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# "ANTARCTIC"

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Editor:

A. S. Helm, M.B.E., M.A., 37 Worcester St., Wellington, N.Z., New Zealand.

Assistant Editor: Mrs R. H. Wheeler.

Business Communications, Subscriptions, etc., to:

Secretary, New Zealand Antarctic Society, P.O. Box 2110, Wellington, N.Z.

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## ACCIDENT TO VEHICLES ON TREK TO VANDA

The completion of the wintering-over station at Lake Vanda in the Wright Dry Valley, about 80 miles north-west of Scott Base, was advanced further following a helicopter and ground reconnaissance on 20 October.

This reconnaissance was carried out by the Scott Base leader, Robin Foubister; the deputy leader and leader of the Vanda Station, Bill Lucy; the base engineer, Allan Guard; the 1867-68 base diesel mechanic, Alan Magee. The group was flown in by helicopter mainly to pinpoint a route into the Lower Wright Valley, which runs off the coastal Wilson Piedmont Glacier.

It was the first time that an attempt had been made to have vehicles enter the valley, which is hemmed in by steep moraine-covered slopes and the Lower Wright Glacier. They decided that after coming off the glacier the tractor-train would have to descend about 700 ft. to the valley floor before travelling about 16 miles up the valley floor to the site of the new station, 150 yards south-east of Lake Vanda. A roadway would have to be formed off the glacier down into the valley. This would be done by a Caterpillar D4 bulldozer which formed part of the tractor-train.

Two huts had been erected at Lake Vanda last season, but the main accommodation hut for the five men who will winter over lay in a dismantled state at the foot of Hogback Hill, where it was deposited by helicopter last summer. This hut had been formerly used as a summer base for Canterbury University biology studies at Cape Royds.

The bulldozer, two tractors, and a Sno-cat used by Sir Vivian Fuchs on his Trans-Antarctic Expedition of 1957-58 moved out of Scott Base on October 22, and moved northwards up the sea ice to Cape Royds before heading west to the Wilson Piedmont Glacier.

Loaded with the huts, fuel and supplies weighing five tons, the tractor-train made good progress, travelling non-stop where possible, the six-man team rotating between driving and sleep. Shortly after midnight, on October 28, having travelled up the Wilson Piedmont Glacier without trouble, the party set up a temporary camp high above the Wright Valley. Then Bill Lucy in the Snocat, followed by Hugh Clark in the bulldozer, pushed on, when suddenly the rear of the 8-ton bulldozer broke through a snow-bridge over a crevasse. Lucy turned back to give assistance but, when within 50 yards of the bulldozer, the rear pontoons of his Snocat broke through another crevasse. Fortunately both men escaped from their vehicles unscathed.

A severe radio blackout delayed communications, but as soon as word reached Scott Base plans were made to get the two vessels out of the crevasses. As expected, this took several days, the bulldozer being recovered first, and then it was used to haul out the Snocat after recovery gear was flown from Scott Base.

Afterwards the party was dogged by mechanical breakdowns. While it was being recovered the Snocat broke a differential and a universal, and a spring which had been temporarily repaired earlier in the season. Spare parts had to be flown from Scott Base to carry out the repairs.

Following two weeks of intensive effort, the vehicles were recovered, and the two Fergusson tractors and all the equipment lowered to the valley floor. The final task was hauling the loaded trailers by the Fergussons to the site of Vanda Station. Here the party ran into a new Antarctic hazard — dust. The tractor wheels caused large clouds of dust which hindered visibility and made driving conditions extremely difficult. The trailers also suffered — being conditioned for Antarctic work, they were not equipped with air cleaners.

By the time the tractor train reached Vanda the trailers had almost stopped—their engines choked to death by dust and grit. But the main task had been completed — the vital supplies and material had reached Vanda Station.

## GERMANS LIKE SCOTT BASE STAMPS

New Zealand's southernmost post office is attracting intense interest from philatelists around the world.

In six weeks prior to December more than 1,300 letters have been handled at Scott Base: 500 received through the mail; about 400 date-stamped for personnel at nearby McMurdo Base, and 300 from the Byrd Memorial flight over the North and South Poles.

About two-thirds of the letters received in the mail came from German philatelists.

"We wondered about the sudden interest from Germany," said Scott

Base Postmaster (Mr B. C. Hool, of Thames), "until we received a letter which enclosed a newspaper cutting depicting the four Ross Dependency stamps. Apparently this appeared together with an article in a German national newspaper."

Most of the 500 letters sought the full set of stamps—two cents, three cents, seven cents and 15 cents—as well as the post office's three cachets. Payment has been made in international reply coupons which are equivalent to the cost of overseas surface mail.

Mr Hool's assistant is Mr R. J. Hancock, of Wellington. They said that Scott Base was New Zealand's busiest philatelic post office and was New Zealand's only post office to have its own set of postage stamps. New Zealand's new station at Vanda is also attracting its share of philatelic mail. More than 100 letters have so far been received. These will all be cacheted and signed by the first winter-over party when the station opens in January.



PERSONNEL AT VANDA.

# EXPEDITION TO MOUNT MINTO PROPOSED

Subject to approval by the Ross Dependency Research Committee and the Minister of Science, seven members of the New Zealand Alpine Club, one of them a woman, are planning a scientific and mountaineering expedition to Victoria Land, Antarctica, in November 1969.

The expedition will be financed by personal contributions, and by grants from the Trans-Antarctic Association, the New Zealand Alpine Club, and the Canterbury Mountaineering Club.

To be known as "MOUNT MINTO SURVEY EXPEDITION ANTARCTICA 1969", it will be the first Antarctic expedition to have a woman as a member of the field party.

Those planning to take part in the expedition are:

**Leader, Surveyor:** Mr. P. L. Squires, an electrical and mechanical engineer, with previous experience in the Antarctic during the summer of 1965-66.

**Deputy-Leader:** Mrs. M. G. Clark is a geomorphologist, and has had alpine experience in Europe, Scandinavia and North Africa. She has also climbed extensively in New Zealand, and has made ascents of Mount Cook and Mount Tasman.

**Geologist, Glaciologist:** Mr. T. J. H. Chinn, a geologist who is serving as the Glacial Hydrologist with Ministry of Works Water and Soil Division.

**Scientific Officer:** Dr. D. R. Hutton, a physicist of the University of Canterbury, will be chief scientific officer for the party.

**Assistant Geologist:** Mr. J. Glasgow, a geologist, worked in the Antarctic last season as a field assistant in North Victoria Land for the D.S.I.R.

**Transport Officer:** Mr. I. B. McDonald wintered over at Scott Base as a dog handler.

**Logistics Officer, Field Engineer:** Mr. J. K. Clark, an alpinist with ex-

perience in Europe, Scandinavia and North Africa.

All are members of the New Zealand Alpine Club, and five belong also to the Canterbury Mountaineering Club. Mr. N. D. Hardie, of Christchurch, who has had experience both in the Himalayas and the Antarctic, will be the expedition's patron and advisor.

Both the mountaineering and scientific work will be done in a largely unexplored area centred on an unnamed glacier north of Mount Minto (13,340 ft.) in the Admiralty Range, Victoria Land. Mount Minto is the main mountaineering objective.

Mount Minto is on the south-west side of Robertson Bay and about 50 miles from Cape Hallett. It was discovered in January 1841 by Sir James Clark Ross, and named after the Earl of Minto, who was First Lord of the Admiralty.

