel section by the garage door again collapsed but was quickly repaired.

### CARTOGRAPHY

During Operation Deep Freeze 60, the U.S. Navy Air Development Squadron Six, flew trimetrogon aerial mapping photographic flights over the Sentinel Mountains, the Horlick Mountains, the Executive Committee Range, portions of the mountains on the west side of the Ross Ice Shelf, and the north and west coasts of the Thurston Island/Peninsula. In addition, reconnaissance photography of the Skelton Glacier, the dry valley areas, the head of the Koettlitz Glacier, and the Rennick Glacier were also made. Using ground control obtained previously, the U.S. Geological Survey is preparing maps of the Horlick and Sentinel Mountains. Ground control for future mapping was obtained by USGS topographic engineers during the 1959-60 summer in the Executive Committee Range, in the Hal Flood Range, on Thurston Peninsula, and in north-east Victoria Land. In a co-operative arrangement with the New Zealand Government ground control points established by New Zealand expeditions are made available to USGS, while U.S. aerial photography is provided to New Zealand for mapping purposes.

(In official usage, the name "Thurston Peninsula" will continue to be correct until the Board of Geographic Names has reviewed the evidence for its replacement by "Thurston Island" and has approved the change.)

The American Geographical Society is continuing to maintain its 1:3,000,000 scale map of the Antarctic, begun during the IGY, with the addition of new features and corrected and revised details as they become known.

## NEW N.Z. MAP

The first of a series of five detailed maps of selected areas in New Zealand's Ross Dependency has been published. Produced by the Lands and Survey Department, it delineates with striking effect the topography of 10,000 square miles of the Tucker Glacier and Moubray Bay region, northern Victoria Land, thus filling in an almost blank space on existing maps of the Dependency.

The first exploration of the region was by the eight-man team led by Dr. H. J. Harrington, which surveyed the area in the summer of 1957-58. The map-makers were considerably helped by photographs taken from the air by United States personnel, and well over 800 prints were used in producing the map.

### MAPPING THE DEPENDENCY

Over the past four years New Zealand expeditions have gathered the data necessary to map some 45,000 square miles of the Ross Dependency. Most of this large area lies within 200 miles of Scott Base: a small part of it is close to Hallett Station. The necessarily arduous and in some cases dangerous field journeys necessary to secure this result have been made by parties from the Trans-Antarctic Expedition, the series of geological and survey expeditions mounted by the New Zealand Government, and expeditions sent out by Victoria University of Wellington and the New Zealand Alpine Club.

Although a large portion of the area comprised within the Dependency boundaries (160° E and 150° W south of 60° S) is sea or floating ice-shelf, there still remain 60,000 to 70,000 square miles of mountainous region to be surveyed. Mapping cannot be done satisfactorily from the air. In fact, without adequate ground control air-mapping is practically useless. New Zealand explorers have demonstrated that no other method

of exploring and mapping mountain areas like the coastal regions of Victoria Land can compare with the use of dog teams supported by light aircraft.

The aircraft are required to carry men, dogs and stores from the Base to the area to be surveyed, and from one such area to another. Heavy aircraft cannot land in difficult "unprepared" country, while helicopters can only be used for areas close to the Base.

### U.S. ASSISTANCE

The United States authorities have been most generous in their support, both by providing sea and air transport between New Zealand and the Antarctic and by assisting in the transport of field parties by helicopter to otherwise inaccessible areas; also in emergencies by throwing all their resources into search and rescue operations.

But as New Zealand is charged with the administration of the Ross Dependency it is clearly the responsibility of the New Zealand Government to carry on with and to complete the task of mapping the whole of the Dependency. So there will be work—work which must be done—for field parties comprising surveyors, geologists and the necessary field assistants and dog-drivers, as well as Air Force personnel to provide transport to and from the advance depots, for many years to come.

The large number of applicants of high calibre for these field parties is evidence that New Zealanders are worthy of the trust reposed in this country when the Ross Dependency was established in 1923, and that they are determined to see the task through to its conclusion.

Several volumes of the Scientific Results of the Norwegian-British-Swedish Expedition, 1949-52, in meteorology and glaciology have been published by Norsk Polarintittut.

# News from the Sub-Antarctic

## KERGUELEN (France)

The "Gallieni" effecting the relief of the stations at les Iles Kerguelen and Nouvelle Amsterdam is scheduled to leave Tamatave (Madagascar) on November 10, with 55 men on board for Kerguelen and 34 for New Amsterdam. The personnel being relieved will have been at the respective stations for 18 months.

At New Amsterdam last month the French team captured a sperm whale (cachalot macrocephale) 62 feet in length. The whale had been stranded on the beach.

