

# ANTARCTIC

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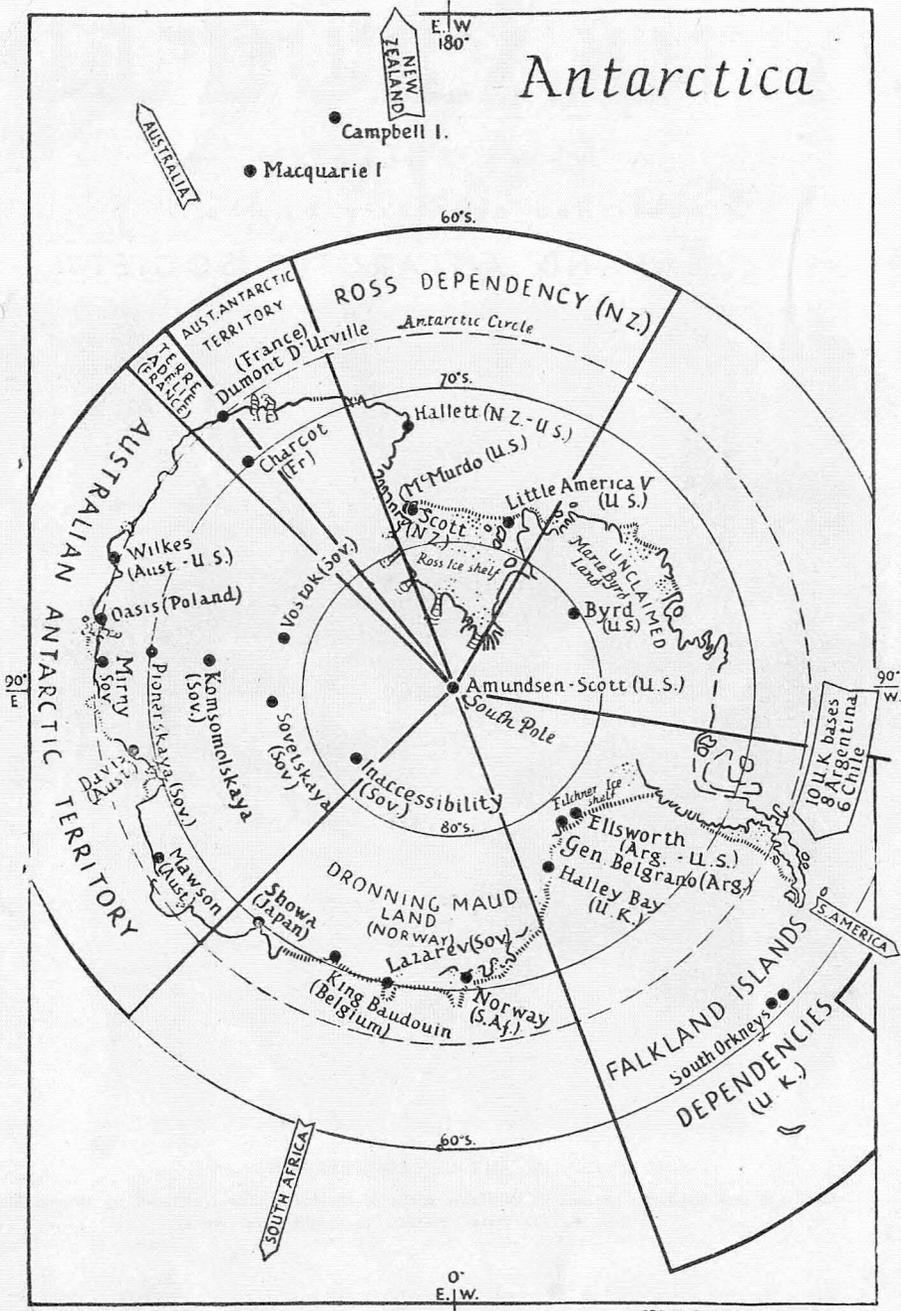


## THE BARNE GLACIER

The seaward terminal face as seen from the Ramp at Cape Evans, looking towards Cape Royds.

Photo: L. B. Quartermain.

# Antarctica



# "ANTARCTIC"

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## S.C.A.R.

### MEETS IN WELLINGTON

Delegates to the fifth meeting of the Special Committee on Antarctic Research (S.C.A.R.), with their advisers, assembled in the Easterfield Building at the Victoria University of Wellington for the opening of the conference on October 9.

This is the first meeting of S.C.A.R. to be held in New Zealand. Those held previously were in The Hague, Moscow, Canberra, and Cambridge, England. The visitors were informally welcomed by the chairman of the New Zealand National Committee for Antarctic Research (Dr. R. G. Simmers). The meeting was opened by the president of S.C.A.R. (Professor G. R. Laclavere, of France).

The United Kingdom and United States delegations were led by Dr. G. de Q. Robin and Dr. H. Wexler respectively. D. M. M. Somov, who was to have led the Russian delegation, was unable to appear because of illness, and the U.S.S.R. was represented by his three advisers.

The delegates of other "Antarctic" countries were: Admiral R. Panzaroni, Argentina; Mr. G. B. Cariola, Chile; Mr. C. Lorius, France; Professor T. Nagata, Japan; Mr. S. A. Engelbrecht, South Africa; and Dr. T. Gjelsvik, Norway.

Dr. E. I. Robertson, of the geophysical division of the D.S.I.R., led

the New Zealand delegation, and Professor K. E. Bullen, formerly of New Zealand, led the delegation from Australia.

About 50 resolutions dealing with scientific work to be carried out during the next few years were unanimously adopted by the Committee, said Professor G. R. Laclavere.

Because of increasing geophysical activity which could culminate in the "Year of the Quiet Sun" in 1964-65, many problems had been tackled by the conference, he said.

"The effect of the 'Year of the Quiet Sun' from the point of view of Antarctica requires much long-range planning and this took up a considerable amount of our time."

Some of the resolutions were purely scientific and were intended to furnish a good programme of co-ordinated research in Antarctica. Other resolutions dealt with technical aspects of research such as logistics and communications and a few of them were related to the Treaty of Antarctica.

### NEW ANTARCTIC SHIPS

In addition to the United States research vessel "Eltanin", another ship is reported as being specially built for Antarctic service, a specially strengthened vessel for the South African National Committee for Antarctic Research. The Japanese are said to be considering building an ice-breaker for Antarctic work.

# NEW ZEALAND SLEDGING PARTIES EARLY IN THE FIELD

Both dog-sledging teams of the New Zealand geological and survey expedition to work this summer in southern Victoria Land near the head of the Beardmore Glacier, in continuation of the New Zealand project for the complete mapping of the Ross Dependency, are already in the field.

Number One party, comprising W. W. Herbert (leader), P. M. Otway (surveyor), V. R. McGregor (geologist) and K. P. Pain (field assistant), is working from the head of the Beardmore eastwards towards the Shackleton Glacier and will possibly go on as far as the Robert Scott Glacier, where they will be picked up at a point yet to be determined, near the end of January, by aircraft of the United States VX6 squadron.

The party was to have been flown in by air to their field base on the Polar Plateau on November 6. Herbert did leave early on that day with a good deal of the party's equipment, and a landing was made on the Plateau near the head of the Mill Glacier, a tributary of the Beardmore. The temperature here was  $-35^{\circ}$  F. and 12 JATO bottles were necessary to take off again. Unfavourable weather conditions developed, and prevented the fly-in of the party.

Conditions improved on the morning of November 7, and all four men landed from an R4D-8 aircraft, piloted by Lieut. J. Weeks, at 1.30 p.m., near the Mill Glacier. Besides the men there were 18 dogs and two sledges.

## IN THE FIELD

On November 16 the party reported by radio to Scott Base that temperatures were down almost to  $-30^{\circ}$  C., the wind was 20 knots with considerable drift, the snow permeating the smallest hole in the tent. The men were sledging in virgin country, fur-

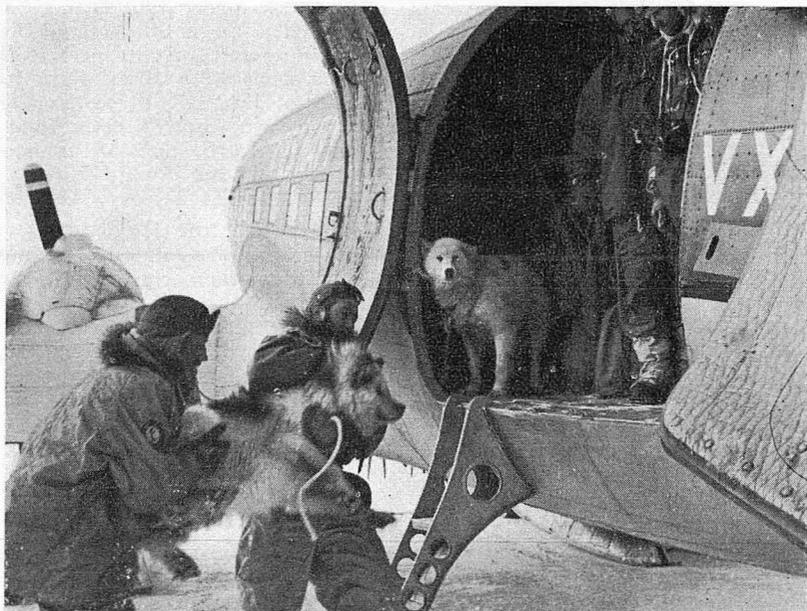
ther south than any dog team had been before in this area, and only about 300 miles from the Pole. They were all slightly frostbitten.

Herbert reported that an intended "easy walkabout" had ended in a thousand feet of geological survey and a station at 11,500 feet. The conditions above 10,000 feet were arduous, and all were suffering from frost-bite and exhaustion. But the geological work was an outstanding success. Beautifully preserved and fragile but extremely significant plant fossils were found that will date the top of the Beacon rock. No "bug life", says Herbert, was found.

## NEW COUNTRY

The aim of this party is to carry out a topographical survey. Particular attention will be paid to the setting up of a station between Wedge Peak ( $84^{\circ} 09' S.$ ,  $172^{\circ} 45' E.$ ) and the Mill Glacier in order to position the eastern flank of the party's area, and to resect on to the mountains forming the western flank, where the other field party will be operating. The geologists will make a reconnaissance survey over the area of operation so as to enable the general structure and geological sequences to be mapped to the scale 1:250,000. As opportunity permits collections of mosses and lichens will be made and soil specimens collected.

VX6 hopes to resupply the parties later. Whether the aircraft lands or drops supplies will have to be decided by the conditions at the time.



No. 1 New Zealand field party en route for the Polar plateau. Kevin Pain and Wally Herbert carry husky on to plane, watched by George Grindley, Mike Prebble and Peter Otway.

Photo: H. D. O'Kane.

## SECOND TEAM

Number Two field party, under Dick Walcott, with Jefferys and O'Kane from Scott Base, had a training run with the dogs to Cape Royds on November 14 to 16. The first night was spent at Cape Evans, and the second at Cape Royds as the guests of Dr. Stonehouse and Terry Jacobs. This party, which will work in the area west and north of the Beardmore Glacier, left Scott Base on December 5 by U.S. aircraft.

The R4D landed Walcott, Grindley, Hewson and Montgomerie at 83° 10' S., 154° E., on the Polar Plateau at an altitude of 7,800ft. The temperature was 6° F.

Using two dog teams, the party plans to make a circuit of the northern end of the Miller Range before moving south to the western extremity of the Queen Alexandra Range.

## N.Z. PUPS FOR A.N.A.R.E.

Two husky pups left Antarctica on November 22 for the longest journey of their lives. On reaching New Zealand they will be shipped to Australia and from there will be sent to Mawson, on the other side of the Antarctic continent. They will be used for cross breeding with other dogs at Mawson which are now becoming inbred.

Born on August 15 in the maternity home at Scott Base where the temperature inside was minus 35deg., they come from the Greenland sire, Singarnet, and Zsa Zsa of Mawson strain.

The pups, Terry and Colette, have progressed remarkably well and each is now more than 40lb. in weight. They should develop into fine sledging and breeding potential for their Greenland characteristics are very prominent.

## AT SCOTT BASE

During August the relative calm of winter gave way to a series of blizzards and unsettled conditions generally with temperatures in the minus fifties. Sun-up on August 9 therefore fell a little flat, and it was the 29th before the hangar caught a few rays.

## SPRING SLEDGING

On September 11 Herbert, Otway, Shanahan and Hare took two dog teams on a spring training run to the old huts at Cape Evans and Cape Royds, covering 80 miles before they returned on the 15th. They found both huts in excellent condition and quite free of snow as a result of the work done by the New Zealand restoration party last summer.

The dogs all performed satisfactorily, even the aged Dismal proving himself to be a great lead dog still. Temperatures ranged from 0° to -25° F. One night it was -12° F. inside the tents and the men woke with their beards frozen to their sleeping bags.

## ALL IN GOOD TRIM

Mr. F. R. Swanston, senior electrical engineer for the Ministry of Works, spent nine days at Scott Base inspecting the buildings and plant. Mr. Swanston reports that after four years of occupation the base, originally intended for approximately two years, is in remarkably good preservation and that all buildings and services are completely functional. Some parts of the plant, e.g. ventilating fans and heaters, have been whirring continuously twenty-four hours a day for nearly four years.

"There appears to be no major reason why Scott Base cannot continue to carry on and become New Zealand's permanent outpost in Antarctica."

## NEW MEN

Replacements began to arrive at Scott Base on October 11, much earlier than has been customary in previous years.

The newcomers found the base well drifted up as the result of a recent blow and the entrances to the covered ways were about eight feet below the level of the snow. The snow cave where most of the food is stored was also blocked, it being necessary to dig down 15 feet to obtain entrance.

Mike Prebble, the dog handler, was presented on arrival with 12 pups, two of them being just a few days old. With the pups the total number of dogs at the base was 69, all in good condition. From such a large pack there was no difficulty in getting suitable teams for the field party's sledges.