Provided the Ross Dependency Research Committee and the Minister approve the expedition as part of its scientific programme for the 1969-70 season, the party hope to leave Christchurch on or about 15 November 1969, and spend six weeks in the field when snow conditions should be at their best. This period will allow for about two weeks of bad weather.

The main scientific work will be a topographical and geological survey. A large geological fault in Mount Sabine will be investigated and samples will be taken from every rock outcrop in the system of ridges above the glacier.

Other scientific studies include sky polarisation by telephotometer, magnetic dip circle measurements, and snow sampling for radio tritium dating.

Mr. Squires said that Mrs. Clark became a member of the party because the expedition was partly her idea, and because she was such a good organiser and climber. She had been appointed as secretary.

He said in an interview that the scientific and mountaineering interests of the expedition were a useful combination because of the advantage of mountaineering experience in geological work.

The expedition would use two radio systems, one between the field parties and the second would maintain a link with Scott Base. At this time it is uncertain whether dogs or motor toboggans would be used on the field trips, but either would draw hickory sleds.

## DR HARRINGTON TO REVISIT McMURDO

Dr. H. J. Harrington, Assistant Professor, Geology Department, University of New England, New South Wales, who has several times visited Antarctica, plans to return to McMurdo this summer with USARP to carry out two tasks. One is to collect more fossiliferous rocks from Minna Bluff, for those obtained in the 1958-59 collection made with Brian Fitzgerald and John Harrison have all been used. The second purpose is to carry out a traverse through the type Beacon Sequence on the south side of the Upper Taylor Glacier. He will be accompanied by a student assistant from the University of New England this year.

## VISIT BY GOVERNOR-GENERAL

The Governor-General, Sir Arthur Porritt, will be one of the United States Navy's distinguished guests at McMurdo Station this season. Rear-Admiral J. L. Abbot, commander of the United States Navy's Antarctic Support Force, announced on 7 November that the Governor-General would visit Antarctica some time in January 1969.

Other guests would include prominent Americans such as Mr. T. Watson, the Chairman of the International Business Machine company, and Mr. D. Ripley, Curator of the Smithsonian Institute, Washington, D.C.

About a dozen United States Congressmen would also visit the ice as

guests of the Antarctic Policy Group. They would be from the Interior and Insular Affairs Committees and the Sciences and Astronautics Committee.

Admiral Abbot said that three parties of foreign exchange representatives would also visit McMurdo this summer. Representatives of the countries which are signatories of the Antarctic Treaty, they will come from the Argentine, Australia, Belgium, Chile, France, Japan, the Netherlands, Norway, South Africa and the United Kingdom.

## WILKES

### PENGUINS:

October was definitely the 'month of the penguin' at Wilkes, with the sighting of two more Emperors by Winston Nickols. Nev Dippel herded them away from the dog-line and a grisly end, and enabled more photos to be taken of what is a rare phenomenon at Wilkes. Not to be outdone, Adelie penguins arrived at the rookery on the 20th, much to the delight of Gil Maher, who won the sweepstake on the date of their arrival.

### FISHERMEN:

Four of the expedition members are keen fishermen, and they recently cut a hole in the ice, Eskimo fashion and proceeded to catch a dozen fish which were eaten with gusto.

### CHESS MATCHES:

October saw the end of the chess match between Byrd Station and Wilkes. Byrd conceded the match on account of their team's return home after seven months' play and no mate.

### BIKE AT BASE:

A new addition to the vehicle park is Frank Scaysbrook's motor bike which arrived in small pieces, was assembled during that year, and is now the latest contender for the land speed record on the Continent!

### WEATHER RECORDS:

October was a noteworthy month weather wise at Wilkes; they recorded the highest gust in 1968—98 m.p.h.; and the first temperature above freezing since middle April—32.8°F. Most amazing of all, rain was observed—most unusual for Antarctica.

# Belgian Activities in Antarctica During 1969

The scientific activities at "Base Roi Baudouin" have been temporarily suspended following the close-down of this base in February 1967, the Belgian Antarctic activities for the year 1969 being limited to a summer campaign as had previously been the case in 1968 in collaboration with the South African Antarctic Expeditions.

This campaign will be extended from December 1968 until March 1969.

## Shipping

Transport aboard the South African vessel "R.S.A."

Departure vessel "R.S.A.": Cape Town, end December 1968; Antarctica, approximately 15 February 1969.

Arrival vessel "R.S.A."): Antarctica, approximately 15 January 1969; Cape Town, 1 March 1969.

Duration of stay: From approximately 15 January 1969 until approximately 15 February 1969.

## Field Party's Itinerary

Sanae-Borga Massivet-Novolazarevskaya-Sor Rondane-Base Roi Baudouin — and back.

## Belgian Field party (8 members):

Commander of Summer Campaign geology, glaciology: T. Van Autenboer, civilian.

Chief pilot (Otter): R. Fagnoul, captain.

Gravimetry, glaciology: H. Declair, civilian.

Electronic technician: C. Stelling, civilian.

Electronic technician: J. M. Corbisher, under-officer.

Pilot (Cessna): W. Kother, 2nd lieutenant.

Aircraft mechanic: G. Nicolas, under-officer.

Aircraft mechanic: V. Daniels, under-officer.

## Work Programme to be carried out by the Belgian Field Party:

Glaciology: Measurements of ice-thickness by radio-echo sounding on the principal flowing glaciers in the zone named under 2, 3.

Some measurements of mean annual temperature.

Study and sampling of the Blue Ice zones.

Gravimetry: Measurements of gravimetric profiles across the glaciers measured by the echo-sounding radar.

Gravimetric measurements on rock as a contribution to the regional gravimetric mapping (with a connection to Sor Rondane).

Magnetism (possibly): Measurements and recording with the Elsec Proton Magnetometer installed in the Otter.

Geology: Local studies.

## Principal Scientific Equipment:

Geodesy: Wild T3 Theodolites, and all the necessary accessories for geodesic and topographic work.

Photogrammetry: Oblique camera.

Glaciology: One Randall (35Mc) radio-echo sounder; one Worden gravimeter; one proton magnetometer; one GFZ balance; field equipment.

## Aircraft:

Cessna, 180 B, single engine; Otter DHC-3, single engine.

## ICE CUBE IV

The series of three flights to the Antarctic, known under the code name of "Ice Cube IV", made by the R.N.Z.A.F. Hercules for the 1968-69 season, ended late in October 1968. The plane carried more than 80,000 lb. of freight for the United States and New Zealand projects on the continent.

## **NEWS FROM FRENCH BASES:**

### **May-August 1968**

During the four months from May to August which, other than May, constitute the real antipodean winter, the various bases in the French territory have enjoyed relatively friendly weather, having had few snowfalls and a temperature rather high for the season. Therefore, after the end of the summer campaigns, they have been able to pursue their work in conditions more favourable than they had hoped.

#### **KERGUELEN**

The celebrations of Midwinter and of the 14th of July which marked these months of solitude were celebrated with appropriate ceremonial and gaiety.

Life at Port-au-Francais would have been uneventful, divided between work and leisure, but for the burning of the two containers on August 22, in which were the chemical laboratory, the source of the disaster, and a part of the general electronic maintenance. The neighbouring lodgings were saved, and there were no personal injuries. However, the observation of natural and artificial radio-activity had to be provisionally suspended.

A team charged with rounding up sheep on Mussel Island had to wait for the low tide towards midnight, to free the barge's propeller which unfortunately had been fouled by the hawser. Because of this they had to spend a night in the open. Arriving at Port-aux-Francais just before the fire, they had the opportunity to warm up again quicker than they had expected.

