ANTARCTIC

A NEWS BULLETIN

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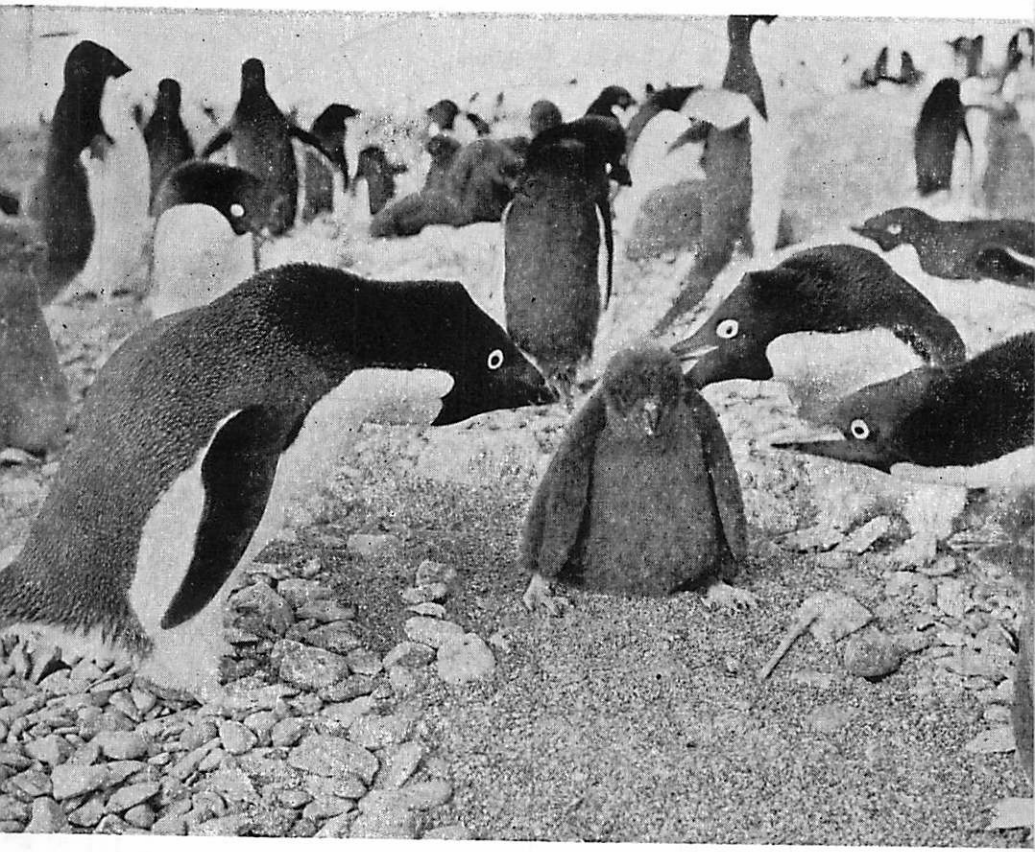
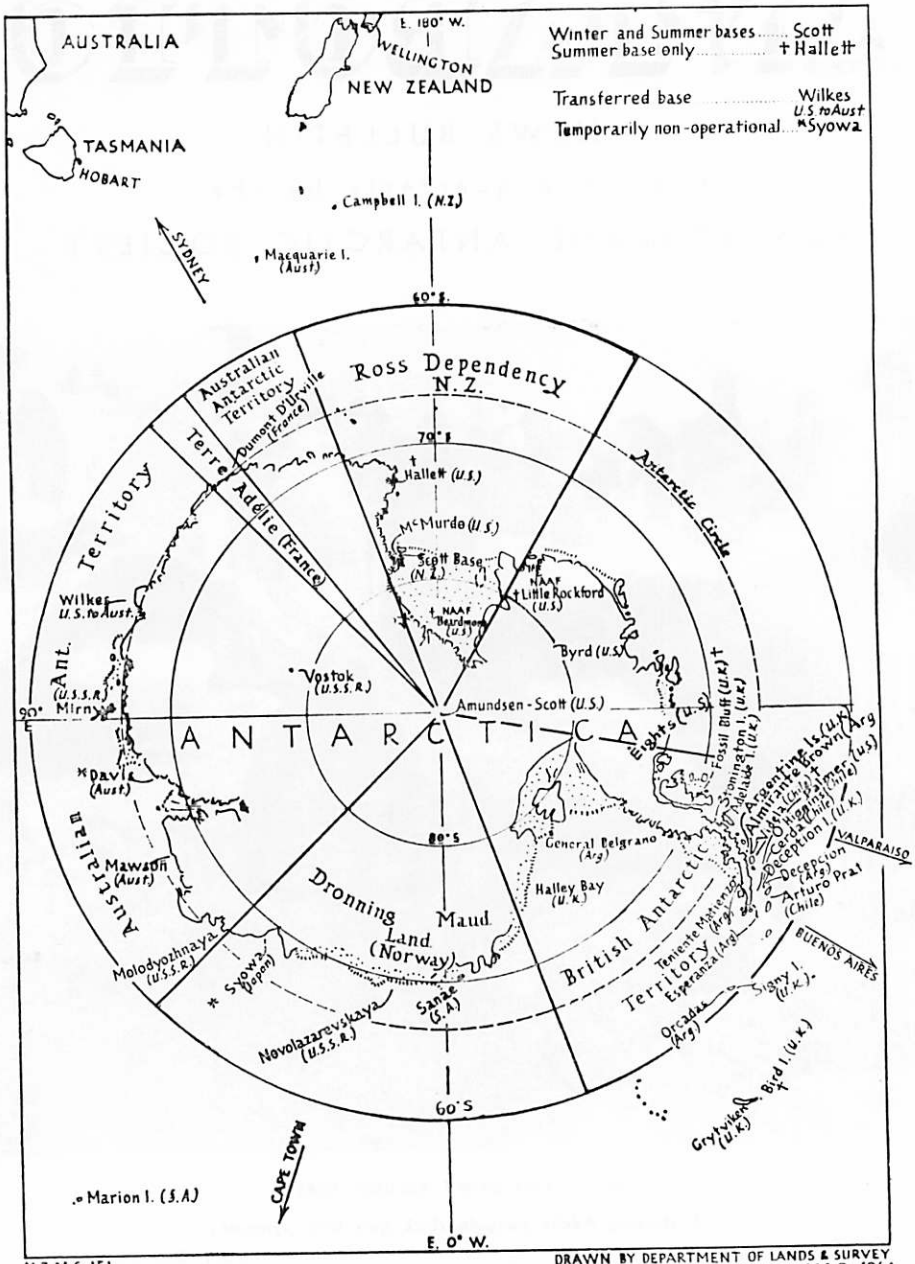


HEY! YOU DON'T BELONG HERE!

A straying Adelie penguin chick gets little sympathy

—Photo F. O'Leary, Dominion Museum

Vol. 4, No. 4 DECEMBER, 1965



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CONTENTS

SUMMER FIELD WORK UNDER WAY IN THE ROSS DEPENDENCY

[We have received the following outline of the November situation of New Zealand's summer programme from Public Relations Officer John Murphy.]

Seven N.Z.A.R.P. field parties are now working in the Ross Dependency. Geology, biology, geophysics, and glaciology are the principal sciences being covered.

FIELD PARTIES OUT

The southern party is 450 miles south of Scott Base and the other principal party is 250 miles north of base.

No dog teams are being used by any of the major field parties this summer. Now that most of the general geology of Antarctica has been completed field parties are working in chosen areas and not moving far from their base camps. Dogs are not suitable for such parties because there is insufficient work to keep the dogs properly exercised. However, some dogs will be used for short journeys about the ice shelf during the McMurdo Ice Shelf Project.

One of this season's moving parties is using motor toboggans and the other is man-hauling.

On the Campbell Glacier, to the north of Scott Base, Dave Lowe, who has just wintered-over, is leading a geological party. The field assistant is Roger Bates and the geologists are Robert Adamson and Rick Cavaney. This party is using motor toboggans and will be in the field about six weeks, until the early new year, to look for a possible contact zone between sedimentary and metamorphic rock strata.

South of base, at the head of the Beardmore, another four-man geological party is looking for fossils reported by scientists on both Shackleton's and Scott's expeditions. This party will also be out of the field early in the new year, and they are man-hauling. Leader of the party is Alan Bibby and the field assistant is Tony Rayment. The geologists are Don Young and Rod Ryburn.

Once more the Victoria University is going into the dry valley region. However, this year's party is a geological one only and with four men is much smaller than last season's party. Leading the group is Dr. E. D. Ghent, and with him are Bob Henderson, Graham Hancox, and Ian Smith.

Arnold Heine is again at work on the McMurdo Ice Shelf movements and he is being assisted by Keith Lloyd, Andrew Sim and Roger Bartlett.

A new project this year is the drilling of the McMurdo Ice Shelf for geophysical studies and this is being done under the direction of Dr. M. Hochstein (Geophysical Survey, D.S.I.R.). With him is geophysicist George Risk, and drillers Justly Hill and Brian Muddiman.

[We regret having to add that Justly Hill has suffered his first accident in many years of drilling operations. While at work two miles south of Scott Base on the afternoon of November 20 his gloved hand froze to the drill and was drawn into the mechanism. Hill's thumb and lower left arm were fractured. He was evacuated by air to New Zealand within 12 hours of the accident and is expected to be in the Christchurch Hospital for about two weeks. He is reported as "doing well".—Ed.]

Biological work is again being done at Cape Royds, Cape Hallett, and Cape Bird. A Canterbury University team under the direction of Dr. B. Stonehouse are on their last year of study at Cape Royds. Dr. Stonehouse was at Royds for just the early part of the season and now the project is being controlled by Ian Spellerberg. He is being assisted by Gregor Yeats, and Bob Kirk. Seals in the McMurdo Sound area are being branded this season by Ian Harkness and John Darby.

Four hundred miles to the north of Scott Base, at Cape Hallett, penguin and skua gull studies are being made by the Dominion Museum. Here John Cranfield has spent a short time and other biological programmes are now being carried out by Fred Kinsky and Tom Chote. At Cape Bird, on the northern

MEN SOUTH

In addition to the main summer party working at Scott Base during the 1965-66 summer, listed in our September issue, other New Zealanders will be in the Antarctic on short-term projects.

E. J. Drummond and **F. N. Blackwell** from the Ministry of Works will be investigating electrical and mechanical services, especially the problems associated with the installation next summer of new generators at the Base. **Brian P. Sandford** and **G. A. M. King,** both veterans of earlier New Zealand expeditions, will be checking the Scott Base Auroral and Ionospheric equipment respectively.

As guests of the Antarctic Division the following spent about a week in the Ross Dependency in early November: **Mr. R. W. Willett** (Director, Geological Survey, and deputy Chairman Ross Dependency Research Committee), **Mr. A. H. Newton** (for many years treasurer of the N.Z. Antarctic Society), **Mr. J. A. D. Nash** (scientific adviser to the Assistant Director-General D.S.I.R.), **Mr. V. A. Le Page** (senior administrative officer, D.S.I.R.), **Mr. L. White** (External Affairs Department, who signed the Antarctic Treaty for New Zealand), **Mr. C. Green** (in charge of technical aspects, Meteorological Service), and **Mr. M. S. Nestor** (scientific adviser, National Party).

Commenting upon New Zealand's record in publishing the results of her Antarctic reseearch projects, Mr. Willett says, "One third of the Antarctic Continent's exposed rock is in the Ross Dependency, which gives New Zealand an obligation to do the best work possible in the area. It is difficult to predict . . . and the second a fault in the radar, put sub-title. For South Africa read **Norway.** how much more fruitful work can be done in the Dependency, but as a unique laboratory the area still offers a wealth of work."

A CORRECTION

We regret an error in our September issue, where two men designated as field assistants were stated to be wintering over next year. In fact, the selection of field party men to remain at Scott Base for the 1966 winter has not yet been made.

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tip of Ross Island, another Dominion Museum party, Dr. E. Young and Reg Blezard, is studying the penguin life.

THE BIOLOGISTS

UNIVERSITY OF CANTERBURY

The University of Canterbury biological unit will this summer complete a five-year phase of the University's research in the Antarctic.

The party to go south in November was Dr. Bernard Stonehouse, leader; Ian Spellerberg, who will observe McCormick skuas for the third season; Gregor Yeates, who will spend his second season on behaviour studies of Adelie penguins; Ian Harkess of the Canterbury branch of the New Zealand Antarctic Society, and John Darby, a university photographic technician, who will mark seal pups (Harkness for the second season); Ian Stirling, who will arrive from Canada in December to take up a teaching fellowship in zoology and study Weddell seals in the Antarctic; and Robert Kirk, who will run the weather station at Cape Royds, and investigate microclimates and the temperatures of freshwater lakes.

NOW—THE SNARES

Applications are now being made for finance to make future studies in the sub-Antarctic islands, centred in the Snares group, where the university zoology department established a small research laboratory in 1961.

A five-year programme based on the Snares was planned to train students on the Sub-Antarctic and also to make a complete ecological survey of this untouched and unspoiled area, study the New Zealand fur seal, the brown skua, the southern population of the red-billed gull, mutton birds (of which there were three to four million on the Snares), native flora, and endemic species of land birds.

BIRD RESEARCH AT CAPE BIRD

Dr. Euan C. Young, whose earlier Antarctic bird studies in 1959-60 have been widely acclaimed, is going south again this summer, and will spend the period from late November till the end of February, with R. Blezard, at Cape Bird, the north-western angle of the triangular Ross Island. Dr. Young's object is to study the relationship of skuas and penguins at a big rookery, free, unlike the small rookery at Cape Royds, from

interested but often disturbing visitors. (See Dr. Young's article "Cape Royds: Tourist Resort of Antarctica" in "Antartic", June 1960).

AND AT HALLETT

F. C. Kinsky, ornithologist at the Dominion Museum, who spent a period at Cape Hallett two years ago, will complete his programme there this summer. He left for the south early in November. With John Cranfield and Dr. T. Choate, Mr. Kinsky will continue the study of such factors as the age of maturity, the mortaliy rate, and the effect on the penguins of human disturbance of the colony both directly by biologists and indirectly because of the proximity of a manned station.

Skua population and behaviour studies will also be carried out by the two biologists, making use of the banding programme initiated in 1959 by B. E. Reid. There is a skua colony of about 150 breeding pairs close by.

Mr. Kinsky hopes to discover among other things just how much an Adelie penguin chick eats. He will have at Hallett the progeny of from 50,000 to 60,000 mated pairs upon which to base his estimate.

MORE EMPERORS

Cranfield returned to New Zealand on November 26 after four weeks at Hallett. The most interesting development in his work was the discovery of a previously unknown Emperor penguin rookery on the point of Cape Washington, containing, he estimates, between 10,000 and 12,000 pairs. Mr. Cranfield last summer discovered another rookery of about the same size at Cape Roget. We hope to publish an account of these two rookeries and their discovery in our next issue.

Kinsky and Choate expect to remain at Hallett until about the end of January. Dr. Choate of the University of Otago is directing an experimental penguin programme in which Cranfield was also engaged.

IN OUR NEXT ISSUE

Another "Antarctic" Poem
Two more Emperor Colonies
Winter Base in Dry Valley?

IT WAS A GOOD YEAR AT SCOTT BASE

Buildings, vehicles and equipment at Scott Base were in particularly good order this year, said Mr. R. B. Thomson (superintendent of the Antarctic Division) in Christchurch, after his return from a 10-day inspection tour of the base. This high standard, he said, was a reflection of the good work of the wintering party under the leadership of Adrian Hayter.

"You know, there was a different atmosphere at Scott Base. Normally you expect a wintering party to be eager to get off the continent and head for home. But this was not the case this year. Perhaps this was because of the excellent co-operation with McMurdo Station and the greater social exchanges that have taken place between the two bases during the winter months", said Mr. Thomson.

THE DRY VALLEYS

New Zealand was interested in the establishment of a joint satellite station in one of the dry valleys not far from McMurdo Station, he said. "We wish to see this set up to get a close picture of annual weather conditions which will help us to resolve how the valleys were formed and still exist.

"New Zealand has done most of the work in this area. The Americans have done some and the Japanese spent a summer there. Last year the Soviet exchange scientist at McMurdo Station spent some time in the valleys. All these scientists have expressed an interest in conntiuing their work there jointly".

Mr. Thomson said he personally would like to see New Zealand return to Hallett Station. The destruction of the laboratory by fire two years ago was a great loss to New Zealand, particularly in upper atmospheric research.

ANTARCTIC FLIGHT

Asked about future participation by the Royal New Zealand Air Force in the Antarctic, Mr. Thomson said the possible reactivation of the Antarctic flight would be most welcome. "We still have the hig hangar down there with R.N.Z.A.F. painted on the outside and nothing inside".

Mr. Thomson said it was possible that next year New Zealand would partici-

pate in a major rocket research programme to be conducted at McMurdo Station. "This upper atmosphere research will be in the regions where satellites are now orbiting".

New Zealand field parties had come, to an end of general geological reconaissance and more emphasis would be given in future to intense specialised work on geological anomalies.

THE DOGS

A decision on the future of the huskies at Scott Base will be made in two years' time, he said. "Then we will decide whether they are worth while and economic for logistic purposes as opposed to our more modern means of motorised transport and taking into account our changed field party requirements. At present there are 37 huskies at the base. This number will be reduced to 30 to provide three teams with a few extras on stand-by.

SPRING ON THE WAY

Scott Base reported on August 2:

"Although the sun will not peep above the horizon for three weeks, its light is reaching higher and becoming more powerful. A week ago a powerful glow lit the northern sky at noon, running in a reddish line along the horizon and rising in a great pale emerald green arc behind Mount Erebus. Then it faded into the starlit sky.

"Yesterday the base party called it daylight, and the two-hour noon glimmer was long enough to take the huskies on their first spring run.

"During the long Antarctic night the 27 dogs have been chained to long wire spans just out of sight of the base.

"Yesterday they went crazy as the dog handlers arrived with sledge harness. As the animals were slipped from their chains and taken to the sledge they fought viciously, and the sledge party wielded rope ends to break up the scrap. The dogs' thick fur prevented any serious injuries".

SUNRISE!

On August 30 the sun itself appeared.

"Light has been returning for the last few days, but today for the first time in months sunlight itself touched Scott Base. For an hour around noon it came flooding in past Castle Rock, through the dip on the sorthern skyline formed between the slopes of Mt. Erebus and Crater Hill. We know now that the night is really over.

"The most obvious reaction is a feeling of sudden release. Suddenly, it seems, there are now hours of daylight when we can go outside and *see*. There are new ways to find and mark across the ice shelf to the new airstrip being built five miles south of the Base. The pressure ridges have changed during the long night and now provide new attractions for the photographers. Even the daily snow collecting for the Base water supply has suddenly become more interesting, because instead of having to follow the one marked route as we did during darkness we can now seek for new and better places. Already we are talking of when we shall see the first Skua gull, the first seals, and when the penguins will arrive at Cape Royds.

American activities also create interest, apart from the fact that these so closely affect our own. From the Base we saw them towing the first aircraft across the ice to the new strip, and a few days ago we saw the first helicopter of the season in the sky. All these things seemed to have happened suddenly, because time plays strange tricks here. The present and future slip past with surprising speed, but if you look back to any fixed event in the past, even as far as a week, it seems like centuries ago with the unreality of a dream.

"Soon the new team will be arriving to relieve us and we have little time in which to conclude our tasks in preparation for handing over—making sure the stores and vehicles are in good order; checking again on supply lists so the new team will not go short during their season; putting the last touches to the sledges and motor toboggans, the field equipment and food boxes for the coming field parties; building new sleeping accommodation and (if we have the materials) a new meat cave to replace the old one wrecked by last year's unusually heavy ice breakout. We are also having a spring clean inside the base; structural renovations and painting have been completed and the last task is to wash down all walls and ceilings. The heating system coats these in months with a thin film of oily soot, which must be washed

off with hot soapy water to restore paintwork to its original freshness and colour.

"For all of us the winter has passed surprisingly quickly, and looking back now it has been a unique and enjoyable experience. Yet we did have our lows and frustrations, and during these passing periods of depression we have disliked the place, as happens anywhere; but now with the flag flying again and all this means, our task nearly done and we hope done well, we experience again the strange but persistent attraction of this place, and we all know we will leave it with regret. Perhaps this winter period can best be summed up for all of us by one who at one time said 'I would not winter over again for £500', and later added 'nor would I have missed it for a thousand'."

MINOR TRAGEDY

At Scott Base on October 16, Stephan, a 105-pound Greenland husky, and Franz, a 10 month old, 95-pound puppy, had a slight disagreement over what must have been a very important matter. Stephan wound up second best and lay twisting with pain. van McDonald, after attempting to alleviate the pain, rushed him through a blizzard to the McMurdo dispensary where he was X-rayed.

When it was found that the right hind leg was broken, Stephan's life hung in the balance. After all, what good is a sled dog with a broken leg?

But Dr. Hughes, assisted by the McMurdo dentist, put a cast on the broken leg. Stephan was a remarkably well-behaved patient and didn't even whimper when the cast was put on, nor did he move when given penicillin and streptomycin shots.

The new cast will be quite a burden to Stephan in future dogfights, but as Dr. Hughes put it when he spoke final words to the dog before Stephan left for Scott Base, "If you can't bite them, you can sure kick hell out of them".