## THE MINISTER SEES FOR HIMSELF

A welcome visitor to Scott Base early in November was the Hon. Blair Tennent, M.P., who as the New Zealand Cabinet Minister in charge of Scientific and Industrial Research is responsible for New Zealand Antarctic activity. Mr. Tennent and Mr. A. McCreedy, M.P., were the guests of Rear Admiral D. M. Tyree, and spent over a week in the Antarctic.

On November 8 and 9 Mr. Tennent made a detailed tour of Scott Base to ascertain at first hand what is involved in living in and maintaining an Antarctic base.

## THE ICE SHELF

In early November a party of four New Zealanders proposed to survey the strain gauge, a cross of marker flags some four miles long on the open ice shelf about 80 miles out from the termination of the Byrd Glacier on the Victoria Land coast. This gauge was set up two years ago to measure the movement of the ice shelf. However, after over an hour's search by air the cross could not be found. It was probably buried under heavy snow accumulation during the past year.

## ROTOITI BATTERED

Heavy seas and winds of 50 knots battered H.M.N.Z.S. "Rotoiti" when the ship was doing picket duties midway between New Zealand and Antarctica in early October. The storm, which raged for two days, carried away a life raft.

In the same area earlier in the month U.S.S. "Vance" took a hammering and suffered several thousand pounds worth of damage.

The "Rotoiti" will help in adding knowledge of the southern oceans as well as fulfilling her main purpose as a weather ship for flights between New Zealand and the Antarctic.

On one, and possibly more, of the cruises she will carry a number of Government scientists who will make surface and deep-sea oceanographic recordings. She has been fitted with a special winch and boom system capable of carrying 3,000 fathoms (about 3½ miles) of oceanographic wire for lowering apparatus and collecting samples.

The frigate has had her two after guns removed to make room for a large balloon hut and helium store. While she is on her 10- or 15-day station radiosonde balloons for determining conditions in the upper atmosphere will be sent up every 12 hours.

Every three hours reports will be made on the surface weather to help in flight predictions.

This is the first time the Royal New Zealand Navy has provided patrols of this sort to help in the United States Navy Antarctic programme.

The Rotoiti, which will operate out of Dunedin, will take about four days after leaving New Zealand to reach her station. Once there, she will have to keep within 10 miles of the central point of the station — quite a navigational problem in Antarctic waters.

"Rotoiti" was relieved by U.S.S. "Vance" on November 28, and will take over station duty again in February.

## V.U.W. PLANS

A two-man Victoria University of Wellington team, Professor R. H. Clark and Mr. R. H. Wheeler carried out during the first half of November two successful reconnaissances in United States VX6 squadron aircraft in order to select suitable areas for field work by a University party in the 1962-63 summer.

The first flight was made during a routine air-drop mission to the Pole Station. On its return flight the Globemaster was diverted to fly over exposed rock areas at the head of the Beardmore Glacier. Projecting above the ice in this region are several nunataks; "islands" of bare rock. These will probably be more closely observed by one of the New Zealand dog-sledging teams later this year.

The second reconnaissance was made in conjunction with a re-supply flight to a United States field party near Cape Murray, a low bluff between the Mulock and Barne Inlets in 79° 35' S., 159° 55' E., and the attempt to re-locate the strain gauge on the Ice Shelf (see below). An ice-free area by the Darwin Glacier was found to be well worth consideration as the field of operation for a subsequent V.U.W. party. The bare land appears to run from sea-level at the Ross Ice Shelf to a height of 4,000 to 5,000 feet. Although sections are cut out by glaciers a mile or so wide, the ice is little broken and appears to be suitable for a back-packing party such as the University usually sends into the field. The area is approximately on 80° S.

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A television team from Channel 3 will visit the Antarctic as guests of the United States Navy in November or early December to make a 25-minute documentary.

After editing and processing in New Zealand, the film will probably be seen on Channel 3 early next year.

## NEW ZEALAND SCOUTS FOR ANTARCTIC

Three New Zealand Boy Scouts are to visit Antarctica early next year on American ships. They are scheduled to leave Lyttelton on the icebreaker "Eastwind" on January 3.

They will arrive at Hallett Station about January 12 and will stay there for five days.

McMurdo Sound will be their next calling place. At Scott Base the boys will be under the control of Mr. Athol Roberts, leader of the New Zealand Antarctic expedition.

They will take part in the work of base support activities while they are being fed and quartered by the Antarctic Division at Scott Base.

The three Scouts are expected to return on the United States tanker "Elkhorn" early in February.

"Once again, such a project has been made possible by the ready and generous co-operation of Admiral Tyree and the United States Navy," a spokesman for the Scouts' Association said. "We are thrilled with the idea. This is just the sort of thing that suits our older and better boys, and it gives a lift to the whole movement."

On November 10 it was reported that 62 Queen's Scouts had applied. All were personally interviewed, and the final selection was to be made at the end of November.

## TO TAKE POISON

Curare, the fast-acting poison used by South American Indians on the tips of their hunting arrows, was an important part of Dr. Stonehouse's luggage when he left for McMurdo Sound.

The curare will be used to anaesthetise the Weddell seals for biological studies. The poison paralyses the seals but does them no harm.

## HALLETT STATION

The first plane, an R4D, reached Hallett from McMurdo on October 15.

In residence since the middle of October have been two construction gangs, one engaged in the erection of new storage huts and the other in the installation of new communications equipment, including several new and peculiarly shaped aerials.

Taylor, the New Zealand Scot who is the new station Scientific Leader, writes: "The new team was immediately impressed by the beauty of the scenery and the comparative warmth of the Hallett region compared with that of Ross Island. Inevitably comparisons between the relative merits of Scott Base and Hallett were quickly made and these should provide topics for inter-station banter on the twice-weekly radio skeds, when the Scott Base boys remember to rouse themselves from their post-prandial slumbers."

"The first penguin was sighted on October 10," says Taylor, "since when the Adelies have been streaming in. Nest-building and mating have been in full swing and the first eggs should appear soon. The Skua population has also been building up with one notable exception — "Big Daddy," the pet Skua reared by last year's team and lacking sadly in ability to fly has been living in warmth and luxury in the biological Jamesway. The arrival of the biologists necessitated his removal to a cage on top of the galley. During the blizzard the door blew open and "Big Daddy" has not been seen since. R.I.P. . . ."

## 1962 TEAM

Eighteen men, nine scientists and nine naval personnel, will be based at Hallett during the 1961-2 season. Of the scientists, three will be New Zealanders, making observations in aurora, geology, ionospheric physics,

seismology and cosmic rays, three will be U.S. civilian meteorologists and the remaining three U.S. Navy aerologists, while a biology laboratory is scheduled to use a building originally erected for communication purposes.

### LARGEST EVER

A giant, ski-equipped transport, the largest aeroplane ever to land at Hallett, was set down on ice 75 inches thick at Hallett on October 24.

This thickness of ice could safely support little more than the landing weight of the aeroplane — 109,000 pounds — and there was, in addition, the contents of the plane — its crew, 5,000 pounds of cargo and its passengers, one of whom was Rear Admiral Tyree, boss of the U.S. Navy's Operation Deep Freeze.

Caution had therefore to be used in setting the aircraft down on the crystal clear ice of the bay, but so smooth was the landing that even the pilot, Commander M. D. Greenwell, "wasn't quite sure myself that we had completed the touchdown."

The passengers, mostly the incoming wintering over party, were greeted by swarms of Adelic penguins from the largest rookery in Antarctica, which put on a clapping and barking performance in keeping with their reputation as the "clowns of the Antarctic".

Mr. P. J. Gill, a geophysicist from the Christchurch Magnet Observatory spent two weeks at Hallett in late October supervising the change-over of staff concerned with the magnetic programme and checking over the equipment.

### A RECORD?

A member of Operation Deep Freeze received 237 letters from his wife when the first mail plane reached the McMurdo base.

## OUR YEAR AT HALLETT

by Peter J. Martin

[Mr. Martin led the New Zealand team of three which shared with the Americans the scientific work at this joint United States-New Zealand station during 1960-61.—Ed.]

On the morning of October 30, we caught a fleeting glimpse of our new home from the window of a U.S. Navy R4D after a 3-hour flight, through low-lying clouds, from McMurdo Sound. A few minutes later, in perfect weather, we stepped out on to the ice air-strip in Edisto Inlet, surrounded by glaciers and mountain ranges, to be warmly greeted by Bob Thomson and Dr. Towles. Accompanying Peter Lowe, Norman Stent and myself were Bob Titus, the new American Scientific Leader, Dr. R. A. Falla, Director, Dominion Museum, Brian Reid, Dr. Colin Bailey, and Dr. Gordon Cartwright of the U.S. Weather Bureau. Bob Thomson, Dougall Farmer and myself had previously wintered over at Campbell Island so our renewed acquaintance was a pleasant one. A four mile drive in a weasel and there seemed to be Adelic penguins everything for this was the beginning of their annual breeding season. The small but comfortable station on Seabee Hook shares this very small area of land with about 150,000 birds, increasing to almost 250,000 when the chicks have been reared.

After an excellent dinner in the combination mess-hall and galley, we began to settle into into our quarters and commenced taking over our new duties. During the year the N.Z. Scientific programmes were allocated as follows: Peter Lowe — ionospherics; Norm Stent — seismology, geomagnetics; myself — auroral physics and ionospherics. Bob Titus, Station Scientific Leader for the year, controlled the aerology programme with the aid of five Americans. Tom Ballard, a young Ameri-

can physicist, assisted with our auroral programme by operating the patrol spectograph during the winter and also operated auroral absorption, galactic noise, and cosmic ray recorders. Doctor Tony Kelly, USMC, acted as Base Commander and Medical Officer, and had his headquarters in the small, well-appointed hospital. A noticeable feature of the weather at Hallett was the warm temperature — hence the name “Banana Belt”.

Within a week, the majority of the wintered-over personnel had been flown out, Bob Thomson remaining long enough to complete his reports. After a small ceremony, in which he handed over to Bob Titus, he departed for McMurdo Sound.

Everyone settled down quickly to Station routine and New Zealand/American relationships got away to an excellent beginning with a small party — the first of many. Highlights of the first month were the appearance of the first penguin eggs on November 6 and a severe radio-blackout which lasted for almost 10 days. This completely disrupted all air-transport on the Antarctic continent as well as closing down our communications channels, thus resulting in a considerable build-up of scientific data.

A medical emergency necessitating the evacuation of one of the Naval support team brought the icebreaker “Staten Island” up from the McMurdo Sound area on December 14. Because of ice conditions the vessel could only approach to within 15 miles of Hallett Station and the patient was successfully evacuated to the ship by two Navy helicopters.

Christmas and the New Year came and went with the usual merrymaking. The Hallett/New Zealand radiotelephone circuit proved an excellent morale booster throughout the year, enabling two contacts per week with

both New Zealand and Scott Base. On January 12, the icebreaker “Eastwind” arrived from McMurdo Sound and transferred Brian Reid and Dr. Colin Bailey to Cape Adare. In between their biological work programmes and blizzards, they put considerable effort into effecting repairs to the huts constructed early in this century by Borchgrevink and Scott’s Northern Party. From our station in the science building we were able to keep daily contact with the two lonely explorers.

After being delayed by storms and unfavourable ice conditions the re-supply ship “Arneb” arrived on February 28, accompanied by “Edisto” and “Eastwind” and unloading commenced at once, under the supervision of Major Havola. Storms delayed the completion of this operation until March 11. For several days, when landing craft could not be used, two helicopters unloaded over 300 drums of fuel oil and much other cargo.

The completion of the re-supply operation and the departure of all vessels isolated the wintering-over team until the end of September. Early in March the auroral programme was commenced. Tom Ballard took over operation of the patrol spectograph and I operated a black and white and a colour all-sky camera programme. This was the first year of the colour programme and results were very satisfying. Installation was commenced of the V.L.F. recording equipment but due to the late arrival of the equipment and installation problems, this programme could not be brought into operation.

Because of Hallett Station’s close proximity to the geomagnetic pole and the absence of excessive cloud cover, many spectacular aurorae were observed and recorded throughout the year. Correlations were often possible between these displays and Norman Stent’s new earth current



## REFLECTIONS AT HALLETT

Mt. Herschel rises behind the auroral tower, with the rawin dome on right.

Photo: Charles L. Roberts, U.S.A.R.P.

programme. 1961, at Hallett, was characterised by many solar flares and magnetic storms during which the radio-telephone circuit to New Zealand suffered greatly. Peter Lowe's ionosphere programme continued normally except for the occasional equipment failure. For the first time at Hallett, absolute magnetic observations were taken regularly as weather and magnetic storms permitted. Throughout the winter an excellent spirit of co-operation existed between the scientific disciplines and this fact enabled us to overcome many technical difficulties. Co-operation from the Navy support personnel was also excellent.

Few ever complained of boredom at Hallett, as nightly movies, plenty

of hobbies, a good cook and a few practical jokers kept all personnel occupied during their leisure moments. July 4 was celebrated in a very spectacular fashion and mid-winter's day was likewise celebrated in the customary manner. Needless to say, the "morning after" was not so bright. During the winter Tony Kelly kept in practice with the occasional small operation and inoculations. The New Zealand and American flags were rehoisted on July 29 and the return of the sun duly celebrated once more.

The "Family Corner" programmes from Radio N.Z. were much appreciated by the New Zealand personnel and were a source of much amusement to the Americans who referred to them as "going on the block". The

ham station KC4USH enabled the Americans to have regular calls home also. During June and July, a series of solar flares made radio calls almost impossible.

Hallet Station had a unique pet during the year—a tame Skua named "Big Daddy". Being discarded by his parents before the winter, he was adopted by Chief Radioman, Dale Sheldon, and nursed through the winter. Flying made him airsick, much to everyone's amusement.