These events should not minimise the importance of the work done during these months which can be summarised as follows:

The new radio transmission centre on Gabrielle Hill has been built and the installation completed.

The new 35 Kw transmitter has been put in place and its trials have been satisfactory.

A new rhombic (Kerguelen-Paris) antenna has been tuned in for use by the new transmitter.

The timber-frame for the radio offices has been erected, one has been completely boarded and the other is ready to complete.

The access road to the future marine biology laboratory has been completed. The platform on which the building will be built is finished as far as the foundation level.

The work of converting the 110-volt electricity supply to 220/380-volt is proceeding cautiously, it being necessary to modify the cabling of certain lines.

The work of interior refurbishing the buildings, appropriate to the winter season, has enabled the renovation of the Hospital, the club house at Port-aux-Francais, and the station at Molloy.

The teletype communication recently established with Reunion Island and Adelie Land has been excellent.

#### **CROZET**

Relatively little snow was experienced at Crozet during the winter, except for August, and the winds were less violent than usual, while the temperature ranges was from +13° to -5°. With such mild conditions the work programme was able to be executed with ease.

The installation of the bulk carburetted hydrogen depot is nearing completion, while the six 50 cubic metre cisterns have been placed on the tar-impregnated cradles.

The loading point comprising a cistern of 5 cubic metres and a pump is in place near the higher station of

the telepherique, and a pipe line going from the depot as far as the loading point has been laid. At last a shelter has been constructed near the depot, to house the transformer which will transmit the current coming from the station. The yard for the lozenge antenna on the platform has been opened, and the holes for the four big posts and the anchorage block have been dug.

The maintenance work has included the greasing of the tractor cable of the small telepherique and that of the carrying cable of the large telepherique.

Several reconnaissances and sorties have been effected by teams of two or three men to Gauss Cape, to American Bay and to Christmas Bay.

### ADELIE LAND

During the winter months, naturally, work at Adelie Land has been mainly confined to indoors. During this period a relief radio station has been installed and directionally tuned in at Marret. The work included the erection of a transmitter mast.

In order to better assure the security of the base, three alarm klaxons have been installed in various buildings as well as a relief lighting system at the central electric-power station.

The garage, the electricity workshops, and the structure of Building 22 as well as the mechanical workshops housed in the old central block have been entirely refurbished.

On August 2 the first preparatory measures were taken for the 1968-69 summer campaign, and comprised putting the field vehicles in order and the installation at Cap Prud'Homme of a depot of 2,000 litre of petrol and materials and stores necessary for the execution of the anticipated glaciology programme.

The attempts at a teletype link with McMurdo, Mirny and Kerguelen have turned out respectively very satisfactory, satisfactory, and quite good.

The first radio-telephone link with Port-aux-Francais took place with complete success on August 25, 1968.

Pleasure/leisure activities have not been overlooked, ranging from beginner's bridge to evening classes. The weekly lectures have taken place throughout the winter months with, it seems, great success; these subjects range widely from the exposition of the research enterprises of the base laboratories in the fields of magnetism, of the ionosphere or of radiation to information topics such as cancer, the internal combustion engine, Australian economy and tourism, palace kitchens, and seals.

—All this adds up to a studious life which would be envied by the Sorbonne and which arouses sympathy!

## PROMINENT NEW ZEALANDERS TO GO SOUTH

The American Ambassador (Mr Henning) has invited six prominent New Zealanders, including the Leader of the Opposition (Mr Norman Kirk), to visit Antarctica from January 23 to 28, 1969.

The Prime Minister (Right Hon. Keith Holyoake) was invited, but was unable to accept because he will be overseas at the time attending the Prime Minister's Conference.

The members of the party will be:

Mr Kirk; Mr W. L. Young, National M.P. for Miramar; Mr Peter Snell, 1960 and 1964 Olympic Games gold medalist; Mr Peter Read, N.Z. Broadcasting Corporation television personality; Brigadier J. R. Page, D.S.O., C.B.E., Director of the Duke of Edinburgh Award in New Zealand; Mr C. G. Gibbons, Chairman of the Wellington Rugby Football Union; and Mr Arthur C. Lillig, American Embassy economic officer.

The party, which will be the guests of the commander of the United States Naval Support Force, Antarctica (Rear Admiral J. L. Abbot, Jun.), will spend four days in the Antarctic, visiting McMurdo Station, Scott Base, and Shackleton and Scott's historic huts on Ross Island.

# BRITISH ANTARCTIC SURVEY NEWS

## RESCUED MAN DIES

It is with great regret that the British Antarctic Survey report the death of Kenneth Portwine on October 10 in the British Hospital in Buenos Aires. His brother had flown out from Britain to be with him. Kenneth was 32.

The Survey are most grateful to the Argentine Government, their Antarctic personnel, his companions at base and the British Hospital in Buenos Aires for the tremendous efforts which they made to save his life.

While he was in hospital he was visited by Dr. John Brotherhood who, readers may remember, was flown out to Christchurch by the Americans last November after being severely injured at Halley Bay. John was on his way back to Britain after spending several months in the Falklands, and subsequent went to Mexico as one of the physiologists accompanying the British Olympic team. He has made a complete recovery from his accident, except for the loss of a few teeth.

## JOINT BRITISH-U.S. PROJECT ANTARCTIC VETERAN RETURNS

A joint British-American project has been organised to survey the Shackleton Range which lies about 300 miles south of Halley Bay. This range was discovered by Sir Vivian Fuchs' Trans-Antarctic Expedition, 1955-58, on their journey to the South Pole, and a preliminary survey was carried out by two of the expedition's members—Ken Blaiklock and David Stratton. A possible route was reconnoitred from Halley Bay via the Theron's last year but, because of heavy crevassing, it was found to be 450 miles—too long for field parties without air support. The Americans have already photographed the whole area from the

air and are now flying in a British field party to provide ground control and carry out geological work.

As the British relief ship, the chartered "Perla Dan", will not reach Halley Bay until the end of January, Ken Blaiklock and a second surveyor are being flown there via Washington, Christchurch and McMurdo. At Halley Bay they will pick up two geologists, two general assistants and three dog teams, and the whole party will then be flown to the Shackleton Range where they will be working for about 10 weeks.

Ken first went to the Antarctic in 1948. He spent two winters with Sir Vivian at the British base on Stonington Island, Marguerite Bay, where he celebrated his 21st birthday, two at Hope Bay with David Stratton, two with the Trans-Antarctic Expedition and two more with the Belgians. Altogether he has spent eight years and two summer seasons in the Antarctic, which is the world record.

## NEW BRITISH ANTARCTIC SURVEY SHIP

The Natural Environment Research Council have decided to replace R.R.S. "Shackleton" with a new ship which is to be built at Leith at a cost of about £1 $\frac{3}{4}$  million. The overall length will be 326 ft., the beam 60 ft. and the cargo capacity 1,800 tons. Two diesel-electric engines will provide 5,000 s.h.p. to a single variable-pitch propeller. Her endurance will be 50 days at full speed, with an economic service speed of about 14 knots.

The hull will be all-welded plating of special steel, one inch or more thick, and the stem will be cut-away to enable her to ride up on the ice and break it with her weight. Other features will be an enclosed crow's nest provided with full controls, and a helicopter deck. There will be accommodation on board for 62 expedition personnel and crew. Although

primarily designed to carry personnel and cargo, a gravimeter room, a large laboratory and a hydrographic davit have been incorporated for oceanographic and biological research. The cargo handling gear has been designed for rapid discharge at exposed anchorages. The ship is expected to serve in the Antarctic in the 1970-71 season.