## A BOTTLE FROM MARION

A bottle released at Marion Island on September 17, 1958, was recovered on the Ocean Grove Beach, Victoria (38° 17' S, 144° 32' E.) on April 23, 1960. The bottle was discovered after one of the fiercest gales in history had swept the Australian coastline.

## "MISCHIEF" and the Weather Men.

Towards the end of November 1959, a small expedition sailed from Capetown in the 29-ton gaff-cutter "Mischief", which is only 45 feet long. It was commanded by the owner, Major H. W. Tilman, with five crew members, all of them "no scientists, but adventurers interested in sailing and mountaineering."

The expedition ventured into the southern Indian Ocean with the main intention of visiting the Crozet Islands and climbing the 5000 foot peaks of that isolated and uninhabited group near 46° 30' S, 52° E. Located halfway between Marion Island and the Kerguelen Archipelago, the Crozet Islands were discovered by the French captains Marion and Crozet in 1772. The group consists of several islands, Possession Island, which is 20 miles long and the

biggest among them, and a number of smaller islands together with a collection of outlying rocks. The islands belong to France and are noted for a large magnetic anomaly. They were frequently used by sealers during the last century.

"Mischief" sailed from Capetown past Marion Island to the Crozet Islands where it anchored for 10 days. Then it headed for the Kerguelen Archipelago, the large group of islands near 50° S, 70° E, which is a French possession with a large scientific base. After a stay of more than two weeks here, the "Mischief" departed for the return voyage, sailing due north at first and then westwards along the 35th parallel. After a short deviation towards Algoa Bay it arrived back in Table Bay by the middle of March 1960.

Major Tilman took meteorological observations for the South African Weather Bureau. The "Mischief" had no radio on board and the observations were therefore not immediately available for current map analysis in South Africa. Merchant shipping in the Indian Ocean normally uses routes north of the 40th parallel, while whaling fleets operate in the far south. The observations from the "Mischief" therefore provided a crucial test for the skill of analysis in South Africa. Merchant sparse and infrequent data.

The forecasters concerned stood the test fairly well. The vast majority of the differences between the 145 observations of actual pressure and the "Map" pressure are between plus 5 and minus 5 millibars, and in 58 cases (40 per cent) even within 1mb. Only nine differences of 10mb and more were found, all clustered around three dates. Here the forecasters erred considerably.

What seemed to be a weak depression was actually quite an active, deepening, full-fledged system. This

## CAMPBELL ISLAND (N.Z.)

There's an air of expectation at Campbell Island right now. Winter which is always a threat to morale is over. Warmer weather is ahead and the annual servicing vessel due to arrive very soon.

Apart from the serious interruption of the Scientific Programme and damage caused by the tidal wave in May, all members of the expedition have come through this trying period with flying colours.

An airdrop in July by an R.N.Z. A.F. Bristol Freighter created a very pleasant interlude. Fresh food, mail, and urgently needed replacement parts were delivered in perfect condition. A creditable performance by the skipper and crew of the freighter.

With brighter weather coming along, preparations can now go ahead on the sites for the new power house and new bedroom annex (adjacent to the present living quarters). We hope to have the power house completed by early February 1961 and the 3 new Listers installed and operating shortly afterwards. Apart from possibly one twin cylinder set, the rest of the Armstrong Superior generators will be returned to New Zealand.

The annual servicing scheduled for October 27 is to be done by M.V. "Holmburn". This ship is much larger than M.V. "Holmglen" and can accommodate 12 passengers in excellent cabins. The new expedition and the boys returning to New Zealand can look forward to a very comfortable voyage.

clearly illustrates the kind of errors which can be expected in current weather map analysis in regions with isolated observations. The "Mischief" proved here to have been a real "mischief-maker" for the forecasters.

(Summarised from an article by Dr. W. Schmitt in S.Af. Weather Bureau Newsletter, April 1960.)

Our search for a radio technician and a cook (mentioned in the June issue) still continues.

All other expedition members have been appointed. They are: Leader, V. M. McNeill, Invercargill (ex-Falkland Islands Dependencies expedition—a hardened campaigner); senior ionosphere observer, I. G. Fisher (D.S.I.R. Rarotonga); ionosphere observer, A. G. Dodds (Kaitaia); meteorological observers, E. D. de St. Croix (Christchurch, J. R. Lamb, Invercargill (previously served at Campbell Island), L. S. Cooper (Christchurch); mechanic handyman, A. L. McNaughton (Auckland); carpenter, J. M. Pitkethley (Wanganu).