By September the days were back to normal length and construction commenced on the new ice runway. Tom Ballard and Larry Enberg completed the survey and the Navy personnel graded the surface and roadways and succeeded in producing the finest airstrip in Antarctica. The excellent weather also permitted many short expeditions out on the sea-ice and several mountaineering ventures up the cliffs behind the station. A large ice-berg containing many beautiful ice-caves attracted much attention. In mid-October, the first Weddell seal pups appeared and the first Adelie penguins returned for their next breeding season. Several Emperor penguins were also observed around the station. On October 15 a Navy R4D touched down bringing in the construction team to assemble the new communications centre, fresh provisions and, most welcome of all — mail, the first since March. Within the next week the relieving scientific party, led this season by Claude Taylor, were flown in together with other visiting scientists.

There was quite a lot of excitement on October 24 when the first-ever C-130 landed on the Hallett air-strip, with Admiral Tyree on board.

On October 27, two R4D's flew out all wintered-over personnel to McMurdo Sound and thence to New Zealand aboard U.S. Navy Globemasters, thus terminating a most memorable year.

## HUH!

For years the men at Hallett Station have smarted silently under the quips of the residents of McMurdo Sound, far to the south, who consistently refer to the Hallet area as "the Banana Belt".

Now the war is on! The men at McMurdo and Scott Base will in future be referred to by the tough men at Hallett as merely living on "the off-shore islands". Hallet is of course on the Antarctic continent itself.

## LARGEST FISH EVER

On November 1, three men — with the help of a Weddell seal — caught what is believed to be the largest living fish ever taken from the waters of the Southern Ross Sea.

The men were preparing to pull a fish trap up from the sea bottom through a hole in the six-foot-thick sea ice when suddenly a seal carrying a large fish in its mouth burst to the surface of the water. Although astonished by this sudden and unforeseen development, the men lost no time in grabbing the fish and pulling it away from the equally surprised seal. They ended up clutching a fifty-two-inch fish weighing fifty-eight pounds.

The exact identity of the fish could not be determined, although it is of the family Notothenidae, a group not often found in warmer waters and having no commonly known names. The fish bears a strong resemblance to the partially decomposed fish remains found off the nearby Dailey Islands last year, and which have been found to be up to 1,100 years old.

The largest previous known catch in these waters was a fish of the same family taken during the British National Antarctic Expedition 1901-4 (Scott's first expedition). This fish was also caught through an ice hole, but with a missing head and damaged body. It weighed thirty-nine pounds ...and ...measured... forty-six inches.

## DEEP FREEZE 62 BEGINS

**Four days earlier in the season than in any previous year, the first aircraft of Operation Deep Freeze 62 touched down at McMurdo Sound, after their flight from New Zealand, on September 27.**

Already delayed a week at Harewood, Christchurch, four aircraft reached McMurdo that day, to make the start of this year's season official, bringing with them engineers, scientists, technicians, 1,327 pounds of personal mail and 1,500 pounds of fresh food for the winter-long isolated personnel of the station.

Within two weeks, feverish activity was under way. Byrd Station had been visited — a month earlier than ever before, weather stations and emergency landing fields at the foot of the Beardmore Glacier and at Little Rockford were manned and in operation, the sea-ice runway at McMurdo had been cleared, re-cleared and cleared again to allow aircraft of a carrier squadron to transport personnel and cargo to and from Harewood, and Deep Freeze 62 was in operation.

Supply drops to Byrd Station began on October 24, when a Globemaster dropped 72 barrels containing 3,600 gallons of fuel. This was 10 days earlier than the first drop to Byrd last year. Only one barrel was damaged.

The first Hercules reached Pole Station on October 28, carrying 200lb. of mail and fresh provisions. Rear Admiral Tyree was on board.

**Atomic power will be used for constructive, not destructive, purposes in Antarctica, and it will start work this season.**

The first atomic power device to be installed will be one no bigger than a drum, which will be buried in the snow and ice near Little America V, an automatic weather station generator, with an expected life of

ten years. This station will automatically record and transmit temperature, wind speed and direction, and barometric pressure, every six hours, with transmitters powerful enough to reach across the entire continent if necessary. It will also transmit on demand from aircraft or ground stations.

Much larger, and requiring more time to reassemble, is a prefabricated reactor system. When it starts operating, some time early next year, it will produce 1,500 kilowatts daily, enough to satisfy a community of 3,000.

Both plants are loaded aboard U.S.N.S. "Arneb", due to reach McMurdo Sound early in December. The weather station can be installed at once, whereas the reactor is expected to take about ten weeks to be assembled. Once in operation it should produce the equivalent energy of 36,000 barrels of fuel oil from a mere 40 pounds of enriched uranium fuel. As well as saving an estimated 75 per cent. on the cost of transporting fuel and operating diesel generators, the new system will also save in man-hours and man- and machine-lives lost in polar transportation work. Since 1955, 17 lives, 17 aircraft and 13 heavy vehicles have been lost in supply operations, in which to deliver a mere thousand gallons of fuel to inland bases involved 4,500 gallons of aviation fuel.

The United States Atomic Energy Commission has already announced plans for a second plant, to be installed some 700 miles from the South Pole and ready for operation by March, 1964.

## NEW BYRD ARISES

Like the phoenix of fable, a new Byrd Station will arise this season from the ruins of the old. Five thousand tons of snow are rapidly rendering the existing Byrd Station, one of the key stations in American operations, uninhabitable — already the roof of the "garage" has caved in, forcing tractors and unloading equipment to winter over outside, while Seabees were working round the clock under the ice six miles away to get more than a mile and a half of tunnels ready for alternative accommodation.

Built for the International Geophysical Year on the surface of the ice, the Byrd Station has been in the past five years becoming more and more endangered by the weight of drifting snow accumulating on and around it. Roofs sagged, floors cracked, walls began to cave in, so it must have been a very relieved wintering over party who watched Admiral Tyree's aeroplane touch down on September 29, a full month earlier than the first flight in to Byrd last year. This season's activity at Byrd is almost certain to be the last, as the new Byrd, comprising one main tunnel and seven side tunnels, is expected to be ready for partial occupancy this summer.

The new Byrd, using construction methods already proved successful in Greenland, will be a series of trenches up to 33 feet deep by 36 feet wide, roofed with steel arches and finally covered with snow.

## RESEARCH SHIP "ELTANIN"

The seagoing scientific laboratory, U.S.N.S. "Eltanin" should be ready for Antarctic operations early next year. At first she will work to the limits of the heavy pack ice, but a more complete cruise plan will be announced shortly. She is expected to operate continually in antarctic waters, with a rotating complement of scientists and crew members.

## AIRCRAASH KILLS FIVE

Five of the nine men aboard a U.S. Navy P2V Neptune aeroplane were killed at Wilkes Station in November when the aircraft crashed after take-off. Four of the men killed were naval personnel, Lieutenant Commander W. D. Counts, U.S.N., Lieut. (Junior Grade) R. P. Compton, U.S.N.R., Petty Officer W. R. Chat-tain, and J. L. Gray, U.S.N., and one a well-known Antarctic scientist, Dr. E. C. Thiel, of the University of Minnesota.

A passenger during the earlier flight of the Neptune was Dr. M. E. Pryor, the American scientist who inadvertently "went missing" in New Zealand before reaching Antarctica.

The flight of the Neptune had earlier been announced as the longest and most potentially hazardous undertaken by the U.S. Navy. Its planned route was a 3,500-mile triangular flight over the least known sector of Antarctica in a new effort to chart the continent by studying its magnetic forces. The flight, starting from McMurdo, reached the Russian base at Mirny, about 1,500 miles away, delivered Dr. Pryor, and was to return via the Australian station Wilkes, 450 miles away.

A Dakota was damaged in a landing mishap while attempting to put down a three-man scientific field party in the Sentinel Mountain Range of Ellsworth Land on November 12. None of the eight men aboard the aircraft was injured.

The accident occurred when the Dakota, operating out of Byrd Station about 450 miles away, contacted high hard sastrugi during landing. The starboard landing gear collapsed, throwing the aircraft on to the wing. A second Dakota evacuated the eight men.

A United States Navy seaman, T. R. Hallard, broke his back when his ship, the U.S.S. "Vance", was

damaged by high seas and gale-force winds, while on sub-Antarctic picket duties on October 7. He fell on a raised deck hatch during a heavy roll.

### N.S.F. RESEARCH

Some six million dollars' worth of awards and grants have been made for U.S. Antarctic research this year by the National Science Foundation. Work will include meteorological rocket firings which will measure temperatures and winds in the stratosphere, gaining experience in ice cover analysis and its effect on surface temperatures, biological research at Mirny which will see how land invertebrates adapted themselves to the extreme climatic conditions, and a direct search for historical and social information collections.

### HE GREW DESPITE THE COLD

U.S. Navy doctors checking on their theory that the bitter cold of Antarctica could restrict men's growth found that one of the outgoing wintering-over party did not conform.

Photographer's Mate Airman Bruce Raymond's height, after seven-and-a-half months at McMurdo, rose from 6ft. 5in. to 6ft. 7in. — apparently. In fact, he had, by stooping, avoided rejection by the Navy on the grounds of super height and had his actual height of 6ft. 6in. recorded as 6ft. 5in. Nevertheless he had still added ½in. to his record (in Antarctica) length.

### NEW MAP

A new edition of a map which should greatly assist those wishing to follow this year's Antarctic operations has been made available by the U.S. Air Force. Technical navigational details have been eliminated and the latest available information has been incorporated to provide the most accurate and up-to-date map possible.

Requests for copies should be

addressed to:—

U.S.A.F. Aeronautical Chart and Information Centre,  
2d and Arsenal Streets,  
St. Louis, Missouri.

### WEATHER STATION'S NEW GENERATOR

By early 1962 the automatic, unmanned weather station near the Little America V Station will be powered by a small cylindrical atomic generator. The 10-watt generator, approximately 21 inches high and 19 inches in diameter, has a design operating life of two years and will replace storage batteries in the station which otherwise would have to be changed every few months.

Four cylinders in the centre of the generator contain fuel pellets of strontium 90 (about three pounds) in an insoluble form. Heat produced by the spontaneous decay of the radioactive material is converted directly into electricity by 60 sets of thermocouples grouped around the square core. Since no moving parts are involved, nothing in the generator can wear out. Heavy shielding of depleted uranium cuts external radiation to a minimum and contributes to the over-all ruggedness of the unit.

The entire weather station will be buried in the snow. Steel and wooden outriggers will be used to spread the weight and keep the station from sinking. Only a whip antenna and the actual sensing instruments will show on the surface. Excess heat from the generator will keep the temperature of the buried electronic equipment within a constant, narrow temperature range — thus avoiding the freeze-up problem which has beset battery-operated stations in the Antarctic.

The weather station will transmit data automatically every six hours over a distance of more than 400 miles to the McMurdo Sound Naval Air Facility. It is also designed so that it can be triggered by radio pulses from land or air to transmit more frequently.

## IN ELLSWORTH LAND

Two parties plan to work this summer in the little known Ellsworth Land, east of Marie Byrd Land and south-west of the Antarctic Peninsula (variously known as Graham Land, Palmer Land, O'Higgins Land).

### SKY-HI

One project is to establish a landing strip at Sky-Hi near the Sentinel Mountain range so that five Hercules flights can be made there to land supplies for the establishment of a new camp site in approximately 76° S., 85° W.

Sky-Hi is 1,525 miles from McMurdo, and the round trip is about as far as the Hercules can go.

After four attempts to land a Dakota aircraft from Byrd Station at the proposed camp-site had been frustrated by bad weather, a successful landing was made on November 26.

When the base has been established, American scientists will spend the rest of the summer there on ionospheric, meteorological, and geomagnetic studies.

### TRAVERSE PARTY

The second project is a University of Wisconsin seven-man traverse, scheduled to leave Camp Minnesota (73° S., 94° W.) in November. Camp Minnesota was established last summer. The traverse will proceed eastward along the Eights and George Bryan Coasts to the vicinity of Mt. Combs; then turn south to Mt. Peterson, north-east toward Mt. Vang and south again to the Joerg Plateau. In the final portions of the journey the party will move north-westward into Ellsworth Land to about 76° S., 78° W., south to Mt. Haag and then to the new Sky-Hi Station. The total distance is about 1,200 miles. The traverse leader is Dr. John C. Behrendt.

En route the party will take elevations, measure snow accumulations, and determine ice thickness by means of seismic soundings.

### ON THE WAY

Hercules aircraft have landed three snocats for the traverse party at Camp Minnesota, and were expected to begin their five flights, with supplies for the Ski-Hi camp, in late November.

When they have done that, three Globemasters will make six flights to Ski-Hi to drop more supplies there.

By the time the Hercules have been to Sky-Hi and landed men and equipment, the base party will be ready to handle the airdrops from the Globemasters.

### LATE NEWS

It was reported on November 29 that three Globemasters had dropped fuel and supplies at Sky-hi the previous day, and had returned to McMurdo, a non-stop round flight of 3,110 miles. The cargo included motor-vehicle parts and rations as well as drummed fuel for the traverse party from Camp Minnesota.

On December 3 a further report stated that the operation, involving in all eleven flights, five C-130 landings and six C-124 air-drops, had been completed. About 52,000lb. of the total C-124 load of 120,000lb. represented fuel for the traverse party.

The seven men of the traverse party left Camp Minnesota on December 1. They had been air-lifted there from McMurdo by C-130 aircraft on November 25 and 26. Included in the party is a Japanese glaciologist, Mr. H. Shimizu.

The whole traverse, using three Sno-cats, is expected to take 80 days. Two Dakotas from Byrd Station will evacuate the party before the winter.

# FRANCE PLANS EXTENDED WORK IN TERRE ADELIE

In addition to preliminary work on the new Dumont d'Urville Station, which should be ready for occupation by December 1963, France proposes to enlarge the scientific programme at present carried out in the Antarctic.