New Zealanders' Spring Journey To Cape Crozier

By D. R. LOWE

[The Antarctic Division in Wellington received the following brief signal from Scott Base on September 13: "Lowe with Calvert, Dorrington, Wright left for Cape Crozier on 11 Sep. with two motor toboggans, two sledges. Returning Base 14 Sept.".

These words recall one of the most famous exploits in the story of Antarctic exploration, the extraordinary journey of Wilson, Bowers and Cherry-Garrard from Cape Evans to Cape Crozier in mid-winter, 1911, man-handling in what Scott, on their return, called "The Worst Journey in the World." We asked Dave Lowe, the leader of the New Zealand party, to tell our readers how they fared.—Ed.]

With the increasing daylight in August and the approaching end of many of the base personnel's stay in Antarctica, the idea of a spring journey to some place of interest becomes uppermost in the thoughts of many, even more so, it seems at times than their return to New Zealand.

This year at Scott Base, Cape Crozier entered the conversations on many occasions. An opportunity to test our motor toboggans after their winter overhaul and in low temperatures was sufficient excuse for us and on September 11 in fine weather and a temperature of −35°C, Bob Wright, Jack Calvert, Brian Dorrington and the writer left for Cape Crozier with two motor toboggans and two sledges.

Our chosen route took us along the edge of "Windless Bight", an area of little wind, deep snow, and low temperatures. It was in this area that Dr. E. A. Wilson, Bowers and Cherry-Garrard on their "Worst Journey in The World" experienced their lowest temperature of −109½°F of frost, and forced as they were to spend some days in crossing it,

accumulated considerable quantities of ice in their clothing and sleeping gear. Cherry-Garrard's sleeping bag alone had 27 lbs. of ice in it by the time they returned to Cape Evans.

Four hours and 25 miles from Scott Base we stopped for lunch. This was our coldest point on the outward trip, −15°C. The thermoses of coffee and soup were most welcome although drinking was made very difficult by the solid mat of ice round everyone's beard. To avoid pressure rollers and crevassing we had kept well out from Ross Island, but now we turned north-east and headed into the "Trough", a wide valley lying between the pressure ridges of the main "Ross Ice Sheet" and Ross Island.

At 5.45 p.m. in falling light we drove up alongside the small volcanic mound where "Wilson's Stone Igloo" commands a view of what is possibly the most desolate and inhospitable location in this section of Antarctica.

It had taken Wilson's party on their winter manhauling trip in 1911, 17 days to reach this point from near Scott Base.

On the last ten miles of the 25 miles of travel down the Trough where one is passing between steep and crevassed ice slopes half a mile on the left and crevassed pressures ridges half a mile away on the right we were considerably slowed down by the very large and hard sastrugi. But at least the temperature had risen — to −33°C — and this was much appreciated all round, as motor toboggans would be almost the coldest form of transport yet invented.

Just sufficient flat space was found amongst the sasturgi to pitch our two tents and all gear well secured, as this area is, by reputation, extremely windy.

While cooking dinner and during the night the tents iced up badly, but by nine the next morning we were under way on foot for the Emperor penguin rookery in a cold southerly wind. We had decided to make an attempt to reach them by travelling down between the Cape Crozier cliffs and the pressure ridges. At 2 p.m. we gained the sea ice at the front of the Ross Ice Sheet.

The four miles between our camp and the ice front had been full of interest. Travelling roped together, we had made our way over jumbled masses of ice where the pressure ridges curved in to crush against the 300 ft sheer or overhanging volcanic rock cliffs.

An interesting point noted on our return to Scott Base and a study of the 1911 map of the area was that the present ice front is about two-and-a-half miles further advanced at Cape Crozier than it was in 1911.

A hurried walk over very smooth sea ice, for three-quarters of a mile along the ice front brought us to a rookery of about 1,000 birds, many carrying chicks. No walking chicks were seen and after a few hurriedly taken photographs and the collection of some abandoned eggs we headed back into a stiff breeze. Better time was made on the return and we reached camp at 6 p.m.

This night and the following morning the wind was gusting up to 50 knots but in the afternoon it died down for us to make a quick clmib up to Wilson's Igloo, 200 ft above us.

This is now only a tumbled down square of rocks, a few tattered remains of canvas still tied to them and a small emergency depot of New Zealand stores and fuel alongside. We stood there in a 30 knot wind, shivered and hurried back to the warmth of our tents.

Next morning, our fourth, I woke at 5.30 a.m. to the roar of a toboggan engine. Bob had been up since 5 a.m. heating the engines with the blow lamps, a necessary preliminary whenever temperatures are below about −30°C.

By 9.15 we got under way back to Scott Base. Soon after passing through the sastrugi section, turning one sledge over three times in the process, we ran into a 20 knot wind and surface drift with temperatures going down into the −50°C region.

The loss of engine power became noticeable and for the next two hours we drove along huddled well down into our down clothing and windproofs: everyone silent in his own world of discomfort and continually pounding hands and feet on toboggan or sledge to keep circulation going.

At 5 p.m. we drove up to Scott Base, very pleased to have made the trip, but also glad at that moment for some warmth and hot drinks.

New Zealand Aircraft Makes First Flight To Antarctica

Although aircraft of the Antarctic Flight of the RNZAF played a notable part in the operations associated with the Commonwealth Trans-Antarctic Expedition of 1956-58, and in New Zealand field work in subsequent years, up till this summer no New Zealand aircraft had flown from New Zealand to the Antarctic.

Then in less than three days one Hercules transport aircraft of the Royal New Zealand Air Force completed three return flights from Christchurch to Williams Field in Antarctica. The last flight returned to Christchurch at 5.25 a.m. on October 30.

During the operation the aircraft travelled 12,900 miles carrying a total of 75,000 lbs. of miscellaneous cargo for both the New Zealand and United States Antarctic research programmes.

This was the first time that an RNZAF aircraft had flown from New Zealand to the Ice. The first flight, under the command of Wing Commander B. A. Wood of Geraldine, left Christchurch at noon on October 27 after a series of delays, and arrived at Williams Field seven and a quarter hours later. The delays, the first a defect in the compass and the second a fault in the radar put back the schedule of flights by about a day and a half. However, by making faster "turn-rounds" at Christchurch and Williams Field, the three flights were completed only 12 hours behind schedule.

Four crews were used to fly the one aircraft to and from Christchurch. This overcame the difficulties of crew fatigue but more important, gave these aircrew valuable experience.

Wing Commander Wood said that the operation had gone as well as anyone had expected. "The flying was different and challenging. We were fortunate in having good weather throughout the entire operation."

He went on to say that the lengths that both United States Navy and Air Force at Harewood had gone to in briefing them before the operation on conditions they were likely to find, was greatly appreciated by himself and those in the crews.

"All the crews," Wing Commander Wood continuued, "have gained valuable experience from these flights and the operation has been a good preparation should we ever be called on in the future to carry out similar work."

Although two of the pilots, Wing Commander Wood and Squadron Leader R. B. Craigie of Nelson, had had an earlier familiarisation flight to the Ice, the experience was a new one for most. It was one of contrast for some too, as they had only a few days before completed a routine flight to the tropics of Singapore.

On hand to meet the first aircraft at Williams Field was a large gathering of New Zealanders from Scott Base and United States servicemen. Wing Commander Wood was welcomed by the Commander of Task Force 43, Admiral F. E. Bakutis, U.S.N.

The crew of the aircraft and the servicing party, led by Flying Officer John Kelly of Wellington, were well protected from the —14° temperature that greeted them as they stepped from the aircraft. The aircraft servicing party remained at Williams Field until the last flight carrying out refuelling and servicing duties as each of the three flights was completed there.

The crews and the servicing party were accommodated in comfortable huts at the Field. Probably the highlight of the stayover of the first crew was the visit to Scott Base where they were shown some of the research work at present being undertaken. Some tried their skills at skiing.

New Zealand Air Force Hercules lands at Williams Field on October 27 and is unloaded on the ice, with Mt Erebus in the background.
R.N.Z.A.F. Photo.

U.S. APPRECIATION

Admiral Bakutis and other high-ranking officers of the McMurdo staff were at the air-strip to welcome the New Zealand aircraft. The RNZAF has clearly made an excellent impression on the Americans at McMurdo, from top to bottom. Scott Base reports that "Antarctic conversation" at the American station has been centring round the three flights. The Americans admire the New Zealand Air Force for its enterprise in flying their Hercules to the Antarctic in the first season after they have acquired them. They also praise the RNZAF personnel and others concerned for the quick turn-rounds and the amount of cargo carried.

JOHN CLAYDON RETIRES

A varied career with the Royal New Zealand Air Force will end with the retirement of Wing Commander J. R. Claydon, of Christchurch, next month.

In 29 years he rose through the ranks from a recruit fitter to his present position of officer commanding the administration wing at RNZAF Station, Wigram.

As Squadron-Leader Claydon he was senior pilot of the RNZAF Antarctic Flight during the Commonwealth Trans-Antarctic Expedition of 1955-58. With Hillary and Miller he accompanied the Advanced Party in the "Theron" to the Weddell Sea Shackleton Base. He later played a very significant part in the route-finding and depot-laying operations by the New Zealand Ross Sea component, and his skill, initiative and courage contributed largely to the success of these operations and of the whole Expedition. He was awarded the Air Force Cross for his Antarctic work. Claydon Peak in the Queen Elizabeth Range is named after him.

In 1960 he was posted to Washington as deputy head of the New Zealand Joint Services' Mission, a position he held for two years.

Before taking his present appointment at Wigram late in 1963 he was deputy director of operations at RNZAF Headquarters, Wellington.

THREE CRUISES FOR ENDEAVOUR

The Navy supply ship, H.M.N.Z.S. "Endeavour," will make two trips to the Antarctic and one oceanographic cruise during the coming summer season.

The oceanographic studies will be made between Stewart and Campbell Islands.

Now refitting at the Devonport dockyard "Endeavour" is due to begin loading supplies at Auckland late in November. She will sail on December 1 for Lyttelton where final loading will commence on December 6. She will leave for McMurdo Sound on December 8.

"Endeavour" is due at McMurdo Sound on December 17 and to leave again for Lyttelton four days later. She will arrive back in New Zealand before the New Year.

Her month-long oceanographic cruise will begin on January 7 and will include a call at the Auckland Islands. She will make visits to Ports Ross and and Carnley to land members of the Department of Scientific and Industrial Research and the Dominion Museum.

The supply ship's second trip to the Antarctic is timed to begin on February 11, when she will again sail from Lyttelton. She will spend four days at McMurdo Sound before returning first to Lyttelton and then Auckland. She is due at the Devonport naval base on March 14.

BURSARY AWARD, 1965

The Canterbury branch of the New Zealand Antarctic Society has awarded Mr. R. Kirk, the 21-year-old son of Mr. N. E. Kirk, M.P., its 1965 bursary to carry out research in the Antarctic.

He is the third recipient of the award. Last year the bursary was shared between two men.

Mr. Kirk will man a synoptic weather station at Cape Royds, and when not engaged in this work he hopes to further his interest in geomorphology around the small lakes in the region.

The branch established the bursary to enable young students to carry out practical research in the Antarctic during the university summer holidays.

HIGH HONOUR AWARDED PETER MULGREW

New Zealand's "Three Outstanding Young Men of 1965", chosen by New Zealand Jaycees from more than 200 nominations, were presented with their awards on October 29.

Award winners were former naval officer, Antarctic veteran, and Himalayan double amputee Mr. Peter Mulgrew, 37, now an executive with an electronics firm; Auckland medical researcher Dr. Albert William Liley, 35; and Rotorua school teacher and Maori leader, Mr. Peter Heremia Anaru, 35.

The selection was made by a panel of judges headed by the Ombudsman (Sir Guy Powles), who presented the awards at the Jaycees' annnual convention in Invercargill.

The idea of the "three outstanding young men" originated many years ago in the United States, where such later outstanding figures as John Fitzgerald Kennedy, and Richard Nixon were chosen long before they became national figures, said Sir Guy. The idea spread internationally and this was the first selection in New Zealand.

ACHIEVEMENT AND SERVICE

The award sought to give recognition to personal achievement and community service. The aim was to provide this recognition at an earlier stage than community recognition of service was normally given.

Selection of three from 77 finalists had been most difficult.

"We were impressed', said Sir Guy, "by singleness of purpose, by initiative, by courage, by sheer competence at the job, by a sense of service, also by humility. Many indeed of the nominees showed these characteristics to a marked degree, which is most encouraging for the future—there is no doubt that we have seen much evidence of real qualities of leadership. Our country's future is in good hands.

WITH HILLARY TO THE POLE

Mr. Mulgrew's citation recounted his South Polar journey with Sir Edmund Hillary as a chief radio electrician in the Navy for which he received a B.E.M. and a Polar Medal. He then studied for and later received a naval commission and later joined the Anglo-New Zealand Himalayan Expedition.

On Makalu he was struck by pulmonary thrombosis and later frostbite. He lost both legs and several fingers, but resolved to walk again and to revisit the Himalayas. Both these decisions were carried through. He returned to his naval career with the research laboratory, and later as an instructor, and now heads the telecommunications section af an electronics firm.

SCOTT BASE LEADER'S ROTARY AWARD

The Scott Base leader, M. M. Prebble, has been awarded a Rotary Foundation Fellowship for a year's study overseas in polar research.

A son of Mr. and Mrs. O. Prebble, of Hinau Street, Eastbourne, "Mike" Prebble is a brother of the recent Victoria University Antarctic Expedition leader Warwick Prebble. Both are veterans of several Antarctic expeditions.

Mike's introduction to the Antarctic was as a volunteer Antarctic Society member of the Huts Restoration Party in 1960-61. He returned as a dog-handler in the 1961-62 summer, and again as deputy leader, Scott Base, in the summer of 1964-65. He will be wintering over as Leader, 1965-66.

The Rotary Fellowships for single men 20-28, are part of an international effort for further understanding and friendly relations between people of different nations.

Mr. Prebble, an old boy of Hutt Valley High School, attended Victoria University of Wellington where he received a B.A. (Hons.) in 1961, and an M.A. in 1965. He received his diploma of teaching in 1963 from the Christchurch Teachers' College and a certificate to instruct bushcraft from the Cobham Outward Bound School.

SUCCESS

Graham Billing's Antarctic novel, "Forbush and the Penguins," reviewed in our March issue, was recently a choice of the American Book of the Month Club and is reported to be having big sales overseas.

A REMARKABLE FILM

The New Zealand National Film Unit's Antarctic film, "140 DAYS UNDER THE WORLD", reviewed after its initial preview in "Antarctic" has now been released for general screening. It will thrill everyone: no Antarctic enthusiast should dream of missing it.

WIDE ACCLAIM

Produced in wide screen format, it is perhaps the most important piece of cinema to come from the Antarctic. It was nominated for the documentary award of the Academy of Motion Picture Arts and Sciences in Hollywood in 1965, and was widely acclaimed after a presentation at the New Zealand Embassy in Washington. "140 Days Under the World" was presented at the opening four months ago of the Bercy Theatre in Melbourne, where it is still running, and has been running over three months in Sydney. In the United Kingdom it is being distributed by the Rank Organisation.

To shoot this film, cameramen Kell Fowler and Sam Grau made several trips to Scott Base and other points in the Ross Sea Dependency where New Zealanders were working. As the successive batches of colour film arrived at Miramar studios, it became apparent that its content and quality were remarkable and would justify production of a 30-minute picture—10 minutes longer than planned.

RIOT OF COLOUR

There are fascinating colours in the reflected light and shifting contours, in the delicate vapours and clouds and, not least, in the creatures which, by returning every summer to renew their species, bring life to a frozen land.

For senior unit director Ronald Bowie, who edited the film and wrote the commentary, the problem was selection.

"The colour was wonderful", he says, "and so were separate images, specially some of the close-ups of faces. To try to connect all this, to convey the significance of the research being done, the excitement of the whole adventure and the beauty of the snowcapes was a fascinating task for me".

FURTHER BUILDINGS PLANNED FOR FRENCH ANTARCTIC BASE

The 2.000 ton Danish ship "Thala Dan" left Le Havre on October 14 with a 900 ton cargo of high precision scientific equipment, prefabricated buildings, gas-containers and other material for the French teams in Adelie Land. She will call at Hobart to pick up the 30 expedition members (compared with the usual 20) who are being flown out from France. The summer relief season in Terre Adelie will extend from mid-December 1965 to the beginning of March, 1966.

The summer works programme comprises the renewal and extension of the ionospheric station by the installation of ionospheric sounding equipment and several fixed and turning antennae; the construction of a mast 74 metres in height; the construction and equipment of a rocket-launching site; installation and putting into operation of new all-sky 10 colour night-sky recording equipment: installation of long-term seismic registering equipment; and a new DECCA wind radar.

When this programme is completed, towards the end of the 1965-66 summer, the ionospheric station at Dumont d'Urville Base will be one of the best equipped in the Antarctic, whether from the point of view of technical methods used or from that of simplicity of operation and automatic functioning.

In addition, a new communal building (18 x 18 m.) for the winter party and a new dormitory (24 x 8 m.) for the summer party are to be constructed and equipped. A start will be made on the installation of plant for the pumping and distillation of sea water to provide fresh water for cooking purposes. A new telephone network is to be installed.

The completion of the two new laboratory buildings (384 sq. m.) by removing from the living quarters the scientific installations they previously housed, makes free additional space for the wintering party. This permits the strength of the winter team to be raised from 20 to 25. Moreover, a team of five additional technicians will be quartered in the buildings of the old "Marret Base". A total of 30 men, 12 of them scientists, will winter during 1966.

FOURTH TIME

Leader of the 16th French Antarctic Expedition in Terre Adelie (TA16) will be **Rene Merle.** He will be wintering over for the fourth time. In 1957 he was principal radio officer. In 1958-60 he was Leader of the 9th Expedition, and in 1961-62 of T.A.12.

Chief Scientist will be **Bernard Mollet** who wintered over in 1958. His special responsibility will be the reconstruction of the Ionospheric Station.

Twenty-five men will participate in the summer work. Four technicians will be working on the erection and installation of the ionosphere mast, and the construction group will number 12. As usual, Paul-Emile Victor will lead the summer party.

ALL MOD. CONS. AT DUMONT D'URVILLE

According to the experienced Australian Don Styles, the new Dumont d'Urville will be one of the most modern, most comfortable and, scientifically and technically speaking, best equipped bases in the Antarctic.

Already two new laboratory buildings have been constructed to house the seismological, geomagnetic, auroral, meteorological, biological, glaciological, radioactivity and cosmic ray installations. The magnetic station has been completely renovated. During the coming summer the seismological station will be completed by the installation of the long-term equipment, and the ionospheric station will also be completely renewed. The substructure required for the future launching of rockets to record disturbances in the ionosphere will be constructed. New living and sleeping quarters will also be erected.

The water pumping and distribution service will function experimentally during the 1966 winter. The whole system will come into operation at the beginning of 1967.

The telephone system will be completed during the 1966 winter. It will necessitate the laying of four kilometres of cable.

A temporary hospital, essential because of the greater risk of accidents due to the increased numbers, will be set up in No. 2 Laboratory. It will be ready for use from the commencement of the 1965-66 summer. The permanent hospital will be situated in the winter party dormitory building, the construction of which is scheduled for 1968.

Features of the new living quarters will be a dining room to seat 60 men, library, bar, record-player room, two photography darkrooms (one especially for the use of amateurs) and a kitchen capable of producing meals for 80 men. This building will be ready for use in 1967.

France commemorated on January 20, 1965, two notable anniversaries: it was 125 years since the discovery of Terre Adelie by Dumont d'Urville in 1840, and it was 15 years since the first landing on the Antarctic Continent of Expeditions Polaires Francaises in 1950—the party led by A. F. Liotard.

France claims to have pioneered ionospheric research in the Antarctic. As far back as the reconnaissance voyage of "Commandant Charcot" in 1949-50 Michel Barré obtained ionograms in Adelie Land, and during the 1950 winter Mario Marret obtained the first ionospheric soundings from a land station, at Port Martin. The first ionospheric station was opened on February 14, 1951, and functioned regularly until it was destroyed in the disastrous fire of January 21, 1952. Ionospheric work was renewed in 1956.

The summer party dormitory will house 46 men. There are two one-man rooms and eleven four-man rooms.

TERRE ADELIE

The July-September quarter was characterised by heavy cloud and considerable snow-fall. The end of August, and September, brought many fine but cold days. A caravan and a weasel were brought back from Pointe Geologie and completely renovated in view of the proposed glaciological journeys in the summer.

JAPAN PREPARES

Following a successful trial voyage, the new Japanese ice-breaker "Fuji" has been taken over by the Defence Bureau as from July 15. Captain T. Honda and his crew, including the airmen, have engaged in a number of sea-going training exercises. "Fuji" will carry two Sikolsky S-GIA and one Bell 47G; also a powerful new snow-car KD60 of 140 h.p.

The 40 members of J.A.R.E. VII were finally selected on October 25. They include a wintering team of 18 men with Dr. A. Muto of Keisei Hospital as leader. The leader of the whole expedition is Antarctic veteran M. Murayama. Three pressmen will accompany the expedition on "Fuji", as will Mr. H. Francis as United States observer.

"Fuji" will leave Tokyo on November 20 and travel via Fremantle, Western Australia (December 5-11). She is expected to reach the pack-ice about the end of the year. The landing of the wintering-over party and the discharge of cargo will be carried out as from the beginning of January 1966.