During the summer period (November 1960 to March 1961) Mr. E. L. Clague (the present senior meteorological observer) is remaining at the Island to assist the met. staff with additional scientific work planned for that period.

Some very interesting results should be obtained from the new American G.M.D. 1A 1680 MC Radio Wind equipment which is to be taken to Campbell Island on the American picket ship in late September this year. The United States authorities are sending a technician to the island to train our staff on the use of this equipment. Perhaps by the application of the usual Campbell Island hospitality, we might persuade the American technician to stay on as radio technician for the full tour!

Next year's party is to be favoured with a new 18ft. launch powered by an inboard Lister. Although weather conditions at Campbell Island are generally unfavourable for regular launch trips, occasional jaunts along Perseverance Harbour in fair weather are ideal diversions and are often combined with sheep hunting expeditions where rough going can be avoided by landing a party ashore at a suitable spot along the harbour. The launch has many other uses which include meeting visiting

ships—refuse dumping—shingle collection for station projects, etc.

The leader, George Poppleton, reports that the canine members of the expedition "Hans" (Campbell Island's oldest inhabitant) and "Flash" are fighting fit and even the sea elephants are showing them respect.

### SCIENTIFIC WORK ON CAMPBELL ISLAND

A proposal has been made to the Department of Scientific and Industrial Research that a scientific party of six men be sent to Campbell Island for the month of January, 1961. As well as carrying out the particular tasks listed below, the expedition will serve to give experience of the Sub-Antarctic regions to several of the scientists for the first time.

Dr. E. J. Godley, Director, Botany Division, D.S.I.R., will lead the party and will be assisted in the botanical work by Mr. N. T. Moar, also of Botany Division. Notes on the plant associations of Campbell Island have been published by L. Cockayne (1903), R. M. Laing (1909), and R. L. Oliver and J. H. Sorenson (1951), but there is no detailed information of the distribution of these associations on the ground. It is therefore hoped to make a vegetation map of the island. Collections of plant specimens, living plants and seeds will be made, and as lichens are of such importance in Antarctic botany, special attention will be given to the little known crustose species which grow flattened and firmly attached to rocks. It is also planned to lay down and map permanent quadrats on the island so that any changes in the vegetation in the future, particularly those which may be due to the removal of sheep, may be followed. Mr. Moar will also be studying bogs and making peat bores to obtain samples for pollen analysis which will throw light on the past history of the island's vegetation.

Little is known of the inter-tidal ecology of the Sub-Antarctic islands and indeed the precipitous nature of much of the Campbell Island coast will make such investigations difficult. However, Mr. P. M. Johns of the Zoology Department, University of Canterbury, will try to fill this gap in our knowledge.

Mr. J. Moreland of the Dominion Museum will be investigating the fishes of Campbell Island and will also make observations of other vertebrates. It is expected that a member of the Animal Ecology Division, D.S.I.R., will also be in the party.

As the sheep on Campbell Island will probably be removed in the near future in the interests of conservation of flora and fauna, it will be of some interest to make a study of this flock which has now run wild for some thirty years. It is hoped that the sixth member of the party will be a sheep specialist from Massey College.

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Dr. Godley's party is quite independent, but is keeping in close contact with the Civil Aviation Administration, which administers the meteorological station on the island. The party will probably occupy the old station.

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### COME SOUTH FOR THE SUN

During the summer months, say Soviet geophysicists, the central regions of Antarctica receive from the sun more than 30,000 calories of heat per square centimetre in one minute. This is 15-20 per cent more than at the equator and 50 per cent more than at corresponding latitudes in the Arctic. There are no low, dense clouds in the interior of Antarctica; therefore solar energy is received continuously during the entire polar day.

## MACQUARIE ISLAND

(Aust.)

On Friday, May 13, the thermometer dropped below freezing point and half an inch of snow fell. This lasted only some hours and soon the only signs of winter were the short days and the absence of migratory birds and penguins. Amateur photographers were already discussing the possibility of using flour for the posing of intrepid snow scenes. Disappointed winter sports enthusiasts were considering suing ANARE for misrepresentation.

"Undaunted by our Manchester-like climate," writes Taylor, "the doc. continues with his physiological surveys, involving much pinching and pummelling and answering of embarrassing questions.

"The international situation in Antarctica remains unruffled and amicable. May Day greetings were exchanged with our Russian comrades at Mirny. Eliza Doolittle Day was celebrated on May 20."

### MIDWINTER

The midwinter celebration at Macquarie had some unusual features. Proceedings commenced at six a.m. with the delivery of a special 30-page illustrated edition of the local magazine "Hardships". The main meal at midday was a magnificent effort. The menu included mushroom soup, chicken, ham and Christmas pudding.