## CHANGE OVER

This summer's relief will be personally supervised by Paul-Emile Victor with Robert Guillard as his chief assistant. The Twelfth French Antarctic Expedition will relieve the Eleventh Expedition led by F. Digeon which has wintered in Adélie Land. The new party of 19 men will be led by René Merle, who has twice previously, in 1957 and 1959, wintered in Adélie Land. With him will be four men who have wintered with an earlier expedition: J. Chesneau (senior meteorologist), R. Novel (chief radio operator), P. Pausat (diesel mechanic) and G. Ricou (glaciologist).

The summer shore party comprises a construction group, a hydrographic team of four, two glaciologists, and a helicopter detachment of four men. Of these 18, three have wintered in Adélie Land on earlier expeditions, and six have taken part in summer expeditions either in Adélie Land or in Greenland.

## WORK AHEAD

With a big re-building programme looming, the new expedition is well equipped for construction work. Explosives and construction equipment are being taken south, as well as no fewer than 6,751 bags containing 250 tons of sand, gravel and cement: 10 tons of cement alone. Also on board "Magga Dan" will be four weasels, three ECIG sledges and a tracked trailer for use on l'Ile des Petrels, on which the base is built. Two of the weasels will be kept on the island as reserve vehicles.

The barge "le Zelee" which was used for disembarkation purposes when the IGY period began in 1956 and was taken back to France, has been re-conditioned at Cherbourg by the Navy and is again being taken to the Antarctic. There will also be a Djinn helicopter.

A shelter measuring 4m. 50 by 2m. will be erected for the cosmic ray programme. Three caravans are being taken, one to serve as a glaciological laboratory and two to house the construction party during the summer's work.

## SCIENTIFIC PROGRAMME

A glaciological programme planned to extend over several years will be initiated this summer. The programme comprises a stratigraphic study of the Astrolabe glacier and the edge of the Polar plateau, as well as sea-water sampling on the surface and in the depth for the study of water masses of glacial origin. A plateau traverse is planned for October 1962-February 1963.

Hydrographic work envisaged includes tide measurements in the Pointe Geologie area, bathymetric soundings in the region of les Iles Dumoulin and elsewhere, survey work along the coast as far as time permits and oceanographic studies between Hobart and Terre Adélie.

Preliminary work will be undertaken in preparation for the installation in the 1962-63 summer of a cable railway.

The addition of glaciology and the study of cosmic rays to the scientific programme will entail a considerable additional strain on the electrical

supply, and it is realised that the measures contemplated for the coming summer are palliatives only.

The biological programme for this year emphasises oceanographic etiology and marine biology: population studies in the Pointe Geologie archipelago, the study of fish and plankton and the physical chemistry of the water. Further study of the Emperor penguins will be undertaken during the winter.

The programme in the other scientific disciplines is unchanged.

### DEPOT LAYING

A party of four men, Renard, Dousset, Maziere and Perrier, left Dumont d'Urville on October 19 with the object of establishing fuel depots in preparation for the scientific plateau traverse scheduled for early 1963. It is hoped to lay three depots, at Geologie (1,000 litres), B11 ter (1,200 litres) and B22 bis (1,000 litres). B11 ter and B22 bis are 100 km. apart, at the points of intersection of the old trail to Charcot Station with the two sides, parallel to the coast, of a square which will be the locale of glaciological studies during 1962-63.

The Emperor penguin studies were interrupted in May owing to bad weather and the break-out of the sea-ice. July saw the hatching of the first chicks; mortality was low. In September the creches were formed and now the mortality was severe. Two hundred dead were noted, half of them killed by Giant Petrels, the other perishing through hunger and cold.

In May, winds of exceptional violence were recorded. Sea ice began forming from June 25 but was broken out several times, to be firmly established at the end of July.

The minimum temperature recorded was  $-33^{\circ}\text{C}$ . on July 22. In that month the highest reading was  $3.2^{\circ}\text{C}$ . on the 7th.

### "NORSEL" RETIRES

The vessel "Norsel" which has been the supply ship used by Expeditions Polaires Francaises to re-supply the Adelle Land base for six years, has been replaced by the "Magga Dan". "Norsel" was aging and was too small for the re-supply task. The new vessel is much larger and infinitely more comfortable.

The red-painted "Magga Dan" will be remembered as one of the vessels which participated in the Commonwealth Trans-Antarctic Expedition and the Royal Society's Expedition to Halley Bay in 1956-57. New Zealanders saw her at the reception to Sir Vivian Fuchs in Wellington in March 1958. In 1959-60 she was the relief ship for the Australian expedition, and has also seen service in the Arctic.

"Magga Dan" is a vessel of 1,950 tons, has a crew of 26 under Captain Petersen, and can carry 36 passengers. She left Cherbourg on October 25 and made a short call at Vigo (Portugal) on the 28th.

### THE LIGHTER SIDE

The news sent home by the 1961 wintering team has reflected the cheerful spirit of the Dumont d'Urville team.

"The jolly month of May was fantastic, alternating between beautiful radiant weather and surly storms so violent that we found all our sea-ice gone, and the nesting Emperors taking refuge on the tiniest remnants of the pack . . . the evenings were occupied with cinema shows, learning English, the traditional chess game by radio against the Russians at Mirny, etc."

"July showed us everything, even plus temperatures — in Terre Adélie in July! The heat wave produced floods due to the melting of the ice on the rock. Light clothing for the winterers: anyway, no palm trees shot up out of the ground. On the 14th [French national day.—Ed.] two months' mysterious happenings were

solved: we watched enthusiastically the presentation of the first film ever completely made in Adélie Land. Its title — 'Brrr! !!' It was a triumph."

In August "numerous visits were paid to the penguin rookery, where the chicks are getting big, ceaselessly demanding their bottles like starving babies."

Two notable events: "the one, agonising, the wine in its barrel frozen: the other delightful: quite moved, we listened with pleasure to the tape-recordings addressed to us by Antarctic old-boys who don't forget Adélie Land.

"September — relief approaching, the arrival of the petrels, heralds of spring, the splendid food produced by our cook, his fresh bread every day, his enormous steaks and his savoury chips have kept our morale high and our health excellent."

#### FAREWELL TO "POM"

Not long after the second World War, three adventurous young Frenchmen, J. A. Martin, Yves Vallette and Robert Pommier, mountaineers all, persuaded Paul-Emile Victor to include in his projects an expedition to the French sector of the Antarctic, Adélie Land.

During the course of the first expedition on board the "Commandant Charcot" en route for Adélie Land, Martin died on October 21, 1949. And now, after a painful illness bravely borne, Robert Pommier, affectionally known as "Pom", has gone too. He died on May 31 at the age of 42.

Robert Pommier was an able photographer and the magnificent photographs in the volume "Terre Adélie" which he published in collaboration with Andre Liotard, his leader in Adélie Land in 1948-49, are mostly his work. He took part also in the expeditions of 1949-51 and 1955-56.

In a moving tribute, the "Bulletin d'Information" of Expedition Polaires Françaises says of him, "As a

young adolescent, in the hard school of the ski-ing scout, he learnt that lovely human friendship born of common effort: gliding over the slopes his eyes were raised to the peaks beyond which lay the unknown, a world still more vast where he dreamed of leaving the impression of his skis."

#### (LATE NEWS)

"Magga Dan" is expected to reach Adélie Land about December 15.

A construction party will carry out preparatory work for the planned new buildings which should gradually improve conditions on l'Île des Petrels. Two surveyors will complete the topographical picture obtained during the 1961 summer.

One of the two glaciologists to work in Adélie Land this year will be Claude Lorius, who wintered in Adélie Land in 1957.

#### KINDRED SPIRITS

We welcome still another society of Antarctic enthusiasts — the **Suid-Afrikaanse Antarktische Vereniging**. Hannes La Grange, well-known to many New Zealanders, informs us that the Association has not yet "even reached the teething stage"; but it has held two meetings already and is busy working out the details of a constitution. The Association sends "best wishes to all Antarctic friends in New Zealand". We in our turn wish the new society great success.

#### OLD FRIEND

When Sir Vivian Fuchs arrived at McMurdo as one of the SCAR delegates who were flown from New Zealand to the Antarctic as guests of Admiral Tyree, he was delighted to see the Sno-cat which he drove across the Antarctic continent in 1957-58. He drove the Sno-cat from the ice landing-strip to the American base.

# Russians Announce Plans for New Expedition

Soviet newspapers published on October 12 details of the preparations for the seventh Russian Antarctic Expedition organised by the Arctic-Antarctic Institute of Glanvsemore, attached to the Ministry for the Marine Fleet of the U.S.S.R.

The seventh expedition will continue the work of its predecessors on the littoral and in the central regions of Antarctica. The team will conduct observations in the fields of aerometeorology, geophysics, glaciology and other scientific disciplines at Mirny on the Pravda Coast, at Vostok in the region of the South Geomagnetic Pole, and at Novolazarevskaya in the Schirmacher Oasis, Queen Maud Land. Komsomolskaya, situated 870 kilometres to the south of Mirny, will, as before, be used as an intermediate and auxiliary base for treks and flights into the interior.

A sledge-tractor train trek organised by the 6th Expedition is heading out from Pravda Coast in the direction of Komsomolskaya, from where they will make for the South Geomagnetic Pole. By early October the explorers had travelled 685 km from Mirny into the interior of the continent. They were still 200 kilometres from Komsomolskaya. On reaching the station, which was closed down temporarily during the Antarctic winter, they will reactivate the station.

The Soviet explorers were due to sail from Leningrad in the middle of November on board the expedition vessels "Ob" and "Kooperatsiya". They will carry a scientific and support team of nearly 300, and 3,000 tons of supplies.

Members of the expedition will make extensive use of aircraft, ground transport and the diesel-electric

vessel "Ob" for carrying out detailed research in the various regions of the continent and the surrounding seas. In particular, it is proposed to establish automatic radiometeorological glacier stations (GARMS) at considerable distances from the Mirny base. These will be specially equipped for operating in the severe conditions obtaining. They will make it possible to obtain interesting data regarding weather conditions on individual glaciers.

Most of the scientists setting out shortly will be experienced specialists, who have worked previously in the Arctic and Antarctic. The expedition will be under the command of A. G. Dralkin, a man who has made a thorough study of the Arctic and who has twice wintered on the drifting station "Severny Polyus-4" (North Pole 4). He has already been to Antarctica, as commander of the 4th Combined Expedition and the leader of a trek by Soviet scientists from Mirny to the South Geographic Pole.

Among the new relief party is V. S. Sidorov who has twice been in charge of Vostok Station. When Sidorov wintered there in 1958, a temperature of  $-87.4^{\circ}\text{C}$ . was recorded on August 25. He will again be working at the South Geomagnetic Pole. Here, on August 24, 1960, a new absolute minimum air temperature for this globe was registered,  $-88.3^{\circ}\text{C}$ .

A young scientist V. M. Rogochev, who has been commander of the

drifting station "Severnij Polyus-8" and spent 353 days on the ice of the Central Arctic, will be commander of Novolazarevskaya Station.

The Expedition will also include a marine division. It will be headed by the veteran polar explorer and oceanographer V. A. Shamontev. In the spring of this year he returned from the Central Arctic, where he commanded the drifting station "Severnij Polyus-9".

A team of geologists under Dr. Lev Klimov will work in ice-free mountain areas of East Antarctica.

### DATING THE EARTH

More than 100 samples of rock collected from the eastern coastal regions of the Antarctic continent have been subjected to radioactivity tests by Soviet scientists to find out their approximate age.

According to the scientists, rocks from the centre of Eastern Antarctica proved to be the oldest among samples tested, having been formed 1,350,000,000 and 1,840,000,000 years ago. Further analysis of rock specimens, the scientists believe, may show that parts of the continent are more than 2,000,000,000 years old.

### AMERICAN OBSERVER

Dr. E. Matthew Pryor, of the Ohio State University, will spend 16 months on biological research at Mirny, under a National Science Foundation grant of \$43,837.

Dr. Pryor, who has already done extensive biological research at Cape Hallett and Ross Island, will return to the United States in 1963.

Each year the United States and Russia exchange scientists at Antarctic bases through agreement between the United States National Academy of Science - National Research Council and the U.S.S.R. Academy of Science.

Under the new grant Dr. Pryor will study invertebrate land animals and

correlate his findings with ecological studies carried out at American stations. He will pay special attention to the way in which these creatures have adapted themselves to the extreme climatic conditions.

### MIRNY

The U.S.S.R. tractor train made a 100 km trial run late in August with four vehicles. The departure of this inland traverse to Sovietskaya, Vostok, etc. which was planned for early September, took place on September 13. The traverse proceeded approximately on schedule despite some adverse snow conditions. The vehicles were making an average of about 20 km per day when last reported.

### VOSTOK

A report from Vostok Station says that a whistler programme operated there for approximately six months. Vostok announced that the number of whistlers recorded increased with the coming of the daylight period and then began to weaken. Late in September they were heard only at night, then quite rarely and of low intensity.

### IN MEMORIAM

This year marks the 140th anniversary of the completion of the first Russian Antarctic expedition (1819-1821) on board the sailing sloops "Vostok" and "Mirny". The expedition, under the command of F. F. Bellingshausen and M. P. Lazarev, had accomplished one of the most arduous and dangerous of round-the-world voyages, in south-polar waters. It enriched world science with most important geographical discoveries.

The Presidium of the Soviet Academy of Sciences has accepted a proposal by the Inter-Departmental Committee for the Study of Antarctica to commemorate the feat by erecting a memorial to Bellingshausen and Lazarev and to the crews of the vessels "Vostok" and "Mirny".

It is considered that the most appropriate place to establish this memorial is Leningrad (presumably in the region of the Galer harbour). The nation's best sculptors will be commissioned to create it.

#### AT NOVOLAZAREV

"Vodny Transport" on August 12 published a report from the station commander at Novolazarev. Some extracts follow.

"Four hours earlier than in Moscow, life and work commences at Novolazarev Station, established by Soviet polar explorers at Schirmacher Oasis in Queen Maud Land. The outcrops of bedrock on which the buildings have been erected are surrounded on all sides by eternal ice.