### H.M.S. "ENDURANCE"

As mentioned briefly in the June issue, H.M.S. "Protector" has been replaced by the ex-Lauritzen Line "Anita Dan" which was purchased by the Royal Navy in 1967. After refit at the Belfast shipyard of Harland and Wolff, the vessel was renamed "Endurance" by the Hon. Alexandra Shackleton, grand-daughter of the Antarctic explorer.

The vessel is 306 ft. overall with a beam of 46 ft. and a displacement of approximately 3,650 tons. It carries two Whirlwind Mk 9 helicopters and is fitted with laboratory accommodation and facilities for hydrographic surveying.

### OTHER NEWS FROM THE BASES

At Signy Island in the South Orkneys, summer field work was initiated during a fine spell in September and was in full swing during October. Various biological projects including seal tagging are being undertaken and frogmen-biologists have carried out a number of dives.

The Deception Island base remained closed throughout the 1968 winter but it will be re-opened for the summer, as the northern base for a twin-engined Otter aircraft which is being flown south from Canada and a single-engined Otter which was left in its crate at South Georgia last year.

At the Argentine Islands salvage work was started in September on the Argentine naval aircraft which crashed there in July when trying to fly Kenneth Portwine out to Esperanza base. Routine geophysical observations continue, and several journeys have been made to the mainland.

From Stonington Island, Marguerite Bay, two parties spent a few days in September at the old Horse-

shoe Island base, 30 miles to the north. Four men also set out for Fossil Bluff, but were hampered by bad weather, thick snow and impassable tide-cracks near the entrance to George VI Sound, and were forced to turn back as their supplies were running low. They were met by a three-man relief party from base at the Puffball Islands in the south of Marguerite Bay. Meanwhile, from Fossil Bluff, two depots were laid in the Sound south of 72° S. in preparation for summer field work. A third depot was established on the east side of the Sound, and an attempt made to find a new route up on to the plateau. A survey party is now carrying out a tellurometer traverse linking the Stonington and Fossil Bluff surveys.

At Halley Bay, six men with three dog teams left base at the end of September to reconnoitre and flag the most difficult part of the route to the Shackleton Range, in preparation for a six-man depot-laying tractor party which set off a month later. Shorter journeys were undertaken to carry out local glaciological work and to train dog teams for work in the Shackleton Range.

### SHIPS' MOVEMENTS

R.R.S. "Shackleton" sailed from Southampton on October 8, and R.R.S. "John Biscoe" on October 23.

### JUNE DREW REMEMBERS

The British and New Zealand members of the Trans-Antarctic Expedition, and those associated with the raising of funds for it in New Zealand will remember Miss June Drew, the Welsh girl who served as Head Typist in the Wellington office for the duration of the Expedition.

June is now married to an Englishman, Mr Alan Archer, and they have two children. They are living at Awali, Bahrein, where Alan is working for an oil company, but June still has a keen longing to return and settle in New Zealand. In a recent letter to the Editor she asked to be remembered to all her friends of Antarctic days.

# AMERICAN STATIONS

Operation DEEP FREEZE 69, the 1968-69 summer support season for United States scientific work in the Antarctic, was officially opened when, on October 8, the first U.S. aircraft arrived at Williams Field, McMurdo, and landed Rear Admiral J. Lloyd Abbot, Jr., Commander of the U.S. Navy's Antarctic Support Force.

Operation Deep Freeze has been supporting the National Science Foundation's scientific research in Antarctica for 14 years, housing, feeding, supplying and transporting civilian scientists engaged in all the many different projects which have been and are being undertaken in that continent. This year more than 2,000 men from the Navy Coast Guard, Army Air Force and Marine Corps will be involved in moving men and supplies to Antarctica by air and sea over an 11,000-mile supply line from the United States.

Before Deep Freeze 69 began officially, there were 263 Navy men and scientists already in the Antarctic and by mid-summer there will be more than 1,000. Ski-equipped Hercules aircraft will open up the three inland stations at Byrd, South Pole and Plateau; Palmer Station, inaccessible by air because of its small area, will be opened by Coast Guard icebreaker, while Williams Field, Hallett Station and Brockton Station will operate throughout the summer to facilitate logistics operations.

## STATIONS

Six United States Antarctic stations, various international co-operative foreign stations and remote field sites will be operating U.S. Antarctic Research Programs during the 1968-69 season. Byrd, McMurdo, Palmer and South Pole stations are all year-round operational sites, while Hallett, site of a joint N.Z.-U.S. scientific programme will be open from October to February, as will Palmer, the smallest of the U.S. bases.

## Hallett

A three-piece salt water distillation unit for Hallett was among the cargo carried by the first Starlifter aircraft to reach Antarctica this year, and its installation will save Hallett personnel the arduous necessity of having to melt down ice from a fresh water glacier during their stay at this station.

## McMurdo

Main project for the Seabees (Naval Construction Battalion Unit 201) at McMurdo this season is the completion of a large personnel building which will be the largest in the continent, a "miniature city" under one roof, providing messing, berthing and recreational facilities for the McMurdo population, as well as a laundry and barber shop. This is Seabees' third season in Antarctica.

## Plateau

Among the smiling faces which greeted the first aircraft to reach Plateau Station in nine months were those of a number of Japanese, who had beaten the first flight in by three days. November 12 brought to Plateau its first new faces since the last flight out in February last, when the Japanese Antarctic Research Programme Traverse party, on a round trip from Showa to the South Pole, reached Plateau for refuelling, vehicle maintenance and a four-day rest.

The incoming aircraft brought five Navy men and a USARP scientist from South Pole Station. These men had had a four-day acclimatisation at Pole to accustom them to the cold, thin air and were to relieve and assist the wintering-over personnel. Relaxation for these "stayers" had been provided earlier with a four-man team football match on the Plateau gridiron. There were no spectators, as the entire population was needed to man the two teams.

## SUPPORT FORCE ACTIVITIES

Units under command of Rear Admiral J. Lloyd Abbot, Jr., in this year's Deep Freeze include Antarctic Support Activities, headquarters in Rhode Island, and maintaining stations "on the ice"; Air Development Squadron Six supplying Hercules and Constellation aircraft and LH-34 helicopters; Construction Battalion Unit 201; an Army aviation helicopter detachment; a Military Airlift Command detachment helping in the movement of personnel from the United States to New Zealand and of cargo from New Zealand to McMurdo; and a Naval Nuclear Power Unit operating the McMurdo nuclear reactor.

Not even five per cent of Antarctic supplies are taken in by air. More than ninety-five per cent is taken by sea to McMurdo, the ships entering by a channel cut in the annual ice by Coast Guard icebreakers, this year four of them—"Glacier", "Burton Island", "Southwind" and "Edisto"; three Military Sea Transportation Service cargo ships ("Wyandot", "Pvt. John R. Towle" and "Alatna") will serve as cargo carriers, with Cargo Handling Battalion Unit One unloading and unloading them in the Antarctic.

Jet aircraft, whose feasibility in Antarctic support operations was tested in 1966, have this year been used for eight scheduled flights in the opening of Deep Freeze 69. The first C-141 Starlifter of the operation reached Williams Field 4 hours and 57 minutes after leaving Harewood, N.Z., carrying 36,980 pounds of priority cargo. Only 4,200 ft. of the 20,000-ft. runway were needed to land the aircraft, which met with near-"banana belt" weather at McMurdo—more than 15 miles of visibility, only 6 knots of wind and a temperature of 9° F.