The afternoon activities included a historical pageant in verse and worse, commemorating the 150th anniversary of the discovery of Macquarie, and portraying such famous characters as Admiral Bellingshausen, Joseph Hatch and Phil Law. Following a buffet tea, the entertainment continued with an orchestral recital by the "Isthmus Sextet".

Hopes of the ski enthusiasts were dashed when June falls of snow melted fast. Warham utilised comparatively mild weather for bird photography and erected a hide in Garden Cove.

### SPRING

On July 25 Taylor reported: "Winter is almost over and this year it appears to have by-passed the island altogether. Our weather has sometimes been warmer than Sydney and almost always better than Hobart. Winter sports enthusiasts have prayed fruitlessly for north winds to blow us down some Australian snow. Already the days are becoming noticeably longer, and several of us have taken the opportunity of trips down the island before commencing the spring programme of painting and other outside work.

"Ferocious sea leopards and a very agile sealion have created interest. In a few weeks breeding sea elephants will make the beaches impassable and will provide victims for our annual seal branding rodeo. Radio conditions have been generally good.

"We still have plenty of fresh potatoes, onions, apples, eggs and also fresh meat on the hoof in the form of pigs and sheep. A few tears are shed as each pig meets its inexorable end, but it is noticed that the loudest mourners also head the queue for second helpings. Footnote: two interesting barrels washed up on the west coast were found to contain only salt water."

### RE-UNION

John Rymill, leader of the British Graham Land Expedition, 1934-1937, flew to England from his South Australian farm in June to attend a reunion of the expedition members. It was expected that 14 members of his party would attend the reunion. The reunion has been arranged to commemorate the arrival of his ship, the "Penola", in Graham Land, 25 years ago. The party's geologist, now Archbishop of Norwich, has arranged the reunion in the House of Lords.

## Whaling in the Antarctic

**There have been several significant developments in Antarctic whaling during the past few months, headed by decisions made at the London meeting of the International Whaling Commission.**

The 17-nation International Whaling Commission met in London on June 20. Fifteen member-nations attended the conference. The other two, Norway and the Netherlands, sent observers. The Australian delegation strongly urged greater protection for humpback whales, on which the Australian whaling industry is based. In the past, the hunting of humpbacks has been restricted to four days in each whaling season. The Commission agreed.

(1) To prohibit completely for three years the killing of humpbacks in Area IV, from which the whales migrate to the west coast of Australia.

(2) To reduce the number of catching days from four to three in Area V, which furnishes the whales caught on the east coast of Australia and New Zealand.

The Commission suspended for the seasons 1960-61 and 1961-62 the blue whale fishing quota in an attempt to persuade Norway and the Netherlands to rejoin the convention.

The Commission also agreed to establish a special scientific committee to advise it on the condition of whale stocks and conservation.

### BRITISH FLEET SOLD?

The British whaling firm, Hector Whaling, decided in July to dispose of a major part of its "Balaena" fleet to the Japanese Kyokuyo Whaling Company. This follows the cancellation of one Norwegian expedition last season, the withdrawal of Norway and the Netherlands from the Whaling Convention, and an increase in the number of Japanese and Russian expeditions. The purchase is being opposed by two other Japanese whaling firms with fleets

operating in the Antarctic. They urge that if the deal does go on, arrangements shall be made to regulate the growing competition among Japanese-Antarctic whaling interests by restricting the new fleet's sphere of operations.

The Japanese have already bought three fleets from abroad during the past five years. As a result of this expansion, Japan is expected to send seven fleets to the Antarctic in December this year, against Norway's seven, Russia's three, Britain's two and the Netherlands' one.

### WHALERS' HEADACHES

This growing competition has really hit the established whaling countries like Britain and Norway. Britain's catch from three expeditions has dropped by about 26 per cent in the past four years, at the same time as the price of whale oil has fallen to low levels.

The reason for the British difficulty is that the International Whaling Commission has been limiting the number of whales to be caught each season but not restricting the number of expeditions hunting them.

Since the Japanese have a flourishing market for whale meat in Japan to tide them over the low oil prices, this does not affect them much. There are still plenty of rivals however and the International Whaling Commission is trying to keep up its "spread" of members by agreeing to set aside the catch limit in the next two years.

Some commentators consider that the result of this is more likely to be a further fall in the price of whale oil than the salvation of competition. It seems that more companies and countries may be on the way out of whaling.