"Our station is situated at the foot of a continental glacier. This explains the many interesting natural phenomena. 150 kilometres to the south of Novolazarev at an altitude of approximately 3,000 metres, vast air masses cool intensively above the ice peak. Then, as it were, they roll down the glacial slope, whereupon the air temperature rises and the relative humidity drops. As a result persistent down-slope winds and a mean drop of 30-50 per cent. in humidity are observed.

"The rim of the sun was observed for the first time after the polar night on July 19. Every day it becomes lighter, the south polar spring is drawing near. We have begun to prepare for summer operations. Our station is the starting base for exploration in this region of Queen Maud Land and to the south of the coast, in the heart of the continent, in the hill country.

"Veteran polar explorer, radio operator Titovsky, often establishes radio contact with short-wave "hams". Recently he established a direct link with Ugolny Bay in the Arctic. This is one of the most distant spots on the globe in relation to our position."

## JAPAN'S LAST YEAR AT SHOWA?

The "Soya" (2,700 tons) left Tokyo on October 30 for her sixth and possibly last voyage to the Antarctic. She will carry out from December 29 to February 21 the evacuation of the wintering team, 1961-62, the careful closing of the Showa station for future re-opening, and mapping with air photographs. Prof. T. Yoshikawa (the leader) and 15 companions, including such veterans as Mr. Y. Kuga (meteorologist) and Mr. K. Hasegawa (carpenter) and nine new men will carry out this task. Captain S. Akita and his crew of 95 will support them, especially in transportation by two Sikorsky S58 helicopters and by surveying with a Cessna 185. During the voyage, observations on cosmic-rays, ionosphere, night-glow, geomagnetism, meteorology and oceanography will be continuously carried out.

#### INLAND TREK

The wintering team has been doing well. Mr. M. Murayama, the station leader, and six men left the station with three snow-cars on October 4 for geographical researches in the unknown area 75°-80° S., 36°-40° E. They reached the edge of the Yamoto Range (71.5° S.) on the 19th, and 73° S. on the 29th, where they reported that the altitude was 2,800 metres and the temperature was -30° C. They will continue their inland dash till the end of November and will return to the station by the end of December. The total length of this journey will exceed 2,500 kilometres.

Dr. H. Ohura (glaciologist), Mr. K. Fujiwara (geomorphologist), and Mr. T. Sakaguchi (meteorologist) have carried out their scientific observations on the Antarctic Ice Sheet.

In addition, the "Umitaka-maru" (1,452 tons) of the Tokyo Institute

## ELLSWORTH

At the Argentine-operated station of Ellsworth, a strong wind blew down the weather shelter on May 22, but no instruments were damaged.

Temperatures in °C. during three months were:

	July	Aug.	Sept.
highest	..... -15.8	-10.4	30.0
lowest	..... -50.8	-51.6	28.8

Fifteen "subjects" were studied in the human physiology programme.

A joint programme of auroral photography was maintained throughout the winter with Pole Station. During September, 164 aurora photographs were obtained at Ellsworth in connection with this programme.

Three United States meteorologists will winter over with the Argentines.

### AUSTRALIAN OBSERVER

An official Australian Observer will accompany the Argentine Antarctic Expeditions this summer. He is Group Captain Robert Dalton, Aviation Officer of the Antarctic Division. Group Captain Dalton, after 23 years' service with the R.A.A.F., was appointed O.I.C. at Macquarie Island in 1953. For two summers (1956 and 1957) he was Australian Observer with the U.S. Antarctic Expeditions and he has made four summer voyages to Antarctica with ANARE.

ANARE in return will take an Argentine Observer on the summer relief voyage to Mawson.

of Fisheries left Tokyo on October 28 for her second voyage to the Antarctic (the first was in 1956-57). Prof. T. Kumagori, the leader, and his ten scientists will carry out biological and oceanographical investigations along the coast of Queen Maud Land and in the Weddell Sea from December 9 to January 23. The Institute authorities plan to continue the researches in Antarctic waters in 1963 and 1965.

## ARGENTINE PROGRAMME

On November 18 a team from the Argentine Antarctic Institute set sail for the Antarctic on the Navy transport "Bahia Aguirre" to carry out a summer scientific programme.

The leader is Capitan-de-Fragata Frederico W. Muller. The three sections comprising the expedition will be engaged as follows:

1. Cosmic Ray studies. Operating primarily from the ice-breaker "General San Martin", this team will be led by Senor Pedro Waibel.

2. Gaciology: leader, Senor Rene E. Dalinger. This group will work in the South Orkneys, Sandwich Islands, South Shetlands and the Antarctic Peninsula and adjacent island groups, with the exception of the Weddell Sea.

3. Geology and microbiology. This group will work in several sections in the Ardley Peninsula, Cape Potter and Lasserre Bay regions. The aim will be to complete the geological reconnaissance of these areas and to establish the stratigraphic correlation of the sections mentioned. Petrographic, paleontological and paleomagnetic collections will be made.

In biology, the primary aim is the collection of microbiological specimens from the respiratory and gastro-intestinal tracts of Antarctic birds, the collection of marine invertebrates, etc.

A further programme in human physiology will be undertaken.

The glaciological programme comprises the systematic reconnaissance of the Argentine station areas in order to determine the position, extent and types of glaciers. Three glaciers will be selected as representative of the differing climatic regions, with special attention to the Hope Bay, Marguerite Bay and Cape Primavera regions.

(We are indebted to the Director of the Argentine Antarctic Institute for the above information, which has had to be hurriedly translated to permit publication in this issue.—Ed.)

# SPRING ACTIVITY AT ALL AUSTRALIAN STATIONS

**Major journeys were accomplished or begun at all three Australian Antarctic bases during the spring months.**

From Mawson a party under Pardoe, the station doctor, dog-sledged 542 miles on a round trip of the Auster, Beaver, Kloa and Foldoya rookeries. From Davis station Hoy led a dog-sledge party up Crooked Fiord, across the Sorsdal Glacier and out over the sea-ice to the Rauer Islands. Several minor journeys were also completed. The beginning of October saw the departure from Wilkes Station of the major summer field activity — the seismic traverse party which will probe 360 miles south into the continent from that station.

## MAWSON

August commenced with seven men absent from camp. Pardoe, Keyser, Smith, Trail and McNaughton were at the Auster Rookery and Denham and Wyers were at Mount Henderson, initiating the meteorological programme.

Three of the biological party returned on September 7 after a rugged time due to a blizzard, which destroyed their tent and caused the loss of one husky.

The other two, Smith and Trail, with the other dog team arrived back on September 9. The party reported a total of 15,000 penguins at the Auster and adjoining Beaver Rookeries. The islands were examined for geological mapping.

Waller and Seavers replaced Denham and Wyers at Henderson and one month's meteorological observations were then completed. Manning this station is no picnic and all are glad to return to Mawson after living in the small uninsulated hut with outside temperatures down to minus

35° F. High winds and drift make the taking of observations very difficult. During August winds averaged 72 m.p.h. over a four-day period.

On August 21, Giddings and Wyers — on motorbike, and Maslen, Wilkinson and Young in the snowtrac — with both vehicles towing sledges, left for Taylor Rookery, followed by a dog sledging party. Giddings did an excellent job as scout, enabling the mechanised party to arrive the same day, with ample time to set up camp before dark. The dog teams arrived on August 23 after camping at Gibney and Einstoding Islands. They were all tired but were pleased with the successful run.

All but the dog party returned on August 24 — all having enjoyed the welcome break from station routine.

The dog teams under Pardoe continued towards Foldoya Rookery.

## AT THE BASE

By the end of August at which time Wyers reported the ice in the harbour to be almost five feet thick, there was still no bird to be seen apart from two giant petrels, although seals were becoming plentiful.

The bald meteorological story for the month of August reads like this:

Total sunlight for the month was 90.9 hours.

The daily average sunlight was 2.9 hours.

The lowest temperature was -17.2° F., the highest was +22.3° F. and the average was +2.9° F.

The maximum wind speeds reached 102 m.p.h. and 95 m.p.h. during two blizzards.

The comparable figures for Sep-

tember, one month later, were:

Total sunlight 112.2 hours.

Daily average sunlight 3.7 hours.

Lowest temperature  $-11.1^{\circ}$  F.

Highest temperature  $+25.3^{\circ}$  F.

Maximum wind speeds 85 and 100 m.p.h. during two blizzards.

### WARM SEPTEMBER

It was the warmest September on record! There were signs of approaching summer, when on September 30 rocks absorbed sufficient heat on a sunny day to cause slight melting of snow. However, there were few days without drift or cloud cover. The sea-ice thickness in the harbour was still five feet at the end of September.

### LONG SPRING JOURNEY

By mid-September Pardoe and the western sea-ice party had reached the Foldoya Rookery and after a period of observation set out on the return to Mawson. The return trip, which was deliberately slowed by geological work, was further hampered by bad weather.

It was a happy occasion when the western sea-ice veterans arrived back on October 13, fit and well, after experiencing many anxious moments and discomforts during their 542 miles of dog-sledging. The year's biological and geological programme, west of Mawson, was exceeded and on the whole it was a record achievement.

Maslen, Weller and Francis, on a twenty-mile trip to Azimuth Island meteorological station near the end of September, encountered heavy snow-drifts on the sea-ice. There were a large number of seals including many pups. Again several giant petrels were noticed around Mawson but the only snow petrels yet reported were those observed in the Masson Range.

### TRACTOR RECOVERY

On October 17, the tractor recovery party returned, after rescuing the D4 tractor which fell into a crevasse earlier in the year. It was a job

which required much skill and teamwork in the constant wind and drift (which seems to be a feature of the area).

This operation had begun on September 21 when Young, Tod, Bird and Waller made a successful run in the weasel to Twintops with some equipment and to set up camp. Tod and Gunter returned to Rumdoodle camp, North Masson, the next day, where they were met by Wilkinson, Giddings, Bergin and Brocklesby, in the snowtrac.

On September 24, Newman and Harris left Mawson for Rumdoodle, but met a party returning in the weasel to Mawson for repairs. The drive sprockets and tracks were replaced and also repairs to the final drive were found necessary. This work hampered the departure and they were also delayed by two blizzards, but finally, on September 26, Newman, Young and Tod left for Twintops, arriving the same day after a good run. All the party was then in the field ready to commence work.

Weller and Brocklesby each made a round trip to see the Twintops area and provide company for the returning drivers.

A shuttle service was necessary to transport camp and salvage equipment to the site and the programme had the appearance of a Spencer Street Timetable, but apart from the unscheduled return of the weasel to Mawson for repairs, and the usual weather interruptions, it worked out well.

Francis persevered with the parallax camera set up on the island, five miles from Mawson. He now has a well-worn track to it across the sea-ice.

Glaciologist Wyers visited North Masson during September to re-measure ice ablation stakes.

A third 60KVA engine was installed in the power house by Newman and Young before leaving for the field, and is now supplying the station with power.

On October 13, Brocklesby, Weller and Hollingsworth set out on a man-hauling trip to Auster Rookery, and although they enjoyed the visit they all agreed that hauling a sledge is for dogs!

Ten days later, a party consisting of McNaughton, McDonald, Ryder and Denham left in a snowtrac for Taylor Rookery and spent an interesting few days there.

The same day, Harris, with Weller, Renouard and Francis, attempted to reach Mount Henderson, but after some spectacular slides on ice slopes they were forced to return and later were assisted on their ascent to the plateau by tractor. Renouard and Francis remained at this met. station. This is a break for Francis, who has been tied down with auroral work during winter darkness.

#### OCTOBER MET. RECORD

Total sunlight, 232.6 hours.

Daily average sunlight, 7.5 hours.

Lowest temperature,  $-6.8^{\circ}$  F.

Highest temperature,  $24.2^{\circ}$  F.

One blizzard with wind to 76 m.p.h.

There was no period of complete darkness—just a few hours' gloom each night which was much appreciated when on the nightwatch duty.

With summer approaching, seals were now fairly plentiful and an increasing number of birds is returning to Mawson.

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#### AIR ROUTE SURVEY

Two Australian Civil Aviation authorities are to visit McMurdo Sound for a fortnight this summer to investigate United States' techniques of airfield construction and maintenance, with a view to assessing the suitability of using Antarctic airstrips for a commercial flying route between Australia and South America.

#### DAVIS

In August, the temperature ranged from  $+24.6^{\circ}$  to  $-18.1^{\circ}$  at Davis,  $-27^{\circ}$  at Platcha. We had three blizzards, with a maximum wind speed of 84 m.p.h. At Platcha the wind hit 132 m.p.h., but no damage was done to the installations. With each blow, snow accumulation increased about the station area.

On August 15, Mercer and Warriner sledged up to Platcha with the dogs to relieve Lied and Hay, who returned next day to Davis.

Brown examined snow petrel nesting sites on nearby islands in readiness for the return of these birds early in October.

With the return of the sun, Platcha has been exploited as a ski-ing resort and Warriner tried to work out a chair-lift for the slope alongside the caravan.

By the end of August, giant petrels had returned to the Vestfold Hills, soon to be followed by the reappearance of other birds, seals and later the penguins. September began with the arrival of the Weddell seals in pairs among the bergs and islands.

Early in September, both the radio and the wind instrument at Platcha broke down. Jabs and Hay dog-sledged up to Platcha and during their overnight stay Sabs sorted out the radio trouble. The Munro anemometer was brought back to Davis for overhaul. Two days later, Tajer and Hay sledged to within three miles of Platcha to return it, and back to Davis the same day. Warriner and Mercer came down the fiord to collect the instrument on skis. These two stayed on at Platcha an extra two weeks to enable Mercer to completely overhaul the tractor. He made a very thorough job of this, including a "classy repaint". Jabs and Redfern finally relieved the two at Platcha on the 16th. There was considerable difficulty digging the tractor through drifts in the basin.

## SLEDGE JOURNEY

During this time, Hay and Brown were preparing gear for the proposed glacier journey. Hay, Brown and Warriner, seven dogs and a heavy sledge departed on September 19 for the Rauer Islands, via Crooked Fiord, the Sorsdal Glacier and the Plateau.