Dr. K. Kizaki of Hokkaido University, a geologist, will winter with the Australian expedition at Mawson.

"POLAR NEWS"

The Japanese Polar Research Association, which was founded at the end of 1964, announces the first issue of its Bulletin, "Polar News", which will be published every few months. Unfortunately for most "Antarctic" readers, the articles and news items, both domestic and foreign, are in Japanese: only the table of contents is (tantalisingly) in English.

Director of the Polar Research Association is Professor S. Kaya, formerly president of the Japanese Science Congress. The Chief Secretary is Dr. T. Torii of Chiba Technical College, well known to many New Zealanders.

NEW SEASON PREPARATIONS FOR AUSTRALIAN ACTIVITIES

The Australian Government has again chartered two polar vessels to make voyages to relieve Australia's Antarctic stations during the comming summer.

The motor vessel "Nella Dan" will leave Melbourne for Macquarie Island on December 2 with 19 men to replace the 1965 party, which will return to Melbourne on December 17.

The relief expedition will be led by F. P. McMahon, logistics officer of the Antarctic Division.

After loading stores in Melbourne, "Nella Dan" will proceed to Antarctica with an expedition led by Dr. Phillip Law, Director of the Antarctic Division.

The ship will call at Wilkes Station to construct a new settlement to be built on a site adjacent to the present station.

"Nella Dan" will then proceed west for the relief of Mawson Station by a team of 26 men.

After a short inspection of Davis Station, which is unmanned at present, the expedition will explore the Knox Coast and the Banzare Coast of Australian Antarctic Territory. A Beaver aeroplane will be carried to assist with this work.

"Nella Dan" will then pick up the construction party at Wilkes and return to Hobart on March 9.

A second ship, "Thala Dan", will carry out the relief of Wilkes Station.

It will leave Melbourne on January 10 under the command of Don Styles, the Assistant Director of the Antarctic Division.

The expedition will call first at the French station, Dumont d'Urville, to disembark seven French scientists, and will then proceed to Wilkes.

The Australian party to replace the 1965 party at Wilkes will comprise 27 men.

The ship will remain at Wilkes for about ten days while stores are unloaded and construction continues at the station. This expedition will return to Melbourne on February 15.

STATION LEADERS

Leaders of the parties who will serve with the Australian National Antarctic Research Expeditions during 1966 have been appointed.

Mawson: Kenneth W. Morrison (34) is a process engineer on the administrative staff of a Victorian manufacturing company. With a sustained interest in the Scout movement, he is at present District Senior Scout Leader for Ringwood, Victoria. Mr. Morrison has had extensive experience in bushwalking throughout Victoria and in organizing canoeing expeditions.

Wilkes: Alan J. Blyth (57). Serving with the Royal Australian Artillery from 1940 to 1945, Mr. Blyth was promoted in the field to the rank of Lieutenant-Colonel, being commander of artillery in the Ramu and Markham Valley campaigns, New Guinea and in the Balikpapan landing in Borneo. Mr. Blyth is manager of his own construction company and has been engaged as a master builder for over 20 years.

STATION NEWS

MAWSON

August was not a pleasant month with many days of drifting snow and blizzards, during one of which the wind reached a near record of 134 m.p.h. Afflick stayed on weather-watch throughout this blizzard to obtain wind recordings when the anemobiagraph broke down. The station escaped practically unscathed except for damage to a hut window, and to the radio aerial. However, on the Plateau, two miles from the station, the vanes of a wind-driven battery charger disintegrated in the blow.

EXPEDITION EMPEROR

At Kloa penguin rookery, 160 miles away, a bird-watching field party, comprising Bensley, Baggott, Watson and Lachal, with two dog teams, reached their objective in just over two weeks—an exceptionally good effort, in regard to the conditions encountered. Five weeks after departing from Mawson the

party returned from their long dog trip to Kloa, and Fold Island emperor penguin rookeries over the sea ice and were accorded a rousing welcome home. They gave glowing reports of the magnificent spectable of thousands of emperor penguins wandering in and around the icebergs. Over 400 miles were travelled, a credit to the four men and their husky teams.

EARLY SPRING

With temperatures rising to an unusual plus 20-odd degrees a barbecue night was held on August 21, but the rising wind curtailed the enthusiasm for steaks on the open fire. The lowest temperature in August was minus 24.9°F.

Motor toboggan teams of Cameron, Haigh, Gordon and Poulton spent a week on a journey to Taylor Glacier rookery, their primary objectives being a census of the Emperor penguins and to depot for the following Kloa party. Approximately 3,500 birds were tallied, many with chicks. Meanwhile, Woinarski, Allison, Martin and Vrana had a successful six-day trip to Auster rookery, where some 30,000 birds were observed, many with chicks. The snotrac broke down whilst en route to Fischer with three men to instal the auroral camera. The minor trouble was immedately repaired and the following day saw the camera in position on Fischer Nunatak.

The Auster rookery trip was repeated twice during September. Early in the month a four-man party did the return trip to Auster rookery in one day. This 70-mile round trip was repeated later in the month by a further group. Figures vary regarding the number of penguins at this rookery, but Woinarski considers it best to count their legs and divide by two.

By September the Antarctic spring had brought about a sudden and most welcomed change in climate after a month fraught with high wind and blizzard conditions. The temperature range was high, with a minimum of minus 19°F, and a maximum of plus 21°. The highest wind gust in September was 104 m.h.p.; average daily sunshine was a scant 4.9 hours with a daily average temperature of minus 4.5°F. Warmer weather has also seen the seals returning.

WILKES

STILL THE HUSKY

Two two-man teams under McLaren, a Canadian glaciologist, each with a sledge hauled by seven dogs, returned to Wilkes after three weeks in the field. They had set out to accomplish combined programmes of glaciological and survey work at Midgley Island and Haupt Nunatak. The men and dogs were sorely tried by blizzards blowing for long periods at hurricane strength and by temperatures dropping to 57°F below freezing point.

Each dog team was required to pull a load of 900 pounds and the men had only the shelter of polar tents throughout their journey. When the weather was at its wildest one sledge was blown over by erratic wind gusts eleven times in eight miles.

On occasions the men were short of food and fuel when bad weather held them back from reaching dumps of supplies established earlier in the year. With three sledge runners broken by the rough terrain, the parties limped back to their station, full of praise for the wonderful performance of the locally bred huskies.

Despite the difficulties, the men made important glaciological observations on the movement of the Vanderford Glacier, 2 miles S.S.E. of Wilkes, as well as surveying Midgley Island en route.

REFUELLING

The station tank farm was refulled this month under the capable eye of Shennan. Allen and Demech lent considerable assistance to the operation by driving the D4 tractors. The rest of the station took it in turns to help with the loading and unloading of the drums.

Physiologist Hicks after constructing his new physiology laboratory almost single-handed, started business in August with his first blood samples.

Walking still appears to be more reliable than motor-cycling or motor-toboganning, as it would appear that a man on foot easily outstripped both other means of transport on a trip to the cabin at Jack's Donga. This spot has a magnificent view over the Swain Islands.

CLIMATE FOR AUGUST

Average temp. plus 7.1°F, maximum temp. plus 33.1°F, lowest temp. minus 13.5°F.

The maximum wind gust was 104 m.p.h., which explains why one day there were aerials and the next only twisted aluminium.

Mechanics S'hennan, Wiggins and Glenny, between Repstat and keeping Wilkes in fuel, spent their time, including many nights, working on the traverse vehicles. These are to be taken out on the spring traverse early in October by Lanyon, Allan, Wiggins, Holmes and Forecast. The party was to leave for an extensive geophysical survey measuring ice thickness, gravity and elevation over a large area about 100 miles south of Wilkes.

McLaren, the Canadian glaciologist, has continued his examination of ice structures. He is doing some very interesting work on the structure of ice crystals and is frequently interrupted by others wanting to take photographs of them through his microscope.

When Forecast dropped his motorcycle through a tide crack, he and McKenzie spent some time fishing for it with a strong rope and a three-pronged hook through a hole in the ice. Twenty fathoms of water and rapidly forming ice made them return empty handed.

For September: Maximum temperature 22°F, minimum minus 14.8°. Maximum wind gust 78 knots; snow and/or drift on 13 days.

A Japanese scientist, Dr. Koshiro Kizaki, has been appointed as glaciologist with the Australian National Antarctic Research Expeditions at Mawson in 1966. He will shortly arrive in Melbourne to begin preparations at the Antarctic Division and the Department of Meteorology, University of Melbourne.

Dr. Kizaki will be mainly engaged in a study of petrofabrics near the Casey Range 19 miles W.S.W. of Mawson. This investigation seeks to determine the relationship between the movement and deformation of ice and the ice crystals, of which it is composed. He will also continue measurements of the heat budget of the plateau ice commenced this year by the present glaciologist at Mawson.

Dr. Kizaki, aged 41, was born in Japan and is married with two children. He served as geologist and glaciologist with the Fourth Japanese Antarctic Research Expedition at Syowa Station from November 1959 to March 1961. He has been a research assistant at Hokkaido University since 1952 and has published a number of papers on the geology of Japan and Antarctica. He is a member of the Alpine Club of Hokkaido and the Japan Alpine Club.

WIVES' CLUB

The wives of the men who go down to the Antarctic have formed the Antarctic Wives' Association (Australia).

The president, Mrs. Philip G. Law, vice-president, Mrs. D. F. Styles, and Secretary Mrs. R. A. Saxton.

Mrs. Saxton says, "The idea is that the wives will be able to get together to exchange news and publications, and learn a little about the Antarctic, the continent where they're not allowed to go".

Mrs. Law, the President, is looking for the right association badge. She feels that their emblem should be a snow white bird, pure and beautiful. "You know, symbolic of our lonely virginal lives at home", she said.

SUPPLIES LOST

The Australian Antarctic expedition had its whole year's supply of tobacco and cigarettes stolen from a Melbourne wharf during the week-end of December 4-5.

LATE NEWS FROM MAWSON

With October came the welcome extra hours of daylight which not only brought back the bird life but also made possible many sea-ice outings after tea. One trip of interest was a day's outing to Giganteus Island to observe giant petrels nesting.

Poulton has been active on the sewing machine making engine covers for the tractors, while Gordon has been fitting radio equipment to the various spring-trip vehicles. By the look of the food sledge, reports leader Woinarski, the trippers should enjoy excellent menus.

As an indication of the weather, on Saturday evening, the 30th, a barbecue held outdoors was enjoyed by all, the husky pups being in strategic positions to pick up scraps.

SOVIET STATION REPORT ON WORK ACCOMPLISHED AND PLANNED

News from the Russian Antarctic committees make it clear that the Soviet bases in Antarctica will be humming with activity as extensive building projects get under way this summer, and are carried on next year even after the return of the Polar ships to Europe.

For this description by E. I. Tolstikov of work planned for the coming summer we are indebted to "Moskovskaya Pravda" for September 12.

"As compared with earlier expeditions, 'Ob' will leave for the Antarctic almost a month and a half earlier, in mid-October. 'Ob' will arrive in the Antarctic at the beginning of the Antarctic summer. A tanker carrying fuel will for the first time arrive in Antarctica together with the 'Ob'.

"The number of scientific projects planned is large. Meteorological, geophysical and actinometric research will be carried out, as well as the study of ionospheric phenomena. The crew on board the 'Ob' will carry out oceanographic investigations. There will also be geologists at work, along the shores and in many inland areas, which they will reach by plane. Physicists and glaciologists intend to measure the thickness of the ice-cover by means of a new radar method.

"We are planning to send to Antarctica biologist-aqualungers. Their observations will uncover new underwater worlds along the shores of the ice continent."

ON THE EVE

Writing on October 21, a few days befor 'Ob' was due to sail from Leningrad, the well-known Soviet Antarctic authority A. Nudelman said:

"The main task of the expedition will be the continuation of a complex programme for the International Year of the Quiet Sun. The new arrivals will continue the scientific watch in Mirny, Vostok, Molodezhnaya and Novolazarevskaya. Unique scientific observations will be carried out at two poles, the Geomagnetic South Pole and the Pole of Cold. A group of 15 men under the leadership of meteorologist N. Artemiev will study the climate, the ionosphere, aurorae, cosmic rays, the earth's magnetic field and the origin of radiowaves at Vostok. An American scientist is to join the group.

"Of special interest is a project to determine the thickness of the ice sheet by radar detection. These experiments will be carried out in a special area south of the Davis Coast. One of the main tasks of the expedition will be to keep Soviet whalers informed of weather conditions in the high latitudes of the Southern Ocean."

Geological and geographical research will go on in the Enderby Land mountains. Glaciological and hydrographic research is to be carried out in Alasheev Bay by a group headed by J. Koblenc. Medical observations are regularly carried out at all stations with regard to man's adaptation to the harsh climatic conditions of Antarctica.

A scientific centre for Soviet Antarctic research is to be established at Molodezhnaya in Enderby Land (see below). A group of builders is being sent to Antarctica for this purpose. Many of the members of this group are proficient in two or more trades.

The members of the ship's crew will carry out oceanographic research from the "Ob" in Antarctic waters, from Pravda Coast to Queen Maud Land. Endeavours will be made to explore again the Amery and West Ice Shelves. As mentioned previously, Soviet scientists discovered that these ice shelves have shrunk considerably.

Several thousands of tons of fuel are to be delivered in a tanker directly from the Black Sea to Mirny and Molodezhnaya. Before the arrival of the ship in

Alasheev Bay, workers hope to have the fuel storage tanks finished.

Personnel of the 11th expedition will number over 300, including the crews of ships and planes. The overland party will be headed by geographer L. Dubrovin, the author of numerous papers on geography, hydrology and glaciology, and at one time in charge of Lazarev Station in Queen Maud Land. He has also taken part in three Arctic expeditions. Seasonal work will be carried out under the direction of D. Maksutov, assistant director of the Soviet Antarctic Expedition. In charge of aerometeorological and geophysical teams will be geographer A. Koptev and engineer V. Smirnov. Aerometeorologists will be headed by hero of the Soviet Union, V. Borisov.

Taking part in the expedition are also scientists from Czechoslovakia, the German Democratic Republic, Hungary, Poland and the USA.

NEW CENTRE FOR SOVIET RESEARCH

Several puzzling and apparently contradictory reports concerning the relative future importance of Mirny and Molodezhnaya seem to be explained in the following authoritative statement.

D. I. Shcherbakov, president of the Interdepartmental Commission on Antarctic Studies, told a correspondent on October 10: "Mirny, the central base of Soviet Antarctic Research is changing . . . We are planning to build a new centre, new scientific pavilions and dwellings.

"What is the reason for this transformation?

"When Soviet ships arrived for the first time on the shores of the sixth continent, to the first polar explorers who when on shore it was nothing but a "blank white spot". They had little idea of its climate or topography. A settlement, Mirny, was founded on the shore of the Davis Sea which later became known as Pravda Coast. Trips were undertaken from Mirny to the Geomagnetic South Pole and the Pole of Relative Inaccessibility. Polar researchers wintering over in other stations, including Vostok, used to reutrn to Mirny, but strong winds, continuous blizzards and snowstorms made life very difficult in the settlement.

"Over the years we have learnt much about Antarctica, we have carried out research and studied new areas. One of these areas, Queen Maud Land, appeared to us the most suitable for our future 'capital'. Here in 1963 we set up Molodezhnaya Station and over the past few years we have been building it up into our main base 'Mirny-2'.

"At present aluminium dwelling houses, mess rooms and scientific pavilions are being built at Molodezhnaya.

"But 'Mirny-1' will remain a scientific observation point, for it is a meteorological observatory which assembles meteorological reports from all other stations working in Antarctica".

ALL THROUGH THE NIGHT

This description of the winter work on the new Molodezhnaya buildings was published in the "Stroitelny Rabochi" on August 21.

In addition to scientific personnel we have a gang of building constructors working at the station. In spite of harsh Antarctic conditions the work of the future Molodezhnaya Observatory never stopped for one day. For the first time in Arctic and Antarctic building practice a large building of aluminium wall panel sections is under construction. The building is a future power station. A practical approach of the gang to the task made it possible to assemble within very short time 460 m2 of wall panels.

Frequent blizzards and strong winds do nothing to help the builders. In June we had 29 days of blizzard and in July 22 days. Compared to last year the July temperature this year is 8 degrees lower, fluctuating between $-10°C$ and $-25°C$. Maximum wind velocity was 32 m. per second.

Our Antarctic settlement is changing in appearance every day. 30 m. high radio masts rise above the ground, huge diesel storage tanks, multi-coloured Arbolite buildings on metal piles enhance the site.

SET TO GO

I. Petrov reported to "Vodny Transport" on September 21 from Mirny that the men were looking forward eagerly to five windless days (as he wrote the wind velocity was 15 m. per sec. and the temperature $-20°C$). Windless days were necessary so that they could start

getting ready for the projected sno-cat trek to Vostok, which is 3,500 m. above sea level.

Eight weasel-truck-tractors had already been overhauled and work was still in progress on several large metal sledge-trailers. Small huts were being built and fitted with navigational aids and radio equipment. Living huts and galleys were already finished.

The tractor-team will carry large quantities of fuel and equipment of various kinds to Vostok. It will have to cover 1500 km. from the Indian Ocean to the South Geomagnetic Pole.

During October half the load was to be taken by truck tractor about 100 km. from Mirny—the first 100 km. are the most difficult, as the ice cover rises steeply here from the shore to the ice-cap.

The Mirny team was busy preparing to meet the new arrivals and had cleared the slope from the high "barrier" to the fast ice where the "Ob" will arrive.

NOVOLAZAREV

Novolazarev Station on June 30 reported strong winds with gusts of 50 m. per second (112 miles per hour) which caused considerable damage to the antenna system. On July 20 again there were winds of 45-55 m.p.sec. in the Schirmacher Oasis area.

Radio communication was being maintained with the Belgian Roi Baudouin Base 500 k.m. to the east, and meteorological observations were being transmitted from Port Stanley in the Falkland Islands to Mirny. Fourteen men wintered at Novolazarev.

VOSTOK

A radio message on July 11 reported the coldest temperature "for a long time", −83°C (−117.4°F). At about the same time the temperatures at Mirny and Molodezhnaya were −28°C (−18.4°F) and −12°C (+10.4°F).

A −80°C temperature was also reported on July 31 with an atmospheric pressure of 600 m.b. Under these conditions it was proving very difficult to carry out the normal observation work.

ANTARCTIC ATLAS

Work is progressing on the forthcoming Atlas of Antarctica to which we have previously made several references. The work of 12 nations has been taken into consideration in the production of the 500 maps, covering such aspects as weather, temperature, geology, oceanography, seismic sounding, glaciological profiles, aurora (e.g., frequency in different areas), geophysical characteristics, the continental relief and the relief of the ocean floor in Antarctic waters. The two volume atlas will include 500 completely new maps, on 225 pages, the remaining 75 pages of the first volumes being devoted to the explanatory text. The second volume will contain articles of an encyclopaedic nature devoted to a description of all the natural elements in the Antarctic.

It is expected that the first volume of the Atlas will be published later this year, and volume two in 1967.

CO-OPERATION

The Director of the Arctic and Antarctic Institute, Leningrad, told Tass in August that the interchange of scientists between Russia and other "Antarctic nations" was a significant factor in the growth of International Co-operation. During the past year no fewer than 50 foreign scientists had spent some time at Mirny or one of the other Soviet Antarctic stations. They included the group of French glaciologists who made a long traverse in tracked vehicles; Japanese scientists who inspected their temporarily unoccupied Soya Base from Soviet planes; and (for the first time) an English exchange-scientist.

It was anticipated that during the 11th Expedition then in preparation scientists from the U.S.A., Hungary, Poland, Argentina and Japan would be visiting Soviet bases. Aerologists, actinometrists, geodesists and microbiologists from Poland, East Germany, Hungary, Czechoslovakia and the U.S.A. were expected to winter over.

UNDERWATER RESEARCH

D. M. Maksutov, assistant director of the 11th expedition, says that the Russians will undertake Antarctic microbiological research for the first time. Three members of the Leningrad Zoological Institute will be the first Soviet aqualungers in the Antarctic. They will descend to 30 m. and take samples in order to study the conditions of life of the micro-organisms.

TOUGH LIFE AT THE POLE OF COLD

David Burke of the "Sydney Morning Herald" flew from Australia to Byrd Station, Antarctica, in October last year (see "Antarctic" December 1964, p.552). At Byrd he had as his room-mate Ben Ignatov, who was station leader at Vostok in 1959. In an article in the "Herald" of August 28 Burke tells something of what life is like at Vostok, the Pole of Cold.

Vostok is a tiny settlement, 2,900 miles south of Perth and is built on the Polar Ice Cap at an elevation of 11,200 feet. Here, throughout the 1965 winter have lived 15 members of the 10th Soviet Antarctic Expedition.

They last saw the sun on April 24. On or about August 24 each year the temperature is at its lowest, somewhere about −125°F. Long before that the diesel oil and kerosene are as thick as syrup, engines refuse to start, rubber hoses and cables break like glass, paintwork explodes to strip woodwork and metal bare, and iron has the brittleness of toffee.

As Ignatov told Burke: "Imagine us, some men bleeding from the ears and nose. One of our comrades could not stop the blood and we had to return him to Mirny. The rest who stayed suffered bad insomnia. Our minds were on edge when we lay down to rest. When we finally slept there were the nightmares."