In the number of whales caught, Japan has already attained the leading position. Japanese whaling companies assert that they have an advantage because they can make full use of whale meat. This covers nearly half of their income from whaling. In Japan, whale meat is not only eaten boiled or roasted, but is used for the making of sausages, meat essence and compressed food. Animal foods are also produced from scraps.

#### 1959-60 CATCH

Last season was a weak one for all expeditions, particularly for the Norwegian, British and Netherlands ones, reports "Norsk Hvalfangst-Tidende". These appear to have op-

erated between about 70° E. and 70° W. The Japanese and Russian expeditions, which had a relatively larger catch, operated for the most part east of 70° E.

The total catch amounted to 15,505 blue-whale units, slightly greater than that of the previous season but considerably lower than the figure of 17,000-17,500 units which had been anticipated.

The total catch in blue-whale units by the participating nations was as follows:

Norway (8 expeditions)	.....	4,564
United Kingdom (3)	.....	1,897
Netherlands (1)	.....	1,037
Japan (6)	.....	5,216
U.S.S.R. (2)	.....	2,789

The total production of oil, in barrels, during the past three seasons, has been as follows (number of expeditions in parentheses):

	1957-58	1958-59	1959-60
Norway (9)	854,675	(9) 797,386	(8) 651,888
United Kingdom (3)	323,472	(3) 359,723	(3) 257,780
Netherlands (1)	116,497	(1) 126,488	(1) 143,050
Japan (6)	630,303	(6) 646,130	(6) 617,131
U.S.S.R. (1)	224,578	(1) 220,914	(2) 334,680
<b>TOTAL</b>	<b>2,149,525</b>	<b>2,050,641</b>	<b>2,004,529</b>

#### WHALE CEMETERY?

Mr. W. H. Dawbin, the former New Zealand authority on whales who is now senior lecturer in zoology at Sydney University, returned to Australia on August 4, after 13 months' research work on whales in Norway and the United States. He told reporters that although he had studied all aspects of whale life from the Antarctic to the Arctic, he had never come across an old whale—met anyone who had. The oldest whale ever caught was only 25 years old. What happened to whales after they reached this age was not known.

"Like the elephants' burial ground," he said, "it is another of nature's well-kept secrets."

#### SOVIET WELCOMES WHALERS

"Pravda" on May 22 reported the return to Odessa of the whaling factory ship "Sovetskaya Ukraina", said to be the largest in the world, with its refrigerator ship "Sevastopol" and 18 chasers. The flotilla was given a warm welcome on the completion of its voyage of nearly 50,000 miles.

Captain Solyanik reported having taken 1,624 whales, 38,600 tons of oil, 7,270 tons of meat-meal, 2,140 tons of "fresh-frozen" meat and 726 tons of liver were processed.

The "Slava" fleet returned to Russia on May 26.

Despite the fact that the Antarctic climate appears to be warming, the thickness of the snow cover in interior regions is apparently increasing.

## BOOKSHELF

(Several of the books reviewed below are published in the United States, France or Italy, but your bookseller should be able to procure them for you.)

**"POLE SUD"**, by Paul-Emile Victor: Paris Hachette, 95 pages, ill. (In French.)

This is the Antarctic book beautiful. The quite short text provides an admirable resumé of man's efforts to conquer the Antarctic. It is written by the greatest living French explorer, a man with 20 years' almost continuous Arctic and Antarctic experience behind him. To this authoritative text is added a wealth of photographic illustration depicting with typically French variety, vivacity and artistry almost every facet of life in the Antarctic. There are nearly 100 photographs, 13 of them in colour. A book to revel in even if you cannot read a word of French.

**"ICE-AGE COMING?"** by Leverett G. Richards, New York. The John Day Company, 128 pages, ill. \$2.25.

The author, an experienced pilot who has flown over both Poles, here summarises, in simple, non-technical language, and with a number of very effective illustrations, what is known about the world's ice, past and present, and what is surmised about its future. A good deal of what Mr. Richards has to say concerns the Antarctic, its ice cap, its glaciers and icebergs. Altogether, the ideal compendium for the layman whose interest in the Antarctic makes him curious about the great ice sheets at both ends of the earth.

**"POLES APART"**, by Richard Pape, London. Odhams Press, 255 pages, ill. N.Z. price 21/-.

This book will appeal more to the person whose knowledge of the Antarctic is rather rudimentary: the

author of "Boldness Be My Friend" was just as ignorant when he travelled on U.S.S. "Arneb" in 1958-59 to Hallett Station (where he met New Zealanders Ken Salmon and Brian Reid), to Little America and to McMurdo. He has gathered together in the 86 final pages of his book not only his own first impressions but much that was told him by his more experienced travelling companions. He is, as a rule careful of his facts (though he seems to have confused Scott and Shackleton when talking of pony transport), and of course knows how to tell an entertaining story.