It took them three days to reach the top fiord. In ice-falls from the glacier, "going" was very slow—after clearing a path with pick and shovel, two miles a day was good progress. Three long portages were involved and in one spot the load had to be hauled over an ice ridge with block and tackle.

Two days were spent marking the route part way across the glacier on foot. The glacier was then crossed for the first time with a sledge and the second day was spent travelling further south to the Rauer Islands. Time was running out and Lied's prediction of bad weather bade a speedy return. Over a known route, returning was a much simpler affair than the outward journey. The party arrived back safe and sound, nine days after its departure, but the sledge was somewhat battered!

## AT BASE

Next day saw the end of the spell of perfect weather that had prevailed throughout the trip, the wind speeds reached 84 m.p.h., which was the highest for the month.

Temperatures during September ranged from +28.7° F. to -8.8° F. That summer was on its way was exemplified by marked diurnal temperature change. Some thawing had already begun about the station. Snow petrels had returned to Long Fjord Basin area.

With summer well on the way, October was a calm month with maximum wind speed of 62 m.p.h. The temperature ranged from +32.2° to -6.4°, and the thaw had begun in earnest.

On the first of the month, Redfearn, Scanlon and Hay sledged down to the glacier to retrieve part of the load deposed from the glacier crossing journey. The fine weather continued and a few days later Hay and Lied returned to the glacier and spent three profitable days laying glaciological stakes to record movement of the ice.

On October 12, Lied and Scanlon tracted to Platcha to replace Brown and Trajer. Brown had spent an energetic fortnight footing it many miles up and down the plateau edge to complete his survey of snow petrel nesting sites. Back at Davis, his bird work began in earnest. Concentrating on selected nest sites on nearby islands, he was out every night of the week studying bird behaviour. The Adelie penguins returned on October 14, firstly in twos and threes, later in columns of up to fifty marching in to their rookeries.

Hay and Warriner left with the dog team on an eight-day biological survey of the north coast of the Vestfold Hills and the plateau edge beyond.

Late in the month, Brown and Mercer tracted half-way up the coast to the north and spent four days doing an intensive biological survey of Long Peninsula.

On November 1, Trajer and Hay sledged up Ellis Fjord for four days to obtain water samples of Crooked Lake. This previously unvisited lake is by far the largest in the Vestfold Hills and apparently is of fresh water. They had to chop through 5½ feet of ice to get at it.

With November well under way, and after recent breakouts of the fast ice, the open sea was visible some six miles to the west.

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## HELICOPTERS

Two T.A.A. Hiller 12E helicopters will do photographic and survey work during the relief.

The helicopters, two pilots and an engineer, will work from the "Thala Dan".

## WILKES

At Wilkes Station, August was another stormy month with an average wind of 20 m.p.h. and a peak wind of 113 m.p.h. The average temperature was 24 degrees below freezing, with a minimum of 56 degrees below freezing. This year showed a marked increase in the average wind and temperature over previous years.

The "Weaselling Williams" returned safely, after a long delay due to bad weather and vehicle troubles. The latter were eventually remedied by McGhee, who made the trip to S.2 with Torckler and Smethurst.

Paish, Grimsley and Hickey spent the end of August at the Vanderford Glacier doing glaciology work by means of the dog team. They were blizzard-bound for several days, Grimsley happily filling in time trying to make amateur radio contacts by using a small hand-generated set.

Station activity during August was building up with preparation for summer work. White, Jewell and Budd spent several days on the plateau checking the drill and borehole thermometer for the three months' seismic traverse. Biologists Saunders and Wilson were preparing for the fishing season. The only Emperor penguin sighted this year jumped out of the water, hotly pursued by a leopard seal. There were many Weddell and leopard seals about during August, also numerous birds, including Pintados or Cape pigeons, giant petrels and the beautiful, all-white snow petrel.

Most of the interior painting had been completed by the end of August. Considerable time was spent on paralleling the diesel generators; but difficulty was found in bringing the motors to a similar standard.

Routine snow accumulation measurements during August were hindered by abnormal drifting.

At one period in September a mirage effect which vertically magni-

fied distant objects made it possible to count the number of seals (20) on the sea floe which was probably about five miles away.

## SEPTEMBER DAYS

September brought more pleasant weather with winds of 100 m.p.h. on only one occasion. The Met. Officer, Breckinridge, was very pleased with the met. section's efforts this month, as only three radio sonde flights, out of sixty, missed — due to high winds.

The temperatures were much lower than the previous months, with the thermometer falling to 77 degrees below freezing.

During the month, the station was a hive of activity with much work to be completed before the change-over in January, and the final traverse preparation.

The engineers, Berrigan and McGhee, have been working seven days a week and working many nights to complete the overhauls of vehicles and preparation of sledges and caravans for the long traverse.

White and Jewell spent a fortnight on the plateau, thoroughly checking the ice drill.

## TREK BEGINS

The departure of the traverse party was delayed by a fall of 54 inches of snow, which made walking about the station a tedious business and causing tractors to bog. Traverse gear was marshalled on the firmer snow on the plateau.

Snow-drifts blew away on October 3, enabling the field party, Smethurst, Jewell, Budd, Church, McGhee and Stadler, to commence their 350-mile outward journey. Later reports indicated the completion of seismic work up to 130 miles of the rock foundation of the ice plateau — found lying sometimes above and sometimes below sea level — with surface altitudes up to 4,200 feet.

During October the persistence of solid sea-ice helped the biology programme. Three visits were made

with a dog sledge to Ardery Island by Orton to check the arrival times of several species of petrels for nesting. Wilson, Saunders, Torckler, Cordwell and Paish also made this interesting trip. All expected birds had arrived, including the Adelie penguins, on October 17.

### SEISMIC TRAVERSE PLANS

The seismic party which set out on October 3 will travel by tractor train to a point 360 miles from Wilkes. The object of the journey is to measure the depths of ice on the Antarctic plateau at points 20 miles apart and thus to determine the profile of the continental rock beneath the ice. It is expected that ice depths up to 8,000 feet or more will be found and that much of the underlying rock will be below sea level.

The first 250 miles of the route was reconnoitred and flagged last year by a party led by Black. Smethurst's party expects to take 100 days for the return journey. In addition to seismic ice depth determinations, the party will make meteorological and glaciological investigations, including the temperature distribution in bore holes up to depths of 100 feet and the measurement of the quantities of snow which have accumulated around the stakes set up along the route by Black twelve months ago. Observations on the density, hardness and stratification of snow will be made by digging pits along the trail, and notes will be made concerning the effects of wind on the snow surface. Drifting snow will be measured and physiological studies of men in the party will be carried out.

The trains will comprise the following vehicles: First train—D4 tractor, sledge with 20 drums diesel fuel, mess caravan, sledge carrying electric generator; second train—D4 tractor, seismic drill, sleeping caravan, sledge with 20 drums of fuel.

In addition, as scouting and support vehicles, there will be two weasels each hauling two small fuel sledges. Each train will be equipped with radio. Cooking will be by electric stove.

### RELIEF PLANS

Two chartered Danish ships will be used, the "Thala Dan" (Captain H. A. J. Nielsen) and the "Nella Dan" (Captain H. C. Petersen).

"Thala Dan" will take relief expeditions to Macquarie Island and Wilkes under the leadership of Mr. Phillip Law. This ship will also visit the automatic weather stations at Chick Island and Lewis Island and carry out further exploration of the unknown coast of Oates Land. She will carry one Beaver aircraft and two helicopters.

"Nella Dan" will take an expedition to relieve the stations at Mawson and Davis and, in addition, will carry out exploration of unknown parts of the coast of Wilkes Land. This expedition will be led by Mr. Donald Styles, Assistant Director of the Antarctic Division.

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Departure dates from Melbourne are as follows:

"Thala Dan" for Macquarie Island,  
November 30, 1961.

"Thala Dan" for Wilkes, December  
23, 1961.

"Nella Dan" for Mawson and Davis,  
January 7, 1962.

The ships will return to Melbourne about mid-March.

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The Officer-in-Charge of each station for the coming year will be:

Mawson: F. M. Lucas, N.S.W.

Wilkes: R. B. Thomson, New Zealand.

Davis: J. R. Harrop, Victoria.

## British Parties' Varied Work at Ten F.I.D.S. Bases

Eight main bases and two subsidiary bases of the Falkland Islands Dependencies Survey have been manned throughout the 1961 winter.

Six of these are on or around the Graham Land peninsula, one is in the South Shetlands, one in the South Orkneys and one on the Caird Coast at the head of the Weddell Sea.

Weather and sea-ice conditions were variable throughout the period but parties from six bases carried out field-work, and all routine activities were continued.

### SURVEYS AND GEOLOGY

Surveyors from Hope Bay visited the western part of James Ross Island and worked on the mainland to the west and south-west of it; triangulation of the Nordenskjold Coast was started in September. At Adelaide Island, an astrofix of the base was obtained and a field party carried out a survey reconnaissance of most of the islands in Laubeuf Fiord, which separates the island from the mainland to the east. The islands lying off the south coast were also visited.

Geologists from Hope Bay worked on the south and south-east coasts of James Ross Island and on the adjacent mainland. Further south parties from Stonington Island, Marguerite Bay, carried out a detailed local survey and then worked on the volcanic rocks of Millerand Island. Work was also started in Laubeuf Fiord by a party from Adelaide Island, and carried as far as the base (W) on the Loubet Coast which was closed in 1959. The geologist wintering at the advance base, Fossil Bluff, in George VI Sound, was hampered by persistent snow cover.

### OTHER ACTIVITIES

Other field-work included the extension of the magnetometer survey on the south-east side of Trinity Peninsula, field magnetometer readings in the Argentine Islands and glaciological work on the stratigraphy of Orwell Glacier, Signy Island. Also at Signy Island, bird-ringing and seal-pup tagging were carried out by parties staying at a small refuge hut on the west coast. At Halley Bay biologists spent much of the winter in a small mobile laboratory at the Emperor Bay penguin rookery, about four miles from base, in spite of monthly average temperatures of  $-32^{\circ}$  C. in June and July and  $-25^{\circ}$  C. in August. Physiological work was continued by the medical officer at Stonington Island.

### FURTHER AFIELD

Other activities included a journey from Stonington Island to the old Horseshoe Island base (closed in 1960) to collect equipment. Dogs were trained, the two Muskegs overhauled and depots laid in various localities, and sledge and Muskeg parties then visited Pyrox Islet at the head of Neny Fjord, the Refuge Islets, and Mushroom Islet at the entrance to George VI Sound. One of the Muskegs later broke through the sea-ice in the south of Marquerite Bay, but fortunately there was no loss of life or equipment and the second vehicle was able to continue its journey to the sound.

Journeys were undertaken from the Argentine Islands to two points on the mainland to the east, and to Petermann, Hovgaard and Booth Islands to the north-east. An ice cave discovered on one of these journeys

## South Africans are Planning for a Busy Summer

The South African team at S.A.N.A.E. is actively preparing not only for extensive field journeys, but for the erection of an entirely new station to replace the old "Norway" base which they inherited from the Norwegians.

On Midwinter's Day telegrams of good wishes from several Antarctic stations as well as from South Africa were received. The living hut had been painted out and decorated specially for the occasion and although routine work had to be continued, the spirit of Midwinter's Day increased as the day advanced.

Radio-communications were very uncertain during July and van der Riet is proud of the fact that he was able to get into touch with Cape Town every day. But there were beautiful auroras. One especially was exceptional, moving over the whole of the sky.

The highest altitude reached by the balloon in July was 80,000 ft. where a temperature was measured of 86° C.

### THE SUN IS UP

"Although the sun was not sup-

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was found to be 50 feet high, 120 feet wide and 60 feet deep.

At Deception Island the two Otter aircraft were dug out and test-flights were made on September 30. Work continued on the new hut at Halley Bay which is now occupied.

### 1961-62 SEASON

The new season's activities commenced with the departure of two of the ships from Southampton — R.R.S. "Shackleton" on October 3 with 19 F.I.D.S. men on board, and R.R.S. "John Biscoe" on October 24 with 29 F.I.D.S. men. M.V. "Kista Dan" has again been chartered and is due to sail from Southampton on December 2 with 16 F.I.D.S. men.

posed to rise above the horizon earlier than the 26th," S.A.N.A.E. reported, "we could observe it already on the 21st. Its appearance lasted only half an hour but that was long enough to comfort all of us. Everybody who could rushed out when they heard the news. Now winter is on the way out and the hours of daylight are lengthening every day. Anton Swanevelder is still busy with his star observations but the cold is a bad enemy. He uses mercury as a reflecting surface and the mercury is constantly freezing hard and losing its shine. Condensed breath is also constantly freezing on the theodolite. He is trying to breathe through a hose behind his back in order to prevent that trouble."

### CRACKING UP

"In the buildings the beams are still constantly creaking. The walls, especially in the bedrooms, are bending under the weight from above. Quite a number of supports will be needed before the end of the year. The floor is also bulging upwards considerably, especially in the dining room, the kitchen and the weather office. This is caused by sagging of the walls; the floor which cannot drop bulges upwards. The door of the darkroom had to be shortened at the bottom. All the entrances to the buildings had been supported at an early stage, nevertheless the ceilings subsided because the thin beams in the corridors started to bend. Most of the beams in the connecting passages between the buildings are broken. Undoubtedly it will be uncomfortable to live

here another year. Although not as badly as in the summer time, a considerable quantity of water is leaking from the ceilings. Sheets of plastic are being used to divert the drip to four gallon tins. The water is then used for generating gas to inflate the balloons. The chimneys and air ducts have been lengthened with two lengths of diesel-oil-drums; a further extension should be made before the end of the year."

The dog-shelters are serving their purpose very well. The roof is now a few inches under the snow and a shaft has been constructed with a lid.