Outdoors, in cold weather rig and face mask, the Vostok man might well be mistaken for a visitor from another planet. His bulky dress contains a 40-watt battery and heating coils for hands, chest and feet. His mask of compressed, foamed polystyrene has a double shield through which the air is warmed electrically before inhalation.

The small silver-zinc storage battery he carries, with a life of six hours even at minus 112°F, has almost the importance of a second heart for without it, in winter, when exterior movement is limited to 15-20 minutes, he could die quickly, even on his own doorstep.

In 1960, Vostok nearly froze to death. Siderov was the leader that year when the bed plate of the main diesel generator suddenly fractured, cutting the power supply. Their precious oxygen for the welding plant was exhausted. It was close to mid-winter—aircraft could not leave Mirny, the Australians could not help nor the Americans.

As Siderov tells the story:

"We remembered that on a late supply flight of the previous autumn, a parachute had failed and the oxygen cylinder air-dropped to us lay somewhere beneath the plateau snow.

"We staked our hopes on finding that cylinder, although it seemed impossible.

"Except for three men, our whole party set off for this location, laying rope lines to guide us a mile through the freezing darkness.

"Oil, wood, clothing and rubbish were taken to start a bonfire on the snow and digging began. As we went deeper, a tent was rigged on top of the shaft and a cast iron stove placed inside.

"For 80 hours the digging went on. At 50 feet we found the end of a cord. At 58 feet our shovels struck hard metal.

"A cry came up from the bottom of the shaft—the cylinder was intact. We lived."

TRAFFIC JAM

(Late News from McMurdo)

A gigantic piece of ice covering an area more than nine times that of New York's Manhattan Island is threatening to temporarily close the newly-cleared channel leading to McMurdo Station.

The ice breaker U.S.S. Glacier noticed the long transverse crack developing while carving a channel to McMurdo.

Located about 8 miles north-west of McMurdo, the floating ice measures 10 miles by 20 miles and averages 4 ft. in thickness.

The direction and force of the wind will determine which way this huge chunk of ice will move.

If the wind blows the ice across the new channel and closes it, the ice breakers U.S.S. Burton Island, U.S.S. Atka and U.S.S. Glacier will be required to recut much of the area they have already cleared.

This might delay the arrival of the first supply ship to McMurdo, U.S.N.S. Alatna, which is due on December 13.

Although this large piece of ice is a threat to the open channel it is expected that it will soon move into open waters and allow re-supply of McMurdo Station on schedule.

Belgian-Dutch Expedition Prepares For Second Change-over

The official occupation of the Belgian Base Roi Baudouin by Expeditions Antarctiques Belgo-Neerlandaises took place on February 6, 1964. The new base adjoins the older station of the same name, which was occupied by a Belgian expedition from January, 1958 till February, 1961.

M/S Magga Dan is scheduled to leave Antwerp in the first week of December with stores for another year at Base Roi Baudouin on board. Also on board will be a "Cessna 180", a jet powered helicopter and an "Otter" aircraft, this latter on loan from the U.S. Navy.

Two teams of huskies fresh from Greenland will furnish some company to the oceanographers who will leave Belgium by ship. The rest of the party will join the ship by air in Cape Town.

The expedition leader is geologist T. Van Autenboer, who has wintered twice before at base Roi Baudouin while surveying the Sor Rondane mountains. In addition, T. Van Autenboer accompanied several Arctic and Antarctic summer expeditions. Other polar veterans are pilot de Biolley, in charge of the aviation team, meteorologist Gordts, biologist Van de Sande, physicist Buis and mechanic Pierre.

SUMMER ACTIVITIES

The coast which was mapped during the 1960 expedition will be remapped. It is hoped that the comparison of the 1960 and 1966 maps will furnish additional information on the movement of the shelf.

The surveyors will be landed for astronomical fixes at different points along the coast. These will furnish the necessary ground control for the construction of the map after the vertical photographs.

The biologists and oceanographers will continue their previous surveys, while also the study of the penguins and seals will be continued by the biologists.

High altitude balloons will be launched for the study of solar cosmic radiation.

The aircraft will also be used to lay depots for the inland traverses of the winter party.

WINTER PROGRAMME

The winter expedition is to continue the programme of the 1965 expedition (meteorology, aerology, ozone recording, ionosphere, geomagnetism, radioactivity, glaciology). An extension of the research in atmospheric electricity is planned while a second riometer will be added, functioning on 20MC.

A rather extensive field programme is planned: the geologists will continue the geological investigations in the Sor Rondane mountains started during the Belgian Antarctic Expeditions of 1958 — 1959 and 1960.

It is also hoped to extend these investigations to the Belgicafjella hitherto only visited by air. The combined ice flow and ice thickness investigations (by gravimeter) in the Sor Rondane area, started in 1959, will be continued and extended. It is also hoped to extend the gravity survey of the Sor Rondane.

The strain network on the ice shelf near Base Roi Baudouin put up during 1965 will be remeasured.

NEWS FROM THE BASE

News received in Belgium indicated that the geophysical work of the 1965 expedition (leader W. Bogaerts) is being carried out according to programme.

The surveyor started his field work in mid-September, and the establishment of a strain network on the ice shelf is advancing well.

Maximum and minimum recorded temperatures during the past three months were: −6.8°C and −43.7°C, while the wind velocity attained a mean of 20 knots.

The members of the team had the opportunity to have some radio-telephone conversations with their families at home. The expedition under preparation received much valuable information via the telephone.

SPRING COMES TO SANAE BASE

We are indebted to the South African Weather Bureau, Department of Transport, for the following outline of conditions and activities at SANAE during August, September and October, 1965.

Although the sun reappeared towards the end of July and 38 hours of sunshine were recorded in August, this month showed no rise in temperature (mean −27.9°C) and in fact the lowest temperature (−50.0°C) of the winter occurred during the month. However, with the reappearance of the sun the men experienced a burst of energy, and even the huskies seem to feel the same, especially after some practice runs. The men were at this stage faced with the task of digging out stores and replenishing the indoor supply of diesoline.

Pollak and Sharwood spent most of the month at the substation on an extensive gravimetric programme to try and determine the effect of the tides on the floating ice shelf on which SANAE and the substation are situated. Surveyor Strydom was a very busy man after the winter hibernation. Besides nightly star fixes, he was testing his tellurometers for the proposed survey between SANAE and Dassiekop. He was also extending his ice-strain network. Joubert was working on neutron monitor results while the Met. men of course carried on their routine work.

September

September with a mean temperature of −30.8°C proved to be the coldest month of the winter and the lowest minimum of −47.8°C came very close to the absolute minimum of −50.0°C recorded in August. Several weeks of bitterly cold weather were experienced and the temperature remained below −40°C for long periods. Brilliant mirages of the buktas and icebergs as well as miraged columns of sea mist were regular features on all sunny days. The Aurora Australis was also particularly widespread and was seen to move north of the zenith.

The first expedition to the mountains which was due to leave at the beginning of September had to be postponed and all geological, geomagnetic and tellurometer survey field work was to be combined in one expedition which was expected to leave early in October. Both available muskegs and a dog sledge team would be used. One of the muskegs would, however, return to SANAE after the tellurometer survey to Dassiekop and Marsteinen has been completed. The dog sledge party would consist of Pollak and Ezekowitz; the support and depot-laying muskeg party would consist of van Wyk, Hodsdon and Smit; Strydom and Steyn would make up the survey team with the other muskeg. With half the team out on field work at times, the fellows remaining at the base would have their work cut out to maintain the routine programme at SANAE.

October

October started off with the worst storm this year. So fierce was the blow that the strongest gusts could not be recorded—the highest recorded was 100 knots. However, after the storm the first snow petrels of the season were seen as a sure augury of warmer weather, which duly came. While South Africa was shivering in bitterly cold weather, a "heatwave" hit SANAE, with an absolute maximum tmeperature of −1.9°C. The mean temperature for the month, −19.4°C, was 11.4°C warmer than September's figure.

After many unforeseen delays the mountain expedition was making slow but steady progress. Three days after departure from the base van Wyk had to bring Hodsdon back to the base as he was suffering from appendicitis. Joubert, his replacement, hastily packed his bags to join the field party. Since then the muskeg has had to return to base twice. Strydom and Seyn were successful with the tellurometer survey but intended returning to the base early in November after the survey to Dassiekop had been completed.

Ezekowitz and Pollak reported that the dogs were behaving excellently de-

spite the short time available to train them. During evening radio skeds Smittie relayed back to the base a cheerful and amusing account of the day's events in the field.

Meanwhile the indoor explorers had been very busy keeping the base programmes going. The mechanician was still working on the muskeg Bernadine to try and get her back on the road. Statt had become a fresh air addict, so that he now spent most of his time outdoors working on a new antenna system which he hoped would greatly improve radio communications. Joubert was preparing another cosmic ray balloon instrument for a flight early in November. Sharkwood had everybody up in arms when he ran his noisy ionosonde once every minute to cover the possible ionospheric effects produced by the Ikeya-Seki comet when it was approaching the sun.

Dr. Jan de Witt has come forward with some excellent delicacies at mealtimes His koeksisters are everybody's favourite. One who is really appreciating the longer days is Joubert who no longer needs a torch to take the midnight Met. readings. It seems that "absence really makes the heart grow fonder" as we have now had four engagements announced from down here. The latest two are Nico Smit and Johan Joubert, who have announced their engagements to girls back home.

THE NEW TEAM

The leader at SANAE for 1966 will be Sean Kavanagh (27), who graduated at the Witwatersrand University in 1960 with a B.Sc. engineering degree in land surveying. He has done underground, aerial, engineering and land surveying throughout South Africa and was recently engaged on the Orange River Project. He spent 1962 in Autarctica as surveyor to SANAE III.

The remainder of the team comprises a medical officer, two geologists, a geomagnetist, an ionosphericist, three meteorological officers, a cosmic ray scientist, two diesel mechanics and two radio operators.

Survey support to the glaciological research programme will be provided by the measurement of ice movement in the vicinity of S.A.N.A.E., in the "hinge" area south of the base and between the base and the ice-front.

The mapping of the bedrock geology and geomorphology of the Borgmassivet Mountains in western Dronning (Queen) Maud Land will be continued. It is anticipated that two geological parties will be in the field with motor toboggan support.

The existing geomagnetic field stations in the vicinity of S.A.N.A.E. will be reoccupied.

Budgeting studies of the Fimbul Ice Shelf will be continued. The rate and volume of the discharge of the Jutelstraumen Glacier will be investigated by repeated tellurometer surveys.

The Trolltunga geophysical traverse will be completed, possibly using radar sounding equipment.

Special efforts will be made to reach maximum possible heights with radiosonde soundings as part of the I.Q.S.Y. programme.

ANTARCTIC MEDAL

The South African Antarctic medal has been awarded to Victor von Brunn.

Von Brunn was appointed geologist-geophysicist-glaciologist for the First South African Expedition, 1960, which was planned and organised at very short notice. He left for Antarctica as a young man fresh from university with instructions to "do your best."

During his year he was responsible for more scientific disciplines than any subsequent expedition member. He also undertook, in the company of his leader, a journey of 500 miles by dog sledge which lasted six weeks, during which he did extensive field work.

When he returned to South Africa, scientific circles were astounded at his achievements in all of the scientific disciplines for which he had been responsible.

THE PENGUIN COURTEOUS

Visitors to the Antarctic Division offices in Wellington are greeted on the stairway by a dignified Emperor penguin. "Percy" is frequently in demand as the prize exhibit at Antarctic displays in various parts of New Zealand. During these periods of absence on duty a card placed on his customary stand reads

"GONE FOR A WALK.
PERC."

TRAGEDY STRIKES BRITISH ANTARCTIC SURVEY

THREE LIVES LOST IN CREVASSE

The loss of John Wilson, David Wild and Jeremy Bailey, working from Halley Bay in the region of the Vestfjella, has overshadowed all other news from the British Antarctic Survey base.

The men were in the cab of a Bombardier Muskeg tractor towing two Maudheim type sledges. On October 12 they were travelling over country which appeared safe when the tractor broke through a crevasse bridge. It was supported for a moment by the tow-bar of the leading sledge but this broke and the tractor fell down backwards about 150 feet. The tractor was badly wrecked in the fall and it is certain the men died instantly.

John Ross, a Scottish geologist, who was the only man of the party not in the tractor, did his best to get down the crevasse but, without assistance, found it impossible. Fortunately Ross had a dog team and he was able to sledge the 50 miles to Pyramid Rocks in the Heimfrontfjella. Here he met another group who reported the news by wireless to base, about 300 miles away as the tractor travels. They then accompanied him back to the scene of the accident. A man went down on ropes only to find that nothing was recoverable and things were left exactly as they were.

Both parties at work in the area had been attempting to finish the geological and topographical surveys started three years ago and, up to the time of the accident, good progress had been made. The remaining men are carrying on as best they can before returning to Halley Bay in December. No further work will, however, be possible this season on the sounding of ice thickness by radar since all the equipment was lost with the tractor.

ANOTHER PARTY MAROONED

Reports from other bases show that on the whole their programmes are going well. The spring temperatures around the Peninsula have been on the high side. Though this may mean an early break up and an easy season for the ships it is not so good for survey in the area east of Adelaide Island. Already a survey party have found themselves marooned at the old Base W on Detaille Island. They are well off for food and fuel and are in no danger but it is frustrating for them not to be able to get on with the work.

FLIGHTS LIMITED

The De Havilland Otter flew south to Adelaide Island on September 26 but owing to bad weather over the Matha Strait it was forced to stage at the Argentine Islands. The second leg of the flight was completed on September 28. Although, in the absence of a second aeroplane, air operations are limited to routes which can be guarded on the ground the Otter is already proving its worth. Apart from sorties in support of field work on the east coast and to Blaiklock Island, two men were flown into Fossil Bluff for base and vehicle maintenance.

A geological party left Stonington on September 18 and reached Mobiloil Inlet on the 20th. Shortly afterwards the party split in two, one to work south of Cape Hinks and the other northward. Another geologist from Stonington is working on the west coast north of the base.

WITH THE SHIP

The "Shackleton" reached the Falklands on November 2 and sailed for South Georgia a few days later. From there she will go to the South Shetlands to land a field party on Livingston Island and to discharge cargo at Decepcion. After that she starts her seaborne geophysics programme, which includes seismic sounding using sonar buoys and the two-ship method in conjunction with H.M.S. Protector.

The "John Biscoe" sailed from Southampton on October 29 and is expected

to reach the Falklands on November 26. Her first task will be the re-supply of Signy followed by hydrographic surveys (using Hi-fix) of the western approaches to the South Orkneys.

Early in the new year she will sail for the west coast of the Peninsula to re-supply the bases there, and to continue hydrographic surveys in the vicinity of the Argentine Islands.

The "Kista Dan" will, as usual, sail in early December to relieve and re-supply Halley Bay. On board will be Sir Vivian Fuchs, who is visiting the base for the first time since it was established early in 1956.

H.M.S. "Protector" will co-operate with the Survey in various ways including sea seismic work, support for field work in the South Shetlands and on topographical reconnaissance of the Cape Kater area. "Protector," an ice-patrol ship, will be making her eleventh voyage to the Antarctic.

Field work in the South Shetland Islands is primarily concerned with a study of their geomorphology with particular reference to raised beaches. At the same time it is hoped to complete a general geological reconnaissance.

SHORT LIVES BUT FULL

We are indebted to the British Antarctic Survey for providing us by request, with the following notes on the three young explorers whose lives have been given in the cause of Antarctic research.

J. T. BAILEY

Jeremy Thomas Bailey was born in Hertfordshire, in 1941.

He attended Watford Boys' Grammar School and then went to the University of Bristol where he gained a second class honours degree in Physics. In 1963 he went to the Scott Polar Research Institute in Cambridge as a research student and candidate for Ph.D. Under Dr. Stanley Evans he worked on a radio echo instrument for sounding the depths of ice sheets in the polar regions. He went to Greenland with Dr. Evans and took the first continuous records of the character of the terrain beneath the Greenland ice sheet.

When he sailed for Halley Bay his enthusiasm for the prospect of extending these studies to Antarctica was unbounded. He had that combination of scientific education and instinctive human understanding which pays such dividends in the field. He was ideally suited to the whole project and continuously happy in it. During the course of several hundred miles of traverses from Halley Bay he acquired many original records of value. It is to be hoped that some of these may be recovered; their use at Cambridge will be the contribution to his memorial which he himself would have wished.

D. P. WILD

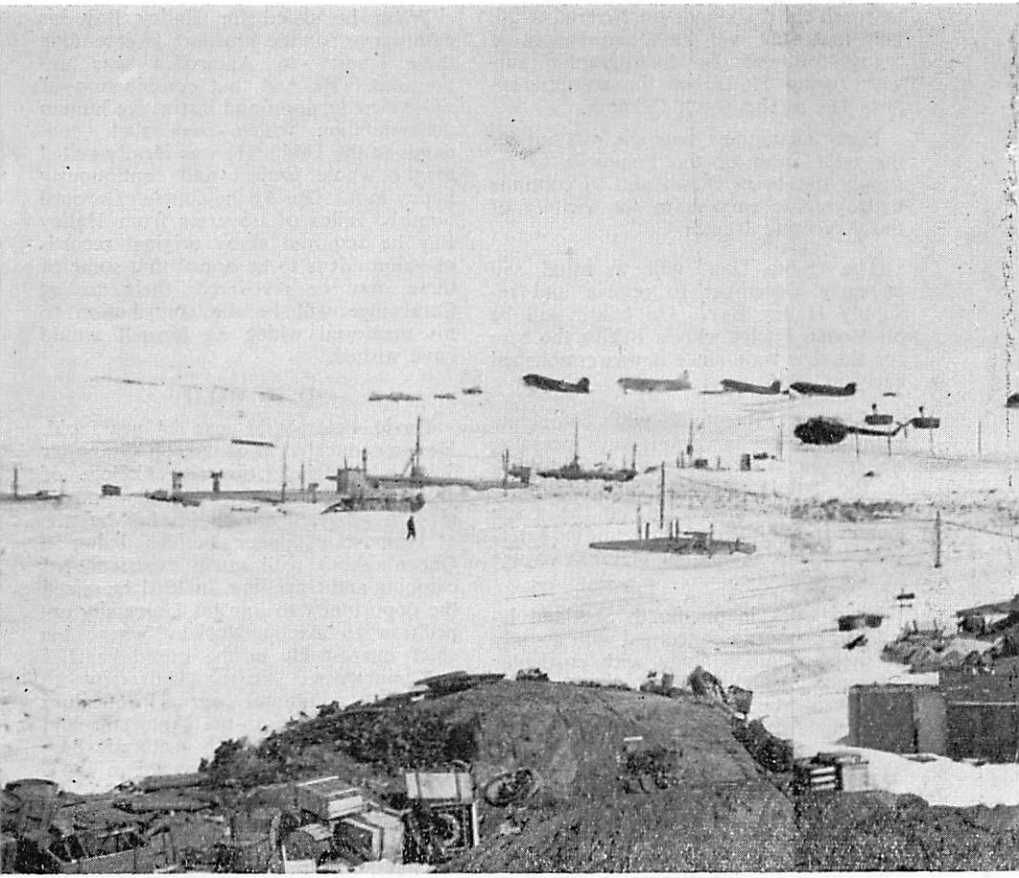
David Peter Wild was 24 years old. He was educated at St. Asaph Grammar School and the University College of Wales, where he gained an honours degree in geography. All his life he was a keen mountaineer besides being a Queen's scout with much experience of camping and travelling. In 1961 he seized the opportunity to join his University expedition to Arctic Norway where his chief interest lay in the raised beaches and moraines. At the University he undertook additional courses to fit him for survey work in the Antarctic and finally joined the British Antarctic Survey as a topographical surveyor in 1963.

His evident qualities of leadership and his great good humour made him a popular member both on board ship and at his base. At the time of his death he was in his second Antarctic year and would have returned in 1966 with an extensive coverage of the mountains at present being mapped. Unfortunately it is feared that most of this work was lost with him.