Perhaps the most interesting part of the Antarctic section is the description of his visit to the old hut at Cape Royds, "a precious memory". Here at least one senses that the author has felt sincerely, and something of his own awe is conveyed to the reader. He is not so good on the Cape Evans hut—and he unblushingly records that "among treasured souvenirs" are "a glass inkwell on which 'R. F. Scott' had been written, also a bottle of Indian ink marked 'Wilson'."

**"DOVE SOFFIA IL 'BLIZZARD'"** by Silvio Zavatti: Bologna (Italy) Edizioni Guiseppe Malipiero, 91 pages, ill. L.500 (in Italian).

A lively outline of Antarctic exploration, very colourfully illustrated, which should be of great interest to young people able to read Italian. One of the eleven chapters (13 pages) is devoted to "The Hillary-Fuchs enterprise". It is notable for a glowing tribute to Fuchs. "Victory could not but smile on such a man", and for an interesting and friendly, if not entirely accurate, assessment of Hillary, who "urged on by his sportive temperament . . . decided to advance on the Pole . . . it was an act of insubordination but the beauty of the project was not endangered." Dr. Zavatti lists the New Zealand polar team and adds, "Their names are recorded for history."

**"LA ROUTE DU POLE SUD"**, by Edouard Peisson, Paris, Bernard Grasset, 284 pages, sketches and maps, 690 frs. (In French.)

M. Peisson has a wide knowledge of Antarctic literature, and he wields a facile pen in this brief but penetrating study of the four great assaults on the South Pole between 1902 and 1913. It is in particular a study of the three men who led these expeditions. Limited in its scope, the book gives just enough earlier history to provide an adequate background. It succeeds admirably in evoking a convincing picture of the three great leaders, Scott, Shackleton and Amundsen, of the task which confronted them, and of their wrestling with this task. While perhaps M. Peisson does not contribute anything substantially new to our knowledge, he does recall vividly the personality and achievements of the great men who pioneered "The Route to the South Pole".

**"DEMAIN, L'ANTARCTIQUE"**, by Michel Reboux, Paris, Maison Mame, 187 pages, ill. (In French.)

M. Reboux's book covers a completely different field from that of M. Peisson. He discusses the Antarctic today and tomorrow. The book falls into three parts, (1) a description of the Antarctic and the story (briefly) of its exploration, (2) modern techniques of exploration and research, with special reference to the French expeditions in Terre Adélie, and (3) an outline of the resources of the Antarctic and the prospects of their exploitation. This is a very wide field and M. Reboux in his very readable book does not always avoid the danger of dissipation of interest. In chapter VI for instance he jumps from nylon garments to the danger of fire, to the perils of isolation, to the use of steel for buildings, to mechanical transport—all in eight pages. But he has succeeded in compressing within his 187 pages a mass of information of very great interest and value to any-

one concerned with Antarctic matters.

**"ICE-BOUND"**: Ronault House of Publishers Ltd., Auckland, N.Z.; 88 pages, ill. N.Z. price 7/6.

This is a magazine-form commercial production largely aimed at the American market, but it is none the less an interesting and useful compilation brimming with facts about the Antarctic of today. In spite of the sub-title "The Story of the United States and New Zealand in the Antarctic", New Zealand's contribution to Antarctic exploration is merely mentioned in passing. The information obviously comes from American sources and is in the main written by Americans; there are two excellent articles by Capt. E. A. McDonald. The "New Zealand" side is confined to a chapter on "Christchurch as Host City" and to a resumé of New Zealand's attractions for the U.S. sailor on leave. To a public accustomed to commercial radio the multiplicity of advertisements will no doubt hardly be noticed.

**"CONTES ET LEGENDES DU GRAND-NORD"**: by Louise Weiss, Paris, Fernand Nathan, 249 pages, line ill. (In French.)

A fascinating collection of Eskimo and Red Indian folk-tales which should enthral anyone, young or old, who has a special interest in the cold places of the earth. Simply written, this book would be an ideal present for a boy or girl eagerly learning French.

### PUBLISHED IN NEW ZEALAND

**New Zealand Oceanographic Institute Investigations in the Southern Ocean**: by R. W. Burling. *New Zealand Science Review*, Vol. 18, No. 2.

**Appendix to Provisional Gazetteer of the Ross Dependency**: by A. S. Helm: N.Z. Government Printer. This supplement to Mr. Helm's

invaluable gazetteer, published in 1958, contains some 200 annotated references, and incorporates all names approved by the Place Names Committee between the publication of the original work and the present.