Within a fortnight, eight flights had been completed by the two Starlifters from the 438th Military Airlift Wing, each carrying some 40,000 pounds of cargo. One of the round trips to Williams Field and back was completed in less time than it takes a C-121 Constellation to fly one way.

A further Starlifter flight is planned for later this year, to bring back live wild-life specimens from Antarctica.

Project Magnet, a continuous world-wide geomagnetic survey being conducted by the U.S. Naval Oceanographic Office, is under way in the Antarctic, for the first time since summer, 1966. An NC-121K Super Constellation, operated by Air Development Squadron Eight, left Christchurch, N.Z., on November 1 to make flights from McMurdo for a week to measure the intensity and direction of the earth's magnetic field, data required for the improvement of navigational and world isomagnetic charts.

A modified U.S. Navy transport aircraft, the Super Constellation is equipped with a vector airborne magnetometer and special navigational equipment to collect the data for the construction of nautical, aeronautical and world isomagnetic charts published by the U.S. Government.

## SCIENTIFIC RESEARCH

Some 150 scientists and technicians from more than 50 colleges, universities, government agencies and industrial firms will participate in this season's National Science Foundation research.

The new research vessel "Hero" will give extra mobility to the scientists, some of whom will use "Hero" as a base for their investigations into changes wrought at Deception Island by the earthquake and volcanic eruptions which wracked the island and drove out the 52 members of the Argentine, British and Chilean research stations in December 1967 (See "Antarctic", March 1968, p. 23).

Launched in March this year, "Hero" is a 125-ft. diesel-powered and sail-equipped wooden ship designed to carry a complement of 10 scientists and 10 crew members. Fitted with laboratory space, she is fitted for all the over-the-side operations required for scientific projects to allow her to serve as a biological and other disciplines' research platform in the Antarctic.

### Deep Drilling Study

Scientists at Byrd Station will analyse, this season, the continuous ice cores obtained from the drilling to the bottom of the ice sheet completed last season. Measurements of the temperature and deformation of the 7,100-ft. drill hole and determination of the electrical properties of the ice at great depth will also be made.

### Sleep Patterns

Psychiatrists will complete this season a three-year study of the sleeping, dreaming and waking behaviour of Antarctic personnel with field studies up to November followed by analysis and interpretation of data at the University of Oklahoma Medical Center. Information obtained is expected to help in planning for human factors in future terrestrial and extraterrestrial explorations.

### International Co-operation

American scientists will be based at a number of foreign stations in the Antarctic this season, again exemplifying the international co-operation that flourishes in that continent, while foreign scientists will work at U.S. bases at the same time.

Dr. Boris G. Lopatin of the Institute of Arctic Geology, Leningrad, wintered over at McMurdo this year and will take part in the U.S. Geological survey of Ellsworth Land, together with a Chilean scientist, Fernando Munigaza. This multidiscipline survey, along the coast of Ellsworth Land, consists of five separate projects, geological, topographical, botanical and magnetic.

Dr. Lopatin's opposite number, U.S. geophysicist Dr. H. LeRoy Scharon, wintered over at Molodezhnaya continuing his magnetic field studies, while another U.S. Exchange Scientist will work on upper atmospheric studies at Vostok.

Wintering over with the New Zealanders in the ice-free Wright Valley will be Allan Riordan, studying micrometeorology, and other U.S. scientists will be working at the Australian Mawson and Wilkes stations on the satellite programme, which is designed to measure the exact shape of the Earth by means of satellites.

Twenty-four researchers at four Antarctic stations will participate in this international study.

U.S. scientists will also help to make up the 35-man team which will participate in the International Weddell Sea Oceanographic Expedition, while support will be given by, among other vessels from other nations, the U.S. Coast Guard icebreaker "Glacier".

U.S.N.S. "Eltanin", together with her sister research vessel "Hero", will accommodate a number of foreign researchers as well as their own. Two U.S. Exchange Scientists have so far been named for this season's Antarctic work, one to join the British Antarctic Expedition (Dr. Paul Williams, U.S. Geological Survey), and the other the Japanese Antarctic Expedition (Gerard Roach, University of Denver).

## COMMENT ON TOURISM

Tourist flights to the Antarctic would place a burden on meteorological staff there and the idea is not popular with either New Zealanders or Americans working on the Continent, a United States weather expert said in Auckland on November 27.

Commander Charles Bird, top meteorologist with the United States Naval Support Force for Operation Deep Freeze, said weather forecasting and accommodation would be the main problems for a commercial airline operating to the Antarctic.

As recorded in "Antarctic", September 1968( pages 162-163), Air New Zealand and Holm and Co. Ltd. are jointly investigating the possibility of operating tourist flights to the Antarctic next summer.

Commander Bird said he felt the official American view was not to get involved with commercial operations in the Antarctic, but if something went wrong, the task force could not help becoming involved.

"People in the Antarctic are working a 12-hour day seven days a week and commercial flights would mean a considerable increase in their work, particularly for meteorological staff," Commander Bird said.

"I personally am not in favour of tourist flights because I know how hard the meteorological types have to work down there.

"We provide the met. service for southbound Antarctic flights at present and I don't think the New Zealand service is geared to do this."

Commander Bird said that December and January were the only two months in which the weather was reliable enough to permit commercial flights and even then they could be subject to many disruptions.

An Air New Zealand spokesman said the airline was aware of the problems of Antarctic flights and would not consider beginning them until all had been solved.

It is understood Air New Zealand envisages a weekly service on a charter basis during the summer, using either Electras or DC-8s.

It is believed such a tourist service would be among the most expensive in the world but the airline believes there is a valuable market.

## NO POLLUTION FOUND BEFORE 1850's

Evidence of pollution only went back to the days of the Industrial Revolution, said Dr W. O. Davis, an American scientist, in Christchurch on November 8.

He said that captured in the ice cores which were being drilled at Byrd Station were traces of contamination throughout the world, but none were evident before the 1850's. At Byrd Station the ice core drill went to 7,100 feet before reaching rock, and it was estimated that the oldest ice there was about 40,000 years old.

The recent solar flares which disrupted communication between McMurdo Sound and Christchurch had isolated Byrd Station for five days.

## POSSIBLE OBSERVATORY AT POLE

An American astronomer paid a visit to the Amundsen-Scott South Pole Station in November to ascertain the feasibility of establishing an

observatory there.

Professor F. B. Wood, the Reese W. Flower Professor of Astronomy at the University of Pennsylvania, who had been working at the Mount John Observatory in Canterbury, said that it was purely an exploratory study.

"No funds have been allotted and none have been applied for, I am just going to see if the observatory is a feasible thing to even think about," said Professor Wood.

It would be a national effort, he said. Much would depend on the financial climate. There was no thought of any multi-million dollar project and it would be on a modest scale initially, probably about the same size as the Mount John Observatory.

Professor Wood said that the South Pole Station would be an ideal site. "The sun is up for six months of the year and the other half we have the stars."

Pole Station was first choice for such a project because the weather was good, and Byrd Station was the second choice.

When he has completed his survey, Professor Wood will report to a committee in the United States which will discuss the matter.

## VISITS TO DEEP FREEZE HEADQUARTERS

Visitors to Christchurch will now have the opportunity of touring Operation Deep Freeze advance headquarters at Harewood International Airport.