J. K. WILSON

John Kershaw Wilson was just 29. Born at Stafford he was educated at Bedales School and Queens College, Oxford, where he took his B.A. degree in animal physiology in 1959. The next three years were spent in studying at Middlesex Hospital Medical School where he gained the degrees of Bachelor of Medicine and Bachelor of Surgery. He successively held posts at Mount Vernon Hospital, Northwoood, Middlesex Hos-

(Continued on page 192)



ANTARCTIC STATIONS—4
MIRNY

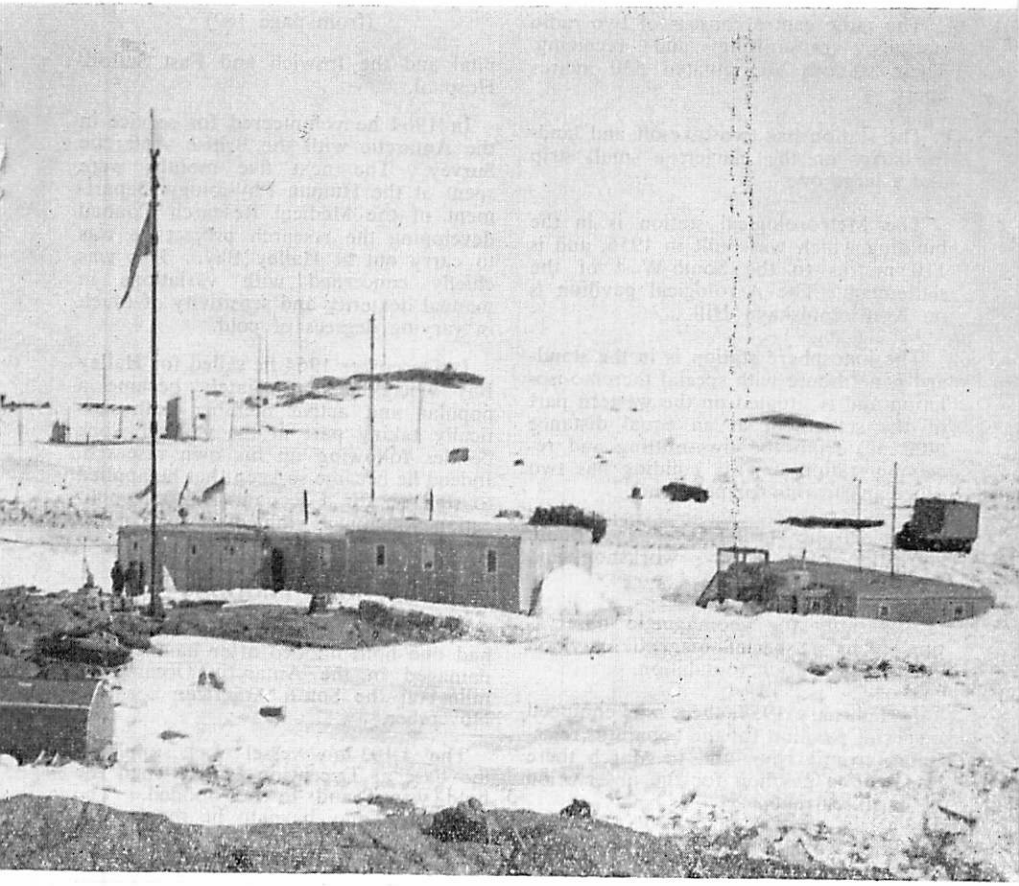
66° 33′ S. Latitude, 93° 01′ E. Longitude, 33 metres above sea level.

Geomagnetic Coordinates: 77°.0, 146.°8

Mirny is a scientific research station and the main base of the Soviet Antarctic expedition. It is situated on the coast of the Davis Sea (in the Indian Sector of the Southern Ocean) on a small prominence called the Mirny Peninsula. The coast in this area and extending to the West and East of the station is called the Pravda Coast.

The station structures are placed partly on four exposures of rock and partly on the surface of the glacier. The thickness of the glacier in this area is 80-100 metres. There is a group of rocky islands, the Haswell islands, near the peninsula. To the South of the station the thickness of the glacier is increasing and 100 kilometres from the station already reaches 1,500 metres. The sea near Mirny is covered by ice which by the end of the winter stretches for a distance of more than 40 kilometres. By the autumn this ice breaks up and floats away, but there are always many icebergs near the station.

When Mirny was established in 1956, twelve standard panel houses were erected on steel truss foundations. Several buildings were also built for storing food-stuffs and scientific apparatus, for repairs to vehicles, etc. In the subsequent years additional buildings have



been constructed, new houses in place of those destroyed by fire, etc. The station equipment has also been improved.

By 1964 there were 42 buildings of different types in Mirny, 18 of them being simultaneously used as dwelling and office apartments. These buildings comprise 56 dwelling and office apartments of a total area of 580 square metres. The majority of the buildings are under snow. Each house which needs heating, has its own autonomous electro-water system which is operated through an electric boiler with a thermo-regulator which permits the maintenance of constant temperature. All dwelling and office apartments have telephone systems which operate through an automatic telephone station.

In the centre of the settlement there is a galley and dining-hall for 90 persons which is also used as a mess-room. There are food depots near this building. In addition there are other depots for food-stuffs, spare scientific equipment, fuel, stocks, spare parts for transport vehicles, workshops, an electric power station and radio station in various places of the settlement. A storage for frozen food-stuffs has been built in the glacier 12 kilometres to the South of the station.

The electric power station is built of metal panels covered with wooden panels and roofing iron.

There is a workshop for repairing vehicles and scientific and domestic equipment.

The radio centre consists of two radio stations: transmitting and receiving. These stations are situated 530 metres apart.

The station has two take-off and landing strips on the glacier: a small strip and a large one.

The Meteorological station is in the building which was built in 1956, and is 110 metres to the South-West of the settlement. The Aerological pavilion is on Komsomolskaya Hill .

The ionosphere station is in the standard panel house with special theremo-isolation and is situated on the western part of the settlement at an equal distance (400 m.) from the transmitting and receiving stations. This building has two office apartments for personnel.

The seismic station is a panel house consisting of a lobby, workshop and working room.

Apparatus for geomagnetic observation is in a special magnetic pavilion erected on a rock foundation.

In February 1957, there was equipped a special pavilion for the apparatus registering cosmic rays, and in March there was built a pavilion for the observation of earth currents.

Station Mirny was officially opened on February 13, 1956.

Observations are carried out at Mirny in: meteorology, aerology, synoptics, antinometry, ionosphere, geomagnetism, earth currents, cosmic rays, polar radiance, measurements of tensity of radio stations' fields, observation of radio-signals of artificial satellites, glaciology, oceanology, aerial photography, medicine, biology and geology.

Mirny is the main base of the Soviet antarctic expedition on the Antarctic continent. It is from here that all main expeditions to the continent and all air-flights into the heart of the continent and over the sea are carried out. It is also the main base for aerial photography.. All supplies of the continental stations and changes of personnel are carried out through Mirny.

(from page 189)

pital and the Ipswich and East Suffolk Hospital.

In 1964 he volunteered for service in the Antarctic with the British Antarctic Survey. The next five months were spent at the Human Physiology Department of the Medical Research Council developing the research project he was to carry out at Halley Bay. This was chiefly concerned with variations in manual dexterity and sensitivity of touch in varying degrees of cold.

In December 1964 he sailed for Halley Bay where he immediately became a popular and active member enthusiastically taking part in the general work besides following up his own research. Indeed he became so keen that he applied to stay on for a second year, an application which was immediately accepted.

HOLD FLOODS

The British research ship Shackleton had one hold flooded after having been damaged in the Antarctic Ocean, 400 miles off the South American coast in November.

The 1,103-ton vessel was supplying the base at Deception Island when the hold was found to be flooded. The Shackleton may have to be repaired at a South American port.

PERSONNEL

1956	92	30
1957	138	43(1)
1958	145	38(2)
1959	97(3)	31
1960	106	41(4)
1961	88	24
1962	55	23
1963	67	24

(1) Including one American.

(2) Including on Czech and one American.

(3) Including one Czech.

(4) Including three East Germans, two Czechs and one American.

Argentine Activities Planned For 1965-66

The work to be undertaken during this summer by the five organisations responsible for Argentina's Antarctic activities is outlined in the following programme issued on October 21 by Capitan de Corbeta (R.E.) Enrique Ortiz, Publications Officer of the Argentine Antarctic Institute.

A preliminary flight was made by the Naval Aviation Group in order to gather information on ice conditions prior to the commencement of relief and re-supply operations by the Navy. A DC4 2T5 aircraft commanded by Capitan de Corbeta R. B. Ambrosio left Rio Gallegas at 5.40 a.m. on August 22 and followed the route Ushuaia, Cape Horn, Decepcion, Mar de la Flota, Vice Comodore Marambia Island, Lindenberg Island, Teniente Matienzo Base, Gerlache Strait, Almirante Brown Base, Decepcion Island, Livingston Island and back to the starting point at 6.33 p.m.

AERO-NAVAL GROUP

During the summer the Aero Naval Group will comprise three HU-16B Albatross aircraft, a P2V-5 Neptune and a DC-4. The three Albatrosses will be in operation when the Decepcion Station is activated and ice conditions permit. Once the ships rendezvous in the operational zone, reconnaissance flights will be made according to the requirements of each station. In addition, they will if necessary evacuate the bases or effect the change-over of personnel.

Over a period of approximately 45 days the ice-breaker "General San Martin" and the transport "Bahia Aguirre" will relieve the men at Teniente Matienzo and Orcadas Bases, carry out repair work to the ramp and wharf at Decepcion, lay buoys in the northern part of the Weddell Sea, re-provision the Teniente Camara Base, pick up personnel and cargo from the Army Base Esperanza (Hope Bay) and make a final inspection of Decepcion Base.

The second phase of the two ships' operation, taking approximately 60 days will involve the relief and re-supply of General Belgrano Base, the inspection and evacuation of Ellsworth Base, oceanographic work in the Weddell Sea, the relief and re-supply of Decepcion, Almirante Brown and Esperanza Bases, servicing of naval and hydrographic buoys, and the final inspection of Orcadas Station.

The third phase, scheduled to occupy approximately 30 days will comprise the inspection of the Navy Stations and the transport back to Argentina of scientific personnel, observers and work parties.

The transport "Lapataia" will undertake a familiarisation and scientific information cruise during January and February, 1966. Present plans envisage the itinerary: Buenos Aires, Mar del Plato (either on the outward or on the return voyage), Ushuaia, Smith Island, Melchior, Decepcion, Bahia Luna (Moon Bay), Laserre Bay, Esperanza, Smith Island, Ushuaia and Buenos Aires.

ANTARCTIC INSTITUTE

Those working in the I.A.A. projects for 1965-6 will be from the Institute itself, from the National Centre of Cosmic Radiation and personnel assigned to the tasks of maintaining the Almirante Brown Scientific Station and the construction of the Auroral Tower at General Belgrano Base. Work will be undertaken at Belgrano, Duke Ernest Bay, Almirante Brown and on board the ice-breaker, "General San Martin".

The scientific programme comprises work in Aurora, Cosmic Rays, icthyological studies, the collection of biological specimens, the collection of samples for analysis of radioactivity and observation of sea ice.

The technical programme comprises the re-conditioning of Almirante Brown Scientific Station and of the scientific installations at General Belgrano Base. In addition, general repair of the buildings at Almirante Brown and construction of a new auroral observation tower at Belgrano will be undertaken.

The largest group, nine men under Capitan de Fragata Federico W. Muller, will be working at Belgrano (repairing the antenna of the ionosonde and installing a new antenna for the riometer, as well as constructing the new Auroral Tower), at Almirante Brown on general repair work, and sea-ice observations.

Three other smaller groups of from two to four men will also be working on the I.A.A. programme. Sr Roberto F. Otamendi will be studying the possibility of installing aquaria in the Almirrante Brown laboratories for "live" biological studies.

NAVAL HYDROGRAPHIC SERVICE

This Service will effect the relief and reprovisioning of the naval stations Decepcion and Orcadas. It will also provide the summer teams for the Teniente Camara and Decepcion stations. It will service all the buoys and lights installed by Argentina in the Antarctic. Extensive oceanographic, hydrographic and survey work will also be carried out, as well as the provision of meteorological data for the ships taking part in the summer programme.

At Teniente Camara the Service will carry out work in icthyology, parasitology, the study of marine invertebrates, taxidermy, meteorology, hydrography, oceanography, tide studies and paleomagnetism.

ARMY PROJECTS

The Army will re-provision and relieve the personnel of the Experanza, General Belgrano and Sobral Bases. Reconnaissance will be made of the northern part of Alexander Island, of the coast in the neighbourhood of Berkner Island, and south from Sobral Base.

AIR FORCE

The Argentine Air Force will relieve and re-stock the Teniente Matienzo Station and carry out considerable air-photography, using Beaver, Otter and other later type aircraft.

JOURNEY SOUTH

During the last week in October a tractor left General Belgrano Base (77° 58′ S., 38° 48′ W.) to attempt as deep a penetration as possible on the meridian 40° W. General Belgrano is situated at the base of the Weddell Sea on the Filchner Ice Shelf, some 25 miles from the United States Ellsworth Station, occupied by the U.S.A. from January till December, 1958, and by Argentina until December 1963; and not far from the site of Shackleton, base of the Commonwealth Trans-Antarctic Expedition in 1956-7.

The Argentine trek on 40°W should take the 6-vehicle, 10-man party some 200 miles south across what is now known to be an extension of the Filchner Ice Shelf, between Berkner Island and the Shackleton Range in Coats Land; and then, if continued, over Edith Ronne Land between the Pensacola Mountains and the route of Fuchs's sno-cats in 1957-8.

The team is carrying out reconnaissance and topographical, meteorological, gravimetric and seismological investigations en route.

SOUTH POLE FLIGHT

Three aircraft from the Argentine Antarctic base General Belgrano landed at the Amundsen-Scott South Pole station about 2 a.m. on November 4.

The purpose of the visit was to provide Argentinian air-crews with experience in Antarctic flying operations and to enable aerial reconnaissance work to be carried out.

The three planes, a DC3 and two Beavers, were expected to remain at the Pole Station for three days. They would then fly on to McMurdo Station, where they would stay for three days and then return to the pole before continuing to their home base, about 850 miles away.

In charge of the mission are Lieutenant Commanders Marie Clegg and Gamraul Munos.

It is the first time an Argentinian flight of three planes has landed at one time at the pole station.

AIRCRAFT CRASHES

It was reported from Buenos Aires on October 3 that an officer and three men had crash-landed during a flight back from Sobral Base, which is 525 miles from the South Pole. They had flown 100 miles when the crash occurred. The plane was badly damaged but the men,

CHILEAN PLANS

The Chilean National Committee of Antarctic Research announced in August its plans for the coming year. The Committee (Comite Nacional de Investigaciones Antarticas) which is the Chilean S.C.A.R. organisation, responsible for maintaining relations with the other countries interested in Antarctic scientific work, works through the Chilean Antarctic Institute, which itself links the various scientific bodies concerned and organises the work in the Antarctic. Logistics are largely in the hands of the Armed Services Antarctic Section, which also correlates the Antarctic work of the Chilean Meteorological Office, the Military Geographical Institute, and the Navy Hydrographic Institute.

There are four permanent stations and two temporary bases (See "Antarctic" September). It is anticipated that Gabriel Gonzalez Videla station on the Danco Coast, Paradise Bay, which was deactivated on January 16, 1965, will be reactivated during 1966.

Four vessels will be engaged in this summer's relief: the icebreaker Piloto Pardo, the frigate Covadonga, the patrol-vessel Lientur and the oceanographic ship Yelcho.

An extensive programme is planned for 1966 in Geology (Dept. of Geology, Faculty of Physical and Mathematical Sciences, University of Chile), Geomorphology (Inst. of Geography, U. of Chile), Glaciology (School of Geology, Faculty of Physical and Mathematical Science, U. of Chile) and Biology (Marine Biology Station, Montemar: Faculty of Animal Sciences and Veterinary Medicine and the Faculty of Agriculture, U. of Chile), Geodesy and Seismology (improvement of instrumentation at Pedro Aguirre Cerda and the setting up of an adequately equipped seismological station at Bernardo O'Higgins Base).

Communications

In order to improve the quality of communications in the Antarctic, without interfering with the national network, a communications system is being planned in accordance with modern technical developments. It is proposed to set up a station at the Arturo Prat Base fitted out with special equipment for the study of ionospheric dispersion and its influence on communications.

An extensive programme of mapping is planned by the Military Geographical Institute.

LOGISTICS

In addition to the usual activities carried out in conjunction with the re-supply and maintenance of the existing bases and refuge huts, it is proposed to put into full operational condition a refuge hut at Telefon Bay (Decepcion Island) and to re-condition the Commodoro Gueslaga Base on Avian Island as a springboard for scientific work south of that latitude.

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a lieutenant, a sergeant and two corporals, were equipped with food, extra clothing and survival kit.

Land and air rescue teams set out early on the 2nd but on the 5th it was reported that the men had been stranded for four days in bitterly cold temperatures. The men were reported well despite freezing winds and a temperature of 30° below zero. An army patrol had been battling through the snow towards them, guided by radio from the wrecked plane. Attempts to locate the wreckage from the air had so far failed.

A later message received by the Argentinian Consulate in Wellington stated that all four men had been rescued.

(Late News)

U.S. PLANE MISHAP

Dec. 7.—Seven men aboard a United States Navy DC3 aircraft involved in a landing mishap in the Ohio Mountains of Antarctica on December 6 were flown back to Byrd Station by a ski-equipped Hercules aircraft.

The DC3 suffered structural damage to its fuselage when the starboard landing gear collapsed and has been left at the scene.

Engineers are considering the best way to repair the damage.

BIG AMERICAN PLANS FOR 1966

SECOND LEG OF AMBITIOUS TRAVERSE AND NEW STATION

The world re-appeared for the 289 U.S. men who wintered over in Antarctica when the first of four Hercules aircraft was finally able to touch down at McMurdo Sound on October 1 despite the efforts by weather to prevent it!

Aboard the aircraft was the first mail and fresh food that the seasonal eremites had seen for six months, as well as the commander of Deep Freeze 1966, Rear-Admiral F. E. Bakutis, this year's leader of Scott Base (N.Z.)., Mr. M. Prebble, and the superintendent of the Antarctic Division of New Zealand's Department of Scientific and Industrial Research, Mr. R. B. Thomson. The arrival of the aircraft and the end of winter allowed Commander Jehu Blades, USN, to relinquish his command of the winter-over party after eight months' responsibility for the men and bases in Antarctica.

Rear-Admiral Bakutis had, before leaving Harewood, N.Z., outlined the main plans for the coming season. The establishment of a new and remote, even for Antarctic conditions, scientific station, the second leg of the Queen Maud Land traverse, the projects of the largest-yet summer scientific party and the non-introduction of facilities for females, were some of the outstanding intentions.

Denying, almost defensively, that he was against women, Rear-Admiral Bakutis reiterated the reasons for the current impossibility of introducing them to the combat-zone-like conditions of the Antarctic, amongst which conditions could be included his estimate of more than 3000 for the number of men involved in this year's plans.

PLATEAU STATION

The new Plateau Station for scientific research is planned as an eight-man, year-round temporary base some 11,000 ft. up on the high centre of the polar ice-cap between the South Pole and Queen Maud Land. It will be the terminal point of the second leg of the South Pole-Queen Maud Land Traverse, some 600 miles from the South Pole Station. In an icy, lifeless climate, with a minimum temperature of – 130°, four scientists, supported by four Navy personnel, will investigate weather and climate, collect snow samples representing a deposition of a possible 100 or more years, and conduct studies of the aurora (the location of Plateau Station being near the auroral belt), geomagnetic variations and VLF signals. Seven to ten days' conditioning at the Pole Station will introduce Plateau's personnel to the cold before they reach the coldest place on earth. Mobile Construction Battalion Six, part of the Naval Support Force, is due to start construction during January. Eight transportable units will be flown to the site by ski-equipped turboprop LC-139 cargo planes and five of the semi-trailer-like units will be connected to make up the main body of the station. Of the remaining three, two will be used for earth magnetism studies, one as an emergency shelter.

IN THE PENSACOLAS

Six separate projects will comprise the final, it is hoped, assault on the secrets of the remote Pensacola Mountains, discovered in January 1956. For two summers already geologists from the U.S. Geological Survey have studied the southern regions of this range, and this year 15 scientists will conduct reconnaissance geology, gravity, seismic and magnetic surveys, study paleontology and establish geodetic control for aerial photographic and mapping purposes. Three other scientists, an entomologist and two algologists, will join the geologists, and the multiple-discipline field party will be established and supported by turbo-helicopters.

USARP will undertake a glaciological study through and under a small glacier by means of drilling and tunnelling by Ohio State University scientists. The

California Institute of Technology will provide scientists to melt snow and ice from a shaft slanting 120 ft. down near Byrd Station, and try to determine the concentration of common lead there precipitated in the last 60 years. Similar studies made in Greenland will give a comparison of the precipitation of lead from the burning of leaded gasolines throughout the world.

Other geological, glaciological, ionospheric, biological and already introduced disciplines will also be studied in varying parts of the Continent.

A new biological research station has been established in the McMurdo Sound area by the N.S.F. to permit year-round investigations into life as it exists in Antarctica.

TRAVERSES

Leg II of the Queen Maud Land crossing is under way. The ten scientists, under the leadership of Dr. E. E. Picciotto of the University of Brussels in Belgium, were flown to the depot laid at the culmination of last year's Leg I traverse, at the Pole of Inaccessibility, to overhaul the vehicles there before taking off on their planned two and a half month journey to the yet-to-be-completed Plateau Station.

A new technique for measuring ice-thickness will be employed, with radar soundings replacing the previously-used method of seismic soundings. Radar will reduce the number of soundings taken yet allow for a more continuous recording en route.

Other members of the traverse party include three glaciologists from Ohio State University, three geophysicists, a traverse engineer, a mechanic from the University of Wisconsin, a geomagnetician from the Coast and Geodetic Survey and a Norwegian glaciologist. Dr. Picciotto's own speciality is physical chemistry and geo-chemistry.

ICE SHELF JOURNEY

Six more scientists of assorted nationality and specialty will make a three-month, 500 miles journey across the Ross Ice Shelf from McMurdo to Roosevelt Island.

Leader will be Mr. E. Dorrer of the Technical University of Munich and his team comprises three other German scientists and two Americans. The purpose of this, the third journey across the Ice Shelf since 1960, is to check measurements of ice movement and snow accumulation made on earlier trips. Three two-man parties travelling five miles apart will measure snow accumulation at some 2000 bamboo poles planted in 1960 by Dr. Swithinbank's party and ice movement at the aluminium tubes placed at 5-mile intervals by an earlier German-led crossing.