**Historic Huts:** by L. B. Quartermain, D.S.I.R., Wellington, N.Z.

A small informative brochure intended for distribution by the American Naval Support Force, Antarctica, to visitors being shown the old huts at Hut Point, Cape Evans and Cape Royds.

**"The Cape Crozier Emperor Penguin Rookery":** Graeme Caughley.

**"The Adelie Penguins of Ross and Beaufort Islands":** Graeme Caughley.

**"Sea-Bird Logs Between New Zealand and the Ross Sea":** R. K. Dell.

In "Records of the Dominion Museum" (Wellington, New Zealand), vol. 3, Part 4, August, 1960.

## THE HORLICK MOUNTAINS

In view of the proposed Byrd Station traverse this summer, some details of the Horlick Mountains as described by William E. Long, a member of the 1958-59 traverse team from Byrd Station, in the I.G.Y. Bulletin for July 1960, will be of interest.

"The Horlick Mountains are a continuation of the mountain chain that extends from Cape Adare . . . to the Queen Maud Range, south and south-east of the Ross Ice Shelf. The structure and rock types are strikingly similar throughout the entire mountain chain. The mountains are massive, tabular blocks, in most places bounded on the north by imposing escarpments and sloping gently toward the south.

"The area marked Horlick Mountains on older maps consists of three ranges, each including numer-

ous peaks. The westernmost range has the highest summits, reaching elevations of about 12,800 feet, with approximately 5,000 feet of relief between the ice-cap surface and the summits. Peaks of the central range are generally about 10,000 feet in elevation, with 4,000 feet of relief between the peaks and the snow surface. The eastern Horlick range consists of 8,000 to 9,000 foot peaks and relief is about 3,000 feet.

"The central Horlick range . . . is about 20 miles long and 5 to 10 miles wide. Peaks of the central range form an asymmetrical arc concave toward the south. Inside this mountain arc is a raised ice plateau with an elevation of about 8,000 feet and a width of 10 to 15 miles.

"Bedrock is well exposed on mountain slopes where the strong winds prevent accumulation of snow. Moreover, no lichens or other plant life were seen on any of the exposures.

"Since air temperatures in the area never rise above freezing, no water is available to form streams or lakes. Hence no erosional features caused by running water are present. In addition, little chemical erosion seems to occur. The dominant erosional process is the scouring and abrasive action of the ice cap flowing around the peaks and of the valley glaciers that have formed within the mountains and, carrying debris from the mountains, drain out to meet the ice cap."

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The U.S. Navy hopes to cover the west and south sides of the Ross Ice Shelf by trimetrogon photography, also extensive areas of Marie Byrd Land, the countains south and east of the Sentinel Mountains, Thurston Peninsula, and the coast of the Amundsen Sea, the Hal Flood Range, and other areas.

## ANTARCTIC WILD-LIFE PROTECTION

The intensified interest in the life sciences which has followed the reduced emphasis on geophysics, in current Antarctic research, has focussed attention on the urgent need to protect and preserve the unique flora and fauna of the Antarctic regions.

The problem was discussed at the 1959 Antarctic Symposium in Buenos Aires, where a resolution was adopted which sets out the dangers now existing. The resolution states:

"The nature of a fauna developed through the joint advantages of an unrivalled food supply at sea and the absence of indigenous enemies on land makes such steps essential both because of the unique characteristics of the birds and animals concerned, and because of their complete lack of means or instinct of self-preservation while out of the water, and their consequent extreme vulnerability to the mischief of unprincipled men and uncontrolled dogs. It is recognised that the killing of seals, penguins and other creatures is sometimes necessary to provide food for men and dogs, and that the judicious collection of biological specimens is likewise fitting and proper.

"However, it must be conceded that each season the resupply operations in support of Antarctic scientific bases bring with them into the Antarctic a number of persons, members of ships' companies and others, who possess a minimum of interest in the natural life and its conservation and who, if not supervised and controlled, have made and will continue to cause serious damage to the floral and faunal populations. Penguins and other colonial forms readily accessible to predation are easy victims and highly vulnerable fauna types.

"It is also true that some careless aspects of modern operations

such as the flying of helicopters over penguin rookeries and the pumping of bilges by ships close to shore, with no malice intended, can cause tremendous harm to wild life populations. Well-intended but ill-advised activities which disturb the natural interplay of population densities, such as the destruction of skuas on the theory that this will benefit the penguins, also leave their marks."

S.C.A.R. at its current meeting in Cambridge, England, will have before it a recommendation from the Symposium that standard regulations should be prepared to provide the necessary protection to all forms of Antarctic wild life, and that all member nations be urged to enforce the regulations strictly.