A letter, well in advance of the visitor's estimated time of arrival, to Public Affairs Office, Operation Deep Freeze, Private Bag, Harewood, Christchurch, will give the writer the opportunity to go out to the airport, to see a movie on Antarctic operations and to ask questions of an Operation Deep Freeze representative.

A visit to Antarctic Air Development Squadron Six's aircraft hangar area will follow, with a sight of an LC-130 ski-equipped Hercules or a C-121 Super Constellation, if either plane is available. Entry to the aircraft will not normally be permitted, on account of maintenance requirements that must be met.

# NEWS FROM SOUTH AFRICA

## IONOSPHERIC PROGRAMME

South African participation in Antarctic Research began in 1960, when the first team, Sanae 1, took over the Norwegian base in Queen Maud Land, Antarctica. When the new base was built at SANAE (South African National Antarctic Expedition) in 1962, the team was expanded to include, amongst others, an Ionospheric Physicist. Since then an Ionosonde has been in continuous operation as part of the Ionosphere Research programme. Antarctic Ionosphere Research has its headquarters at, and is controlled by Rhodes University at Grahamstown in the Cape Province.

Due to the fortuitous placing of SANAE base just west of the Greenwich Meridian on the Antarctic coastline, a mere 3,000 miles southwest of Johannesburg, hourly values of Ionospheric characteristics can be scaled at the base and transmitted back to South Africa. The results are sent to Rhodes University where they are published and then distributed all over the world.

The convenience of the telex facility coupled with a routine fortnightly radio telephone call from the University to SANAE base, used for checking the data, allows the data to be published within a maximum of three months, which is thought to be a world record.

For the second five-year period of the South African Antarctic Research Programme, the Department of Transport has allocated approximately R20,000 per annum for the Ionospheric Research Programme. This has made it possible to develop this programme on a more effective basis.

The Ionosphere Research Physicist at present "down South" is Mr M. H. Williams, a Ph.D. student in Physics at Rhodes University, as a member of SANAE 9. He will be replaced at the beginning of 1969 by Mr Schalk Engelbrecht, a Physics Honours

student from Stellenbosch University, at present undergoing training at Rhodes University.

## METEOROLOGY AND GEOLOGY

Due to longer periods of daylight and higher temperatures, the particularly fine weather of October encouraged much activity at the base. The first summer party of four members returned from the mountains after a very successful expedition lasting about a month. During this time various depots were replenished with fresh supplies for the future use of the geologists. Many interesting experiences were recounted on their return. During this summer a joint American, Norwegian and British expedition will be working halfway between SANAE and Halley Bay. SANAE will assist with radio communication.

## TENTH PARTY

The names of the tenth South African Antarctic Expedition have been announced. They are:

Leader: Mr Henry Fulton.  
 Meteorologists: Captain P. C. L. Steyn, Mr J. B. Kock, Mr J. R. van der Merwe.  
 Geologists: Mr Anton Aucamp, Mr L. G. Wolmarans.  
 Cosmic Rays: Mr P. J. König.  
 Ionosphere: Mr E. Engelbrecht.  
 Geomagnetist: Mr P. R. Sutcliff.  
 Medical Doctor: Dr A. G. Grobler.  
 Mechanics: Mr W. Hodsdon, Mr C. A. Spencer, Mr G. J. Mackie.  
 Radio Operators: Mr A. J. Niemandt, Mr C. B. Muir.  
 Radio Technician: Mr R. W. Johnston.

It is of special interest that the leader, Mr Henry Fulton, is taking part in an Antarctic expedition for the third time. He over-wintered in Antarctica during 1962 and 1966 and in the latter year he was deputy leader.

This will also be Mr Wilf Hodsdon's third turn of duty in Antarctica. He over-wintered in 1965 and 1967. He was deputy leader in 1967

and has been invited to act as leader of the mountain expedition which is to over-winter in the mountains.

Another member who is a veteran is Captain Steyn, the senior meteorologist who has been appointed as deputy leader of the expedition. He was a member of SANAE 8 during 1967.

Two members of the ninth expedition at present in Antarctica, namely Mr Anton Aucamp (geologist) and Mr Clive Spencer (senior mechanic) have decided to remain at the base for another year as members of SANAE 10. This is most advantageous for Antarctic research, as these persons as well as the aforementioned three members, will return to South Africa with a wider and better understanding, experience and knowledge of Antarctic conditions.

The members of the team are mainly bachelors, with the exception of the leader, Mr Johnston and Mr Niemandt.

The team has assembled in Pretoria and will attend a training course which will include fire fighting, first aid, cookery and elementary needlework, physical fitness, mountaineering and special instructions in the knotting, tying and joining of ropes. The Public Service Commission will also give training in supervision and management as well as instruction in human behaviour under adverse conditions.

The South African supply vessel, the "RSA", is expected to depart from Cape Town on 28 December, 1968. A Belgian research team comprising of nine members under the leadership of the experienced Mr Tony van Autenboer, will accompany the ship. They will return with the "RSA".

During the sojourn of the "RSA" in a bukta near the base, and while the supplies for 1969 are being unloaded and transported to the base, a new winter-over base will be erected south of SANAE. The equipment and supplies will be transported by Muskeg and with the help of the Belgian aircraft. For the first time in South African Antarctic history, a four-man field expedition will over-winter in

the mountains. The party will consist of the two geologists, a senior mechanic and a radio operator. A Parcoll hut and an emergency hut are going to be erected and equipped so that they will be as safe and as comfortable as can be expected. This over-wintering will provide a tremendous impetus to the Geology programme as they can start work immediately.

Mr R. W. Rand, Assistant Director of the Division of Sea Fisheries of the Department of Industries will accompany the "RSA" to make a study of plankton, fish and other pelagic fauna. Special attention will also be paid to the study of seals.

During March, 1969 a visit is expected from the 9th Japanese Antarctic Expedition on board the "Fuji". The French Antarctic Research ship, the "Galhini" is expected to depart from Cape Town en route to the Antarctic on the same date as the "RSA". This will be the first time that a French Antarctic Expedition will pay a visit to South Africa.

## WILDLIFE FROM ANTARCTICA

One hundred and ten specimens of Antarctic wildlife passed through Christchurch on December 2 on the way to American zoos and research institutions.

Carefully crated in a US Air Force Starlifter, the live cargo consisted of 28 Emperor penguins, 48 Adelie penguins, 30 skua gulls and four Weddell seals. In charge of the cargo was Dr R. Penney, of the New York Zoological Society, who had spent three weeks in the Antarctic collecting the specimens.

The seals were about five weeks old, and weighed approximately 200 lbs. At airports in the United States the plane will be met by refrigerated trucks which will pick up the live consignments for delivery.

It was the third airlift of animals and birds from Antarctica to the United States. Normally, because of the expense, the United States Antarctic Research Programme tries to plan such flights only every two or three years rather than as an annual event.

## RUSSIAN PLANS FOR 1968-69 SEASON

In the 1968-69 season the Russians will be operating their five Antarctic Stations, Mirny, Molodezhnaya, Vostok, Novolazarevskaya and Bellingshausen.

Mirny remains their major observatory and base. However, much will be done to extend Molodezhnaya, where the Antarctic Meteorological Centre will be organised which will supply information, including weather forecasts to interested stations. A powerful radio station will be installed. At Molodezhnaya a scientific rocket polygone will also be built for the study of high layers of the atmosphere. Among other studies this will allow the Russians to conduct very interesting comparisons with the results of rocket soundings in the Arctic: on the Heiss Island (Franz-Josef Land).