STATION NOTES

McMurdo: This season should see the first increment of construction of a new personnel facility, capable of accommodating 250 men and feeding 500. This year's plans cover the erection of the shell for the cafeteria, laundry and mechanical features, and partial installation of plumbing and electrical systems. During the next two Deep Freezes, completion is scheduled of the galley and messing facilities, and of a two-storey barracks and living quarters. A six-bed dispensary is scheduled for completion this year, the shell having been put up during Deep Freeze 65. The dispensary is planned to include an operating suite, with mod, cons., examination areas for ears, eyes, noses and throats, as well as three consultation booths, a pharmacy, laboratory, diet kitchen and storage area. Other additions planned for McMurdo are a new Public Works and Transportation Centre, the extension of the fuel distribution system and a supply warehouse for VX-6. 200 miles away the Brockton Weather Station, a three-man set-up, is now operational.

In October, on the anniversary of the birthday of the late Rear Admiral Richard Byrd, a memorial to him was dedicated by the Commander of this year's U.S. Navy Antarctic Support Force, Rear Admiral F. E. Bakutis. The ceremony was observed by more than 450 Navy men together with U.S. and New Zealand scientific personnel from McMurdo and Scott Base.

A statue, designed by Sculptor Felix de Weldon, noted for his Iwo Jima war memorial in Arlington, Va.,—a replica of the Admiral Byrd memorial on the Avenue of Heroes in Washington, D.C.—stands on top of a polished Norwegian

block marble pedestal, inscribed with the achievement of Admiral Byrd, and his own words: "I am hopeful that Antarctica, in its symbolic robe of white, will shine forth as a continent of peace, as nations working together there, in the cause of science, set an example of international co-operation."

As Admiral Bakutis told his audience, these words are even more appropriate now, in a year of International Co-operation.

AT LITTLE JEANA

Lonely but essential. This is the summer season outlook for Little Jeana, an advance weather station that opened its reporting season on October 2 with its first weather message of Operation Deep Freeze 66.

The three U.S. Navymen who man Little Jeana are 200 miles from the nearest outpost of civilization—McMurdo Station. Everything in Operation Deep Freeze from aircraft flights to penguin studies depends on the weather and this mobile weather station, located on the Ross Ice Shelf, will provide advance warning of storms throughout the coming summer season.

Established in October 1964, the station consists of three interconnected ski-mounted trailers which rest on a relatively level snow surface with no natural obstructions to vision within a 50 mile radius. Equipped with the latest in meteorological equipment, one areographer's mate, or "weather guesser" as he is commonly known, observes weather and informs McMurdo Station of what to expect. Weather reports go out every three hours.

The weather guesser's two stationmates, usually an electronics technician and an engineman or machinist's mate, maintain all the station equipment.

Little Jeana will remain in operation until March, when it will be closed for the winter season.

Extremes of weather are experienced even in Antarctica. In July, meteorological readings recorded a record warmth at Eights Station and the lowest temperature ever recorded at Pole Station at $-80.5°C$ as well as the lowest monthly average, in contrast to Eights' high average.

Hallett, too, had its "mostest" weather, when storm winds, travelling at more than 85 mph for three days, knocked out all the station's major power facilities. While the storm still raged outside, all hands inside set to work to restore at least the vital communications system, with the emergency 30kw generator. The rest of the station, and its equipment struggled on from the reduced output of a defective generator; three days later Hallett was back on full power.

Fresh fish featured as a special after they had been caught in the "restaurant" recently at McMurdo Sound. Cutting a hole in the floor of the biologists' hut on the bay ice of the Station, two U.S.N. chief petty officers and the Soviet exchange scientist (Dr. I. A. Zotikov) spent three hours with shrimp-baited hooks and "landed' more than 15 fish from 6 to 16 inches long. Back in the laboratory Dr. Zotikov prepared a special broth in which he cooked the fish, and the invited guests, his fellow anglers, were not the only ones who succumbed to the tempting aromas that resulted.

Rear Admiral Bakutis is not only the commander of this year's U.S.N. Antarctic Support Force, but also an honorary member of the Canterbury branch of the N.Z. Antarctic Society. This honour was bestowed on Rear Admiral Bakutis during his time in Christchurch before the openeing of Deep Freeze 66 at a meeting of the Branch when he was presented with the society tie and a copy of the Antarctic Society survey "Antarctica". Rear Admirals G. J. Dufek D. M. Tyree and J. R. Reedy, Admiral Bakutis' predecessors in command, were also given honorary membership during their terms of office.

The tourist trade has recognized Antarctica. In January next a New York travel organisation is reported to be taking 50 visitors on a tourist expedition to the Antarctic Peninsula. The tourists will fly to Buenos Aires and from there travel by Argentine Navy ship to Palmer Station where station staff and passengers will change places temporarily. From

LOGISTICS

Unfavourable weather conditions in the far south delayed the opening of this season's operations in the Antractic. Originally planned to leave New Zealand on September 30, the first four aircraft that the U.S. Navy used to re-open the southern continent were not able to reach McMurdo until November 2, and then had trouble actually touching down. Four ski-equipped Hercules left Harewood at 90-minute intervals, but one had to turn back because of a faulty compass, another had to wait around after reaching McMurdo until the weather cleared enough for its landing.

Later storms and mishaps further upset planned movements. The new skiways and runways made conditions at McMurdo easier, but the troubles occurred elsewhere. On October 10 a hoax bomb-warning received at Harewood forced a Hercules to jettison fuel and return to Christchurch for a fruitless search; on October 16 bad weather at McMurdo diverted a Super Constellation to Hallett and forced the return to New Zealand of a Globemaster, where it rejoined its companion Globemaster which was awaiting a replacement propeller to arrive from the United States. And on Novemhber 5 two DC3 aircraft came in to Christchurch after having left Invercargill for McMurdo and then developing compass and radio faults.

Trials and tribulations do not deter the Support Force however, and the Antarctic has long since been re-opened, champagne and cakes being turned on at Byrd Station for the arrival of Rear Admiral F. E. Bakutis on October 6.

The possibility of mid-winter flights to the Antarctic is still under serious consideration by the National Science Foundation, according to a Foundation representative, Mr. P. M. Smith, in October. The Foundation staff and the Navy Antarctic support force had been studying the question closely, he said.

The scientific advantages of mid-winter flights would be tremendous. Greater year-round observation of the Antarctic, greater opportunities for highly-trained men unable to make the summer flights and the morale boost to wintering-over personnel would all accrue. Such flights might well be tried experimentally within the next year or two.

Yet another vehicle for Antarctic use will make its trial run in the snow and ice this season. This is a "Snow Volks", a Volkswagen modified in Christchurch for snow operation, designed and constructed by a former colonel with the U.S. Arctic Rescue Squadron, Mr. Parker B. Mudge, now a member of a Christchurch motor firm.

Fibreglass skis replace the front wheels of the Volkswagen, skis with a ground pressure of 1 lb. per square inch and fitted with keels to prevent side slip on turns. The rear wheels wear tractor grip tyres on hard snow or paddle wheels on soft snow, and tests have shown the Snow Volks to possess light steering and as much if not more traction than a four-wheel drive vehicle. A special heater will be fitted for Deep Freeze work and possibly a reserve petrol tank to give it a range of 300-400 miles.

Anvers Island the ship will proceed to the Melchior and Smith Islands, on a tour that is a private venture.

PICKET SHIP

The radar picket ship U.S.S. "Calcaterra" has completed the first of her four scheduled ocean station pickets at 60 degrees south latitude, 158 east longitude, in support of Operation Deep Freeze 66.

Commanded by L.-Cdr. William C. Earl, U.S.N., "Calcaterra" left Dunedin on September 1. After a brief stop at Campbell Island to deliver personnel and supplies, she arrived on station on September 28, three days before Rear Admiral F. E. Bakutis flew to McMurdo Station to officially open the 1966 season.

The ship returned to Dunedin on October 24, and was due to depart for her second picket on November 9.

A young American scientist back at McMurdo after 14 months at the under-snow Byrd Station "went around for days with a grin of ecstasy on his face."

"Mountains!" he would say: **"Mud!"**

On The Sub-Antarctic Islands

KERGUELEN
(France)

Earlier in the year a 400 sq.m. metal hangar was erected, providing shelter for all the station vehicles.

Since April all radio links with Paris, Nouvelle Amsterdam and the Australian station Mawson have been effected by teleprinter. Good results have been obtained particularly in linking Dumont d'Urville and Mawson.

DOWN ON THE FARM

The February "shear" made a sheep census practicable: the flock then numbered 551. But 163 of these were destined for "la boucherie".

The reindeer herd on High Island was estimated during an Easter visit to the island to number 31, nine of them males.

A journey to Lake Bontemps led to the re-discovery of the grave of the German soldier who died on Kerguelen during the second World War.

A total of 125 men will participate in the coming summer programme, and 64 of them will be wintering over.

The summer programme will include physiological study of the fish from a camp to be established in la Baie de Noel (Christmas Bay) on the north coast of the island.

The photographic coverage of the northern part of the island will be continued, using two helicopters based on la Baie de Noel.

CROZET ISLAND
(France)

The second team completed the fitting up and painting of all the buildings erected by the first team.

Wind is a major enemy on Crozet, and among the precautions taken have been the erection of massive wind breaks round all the base buildings especially those with gable roofs and the strengthening of the dormitory roofs with brace rods, this considerably reducing the noise of the winds.

The Crozet weather report for the third quarter of 1965 is succinct: "July, acceptable: August, very mediocre: September, detestable". Nevertheless, considerable useful work was done, outside and in.

The Crozet wintering team will number 15. The base, erected in 1964-5 on Possession Island, comprises seven buildings. Possession Island is one of two islands forming the eastern group of the Crozet archipelago.

MARION ISLAND
(South Africa)

August this year will be remembered as a month of thunderstorms. No less than three of these occurred, viz., on the 13th, 18th and 19th, bringing memories of Pretoria to the men on the island. The highest temperature recorded was 11°C and the lowest – 5°C.

The Gentoo penguin chicks were putting on weight at a remarkable rate. The Antarctic petrels were nesting.

On September 15 the men celebrated the halfway mark of their stay on the island. In their opinion one of the members has the makings of a M.B.E. because, like a Beatle with his long hair, guitar and original songs, he treated them to music second to none in the Prince Edwards group of islands.

One problem they have not been able to solve is that one of the men was gifted with exceptionally strong hands, causing water taps to be tightened in such a way that pliers had to be used by the rest when they wanted water.

The first baby elephant seal was born during the month. The migration to Marion was in full swing with more and more bird and animal life appearing every day.

Below freezing temperatures occurred frequently, causing a lot of manual labour as waterpipes froze, and water had to be carried in buckets to the upper air building for the low pressure gas cylinder or "bomb".

October proved to be a month of lovely sunshine. On a few days no less than 13 hours of sunshine were recorded. Unfortunately, the wind could not be persuaded to subside, and that prevented the men from really enjoying the sunshine. Although they were very keen

to see the comet Ikeya-Seki, the sky was always obscured in the early mornings so that it was not seen at all.

This summer an ornithologist and a biologist will be working on the island until March 1966. Their activities will include a continuation of the collecting of flora and fauna, including plankton, begun last summer, plant ecology, types of patterned soil, etiology of Sooty Albatross and Gentoo Penguins, census of breeding birds, ringing of birds and study of the soft-plumage petrel complex.

An effort will be made to visit Prince Edward Island.

GOUGH ISLAND

(South Africa)

With the advent of spring a change was noticeable in the behaviour of the local birds. Albatrosses, black and white, were busy building nests and penguins also made their appearance on every available little beach. There was an upward trend in temperatures and the sun broke through the clouds more frequently.

The fish efforts of Venter were at last rewarded. To the surprise of everyone he landed a ten pound snoek and a sixteen pound blue fish.

During October Gough Island was at its best with the vegetation displaying all the variations of green imaginable. There was a spell of eight days without rain and the "drought" was getting serious.

A memorable event was the arrival of the "Tristania" with mail and stores. Owing to unfavourable weather the offloading was delayed for several days.

CAMPBELL ISLAND

(New Zealand)

Once again the m.v. "Holmburn" was the vessel which carried out the annual servicing at Campbell Island in November.

As three members of the 1964-65 expedition are having another tour of duty, only one of the new party had to travel south at the time of servicing, all technical personnel having travelled on the picket ships earlier in the summer season.

The unloading and loading of cargo was done in rather calm conditions, with a very dry spell of weather following, which continued for nine days; but Campbell Island rain returned and filled the water tanks to the brim in a matter of hours.

Banding the Royals continues in earnest, and this year the party have banded over 2,000 birds.

Advice was received in September of the recovery of a Royal albatross at sea off Southern Brazil. The bird had been banded in the winter of 1962, making the ninth South American recovery of Royal albatross chicks banded that winter by Gaffin and Clark.

The most sensational recovery of the season was made by Met. Observer Dave Paull on February 26. During a trip around the pegged nests he recovered Royal Albatross R.1504 formally A.11, banded as a breeding adult by Sorenson in 1943. The bird is therefore at least 30 years of age, the oldest recovery of a Royal at Campbell Island.

On September 12 1964 Clark and some members of the party were able to observe the Right Whales in Northwest Bay, at close quarters. They estimate their numbers at about 12. Two calves were seen, one of which was pure white, a sight that Clark has never seen before.

EXPEDITION TO AUCKLAND ISLANDS

JANUARY, 1966

Organised as a follow up of a successful expedition to the Auckland Islands in December/January 1962-63, two scientific parties will again operate in the area in January 1966. As before, the planning has been undertaken jointly by the Dominion Museum and Botany Division, D.S.I.R., the respective leaders being Dr. R. A. Falla and Dr. E. J. Godley.

ADAMS ISLAND

Previous operations were confined to the vicinity of Port Ross, but this time there will in effect be two separate expeditions, the main one concentrating on Adams Island at the south end of the group. This is a large island unmodified by the several introduced animals and plants that have become established in the northern section. The

Adams Island party will establish a camp and they plan in the course of the month to extend their survey over the whole of the island. The small boat will provide some restricted opportunities of visiting the adjacent main island also. Personnel of the Adams Island party will be Dr. E. J. Godley, botanist and leader; Mr. P. Johns, Canterbury University, terrestrial invertebrates; Dr. G. Kuschel, Entomology Division, D.S.I.R., a special study of weevils; Mr. K. Wise, Auckland Museum and Bishop Museum, general entomology; Mr. P. C. Rickwood, University of Otago, geologist; Mr. B. D. Bell, Senior Field Officer, Wildlife Division, Department of Internal Affairs, and Mr. J. Kendrick, assistant, survey of vertebrate fauna.

PORT ROSS

The other party is returning to the Port Ross area and will be mainly concerned with the restoration of the living hut and outbuildings which are intended to serve the needs of visiting scientific parties for the next decade or so. A limited programme of supplementary collecting and special studies will be undertaken by the three scientific members of this six-man party which comprises Dr. R. A. Falla, leader; Mr. R. Ordish, Dominion Museum entomologist; Mr. G. Fineran, Canterbury University, botanist; Mr. K. Burns, carpenter; Mr. Colin Clark, building and field assistant; Mr. W. Groenstein, radio operator and boatman. Both parties with their equipment are to sail from Lyttelton by H.M.N.Z.S. "Endeavour" on January 7 and expect to be picked up by U.S.S. "Calcaterra" in time to disembark at Dunedin on February 6.

MACQUARIE ISLAND
(Australia)

Ellwood in his August "Newsletter" describes the coming of spring: "At last the Island is coming to life again, with birds and seals arriving from winter holidays. Continuous raucous screeching, not altogether music to the ears, whilst to most of us heralding spring, means more bites, scratches and bruises for Dart who has the job of banding any he can catch. Seals are arriving in vast numbers for the breeding season, so Bryden took the opportunity to take measurements of two bulls. The first one was 18 ft. long with a girth of 13 ft. and weighing 3¼ tons. The second one was bigger still with a length of 19 ft., a girth of 15 ft. and a weight of 4 tons. Fights among bulls are common now and the noise carries quite a long distance.

"Cape Pigeons, rarely seen around the station, have become a common sight, Graham has eventually been able to get photos of Leopard seals, five of which have visited the station area so far.

"Olrog and Jackson were erecting a radio mast. They picked a nice calm summer's (?) morning for the job but the wind rose about 20 knots in two hours, so that the man at the mast-head felt like a fish at the end of a line. Robb and George were preparing to fill a balloon for a sonde flight when a sudden strong gust of wind blew the roof off their building. Re-sheeting was done in winds up to 35 knots.

"Weather details for a month: highest temperature 45°F; lowest 29°; highest wind 81 m.p.h.; rain, snow, hail, etc., on 26 days; a total of 46 hours of beautiful sunshine. And for September: highest temperature, 44°F; lowest 30°; rain, hail or snow on 27 days; highest wind gust 83 m.p.h.; sunshine on 20 days, giving a total of 75 hours. It was beginning to be like summer again, until the past week brought on the big freeze of waterlines, etc., so that many found the morning wash in icy water a little hard to take. Any strange sounds heard in Tasmania were probably those of chattering teeth at Macquarie. Giddings, using a bulldozer to collect gravel for concreting, had a bull seal attack him and the tractor. The seal lunged at the blade thinking to take a good bite, and all he got was a mouthful of broken teeth. The seal turned tail and went off to sea.

Leader Ellwood writes: "A scientist's trials. With the number of seals around Bob Sutton's magnetic huts, Bob is finding it harder to get in to change the records on the magnetometers, but he considers it's lucky that the seismograph is not in the same building. The traces would certainly show some odd disturbances when the building is hit by three tons of blubber!"

Whaling Industry Seems Bent On Self Destruction

Apart from agreeing that another meeting should be held at some unspecified time in the future, the five countries which took part in whaling talks again in September appear to have agreed on very little else.

The meeting opened in Tokyo on September 3, and broke up on the 7th, a day earlier than scheduled. The participating nations were Holland, Japan, Norway, the United Kingdom and the U.S.S.R.

Although there was general recognition of the very real threat of extinction that faces the whales today, the meeting made no progress on the question of quotas.

Japan will stick to its present quota of 52 per cent. of the total agreed catch. So will Norway to its quota of 28 per cent. Russia is not happy with its share, 20 per cent., and wants to share the agreed quota equally with Norway and Japan. The U.K. and Holland are no longer active whalers, at any rate for the present.

Russia's unrest raises the question of whether the 1965-66 world whaling quota will in fact be further reduced next season, as was agreed at the June meeting in London of the International Whaling Commission.

Whales are being killed at a rate which makes it impossible for stocks to be renewed. So serious has the depletion of the whale population become that the few remaining whaling nations have not even been able to reach the limits they have themselves set. In 1962-63 the limit was 15,000 blue whale units: only 11,000-odd were actually caught.

The quota for 1965-66 is a mere 4,500 units. But the scientists say even this is twice as high as it should be if whales are to have a chance to survive.

Today there are only about 1,000 blue whales left, while the number of humpbacks is about 10,000. Both of these are now protected, but the fin and sei whales, which form the basis of the industry today are not.

"It is hard to understand," says a writer in the Australian *Financial Review*, "why the whaling industry does not embrace scientific all-round protection of the whales, for only by doing this does it have any long-term future at all.

"The extraordinary thing about the history of the whales is that the industry has seemed unable to grasp the self-evident fact that its fate and that of the whales are inextricably bound up."

SLAUGHTER TECHNIQUES

Research scientists on the whaling factory ship "Sovietskaya Ukraina" reported very successful results from the use of the South American arrow poison curare as an alternative to the explosive charges still used for whale-killing. Curare causes rapid anaesthesia and the carcase floats until picked up.

The electric harpoon has also long since been proved an effective and relatively humane killer, but the whaling industry has shown little interest in adopting it.

WHALING FIGURES

An indication of the catastrophic fall in the Antarctic whale catch is given by the following figures selected from statistics published in the Norwegian Whaling Gazette for August.

Season	Catch in Blue whale units	Oil product'n in barrels
1954-55	15,323	2,061,789
1961-62	15,252	2,001,961
1962-63	11,306	1,495,779
1963-64	8,429	1,299,476
1964-65	6,986	1,017,611

The agreed maximum catch was lowered from the usual 15,000 blue whale units to 10,000 in 1963-64 and to 8,000 in 1964-65, but this in no way affected the total catch, since neither in 1963-64 nor in 1964-65 was the actual catch as high as the agreed maximum.

In actual numbers of whales caught the drop is not shown so markedly: e.g.,

1961-62	37,359
1962-63	30,159
1963-64	28,921
1964-65	31,413

This is because the kill of the huge blue whales has dropped from 1,118 in 1961-62 to a mere 20 in 1964-65, and there has been a less-marked but still significant drop in the kill of fin and humpback whales: with a corresponding increase in the kill of the much smaller sei whales: 4,749 in 1961-62 and 19,874 in 1964-65. As the Norwegian Whaling Gazette says: "The great increase in the catch of sei whales is due to the fact that the expeditions have, owing to the fall off in the catch of fin whales, concentrated their activity on fields where occurrences of sei whales were largest."

The drop in blue whales caught has not been due, to any great extent, to restrictions recently imposed. There was a steady fall from the 6,966 in 1950-51, through 5,124 in 1951-52, 2,684 in 1953-54 and in the past four seasons

1961-62	1,118
1962-63	947
1963-64	112
1964-65	20

FOOD FROM ANTARCTIC SEAS?