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A new feature at Byrd is an exercise bicycle. It is in constant use by persons attempting to remove inches from ever increasing waistlines. The cook is determined not to be defeated by this infernal machine and continues to ply station personnel with all sorts of cakes, pies, pastries, and other delicious high calorie offerings from his galley.

## ERRATA

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"Antarctic", vol. 2, No. 5, March 1960.

P. 183. We regret a mis-statement in the double column heading. While the "Soya" could not get close inshore in 1958-59, the relief was effected by helicopter. "Soya" in fact offered assistance to U.S.S. "Glacier", herself engaged in rescue work.

P. 187, foot col. 2. A correction of the phrase "for the first time in more than 30 years" is implied in the more detailed account of "Ob's" visit to Peter I Island in vol. 2, No. 6, p. 216.

P. 188. The American scientist compelled to winter over a second year at Ellsworth was not Mr. Heap but Mr. William Johnson, a meteorologist.

## PHILATELISTS!

Stamp collectors will again be afforded an opportunity to obtain a limited number of covers post-marked in U.S. Navy Antarctic Post Offices at the Byrd and South Pole Stations and from several of the ships participating in Operation Deepfreeze 61.

Individuals are limited to one cover each from the Byrd and South Pole stations, and not more than three covers each from ships.

U.S.N. postal regulations prohibit accepting philatelic mail when it appears that it is to be used for commercial purposes. Requests for postmarks submitted through or by dealers will be returned uncanceled.

Covers must have adequate U.S. postage affixed or be accompanied by international reply coupons. Ordinary mail covers require eight cents U.S. postage or one international reply coupon. Air mail envelopes or endorsements require 25 cents U.S. postage or four coupons for each cover.

### BYRD AND SOUTH POLE

Send addressed envelopes to:  
Deep Freeze 61 Philatelic Mail,  
U.S. Naval Postal Facility,  
Christchurch.

One cover will be sent to Byrd Station, the other to the South Pole station. If a postmark is desired from only one of the stations, senders should indicate on the lower left hand corner of the cover, the cancellation desired, "Byrd" or "South Pole".

These covers must be mailed in time to reach Christchurch by October 15. The covers will probably be postmarked during the Antarctic winter and returned during the first months of 1962.

### COVERS FROM SHIPS

Send addressed envelopes to:  
Deep Freeze 61 Philatelic Mail,  
(Name of ship from which postmarks are desired)

c/- U.S. Naval Postal Facility,  
Christchurch.

The following ships will accept covers up to the dates listed (the date given being the last for receipt of covers at U.S. Naval Facility, Christchurch):

USS "Wilhoite" (Ocean Station vessel), September 23; USS "Edisto" (icebreaker), November 24; USS "Eastwind" (icebreaker), November 24; USS "Glacier" (icebreaker), November 26; USS "Staten Island" (icebreaker), December 5; USS "Arneb" (cargo ship), February 9.

Covers received after these dates will in most instances be returned to senders.

The cargo ships USNS "Private John R. Towle", USNS "Greenville Victory", and the tanker USNS "Alatna", will not operate a post office.

Postal clerks at the Byrd and South Pole stations and aboard ships have been instructed to return ALL covers unpostmarked:

- (1) when individuals have forwarded more than allowed;
- (2) it appears that covers are to be used for commercial purposes;
- (3) and covers are mailed to ships which do not operate a post office.

### THE RIGHT WHALE

A whale which cruised for several days off Newport Beach near Sydney, after calving, was identified as a Right whale. The Right whale almost became extinct through the ravages of the whalers up to the early '90s. The International Whaling Commission strictly bans the killing of Right whales, which are distinguishable by their high arched heads with white, horny protruberances.

# The New Zealand Antarctic Society

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

You are invited to become a member.

## BRANCH SECRETARIES

Wellington: J. H. Hall, Box 2110, Wellington.

Canterbury: G. King, 80 Slater St., Christchurch, N.E.1.

Dunedin: J. H. McGhie, Box 34, Dunedin.

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## "THE ANTARCTIC TODAY"

This volume is out of print, but a limited number of the following **separate sections** is available, the stapling slightly rusted:

**Ionosphere Research** (J. W. Beagley).

**Meteorology** (A. R. Martin).

**Marine Biology** (R. K. Dell).

**Aurora Australis** (I. L. Thomsen).

**The Nations in the Antarctic** (recent Australian, South African, French, etc., exploration by leading experts in the countries concerned).

These separates are available at a cost of four shillings each from the Secretary, N.Z. Antarctic Society.

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