The Soviet geologists plan to undertake studies of the Antarctic platform and of the paleogeographic conditions of its formation. This will allow ore prospecting in future, for coal, mica, iron, graphite, etc. On the Queen Maud Land it is planned to accomplish seismic sounding of basic rocks along the profile Wohlthat Mountains — Novolazarevskaya — the sea.

Extensive activities will be conducted by glaciologists. A traverse will be undertaken with glacio-geodetic aims along the route Mirny-Vostok. The French scientists, as four years ago, will take part in the traverse. The party will determine the rate of movement and the character of deformation of the glacier. In the Molodezhnaya area the radar measurements of the ice thickness will be conducted from aircraft. At Vostok Station it is planned to drill a deep hole in the ice by the aid of an electric bore.

The parties at the various stations will continue research of the ionosphere, geomagnetism, aurora, and a large series of most diverse aerometeorological observations of meteor trails, and registration of

seismic phenomena. The medical programme includes psychological, biochemical and physiological observations at Vostok Station which is located at the Pole of Cold.

The new Expedition and its equipment will be shipped by four ships: "Ob", "Professor Zubov" sailed in November, and a freight vessel and a tanker embark at the beginning of 1969. During the voyage the ships will conduct oceanographic measurements.

Apart from the crews, 300 men will take part in the Expedition, and more than 200 men will stay for the winter period. In addition to the Soviet scientists, the party will include scientists from France, Poland and East Germany. Dr D. Maxioutov of the Leningrad Arctic and Antarctic Institute is the Head of the Expedition; Dr A. A. Artemiev is Chief of the Vostok Station (he wintered there before); Dr T. Serveiev is the Chief of the Novolazarevskaya Station, and P. Kudriavtse is the Chief of the Bellingshausen Station.

### RUSSIAN ATLAS

The text and map legends of the first volume of the Soviet Antarctic Atlas published in 1966 have been translated into English and published as a special issue of the journal "Soviet Geography" (Vol. 8, No. 5-6, 1967) published by the American Geographical Society under a grant by the National Science Foundation.

### POSSIBLE ANTARCTIC SHIP FOR AUSTRALIA

In answer to a question in the Australian Senate, the Minister for Supply (Senator Anderson) on September 12, 1968, said that he would investigate the possible construction of a ship for Australian use in the Antarctic.

# TENTH JAPANESE ANTARCTIC RESEARCH EXPEDITION

## 1968-70

The forty expedition members of the 10th JARE left Tokyo on November 30, 1968, aboard the icebreaker "Fuji". Dr Kou Kusunoki is in charge of the wintering party consisting of 28 men as detailed in "Antarctic", September, 1968, page 138, while Mr Nozomi Murakoshi will lead the summer party of 12 men and one press reporter. An American scientist, Mr Gerard A. Roach, will observe the summer operation between Fremantle, Australia, and Cape Town, South Africa. After calling at Fremantle between December 15 and 21, the vessel will proceed to Syowa. The change-over period will last until the end of February 1969, then the ship will call at Cape Town between March 14 and 20. From which city the winter-overing personnel of the 9th JARE will fly back to Japan. After calling at Colombo, Ceylon, between April 5 and 9, the ship will return to Tokyo on April 25, 1969.

### JAPANESE TO WORK AT VANDA

On December 7 Dr Teisuya Torii of the Japanese Polar Research Association and his colleague Dr N. Yamagata who visited McMurdo in 1963, and Mr I. Mukuo, of the Kyodo News Service who was there in 1965-66, left Christchurch on a visit to the Antarctic.

During a visit to Wellington they were outfitted with polar clothing by the New Zealand Antarctic Division. Held discussions with the Superintendent and officers of the

While in the Antarctic Dr Torii hopes to have the opportunity of flying to the South Pole Station and visiting the Japanese exchange officer there, Mr Murayama.

Dr Torii will work at the Biolab at McMurdo Station prior to visiting Vanda Station, where he will stay a week, during which time he will carry out a geo-chemical investigation of Lake Vanda.

The scientific activity of the 10th JARE is largely a continuation of activities of the previous years. However, a Lockheed Lasa-60 will be used for aerophotogrammetry during the summer period. The aerophoto survey will cover the southern part of Lutzow-Holm Bay and Yamato Mountains, about 300 km. south of Syowa. Erection of buildings for a rocket launching programme is one of the main tasks during the change-over period. Three buildings, a rocket assembly shop, telemetry and radar station, and control centre house will be erected. Erection of one living quarter and extension of work of the vehicle warehouse will be undertaken. In conjunction with conjugate points studies, about ten high-altitude balloons will be re-

# ANTARCTIC STATIONS

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## PLATEAU STATION

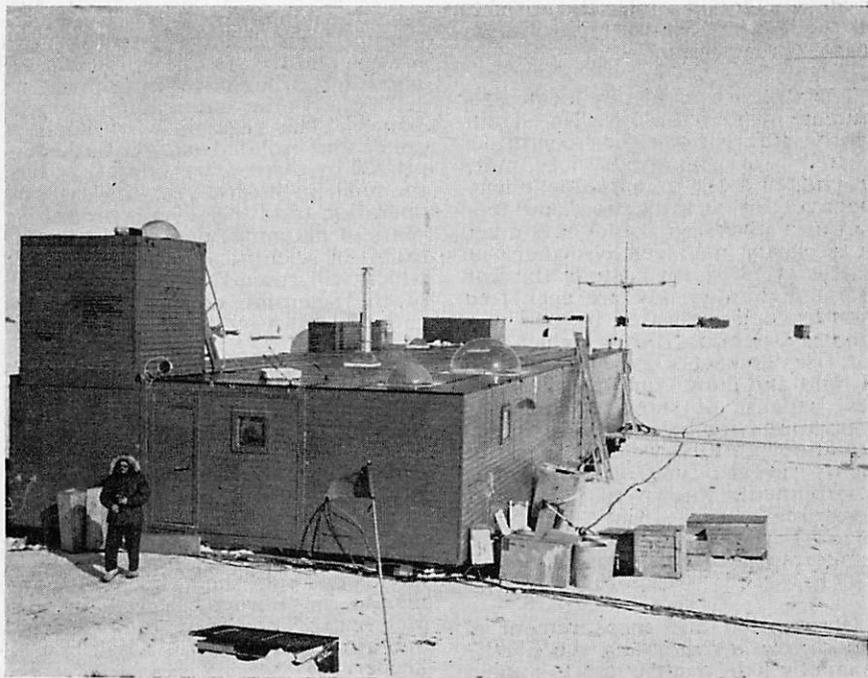
By Lieutenant Archie D. Blackburn,  
M.C., U.S.N.

For three years from 1966 the United States has operated a station at a remote spot on the south polar plateau. Situated at 79° 15' S., 40° 30' E., the station has sat atop approximately two miles of ice at an altitude above sea level of nearly 12,000 feet. Because temperatures during the winter months averaged below -70° F., no aircraft operations were possible from mid-February to mid-November, leaving the eight-man complement completely isolated, except for radio communications, for eight months each year.

Located about 700 miles from the South Pole in the direction of South

Africa, Plateau Station has been sustained by LC-130F Hercules aircraft which flew from McMurdo, 1,400 miles away, frequently staging through Amundsen-Scott South Pole Station. The isolated site was chosen to fill a gap in scientific coverage. Programmes were conducted in meteorology, micrometeorology, upper atmosphere physics, and geophysics.