The Melbourne "Age" on September 2 featured in its Science Notes an article by K. C. Hines, "Food Production of the Future". The following reference to the possibility of obtaining food for a starving world from the teeming waters of the Antarctic will be of interest.

"The last of the unorthodox methods of food production involves the harvesting of plankton, vast shoals of tiny animals and plants which swarm particularly in the Polar seas.

"Following on the publication in 1962 of Marr's report on the 'Natural History and Geography of the Antarctic Krill' (one of a series of reports on the Discovery voyages in the Antarctic), there has been great interest in the possibility of producing protein from the enormous quantities of these small prawns which, if unsatisfactory for human consumption, would at least provide a rich source of nourishment for domestic animals.

"Research of the kind carried out by Marr and others has demonstrated a marked correlation between the distribution of the large whales and the shoals of krill, and has also investigated the importance of this form of marine life for all the animal populations of the Southern Ocean.

ANTARCTICA AWAITS THE HOVERCRAFT

(See "Antarctic" June, p.109 and September, p. 150).

The British Antarctic Survey may test a hovercraft in the Antarctic next year, states a press message from London dated October 25. The great attraction of the hovercraft or A.C.V. (Air Cushion Vehicle) is its apparent ability to carry supplies from ship to shore over loose ice. It is also hoped that hovercraft will be able to skim across snow-covered crevasses.

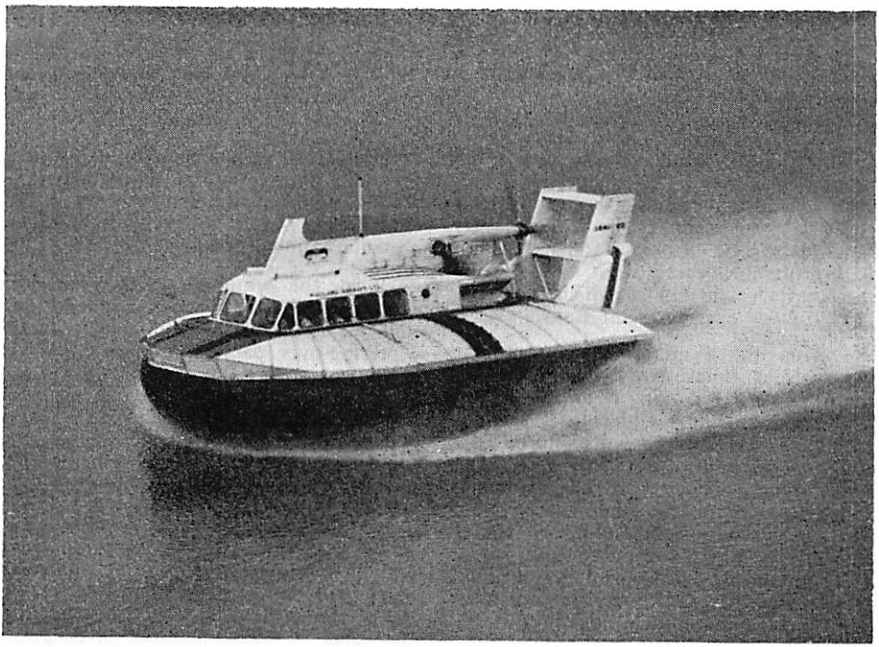
A trial small hovercraft is being built at the Kingston College of Technology, and it may possibly be ready for trial this coming season.

Hovercraft are being used by Americans in the Arctic, but snow conditions in the north are quite different from those encountered in the Antarctic. However, the pressure of even the lightest tractor available would be greater than that of a hovercraft. Unfortunately, a hovercraft would cost about £93,750, whereas a Sno-cat costs about £7,500.

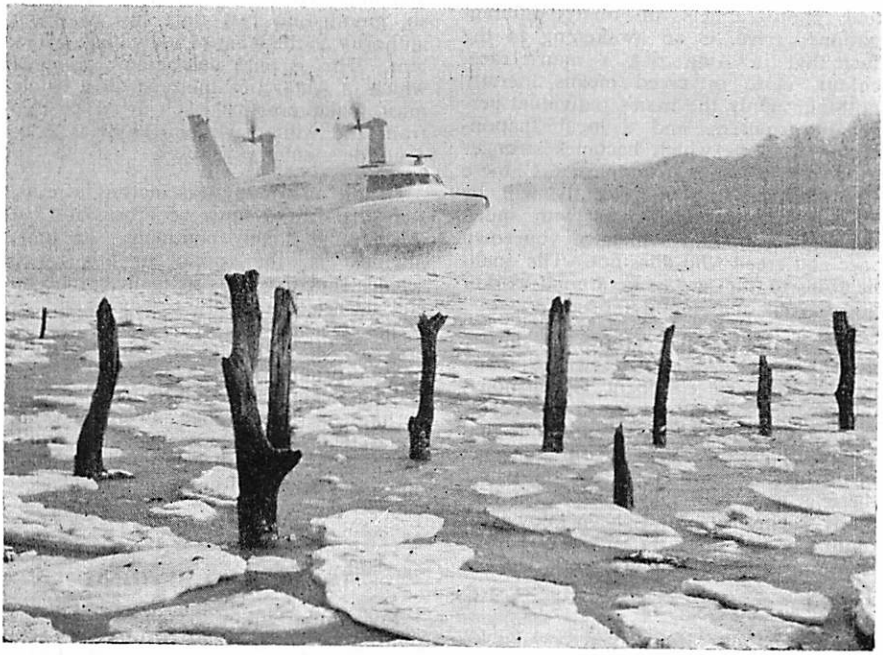
The 30-minute colour film, "140 Days Under the World" produced by Geoffrey Scott and Oxley Hughan, was made in close co-operation with the Antarctic Division from the planning stages on; and in collaboration also with the Antarctic research division of the U.S. Navy Department

Kell Fowler says: "For me the most fascinating thing was trying to catch the personalities of the men. They are all dedicated types, with strong personalities. One of the scenes, I feel, that perhaps captured something, was the one of the return of the explorers to Scott Base . . . sun-tanned, enthusiastic. They had by then qualified for the title of O.A.E.—Old Antarctic explorer—and they looked it".

"It is significant that the Russians intend to send a special ship to the Antarctic next summer for the investigation of krill."



SR. N5 during trials.



SR. N2 operating over ice in England.

ANOTHER VALUE OF ANTARCTICA

By Adrian Hayter*

Many ask "What return does Antarctica give us?" The question may spring from a genuine interest or from a sense of responsibility as a tax-payer; but it is a good question, and its answer will probably decide what becomes of the Ross Dependency of which the "capital" (in our eyes) is Scott Base.

During the summer, with continual daylight, at times every man is called upon to work very long hours, when the problem is to find the time to sleep and recuperate in order to work more. This arouses the first query; why is it that today, when society generally demands shorter hours, each year many New Zealanders knowingly volunteer for a way of life in opposition to that generally demanded? And why do most of those, after the experience, treasure it as one of the best of their lives?

Another noticeable lesson of the summer, when visitors, scientists, newsmen and photographers of many different nations arrive, is an awakening to the fact that in Antarctica a man's race, colour, caste or creed means literally nothing. Only the man's individual personality matters, and a local "nationality" develops which becomes stronger than others. For example, a Chinese Communist who "fits" locally will be welcomed into your mess with much more warmth than a man of your own race and creed who does not. The qualifications to "fit" are to be a good worker and devoid of pompous nonsense.

Yet we must be careful of smugly asserting that Antarctica (where many nations share a continent in harmony) demonstrates a pattern for world peace. It merely demonstrates the principle that where all nations share a common goal, in this case scientific research, and where there is no greed, they can live in harmony. This truism has been known for centuries, but does its successful application in Antarctica only work because nothing worth being greedy about has yet been discovered? Perhaps (for example) only if oil were discovered in the Dry Valleys would we find how genuine our international co-operation really is.

During the winter the pattern changes. The visitors, field parties and summer staff depart, to leave the very reduced wintering-over party in isolation; but it is the isolation of a group not of the individual, and this with the harsh environment outside quickly teaches any man that the fundamental problem is to find how a number of individuals all different and all insistent upon their freedom, can live in concord to ensure as a group the security which each individual needs as much as his friend.

As with any group there must, of course, be a Leader who, on paper in this case, is understandably given total authority, but who (when the last plane and ship have departed not to return for six months) in fact only has as much authority as the team of individuals allow him. This is pure democracy, an ideal which in Antarctica the team as a whole must make practical if it is to emerge from the winter without physical accidents or mental psychoses.

Of all the many fascinating aspects, some harsh and some very beautiful, of this strange lonely continent, the most obvious is the pre-occupation with science; but may this in truth not be an end in itself but only a way to it. It is possible that the true value of Antarctica is the stimulus to think of basic human problems, to which science can provide never more than half the answer; perhaps in the strange awareness that Antarctica arouses lies the other half, to complement our scientific knowledge and bring more sense to our world as a whole.

* Author, soldier, lone voyager, and Leader, Scott Base, 1964-65.

INDEX AND BINDING

For important particulars regarding putting your copies of "Antarctic" into permanent form, see pages 213 and 215.

ANTARCTIC BOOKSHELF

BIOGEOGRAPHY AND ECOLOGY IN ANTARCTICA. Edited by J. van Mieghem and P. van Oye. Dr. W. Junk Publishers—The Hague, 1965. Price: 115 guilders or $31.95.

(Reviewed by C. A. Fleming)

This cloth bound book of XXVII + 762 pages (146 figs. and 24 plates) is volume XV of *Monographiae Biologicae*. It contains an introductory section and 18 articles by authors from New Zealand, Australia, Japan, Hawaii, U.S.A., Great Britain, Holland, Sweden, U.S.S.R. and France, edited by officers of the Belgian Centre National de Recherches Polaires. Coverage is admittedly incomplete since several groups of organisms are not dealt with. The chapters have full bibliographies and with one exception are in English. The double-column index occupies 10 pp.

The introduction (J. Schell) reviews the history of exploration and summarises the following chapters, which are of unequal length, ranging from 7 to 97 pp. Geology, by New Zealander H. J. Harrington, is well covered by a stimulating review including some brave new interpretations of Antarctic history, combining drift and land-bridge concepts. Descriptive sections on climatology (M. J. Rubin) and oceanography (F. Ostapoff) serve as introductions to the biological chapters. Fresh-water algae receive a detailed survey by M. Hirono, lichens a briefer treatment by C. V. Dodge, who concludes that they probably colonised *de novo* from Fuegia, so long ago that their ancestry is scarcely recognisable. N. M. Wace introduces his chapter on higher plants by a review of Antarctic plant fossils. He divides living circum-Antarctic plants into "Tertiary continental" and "Quaternary (*sic*) insular" groups, and (like the present reviewer in several published papers) has underrated the extent to which earlier plant-geographers (Schimper; Cheeseman) recognised the separate histories of these elements. Wace also reclassifies Antarctic vegetation structurally. He accepts an "Antarctic flora" and its explanation through closer land connection during or since the Cretaceous, in a refreshing and balanced discussion.

J. M. Sieburth's review of Antarctic microbiology (28 pp.) includes an appeal for more systematioc field studies. P. M. Davies gives a fascinating summary of planktonic circumpolar Chaetognatha and their life histories. J. C. Yaldwyn has documented Antarctic-Subantarctic decapod Crustacea. A. W. B. Powell's essay on the Mollusca includes interesting contributions on the age of the fauna, bipolarity, faunal areas, and the families represented, based on a scattered and growing specialist literature to which he has contributed so much. M. Vervoort, the late Dr. Mary Rogick and P. Dalenius contribute succinct reviews (with check-lists) of Antarctic free-living Copepoda, Bryozoa, and mites. J. L. Gressitt gives a well documented and illustrated account of Antarctic land arthropods, whose make-up is determined by hostile environment and erratic dispersal.

A. P. Andriashev's review of Antarctic fishes is thorough and refreshing, even if the term "Notal Zone", for the Subantarctic, seems an unnecessary addition to scientific jargon. He discusses problems relating to an over-deep continental shelf, cold adaptation, reproduction, white bloodedness, the fish remains on shelf ice, the boundaries (and subdivisions) of the Antarctic Region, bipolarity, and the origin of the fauna, confirming Reegan's opinion that the endemic Notothenoid families imply a long period of development in cold seas.

Longest chapter of all is the Ecology of Antarctic Penguins by J. Prevost and J. Sapin-Jaloustre (97 pp., in French; 36 photographs), introduced by a detailed survey of environmental factors, including microclimatic data from Adelie Land. Accounts of the Adelie and Emperor are liberally illustrated by growth-curves and graphs showing seasonal abundance, thermo-regulation, gonad, thyroid and liver cycles, and mortality. The cycles of Emperor and King penguins are compared in a discussion of the evolution

of behaviour in *Aptenodytes*. K. H. Voous gives a comprehensive account of other birds, including discussions of colonists from the northern hemisphere, breeding seasons and zonal species-pairs, predators, food, range at sea, and migration.

The final chapter on human adaptation to Antarctic life (by O. Wilson) may seem somewhat out of place, but should be read as a scholarly contribution to the autecology of the dominant land mammal of modern Antarctica.

The authors have struggled to keep up with the mushrooming literature of the past decade, with uneven success since some manuscripts were apparently completed well before publication.. It would be churlish to criticise the sometimes inadequate editing of translations when so much has been done to make them available to an English-speaking public, but a little more trouble would have saved many solecisms. Many chapters are no mere compilations, and the volume must rank as a primary reference for many facts and interpretations in Antarctic biology.

ANTARCTIC FIRST AID MANUAL.

Although Mr. A. J. Heine's manual reviewed in our last issue is "not for sale", the Antarctic Division will gladly forward a copy so long as the small stock lasts, to any genuinely interested person. Application should be made to the Information Officer, Antarctic Division, D.S.I.R., P.O. Box 6022, Wellington.

"ANTARCTICA"

SOCIETY'S BOOK PRAISED

The authoratative and comprehensive survey of modern Antarctic research, edited by Dr. Trevor Hatherton and published for the New Zealand Antarctic Society, the New Zealand edition by Reeds, is now available.

Reviewed in "Antarctic" Vol. 4, No. 1 (March, 1965) this impressive volume is now on sale in New Zealand bookshops, and has been given long and laudatory reviews in the press, both here and overseas.

The N.Z. retail price is £5/5/-, but copies are available to Society members only at a considerably reduced price. Apply to your branch secretary.

CAPTAIN SCOTT — THE FULL STORY, by Harry Ludlam. London, Foulsham, 239 pp., ill. Published price 30/-.

The time has come for a franker assessment of the character and achievements of Robert Falcon Scott than was perhaps possible when the earlier biographies (Gwynn 1929, Seaver 1929) were written. Harry Ludlam, in this new "life" has, judging by the sub-title, had this re-assessment in mind. He has drawn to some extent on letters and contemporary newspaper reports to portray some aspects of Scott's character which other biographers have not been aware of, or have deliberately left unmentioned. But there are no revelations to those who have read at all widely in earlier books, and there is no justification for the suggestion that Ludlam has "debunked" the legendary Scott, who remains, despite his limitations, the noble figure who aroused the hero-worship of a generation.

This is a book that will appeal more to the ordinary reader than to those who are already familiar with the Scott epoch in Antarctic exploration. It is, strictly speaking, a readable account of Scott's expeditions rather than a "full" biography of Scott. His early life is neatly but succinctly sketched: the delicate, rather moody boy, the "Britannia" cadet with his "horror at the sight of blood" and a "tendency to seasickness" who had nevertheless a "spontaneous gaiety" and was the "natural leader in boyish escapades". But 200 of the 230 pages of text are devoted to the preparation and carrying through of the two great expeditions and the almost humiliating appeals for financial support which preceded and in one case also followed them. In fact, the amount of space devoted to this going round "hat in hand" on "a third-class ticket" to solicit funds is quite disproportionate. One would have liked less about the pounds, shilling and (literally) pence given grudgingly by this one and that, details of the lectures delivered both in the United Kingdom and at Cape Evans, and particulars of awards bestowed, and more about the inner springs of the man as visionary, planner and leader.

However, Mr. Ludlam has been an assiduous collector of information and

conscientious in his presentation of it. The Antarctic specialist will welcome the new material even if it is not particularly illuminating. The author's assessment of the causes of Scott's "failure" is well balanced and helpful. For the person who is new to the Scott story the very fact that space is also given to the journeys and contemporary expeditions in which Scott himself did not take part will satisfactorily round off the picture. As Peter Scott says: "It covers the story very well".

—L.B.Q.

ANTARCTIC BIBLIOGRAPHY

Antarctic enthusiasts have for so long been frustrated by the absence of any up-to-date bibliography comparable with the *Antarctic Bibliography* published by the U.S. Bureau of Aeronautics, Department of the Navy, so long ago as 1951, that they will assuredly welcome with open arms the publication of *Antarctic Bibliography,* Vol. I. This quite massive volume of over 500 pages covering only Antarctic books in 13 languages, published between 1962 and 1964, affords striking evidence of the ever-increasing documentation of Antarctic exploration and research.

This most comprehensive and valuable bibliography has been prepared by the Cold Regions Bibliography Section of the U.S. Library of Congress, with funds from the National Science Foundation. It is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., U.S.A. Price $4.25.

The publications are listed under General; Biological Sciences; Cartography; Expeditions; Geological Sciences, Ice and Snow; Logistic, equipment and supplies; Medical Sciences Meteorology; Oceanography; Atmospheric Physics; Terrestrial Physics, and Political Geography. Over 75 per cent. are in English. In the "Expeditions" section alone there are 54 entries. Of the 2,000 publications listed, some 900 are of American origin. Of the remainder, 17.5 per cent. are from Britain, 5.2 per cent. from France, 4.3 per cent. from Japan, 3.5 per cent. from New Zealand, and 2.1 per cent. from Australia, with smaller numbers from another 23 countries.

The abstracts (mostly from 50 to 250 words in length) are not critical, but are intended to indicate the nature and coverage of the work. They are excellently done. Altogether, this is a most commendable piece of work. New Zealanders will regret the avowed intention not to use the term Ross Dependency, presumably regarded as having political significance, but will rejoice to notice that the attempt has not been wholly successful!

One is left with a hope that the compilers will somehow manage to produce a Bibliography covering the "missing" period, 1952-1961, and so place us even more completely in their debt.

GAZETTEER OF THE AUSTRALIAN ANTARCTIC TERRITORY (A.N.A.R.E. Interim Reports: Publication 75). Compiled by G. W. McKinnon, Antarctic Division, Aust. Dept. Ext. Affairs, Melbourne, 153 pp.

This annotated list of approximately 1,300 place-names covers an area, parts of which have been explorel by expeditions from Britain, France, Germany, New Zealand, Norway, the U.S.A. and the U.S.S.R., as well as from Australia. The naming has been finalised only after consultation with the British, New Zealand and United States Antarctic Place Names Committees when these countries were involved. Many of the names were suggested by New Zealand following the journeys "across the border" into Australian Antarctic Territory by Carlyon and Ayres, Miller and Marsh, and Brooke's party of the Trans-Antarctic Expedition, and by later New Zealand field parties led by Walcott, Gair Hewson, Willis, Miller, Laird, Le Couteur and Ford. These place-names are included in the gazetteer.

In each case brief details are given of the location, discovery and nature of the feature, and of the significance of the name given to it.

THE STRUCTURE OF ANTARCTICA AND ITS ICE COVER, by Charles R. Bentley. 55 pp., charts and digarams. Reprinted from Research in Geophysics, Val. 2; Solid Earth and Interface Phenomena. Massachusetts Institute of Technology, Cambridge, Massachusetts, 02142, U.S.A. (Review copy from University of Wisconsin Geophysical and Polar Research Centre.)

Though written by a glaciologist for glaciologists, this is one of those scientific papers which contain much of value to the layman with some general interest in and knowledge of the Antarctic.

TELLING THE CHILDREN

Two recent publications are specially designed to interest New Zealand school children in the Antarctic and to inform them about the work New Zealanders are doing in their own Ross Dependency.

LEAFLET

The first, a fact-filled leaflet written by Dr. B. Stonehouse, was published under the sponsorship of the Christchurch City Council and the Canterbury branch of the Antarctic Society. Five thousand copies were sent to intermediate and secondary schools to mark Antarctic Week.

The leaflet is well illustrated, and has maps of the area. It gives information on Antarctic exploration, topography, climate and recent developments, written from a New Zealand point of view.

BOOKLET

The second publication is THE ROSS DEPENDENCY IN PICTURES, by L. B. Quartermain, and was produced by the Government Printer for the Antarctic Division, D.S.I.R. It consists of 35 pictures of Antarctic scenes, grouped under "Getting There", "The Place", "The Men" and "Into the Field". Each picture is explained in approximately 200 non-technical words. There are two maps and a short bibliography. A copy has been sent to each of the 2,000 schools in New Zealand, and the demand for additional copies which has resulted points to a likely re-print.

ERRATUM

June issue, p. 102. Bouvet Island: sub-title for South Africa read **Norway.**

THE VETERANS

FELIX ROONEY

The death occurred in Wellington on November 4, 1965, of Felix Rooney.

Mr. Rooney was born in Glasgow in 1885. At th eage of 21 years he left London for New Zealand with Shackleton's British Antarctic Expedition, 1907-09, as a member of the crew aboard the S.Y. "Nimrod".