On the social side the men at S.A.N.A.E. now have the following: two radio amateur licences, weekly radio letters and telegrams, monthly telephone calls of 9 minutes per person, a half hour programme on Radio South Africa every 4 weeks and a programme on Radio Nederland once a month.

On August 12 a severe blizzard raged over S.A.N.A.E. The pressure dropped 15 millibars in 3 hours at one stage. The highest gust was 143 miles per hour (124 knots). The following day a gale of 43 knots felt like a light breeze. The main damage done was to the aerials of the radio theodolite. After the blizzard a heatwave reaching  $-10^{\circ}\text{C}$ . followed.

In some or other way due to the sinking of snow on the living hut a peg penetrated the roof. The men decided not to remove the peg but to measure its rate of penetration as well as the amount of snow which melts around it — so far the maximum has been 2 gallons in 24 hours.

#### FIELD TRIPS PLANNED

Towards the end of August the dogs were brought out and post-winter training started. Two of the original Greenland Huskies, the leader "Buster" and "Leeu", died during the winter; this leaves a team of six which unfortunately will cut

down the field work activities to some extent. Dogs and the Muskeg will be used as required. Several trips are planned to the north and the north-west of the station for geomagnetic, glaciological and survey work. The dogs will be used for further survey in the mountains south of the station.

#### NEW BASE: NEW SHIP

The planning and pre-erection of the buildings for the new station, some twelve miles north of the present Norway Station, are going ahead in Cape Town. The South African ice vessel at present being built in Japan will probably leave Cape Town towards the end of January. On board will also be a team of building and construction experts to erect the new base. Two muskeg tractors and maudheim sledges will also go down. The ship will leave Antarctica again in the beginning of March.

The scientific programme for S.A.N.A.E. 1962 will be the same as for 1961 with the addition of one geophysicist for upper air physics studies.

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#### A RADIO-MAN TALKS

In an interesting article in the South African Weather Bureau Newsletter, Mr. J. du Preez, who was radio-technician at SANAE in 1960, tells of the "radio-life" of the South Africans at the station. We are pleased to quote a few paragraphs.

"We were in daily contact with British, Belgian, Japanese and Australian bases. But these connections also were badly affected by magnetic storms. Sometimes we had just started transmitting messages when the situation suddenly changed and we had to choose another frequency quite often. Sometimes this helped, but often it did not.

"On mid-winter day, all communications had been kept ready to convey our mid-winter greetings to all

bases. But we had not taken into account the bad transmission conditions and we "Sannie-posters" had to content ourselves with tendering our good wishes to each other. Before that we had made provision for sending our messages by Morse code to the various bases.

"In April, 1960, we started two chess competitions with the British base at Halley Bay. Every day there was great excitement to hear what moves were to be made. The game lasted until December and the result was one draw and one in our favour. It has also happened that some wrong information was transmitted and then we had to do much head scratching to get it all sorted out. Nevertheless, it provided great fun for both sides.

"Also, real pioneering work was carried out. Before long Japanese and South African words were exchanged. Really firm ties of friendship with all bases were established. When the time came for sledge expeditions, after the winter was over, a small radio-transmitter was built. With the assistance of a portable radio-receiver and that small transmitter we could on an average maintain reasonable connection with the people in the snow fields. It was, however, necessary that those departing on an expedition should have a good understanding of the Morse code. As the capacity of the dry batteries had been badly affected by the low temperature, we had to warm them first on a primus stove.

"The news broadcasts from South Africa were usually received very well and when the news came there were always some members of the expedition listening. The All Black rugby tour through South Africa was followed with interest. Reception of the B.B.C. was very good indeed."

## SOCIETY NEWS

### NEW BOOK

Some two months ago a sub-committee of the Society Council reported favourably upon the advisability of the Society proceeding with the publication of a book on similar lines to "The Antarctic Today", but incorporating all the many advances in knowledge obtained during the I.G.Y. and subsequent periods of continuing activity.

Dr Trevor Hatherton, N.Z. scientific leader during the first I.G.Y. period at Scott Base and who returned to Antarctica in 1958-59 to join a U.S. traverse team on the Polar Plateau, will be editor of the new work. Some 20 possible contributors have been approached. Of these, 12 are New Zealanders, other contributors being authorities from Australia, the United States and the United Kingdom. Manuscripts should be available by March or April of 1962 with a desired publication date late in 1962.

### COMMEMORATIVE FUNCTION

The 50th anniversary of the reaching of the South Pole by Norwegian and British parties will be commemorated at a function of the Wellington Branch of the Society on December 14. It was on this day in 1911 that Amundsen and his four companions reached the vicinity of the Pole, the first ever to do so. Scott and his party reached the Pole on January 18, 1912.

Dr. A. B. Andersen, Consul for Norway, will read relevant extracts from Amundsen's account of his accomplishment, and the High Commissioner of the United Kingdom, Sir David Francis Cummings-Bruce, will read similar portions from Scott's diary.



#### IN MEMORIAM

**Handing over the Memorial Plaque at the Pole Station: G. de Q. Robin (U.K.), R. Adm. D. M. Tyree and Philip M. Smith (U.S.A.), T. Gjelsvik (Norway), Athol Roberts (N.Z.), October 28, 1961.**

—Official U.S. Navy Photograph by F. Kazukaitis.

#### FIFTY YEARS AGO POLE CEREMONY

The fiftieth anniversary of the Amundsen and Scott conquests of the South Pole was commemorated on October 30 in a brief ceremony at the bottom of the world. Representatives of the United States, Norway, Great Britain, and New Zealand were landed at the United States Amundsen-Scott South Pole Station at 9.00 in the morning aboard a C130 Hercules ski-plane of the U.S. Navy's Operation Deep Freeze 62. The route taken on the flight followed closely that taken by Scott's party. The weather was fine and sunny and the temperature  $-46^{\circ}$  C.

Rear Admiral David M. Tyree, Commander U.S. Naval Support

Force, Antarctica, was at the station ski-way to greet the party which included: Dr. Tore Gjelsvik, Director of the Norwegian Polar Institute, and Chairman of the Norwegian National Committee on Antarctic Research; Dr. Gordon de Q. Robin, secretary of S.C.A.R. and Director of the Scott Polar Research Institute, Cambridge, England; Mr. Philip M. Smith, Senior United States Antarctic Research Program representative in the Antarctic; and Mr. Athol Roberts, leader of New Zealand's Antarctic Scott Base.

The ceremony commenced in the Pole Station's dining hall with opening remarks by Admiral Tyree, who then called on Mr. Smith, Mr. Roberts, Dr. Gjelsvik and Dr. Robin to speak.

The commemorative ceremony then moved from the interior of the station to the flag pole half a mile away at the exact geographic South Pole. Here, in the minus forty degree temperature, Dr. Robin and Dr.

Gjelsvik presented a grey marble plaque to the Officer-In-Charge of the South Pole Station, Lieutenant Philip K. Swartz, and the Station's scientific leader, Mr. Ben W. Harlin. The plaque bore the inscription:

**90° S.**

**14 December, 1911**

R. Amundsen  
O. Bjaaland  
H. Hanssen  
S. Hassel  
O. Wisting

**18 January, 1912**

R. F. Scott  
E. A. Wilson  
H. R. Bowers  
L. E. G. Oates  
E. Evans

**A Tribute from Great Britain and Norway 1961**

Presented to the U.S. Amundsen-Scott South Pole Station.

Also present at the ceremony were Dr. Paul A. Siple, the veteran who was the first scientific leader at South Pole Station, and Cdr. Ronald K. McGregor, Commander of U.S. Antarctic support activities.

**N.Z.B.S.**

**TO REMEMBER SCOTT**

The New Zealand Broadcasting Service has made tentative arrangements to commemorate, in the last week of March, 1962, the death of Scott and his companions 50 years ago.

A documentary over all YA and YZ stations will recall the events of the tragic last days, and will feature memories by C. R. Ford (1902-04), T. Clissold (1910-12) and other New Zealanders associated with Scott or with the Pole. It is hoped also to include the voices of several Australian Antarctic veterans, and the B.B.C. has been asked to assist.

Attempts to build up a similar programme in honour of Amundsen met with little success, but a short tribute has been prepared for broadcast nationally on the evening of December 16.

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**PUBLISHED IN NEW ZEALAND**

**THE FAUNA OF THE ROSS SEA:**

Part 1, Ophiuroidea: H. B. Fell. N.Z. Oceanographic Institute, D.S.I.R., Memoir No. 18. Wellington, Govt. Printer. 79 pages, and 21 full-page plates, two in colour. 15/- from Government Printing Office.

This is the first major publication resulting from the summer research cruises undertaken by the N.Z. Oceanographic Institute since 1956-57.

**PELAGIC HYPERIIDEA (CRUSTACEA: AMPHIPODA) COLLECTED BY THE MAGGA DAN BETWEEN AUSTRALIA AND ANTARCTICA** with some notes on their distribution: D. E. Hurley. In N.Z. Jour. Science 4:3, September 1961. N.Z. Oceanographic Institute contribution No. 91.

## THESE UNITED NATIONS

The extent to which men of different countries, sometimes, ideologically, at opposite poles, can and do work together in the Antarctic with complete mutual confidence and friendship is one of the happiest features of life in the Great White South. This cooperation is evident in the projects outlined below, as in very many others.

### MAPPING THE SEA FLOOR

Lt.-Cdr. J. Peeler of the U.S. Navy is in charge of a project to obtain bottom contours of the sea floor near McMurdo Base and working with him are two oceanographers from the American Hydrographic Office and a New Zealander, Mr. N. M. Ridgway of the N.Z. Oceanographic Institute.

The information is necessary for the laying of two pipe lines, one of which will be used to provide water for the atomic reactor on Observation Hill and one for the disposal of sewage. The party's findings will of course also be useful for navigation in the area.

The New Zealand Oceanographic Institute is providing a portable echo sounder of the type normally used to measure water depth at sea. On this occasion it is proposed to operate the instrument from the surface of the ice and to transmit the sound-waves through both ice and water. If successful, this will reduce the time required for the survey by two-thirds. The alternative is to drill holes through the eight to ten feet thick ice and then to measure the depth with a weighted line.

### WHAT IS ROOSEVELT ISLAND?

Rising gently from the vast level plain of the Ross Ice Shelf not far south of the series of Little Americas established near the ice edge by Byrd and later American explorers, is what appears to be a great mound of ice about ninety miles by forty. When Byrd discovered it in 1934 he

naturally called it an island, and so it appears on the maps.

But in 1958 Dr. A. P. Crary discovered that on the northern tip of the "island" at an altitude of 600 feet, this ice is 1,200 feet thick. This showed that the real top of the island at this point was 600 feet below sea level. Is "Roosevelt Island", then, an island at all? If so, how extensive is it? Or is it merely an ice dome resting on either bedrock or unconsolidated sediment well below sea level?

This summer an American team of seven men headed by an Argentine (Mario B. Giovinetto) and including New Zealander Ray Logie, an engineer who wintered last year at Scott Base, and Manfred Hochstein, a West German seismologist, is going to try and find the answer.

The team landed on the island on October 27 by R4D and C-130 aircraft from McMurdo, with a further C-130 flight the following day. Jamesway buildings, three "Trackmaster" tracked vehicles and a motor toboggan have also been flown in. Extensive traverses covering the whole island are planned.

### VISITORS

The twelve S.C.A.R. delegates who visited Antarctica as guests of Admiral Tyree after the Wellington conference were allocated to the American and New Zealand bases by drawing names from a hat. The result was that the New Zealanders at Scott Base had as their guests Admiral Panzarini and Dr. O. Schneider of Argentina, and Drs. R. Torii and Hiroyuki Oyeda of Japan.

### CHECKING FALLOUT

When New Zealander A. J. Heine, of the Geological Survey, Lower Hutt, and Dr. C. Lorius, a French member of the Special Committee on Antarctic Research, return from Scott Base, their chief souvenir will be water — gallons of it, all carefully labelled.

The water — actually melted now — will probably make it possible for a detailed graph to be drawn of the amount of radioactive fallout in the Ross Dependency at all times since the first atomic bombs trials were conducted in the United States toward the end of World War II.

The snow was taken from various levels in the snow-mine dug in the Ross Sea shelf ice about two miles from the base two seasons ago. According to deductions made at that time, the snow at the bottom of the mine fell about 1940, so that the accumulation at various levels represents the whole spectrum of snow-fall from pre-bomb days to the present.

In addition to collecting samples from the snow-mine, Mr. Heine checked the movements of parts of the ice-shelf since markers were set out a few seasons ago and also measured pressure-ridge movements in the ice and snow accumulation at various sites.

### FRENCHMAN AT BYRD AND SCOTT BASE

Claude Lorius, experienced French Antarctic glaciologist and a delegate to the SCAR meeting in Wellington, was impressed by the "water well" he saw in use at Byrd Station during a 15-day visit to the Antarctic which included a week at Scott Base.

He had been at Byrd before when he was a member of the American traverse party two years ago. Last week he visited again a pit he had helped to dig near Scott Base and collected some water samples to further his isotopic studies.

### N.Z. PILOT WITH VX6

Flying Officer P. W. Tremayne has joined the United States Navy VX6 Squadron as an R.N.Z.A.F. observer for the present season in Antarctica.

He will fly the squadron's Otter aircraft from McMurdo Sound to gain flying experience under Antarctic conditions. This will include some flights in support of New Zealand ground parties operating from Scott Base.

Twenty-two years of age, Flying Officer Tremayne joined the Air Force in 1957 and trained at Wigram as a pilot. He carried out Antarctic training near Mount Cook with the R.N.Z.A.F. Antarctic Flight in 1959 and then served with No. 41 (Transport) Squadron based at Singapore with the Far East Air Force.

Flying Officer Tremayne will serve with the United States Navy Squadron until about March next year.

### TO CAPE CROZIER

Dr. B. Stonehouse and Mr. T. Jacobs of the Zoology Department of University of Canterbury were flown from McMurdo to Cape Crozier on October 23 with biologist Dr. Robert Carrick of Canberra and three American biologists. They were landed on a col overlooking the Adelie penguin rookery, where several thousand birds were observed, with more arriving during their two days' stay. 200 Adelies were banded and early courtship behaviour was observed.