On returning from the Antarctic he decided to remain in Lyttelton. He served on Trans-Tasman and coastal ships, including the "Cygnet" and the "John Anderson", till the outbreak of the first World War, when he joined the 1st Canterbury Infantry Battalion. He served on Gallipoli and the Western Front until the end of the war, except for a period in hospital after he became a casualty at Armentieres. After the war he married an Irish girl, who died some years ago.

He was with the Union Steam Ship Coy. for 24 years, retiring 19 years ago. For the past 10 years he has resided with his eldest daughter in Lower Hutt. He is survived by one son and three daughters.

HONOURED NAMES

Recent deaths of men noted for their contribution to Antarctic exploration and research include that of

Hjalmar Riiser-Larsen (74). After a notable series of Arctic flights, he led a Norwegian expedition to the Antarctic in 1929, which charted the Queen Maud Land and Crown Princess Martha coasts. In 1931 he added Princess Ragnhild Land to Norway's sphere of operations. As General Riiser-Larsen, he died in Copenhagen on June 3.

FRANK DEBENHAM

It is with deep regret that we learn, as this issue goes to press, that Professor Frank Debenham died in a Cambridge nursing home at the age of 91. One of the fine band of scientists on Scott's Last Expedition, "Deb," as he was affectionately known, never lost his active interest in the Antarctic, and was always eager to help anyone engaged in Antarctic research.

We hope to publish a tribute, in our next issue, by one who has long worked with him and knew him well.

50 YEARS AGO

CHRISTMAS DAY, 1915

December 1915 found both the Weddell Sea and the Ross Sea components of Shackleton's Trans-Antarctic Expedition in trouble. "Endurance" had been trapped in the Weddell Sea, crushed, and finally sunk on November 21. The 28 men already out on the sea-ice now needed something more robust beneath them than "Ocean Camp", and on December 22 set off dragging two of the ship's boats to find a more secure campsite. They celebrated Christmas before they started.

Carpenter **Harry McNeish** recorded in his diary*: 22nd Dec.

> "Xmas Day with us and I hope you are all having a good Xmas at Home. I have been busy today but I managed to get the sledge ready as we start at 4 a.m. tomorrow there has been no scarcity of food and we can lift and eat anything we want today as we have to leave a lot behind".

Shackleton in "South" recalls the same day:

> "For the last time for eight months we had a really good meal—as much as we could eat. Anchovies in oil, baked beans and jugged hare made a glorious mixture".

Of the 25th he says:

> "We wondered . . . as we sat down to our"lunch" of stale, thin bannock and a mug of thin cocoa, what they were having at home".

McNeish says: "It has been snowing most of the time".

Over on the Ross Sea side, nine of the ten marooned by the break-out of the ice enclosing "Aurora" were sledging south after a tough winter at Cape Evans, to lay depots for Shackleton's expected crossing party. On Christmas Day Joyce, with five others, was approaching the Minna Bluff depot. He wrote in his diary**:

> "Xmas Day on the Barrier. All days are the same in these regions. Up at 5.30. Wished all hands the very best. Dug out camp and under way at 8 o'clock. Going same as yesterday sinking in up to the knees in places, lunched at noon. Under way 1 o'clock. A peculiar thing is everyone has been talking about good things, especially smoking. It makes one long for same especially when you are on the trek, as there is no conversation except when one halts for a spell. Ah well, will make up for lost time when we get relieved. Camped 5.45. Dist. 8¾ miles. About 5 miles off Depot. Blizzard 9.50".

Joyce's entry for Sunday 26th and Monday 27th is simply:

> "Still blizzarding, laid up".

AUSTERITY?

By contrast with the above, here is a report from France of the rugged conditions awaiting the new French team for Adélie Land.

Fifty-four Frenchmen are now on their way to the French Antarctic base at Dumont D'Urville. More than half of them will stay in Antarctica for 15 months. The others will be there for three months.

"And we shall drink only Australian wine," Mr. Rene Merle, 54, deputy leader of the expedition said.

"It would be foolish to take French wine with us when Australian wine is so fine."

The French expedition will get supplies of Australian meat and vegetables as well as wine in Hobart and take them by ship to Dumont D'Urville, leaving Hobart on December 7.

But the cooking in Antarctica will be all French and the bread will be like the bread of Paris, because in the expedition team are two French chefs, one of whom is a master baker, as capable of turning out authentic crusty baguettes, hot croissants and brioches in the ice bound wastes of Antarctica as in the Champs Elysees.

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* MS in Turnbull Library, Wellington, N.Z.

** MS in Turnbull Library. Published with considerable "editing" in Joyce's book "The South Polar Trail", 1929.

MEN FROM THREE NATIONS AT LAKE VANDA

In an article in the Russian newpaper "Vodny Transport" of 23 September, I. Zotikov, the Russian scientist in charge of the party which investigated the heat problem at Lake Vanda, in the Taylor Valley, early this summer, tells of the party's work.

Four of us left McMurdo in a helicopter heading in the north-easterly direction towards the lake 120 km away. We reached our destination on the 1st September and began to make ourselves at home on the lake's deserted shore. There was one New Zealander, physicist George Jones; two Americans, technician David Cook and a naval officer John Ditmar, and myself. We set up two tents and fixed the recording equipment for temperature, water salinity and its optical properties. We assembled the power-drill and a temporary power plant and got ready other necessary equipment.

Lake Vanda gave us an unusually cold welcome for this time of the year. The thermometer was down to −45 −49°C. The generator and drill motors would not start and we had to warm them up in the tent on the flame of our oil-burner. The drill holes in the lake ice cover kept freezing over.

Two days later we obtained our first scientific data. The thickness of ice on the lake was about 4 m. Underneath was free water whose temperature increased with the distance from the ice cover. At a depth of 12 m. there was a 30 m. wide belt of water with a constant temperature of 7°C and near the bottom at a depth of about 60m. the temperature was 25°C.

Our subsequent measurement confirmed these initial results. A study of the result disclosed an intense flow of heat from the bottom of the lake. This flow exceeds many times the degree of heat which normally flows from the interior of the earth. Our calculations revealed a considerable concentration of salts and high density in the low-lying layers of water. These layers do not mix with the upper layers and therefore the flow of heat measured by us is sufficient for maintaining throughout the year a 25°C temperature in the layers near the bottom of the lake.

We stayed nine days at Lake Vanda and worked in heavy frost and piercing winds. We never succeeded in establishing radio contact with the American base, and Ross Island never heard our calls. The valley in which Lake Vanda is situated turned out to be impenetrable to radio waves.

We finished our work on Lake Vanda on the 9th September. The last night was particularly nasty. Gusts of wind reached 35 m. per second. We were afraid our tent would be torn to shreds. Towards morning, as often happens in Antarctica, the wind dropped. In McMurdo they seized this opportunity to send out two helicopters to collect us and take us back to McMurdo.

S.P.R.I.

The Scott Polar Research Institute in Cambridge, England, built in memory of Robert Falcon Scott, has been granted $280,000 (£100,000) by the Ford Foundation to enable the construction of a three-storey extension to the present brick building. The extension will provide accommodation for lecture rooms, administrative offices, map and drawing room, laboratory, storage for archives and film, workshop, darkrooms, a cold room and eight research rooms, as well as for extensions to the museum and library.

It is hoped that building will start in the spring of 1966 and be completed by the end of 1967. All who have experienced the friendly and efficient help so generously extended by the staff of the Institute to, among others, those interested in Antarctic research will welcome the news that the facilities of the S.P.R.I. are to be so satisfactorily extended.

A BIG 'UN

The "Nella Dan" back in Australian waters from the Antarctic reported an iceberg 90 miles long and 30 miles wide off the Kemp Coast, blocking the approaches to Edward VIII Bay.

TRANS-ANTARCTIC ASSOCIATION HELP AVAILABLE

Following the successful conclusion of the Trans-Antarctic Crossing the Expedition, through sale of publications, films and photographs, made a profit, the principal of which was invested in order that there would be a regular income which could be put to worthwhile Antarctic causes.

Long discussions took place between the London and New Zealand Committees as to the best form of assistance which could be granted from the funds. The total sum varies each year, but it is of the order of £1,700 per annum, one-third of which is available for use on the recommendation of the New Zealand Committee, confirmed by a joint committee which meets in London to make the final allocation.

Applications should be sent in before February 15 each year, and in the case of applications through the New Zealand Advisory Committee, should be sent to Mr. A. S. Helm, the Secretary, New Zealand Trans-Antarctic Association Advisory Committee, 37 Worcester Street, Wellington, New Zealand.

Briefly, the objects for which the Association is established are:

(a) To promote, organize, encourage or support expeditions for the exploration of the Antarctic regions.

(b) To encourage or support education or research in the various sciences so far as they apply to the Antarctic.

(c) To encourage or support the dissemination or information acquired as the result of the foregoing objects.

SCIENTISTS WATCH ANTARCTICA

It is becoming almost a habit to include a session on some facet of Antarctic research in the programme of important Science gatherings. At the Congress of the Australian and New Zealand Association for the Advancement of Science held in Hobart in August, attended by over 2,000 delegates, one of the principal symposia dealt with Antarctic Biology.

RECOGNISE IT ?

Art critic Elwyn Lynn, reviewing in *The Australian* an exhibition of 26 Antarctic paintings by Sidney Nolan, says:

"Never has man looked so isolated and vulnerable as the men in the South's vast desolation. They are dressed in dreary grey; their sunglasses turn their anguished gaze inwards; one is hollow-eyed, desperate and not unlike Nolan himself.

"Some look indigenous, yet unwanted: some are wafted up like mirages, real and unreal. One, on a brown pony, is naked, his leg a brilliant green . . .

"The masts of a ship, caught in the cold, blue ice, break into a yellow foliage in protest against the barrenness. In another, a bird swoops towards a crag of ice while the indigo sea beyond plunges to eternity. Two figures, almost indiscernible, stand beneath a reddened flag streaming in the wind. All the while the landscape heaves, glaciers writhe and undulate, almost cascade with slashed and curdled paint."

"Nolan's Antarctica," says the critic, "is the Anxious and Apprehensive Land."

WELL!

Nearly all of the 26 paintings were sold **in an hour** at Melbourne's Australian Galleries in September. The lowest price for any one of the paintings was £1,000.

YOU'RE LUCKY

An unexpected cache has revealed a very small bundle of early issues of the

ANTARCTIC NEWS BULLETIN
1950-1955

There has been a constant demand for these issues from collectors and from enthusiasts keen to complete their sets, and this very small stock will be speedily exhausted.

Meanwhile copies are now available of all numbers **except** number 18. Copies of numbers 1, 2 and 3 are authorised reprints (1955). Price 5/- per copy.

"ANTARCTIC"

A few copies have also become available of Vol. 1, number 2, Vol. 2, numbers 1 and 2.

DENMARK RATIFIES ANTARCTIC TREATY

On May 20, 1965, Denmark ratified the Antarctic Treaty and thereby joined the group of nations which subscribe to the principles of the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica.

The International Geophysical Year in 1957/58 resulted in unparalleled international cooperation in scientific research in Antarctica, and the Antarctic Treaty came about as a result of the desire to continue this peaceful cooperation between nations to the benefit of all mankind.

Denmark's ratification of the Treaty recalls the participation of the Lauritzen Lines' "Dan" ships in many of the scientific expeditions working in Antarctica.

The Antarctic Treaty has now been ratified by the following nations: Argentina, Australia, Belgium, Chile, Czechoslovakia, Denmark, France, Japan, New Zealand, Norway, Poland, South Africa, The United Kingdom, The United States of America, The USSR.

WELCOME AWARDS

Many New Zealanders will be pleased to learn of two recent awards to Australians.

John Bechervaise, a Victorian, has been awarded the Royal Geographical Society's John Lewis Gold Medal for his work as explorer, writer and educationist, Mr. Bechervaise, who is 55, has led three Australian National Antarctic Research Expeditions, and this summer was at McMurdo as the Australian Government's official observer with the American "Operation Deep Freeze".

P. J. Milne, a member of Australia's Macquarie Island team in 1961, and till recently in charge of the observatory in West Samoa, has won a Seato Fellowship to study seismography in South East Asia. While at Macquarie Island he installed and operated seismic apparatus. Mr. Milne has been a valued contributor to "Antarctic".

We congratulate our two contributors on their well-deserved recognition.

SCOTT ON RADIO

Australian Stations have been broadcasting Douglas Stewart's radio play, *The Fire on the Snow*, the dramatic re-telling of the tragic finale of Scott's Last Expedition, first broadcast in Australia in 1941, and over New Zealand stations in 1949. Described as "one of the most acclaimed Australian works for radio" the play occupies about an hour. When it was first produced, the A.B.C. Weekly noted that it had provoked more correspondence than had any other A.B.C. play or features and devoted an editorial article to "The Beauty of Words" with special reference to Stewart's language.

Douglas Stewart, a New Zealander, attended Victoria University, Wellington, before working his passage to England and back to Australia where he joined the staff of the Sydney "Bulletin".

Perhaps the N.Z.B.C. might be persuaded to give New Zealand listeners another chance to hear this distinguished New Zealander's work.

LESSON FOR THE WORLD

In a message issued on May 1, following his receipt of the first report by his Antarctic Policy Group, President Johnson said:

"I have been deeply impressed by the sensible way in which the 12 nations active in Antarctica work together. In that frozen continent. . . . National differences are no barrier to a common effort in which everyone gains and no one loses. The scientific findings of all countries are pooled for the benefit of all. Men in danger or in need can call for help knowing that it will be given unstintingly by any country that can provide it.

"We are now celebrating International Co-operation Year. It is my earnest hope that the same success that has marked the Antarctic programme can be extended to every field of international endeavour, not only during this special year, but in future years as well."

THE "DAN" SHIPS

The proud record of the Lauritzen Line Polar vessels was upheld during the 1964–65 summer season.

The **"Nella Dan"** carried relief personnel and supplies to the **Australian** Mawson station and evacuated the Davis station. Using the "Nella Dan" as base the Australian expedition also carried out various surveys in Enderby Land by means of helicopters and a ski-mounted plane.

The **French** relief expedition and supplies were carried by the **"Thala Dan"** to the Dumont d'Urville station on the Adelie Coast, and the "Thala Dan" was furthermore used by the Australian expedition to supply the Wilkes station and evacuate the Davis station.

The **"Magga Dan"** took the combined **Belgian/Dutch** relief expedition and wintering supplies to the Roi Baudoin base in Breid Bay on Princess Ragnhild Coast. On the voyage the expedition carried out various scientific work.

The **"Kista Dan"** relieved the **British** station of Halley Bay in the Weddell Sea, calling en route at the Falkland Islands, South Orkney Islands, and South Georgia.

YACHT IN FAR SOUTH

A Wellington-built 11 ft. yacht is believed to be the first ever sailed inside the Antarctic Circle.

Designed by Dr. H. H. Wagstaff, of Eastbourne, the yacht "Tiny Too" was bought by Lieut.-Commander S. A. Coakley, of San Diego, a helicopter pilot aboard the U.S. icebreaker "Stalen Island".

The yacht was launched on McMurdo Sound on February 5. The water was 26°F. The skipper was attired in a neoprene wet diving suit, but was careful to choose suitable weather to avoid a ducking.

"Some thin ice was forming on the surface, so she even got in some honest to goodness ice-breaking," Lt.-Cmdr. Coakley wrote to Mr. Wagstaff.

The Moth class yacht, a double-chined craft, has a 4 ft. 9 in. beam to support its 80 square feet of sail.

INDEX

We regret that a statement in our September issue, "An index for volume 3, has been prepared", while correct, gave the impression that the index was printed and available. In fact, printing has only just been completed and copies will be posted to those who have ordered them.

Please note the price, 3/-.

For Uniform **Binding** forward the 12 issues, March 1962-December 1964, **with index to**

Express Binding Service,
P.O. Box 3428, Wellington.
Price for Binding only 15/-.

THE UNFINISHED MAP

Antarctic men have long pondered the possibility of an ice-filled strait linking the Ross Sea and the Weddell Sea. Surface traverses and air observations in recent years seem to have proved conclusively that no such frozen water-way exists. Dr. T. O. Jones, Head of the United States Office of Antarctic Programs, states categorically, "no 'Channel' below sea level connects the Ross and Weddell Seas." The Heritage Range, the Ellsworth Mountains and the Horlick Mountains completely bar the way.

Not long ago such a conclusion would have seemed to be definite proof that the Antarctic is one great continent. However, the probing of the ice-cap in recent years by seismic sounding and radio altimetry has disclosed that much of the earth's surface beneath the ice of West Antarctica (the area, north of a line joining the Ross and Weddell Seas, which terminates in the Antarctic Peninsula) is below sea level, and that ice filled fjords extending far inland from the Amundsen and Bellingshausen Seas (between the Ross Sea and the Weddell Sea) make the northern part of West Antarctica west of the Antarctic Peninsula an archipelago, a vast group of mountainous islands hidden beneath the ice.

The true picture of the Antarctic's sub-glacial topography has obviously still to be revealed.

ANTARCTIC WEEK IN CHRISTCHURCH

The Antarctic Week organised annually by Christchurch civic authorities with the co-operation of the United States Naval Support Force and the Christchurch Branch of the N.Z. Antarctic Society opened on September 27 with a function in the Civic Theatre. Addresses were given by the Mayor (Mr. G. Manning), Rear-Admiral F. E. Bakutis and Mr. R. B. Thomson. During the evening radio contact was made with McMurdo Base, and the audience heard the voices of Cdr. J. L. Blades (Commander U.S. Support Force, Antarctica) and Adrian Hayter (Leader Scott Base). Admiral Bakutis presented the prizes to the winners of the school painting contest.

A display of photographs of the Balleny Islands expedition was presented in a city store, and the United States Navy held the the usual "open-house" at the Christchurch Airport. The flags of the 12 Antarctic Treaty nations were raised and lowered daily at the Scott Memorial.

ANTARCTIC CENTRE

At a meeting convened by the Canterbury branch of the New Zealand Antarrctic Society to consider ways of helping in the establishment of an Antarctic hall at the Christchurch Museum, Dr. R. S. Duff, Director of the Museum, spoke of the new three-story wing which is planned for 1970 to commemorate the hundredth anniversary of the founding of the Museum.

"We want as large a complex of Antarctic features as possible", said Dr. Duff. There was space for an L shaped wing—the larger arm 120 ft by 40 ft wide (or 58 ft wide with a centelever construction over the whale skeleton), and the smaller arm 66 ft long by 30 ft wide.

The proposed new wing would include in addition to the Antarctic Hall, 90 ft by 40 ft, a public lounge and reading room, a small display hall for special exhibitions, a hall of ethnology, stamp and coin rooms, a natural history reference room, a marine gallery and small lecture theatre.

NO LIFELESS WASTE

[Those who have tended to regard Antarctica as a barren wilderness void of all living things may be surprised to read this American summary of Antarctic biology.]

Penguins spend most of the year at sea, but breed in land rookeries. The foot-and-a-half tall Adélie penguins are the most numerous, some rookeries having about one million birds. Gull-like skuas and Leopard seals are their principal enemies. Emperor penguins are three to four feet tall, much less numerous, and breed on fast ice near land during the winter. Less is known about them. Many other kinds of sea birds are found in the Antarctic, mostly on islands or on the far-northward-reaching Antarctic Peninsula, where land life is also relatively abundant.

Parasites and microbes are widespread. Parasites heavily infest most Antarctic animals, and microscopic species from simple fungi to many-celled organisms are found in soil, water, animals, and sometimes even ice.

Primitive plants—algae, lichens, and mosses—grow on rock and soil here and there where mountain tops poke through the icecap or where the ice has receded; algae also grow in snow, meltwater, and lakes that occur in some ice-free regions.

The largest animals that live in interior Antarctica are small wingless insects, mostly silverfish-like springtales; and mites, mostly the spider-like *Nanorchestes antarticus* (no common name). Both of these arthropods live in the soil under rocks or around plants. They depend for their existence on favourable microclimates in their tiny niches—when normal air temperature is below freezing, temperature in these niches is often (when the sun is up) warm or even hot.

Biology in the Antarctic, as elsewhere in the world, consists of such studies as: *distribution*—life forms and species that exist, in what numbers at each site (or depth), where and how they move and migrate during the day and year; *behaviour; ecology*—the factors that govern distribution and behaviour, including food, predators, weather, and soil or oceanographic conditions; and *anatomy and physiology*—detailed studies of the form and inner workings of the individual.

The New Zealand Antarctic Society

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

You are invited to become a member. The membership fee includes subscription to "Antarctic."

BRANCH SECRETARIES

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

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OUT OF PRINT

Volume 1, numbers 1 and 9;
Volume 2, numbers 3, 4, 7, 8 and 9;
Volume 3, numbers 5 and 7

are OUT OF PRINT. Some others are in very short supply. Copies of available issues may be obtained from the Secretary of the Society, Box 2110, Wellington, at a cost of 5/– per copy. Indexes for volumes 1 and 2 are also available, price 2/6 each index. (An index for volume 3 has been prepared) **and is now available. Price 3/-.**

SOCIETY TIES

The N.Z. Antarctic Society tie is now available. The design is similar to those used for the ties of kindred organisations in the United Kingdom and Australia. The dark blue background, light blue and white stripes and motif of penguins and kiwis provide a striking pattern, yet a reserved note is retained over all.

Ties are available through N.Z. and Branch Secretaries of the Society at a cost of 17/6.

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