On the 25th the party was transferred for a two-hour visit to the Emperor penguin colony below Cape Crozier. Here over a hundred dead chicks were measured in order to discover the age at which most deaths occur. Collections of abandoned eggs and dead chicks were made for later study and a census was taken.

# Reports from the Sub-Antarctic

## MARION ISLAND

(South Africa)

During the night of June 7, a gale destroyed the fence of the sheep pen and the following morning the inmates were missing. Fortunately they were found not far from the station. To prevent a recurrence, a stronger fence was erected. Due to the boggy nature of the soil it was possible to drive the thick poles in to the required depth by means of a four pound hammer. The wind-driven generator was also damaged by strong winds.

Some of P. A. le Roux's racy reports must be quoted in full:

"June," he says, "distinguished itself by strong winds, sometimes maintaining gale force for twenty-four hours or more, and subsequently diminishing, changing direction by a few degrees and blowing again with renewed force. Especially during the first half of the month things were unpleasant owing to the strong wind. Releasing balloons was extremely difficult. Somebody once said that meteorologists have on such occasions a language of their own. All methods of releasing were tried out, those recommended by the handbooks and also those which will never be recommended at all. But after much struggling the attempts were always successful and really we had no reason for complaints.

"Owing to the variable weather and other adverse circumstances our outdoor activities were more or less limited during this month, but the temperature was relatively never too low. On two or three occasions the sun broke through nicely during the afternoon and then we were even able to dispose of some of our clothing. The expensive cameras were

then taken out in order to perpetuate the buildings and other spots so well known to us on photographic papers. Further, Burnie and Chris are building a small boat, Christo and Tobie are working on a harpoon; they are all very mysterious about the purpose of their activities, but they have assured us that they do not intend any common action. Accordingly I do not believe that they are planning a secret whaling expedition.

## DO IT YOURSELF

"Some times there are complaints of tooth ache. On such occasions Beertjie, our medical man, wishes to apply syringe and forceps immediately. But so far nobody has ever thought of that. One Saturday evening, however, the old Beer had a bit of a toothache himself. He pressed and felt the tooth for some time and then decided to have it out immediately. We all laughed about this in our opinion impossible situation. But a few moments later the man came back with a horrible tooth in one of his terrible forceps. We were all greatly surprised and most of the comments came from George, who produced a dry laugh. We others licked out teeth with our tongues and walked out. For the rest we are still very happy."

## KERGUELEN

(France)

Everything is progressing normally on les Iles Kerguelen and the scientific programme is developing as planned and hoped.

"At present" (September 19) "the forthcoming summer activities are being feverishly prepared," reports le Chef du Bureau Administratif. "This, always a difficult task, is be-

coming more complicated every year, to such an extent that we shall have at Kerguelen for two months — from the end of December till the beginning of February — a large scientific team which will ensure a very full summer programme.

"This programme will comprise, in addition to the scientific disciplines already covered, studies in glaciology, algology and especially cosmic ray measurements."

### CROZET ISLANDS STATION

"To this must be added the inspection of the Crozet archipelago with the aim of installing a meteorological station there at the end of 1962."

### CAMPBELL ISLAND

(New Zealand)

The annual servicing ship, "Holmburn" left Wellington on November 10 and after a rough passage arrived at Campbell mid-afternoon on November 14.

The ingoing team consisted of Colin Clark, Leader; L. P. Rush, Junior Ionosphere Observer; G. W. Voigt, Mechanic/Handyman; R. B. Goffin, Meteorological Observer, and S. J. Smith, Cook. The remainder of the team went down to the Island on the U.S.S. "Vance" in September.

The unloading of stores commenced on November 15 and despite showers of sleet and snow, was completed in record time. The ship left for New Zealand on November 16 and arrived back in Wellington on the morning of November 19.

The outgoing personnel consisted of V. M. O'Neill, Leader; E. D. de St. Croix, Meteorological Observer; A. G. Dodds, Ionosphere Observer; K. B. Lyons, Radio Technician; G. Johnston, Cook; J. M. Pitkethley, Carpenter, and A. L. McNaughton, Mechanic/Handyman.

Two major jobs of construction were completed by the outgoing party, namely a new Power-house and new bedroom annexe to the

main hostel. The expedition members are to be congratulated on a very successful year.

There are no major construction jobs for the coming year, but a lot of time will be taken up with routine maintenance, particularly of roadways, where the Marsden matting has started to deteriorate after many years' service.

### MACQUARIE ISLAND

(Australia)

"Spring is here," reported Stean at the end of August, "but the O.I.C. Weather apparently made no provision for Macquarie Island, and the lazy winds, that can't be bothered going around one, don't help.

"Watson is preparing for a heavy season of seal-pup-branding and Reid is cooking up some intriguing methods of weighing a fully grown beachmaster.

"Merrony and Watson had a successful trip to Hurd Point for biological observations.

"Weather picture for August was rain, hail, snow, and frost and of course wind with an average of 18 m.p.h. and a maximum of 58 m.p.h." The lowest temperature was 28° F. and one day it shot up to 45° F.

Weather statistics for September read 45 21 37, i.e. Max., Min. and Average Temperature. There was some form of precipitation on twenty-three days including ten days of snow and there were seven days of sub-freezing conditions. The maximum wind was seventy-five m.p.h.

### EXAMS LEAVE HIM COLD

One of two school cadets chosen to visit Macquarie Island for 17 days on "Thala Dan" this summer, Cadet Under-Officer R. F. Irvine of Sydney, will probably sit his Honours leaving Certificate examination on the island, as the examination in German takes place during the time he will be there.

# THE SHAPE OF ANTARCTICA

All who have followed with interest the published results of recent Antarctic exploration are aware that the conventional map of "the Antarctic Continent" gives a far from accurate picture of the shape of the land which lies buried beneath the great ice sheet. In the May 1961 issue of "**New Scientist**", **Dr. Raymond J. Adie**, the English geologist, has summarised the results of recent research in this field in a way which the intelligent layman can understand, and we are indebted to him and to the "**New Scientist**" for permission to publish the article in an abbreviated form.

The exploration of this continent has followed a natural sequence: mapping of the continental boundaries and surveys of the interior, followed by geological surveys. Much surprising new information has resulted from this work.

Using carefully controlled radiometric methods along many air traverses, the Russian expeditions have provided valuable general information on the surface topography of much of East Antarctica. Their results indicate that the highest domed part of the Antarctic Ice Sheet, over 4,000 metres above sea-level, is in the vicinity of the Pole of Inaccessibility (the point farthest from the coastline) and that two great spurs extend from this area towards the Davis Sea (along the 90° E. meridian) and towards the Oates and King George V Coasts. Oddly enough, the geographical South Pole is situated in a depression at a height of 2,800 m.

Topographically, Antarctica is almost bisected by the deep embayments of the Ross and Filchner Ice Shelves. In Marie Byrd Land, the main part of West Antarctica, there are several mountainous areas, undoubtedly the sites of ice-buried islands, but none of these rises above 3,500 m.

So much for the surface exploration of Antarctica. What about the

topography of the bedrock that lies under the thick ice sheet? Because it is the largest ice-covered region of the Earth's surface, the configuration of the sub-ice topography of Antarctica has attracted much attention from geophysicists and glaciologists in recent years. Considering that approximately 20 million cubic kilometres of ice are locked up in the Antarctic Ice Sheet, it would be interesting to speculate upon the results of sudden deglaciation of the continent by melting. What would be the nature of the ice-free land surface, its reaction (or isostatic adjustment) to relief from the tremendous load of the ice sheet, and the consequent rise in the level of the world's oceans?

The first successful systematic investigation of this problem was by Dr. G. de Q. Robin, who worked in Dronning Maud Land with the Norwegian-British-Swedish Antarctic Expedition in 1949-52. By using the technique of seismic shooting — a form of echo-sounding using explosive charges — he showed that much of the coastal area of that part of Antarctica was bounded by an ice shelf, floating in places and grounded on higher parts of the sea floor in others, and that the sub-ice topography was fjord-like but rising gradually inland.

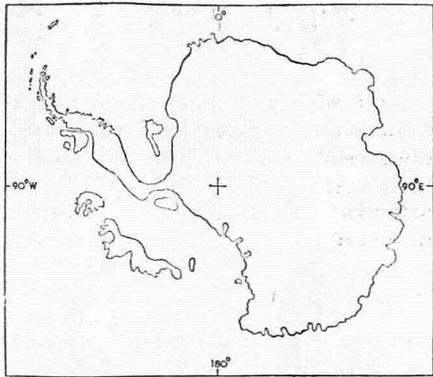
During the International Geophysical Year and since, the Russians and Americans have used the com-

bined results of seismic, gravity and magnetic surveys to determine the sub-ice topography of various parts of the continent.

Working from their main coastal station at Mirny, Russian geophysical teams have completed many traverses across East Antarctica. Their results, in addition to confirming those of Dr. Robin in the coastal areas, have indicated that the bedrock topography rises gradually inland towards the Pole of Inaccessibility. They have reached the conclusion that the bedrock topography seems to be reflected in that of the ice surface. Isolated projections in the ice sheet are really the peaks of buried mountain ranges, and surface hollows define deep valley systems.

The American geophysicists (led by Drs. A. P. Crary and C. R. Bentley), working in West Antarctica from Little America, Byrd and Ellsworth Stations, have produced rather more spectacular results from their surveys. Using similar techniques, they have demonstrated convincingly that the coastal mountains of Marie Byrd Land are in fact the tops of a series of off-shore islands separated from the mainland of East Antarctica by a 500-600 km. wide channel reaching a depth of 2,500 m. below sea-level in places, and joining the Ross and Bellingshausen Seas. There may be a minor offshoot of this major channel linking with the Weddell Sea. This is perhaps one of the most startling geographical discoveries of this century.

These researches have shown that should the Antarctic Ice Sheet melt the continental outline would be similar to that in (the diagram). The resultant melt water would cause a rise of about 65 m. in sea-level, with disastrous effects on the world's largest ports and cities. Also, Antarctica would rise 500-600 m. to compensate for the relief of load.



**SKETCH-MAP:** The approximate outline of Antarctica after removal of the ice sheet and subsequent isostatic compensation.

From reconnaissance and detailed geological surveys in both West and East Antarctica, particularly those carried out in the past five years, we are gaining a clearer picture of the geological history and structure of the continent.

The history of Antarctica has been a long, varied and interesting one. In the course of time it has experienced mountain-building processes, severe erosion and sedimentation in off-shore troughs, incursions of the sea following subsidence, large-scale crumpling and fracturing of its sedimentary cover, and inundation by widespread volcanic eruptions. The climate of Antarctica has also fluctuated widely and has undergone several reversals. In the middle Jurassic (160 million years ago) the climate was temperate to sub-tropical, as evidenced by the remains of luxuriant vegetation, but since then it has slowly deteriorated to a state of refrigeration in Pleistocene and Recent times.

The continental shield, or geological heart of Antarctica, is indeed similar to that of the other southern continents in that it is composed essentially of highly metamorphosed crys-

talline rocks of complex structure and often of obscure origin and history. However, it is now known from detailed surveys that the continent comprises two totally distinct and contrasting geological provinces, which have evolved separately under different environmental conditions since early Palaeozoic times.

On the basis of recent work in Antarctica, the relationship between surface and sub-ice topography, geology and structure is slowly emerging. It seems that there is a connection between the first two, but the topographic breaks do not coincide absolutely with the geological and structural ones. A great deal of work remains to be done and many pertinent questions are still unanswered.

Each new discovery brings in its train further questions such as: Is the Antarctic Ice Sheet advancing or retreating and, if so, how quickly? When will the ice sheet disappear, if at all? Is the climate of Antarctica ameliorating or deteriorating? What are the mineral resources of Antarctica? With patient exploration and research, which will undoubtedly take many years yet, these and countless other problems will gradually be solved and Antarctica will become geologically and geophysically as well known as the other continents.

#### WHALING CLOSURE

The land-based British Antarctic whaling station Leith Harbour, in South Georgia, the centre of British Antarctic whaling for many years, is closing because of the present poor market for meat extract and the low whale-oil price.

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#### CONCLUDING VOLUME TWO

See next issue for details regarding  
**INDEX and BINDING.**

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## WHALING NEWS

### NEW RUSSIAN FLEET

The Soviet Far-Eastern whaling fleet is being equipped with a powerful new whaling flotilla, "Sovietskaya Rossiya", with twelve diesel-electric whale-chasers for the coming Antarctic season.

The Chief Administration for the Far-Eastern Industry is recruiting the crews for the new flotilla. N. Buyanov has been appointed commander of the base-ship "Sovietskaya Rossiya".

The "Sovietskaya Rossiya" was to set sail in the second half of October. Antarctica is a new sphere of operations for the Far-Eastern fleet. To familiarise themselves with local conditions, last season the crews of four diesel-electric whale-chasers from the Far-Eastern fleet operated with the Kaliningrad flotilla "Jurii Dolgorukii. They were: the "Voskhitelny", "Velichavy", "Vlastny" and "Komsomolets Ukrainy". Included on board in addition to crew members were the first mates and harpooners.

### ANTARCTIC IMPORTANCE IN WORLD WHALING

Some indication of the importance of the Antarctic in the world whaling picture is given in figures published in the Norwegian Whaling Gazette concerning the world catch 1960.

Of the total 63,205 whales killed in this period 36,559 were taken by Antarctic pelagic whaling fleets and 2,333 from land-based whaling stations on South Georgia.

Oil production figures are:

Antarctic: 2,148,438 ballels.

All others areas: 724,707 barrels.

So that of the total oil produced, the Antarctic provided just on 75 per cent.

# 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: Mrs. R. Balham, Box 2110, Wellington.

Canterbury: J. H. M. Williams, 85 Waimea Terrace, Ch'ch.

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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THE ATLANTIC TODAY

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