Built during the 1965-66 operating season, the main station consisted of four prefabricated vans, each measuring 36 by 8½ by 8½ feet with a maximum weight of 23,000 lb. The space between the vans was floored and roofed to give a central living area of approximately 25 by 72 feet. A fifth van and a 16- by 32-foot



PLATEAU STATION.

Jamesway hut were set up about 1,000 feet from the main building to be used in case of emergency. The construction crew lived in two Jamesways, which were left on the site. These, with two others added later, provided recreation and storage space.

Two 55-kilowatt generators were installed in the main building. Each was sufficient to power the station. The emergency huts housed a third generator. Heat was derived from the warmed engine coolant of the diesel generators by means of a heat exchange system. The exhaust heat from the same engines was used to melt snow for water. Other amenities included an electric kitchen, washing machine, clothes dryer, a shower, and flush toilets. The United States Navy has manned the station with a physician, a mechanic, an electronics technician, and a cook to support the programme of scientific investigation carried out by four civilian scientists under the auspices of the United States Antarctic Research Programme.

The station was ideally located for studies in meteorology. No significantly different weather conditions existed for hundreds of miles around, and the remarkable phenomena of air stratification and temperature inversion could be studied in a clarity not seen elsewhere on Earth. At 79° south latitude the Antarctic night and day are each four months long separated by two two-monthly periods during which the sun rises and sets. These long periods of light and dark, combined with the vast expanse of snow, provided an opportunity for basic studies in heat radiation. Routine weather measurements revealed one of the hardest environments known to man: temperatures varied from -1.3° F. to -123.1° F., with the mean annual temperature being approximately -70° F.

Observation and measurement of the *aurora australis* and the Earth's magnetic field contributed to studies in physics. Micropulsation techniques and monitoring of very low-

frequency radio noises were carried out as part of the Antarctic upper-atmosphere physics programme.

The prevailing climatic conditions, relatively high altitude, and the long and virtually absolute isolation at Plateau Station offered unique opportunities for medical observations related to the specific disciplines of physiology and psychology. Though the Navy medical officer also has served as officer-in-charge of the station, he has found time to record several parameters of physiological and psychological information. Living in close quarters with a few other men for long periods of time proved as real a stress as did existing in an environment where temperatures never exceed 0° F. Awareness of the impossibility of survival without fuel and functioning equipment cannot be hidden from consciousness even by exceptional personal confidence and reliability.

During the current season, the scientific equipment will be removed (except for the micrometeorological tower), and the station will be closed about 1 February 1969, but otherwise left ready for immediate reoccupancy. The feasibility of such a small and isolated station has been proved by three years' operation, but the final justification for this type of operation (and the several preceding years of planning) depends upon the extent of scientific knowledge gained, which will come from the reduction of the scientific data so arduously gathered.

## FIRST WINTER POSTMASTER

The first man to spend a winter as postmaster at Scott Base returned to New Zealand this summer. He is Mr George Edlin, who worked in Invercargill for 20 years in the Post Office before going to Scott Base. A man of many interests, he has dabbled in poetry, some of which has been published, been a commando in Borneo, served in the Merchant Navy as a radio officer, and also tried a year as a lighthouse-keeper.

Mr Edlin claims to be the oldest man to winter-over at Scott Base.

# NORWEGIAN WHALERS WITHDRAW FROM ANTARCTIC

It will come with amazement to many, and sadness to those who have been associated with the Norwegians in the south, to learn that they have decided to abandon Antarctic whaling from this year.

Of all the countries associated with whaling the Norwegians had the longest association with the South Polar regions, although their bases were as far removed as they could possibly be.

For sixty years Norwegians have hunted the giant mammals, and I well remember as a lad standing on a hill on my father's farm at Riverton watching the enormous mother ships and their satellite whale chasers passing through Foveaux Strait like a huge armada en route from their base at Paterson Inlet in Stewart Island. After a few years they withdrew from Stewart Island, but while they were there many a young man from Riverton, Bluff and Stewart Island served a term or more as a whaler, and earned high wages.

Antarctic whaling was a way of life for an entire community in the Vestfold County south of Oslo, and marriages and birth statistics in that region clearly reflect the whaling seasons. Most children were born in the new year and spring, and most marriages took place in May and June when the sailors returned to port with plenty of money in their pockets and a keen longing for home life after the long and arduous season in the Antarctic. Sandefjord, a small town of 7,000 people, on the west coast of Oslo Fiord, was one of the whaling capitals of the world, with more men in its population acquainted with the Antarctic than could be found in most major capitals or ports. This tiny town was a household word all over the world because of its whaling associations.

It was Svend Foyn, a Norwegian sealer who invented the grenade harpoon gun in 1872, and utilised steam-driven launches to pioneer modern whaling. This method revolutionised whaling and changed it entirely. Not only was it now possible to chase more successfully the slower sperm whale but also the faster and stronger species such as the blue whale, fin whales and humpbacks.

At the time of the invention of the harpoon gun most whaling was carried out in the Arctic regions, and from 1863 to 1904 no less than 18,000 whales were caught in Arctic waters, and the numbers were sadly depleted.

As early as 1892-93 Mr Christensen, of Sandefjord sent his whaler, "Jason", to Graham Land, under the command of Captain C. A. Larsen. Ten years went by and whale stocks in the north had diminished to such an extent a new area had to be found. Captain C. A. Larsen returned in the "Antarctic" and in 1904 founded a whaling company which is still flourishing at Grytviken, in South Georgia. Mr Chr. Christensen, the other famous pioneer of Antarctic whaling sent the first factory ship, the "Amirlen" to the Falkland Islands and South Shetlands in 1905. In 1908, in an effort to regulate the whaling industry, the British Government claimed the Falkland Islands Dependencies. Until 1920 almost all of the Antarctic whaling was centred in that region, but following the published accounts of the Scott and Shackleton expeditions interest began to centre on the Ross Sea where it was apparent that there was a vast untapped reservoir

of whales awaiting the attention of ambitious whaling captains.

Captain C. A. Larsen and his partner, M. M. Konow, trading as the Rosshavet Whaling Company of Sandefjord, entered into an agreement with the British Government to pay a commission on all whale oil taken from the region, and to pay an annual licence fee. The British Government claimed the Ross Dependency sector in 1923, following the agreement made with the Norwegian company a year before.

The Norwegians established their Stewart Island base and at first had a monopoly, but soon other companies sent fleets to this lucrative area. Some companies paid royalties, others did not, and from 1929 no further royalties were paid. The staggering total of 66,000,000 gallons of whale oil was taken from the Ross Dependency area in the years between 1923 and 1931, with the bulk of it from Norwegian ships.

In 1930 there were 41 expeditions, of which 30 were Norwegian, with catches in those years as high as 40,000 whales in a season. Following a glut caused by over-exploitation coupled with the world depression, the whales in the Ross Sea had a period of comparative peace, for there was negligible operation from 1931 until modest activity was resumed in 1938-39, and none at all from then until the 1946-47 when there was keen competition among fleets from various countries.

Even earlier the enormous drain on whale stocks had naturally caused concern as to the possible extinction of the species, and a Convention for the Regulation of Whaling was drawn up at Geneva and came into force in 1935. Since then whaling has been strictly controlled; certain types were not allowed to be killed, and the number of the others to be taken was severely restricted.

Once as many as 10,000 Norwegians went to sea after whales, and earned very high money for their labours. Now in recent years more shipowners have transferred their attention to the more profitable and stable tanker industry.

Whaling men have settled down ashore to the regular hours of other occupations, and the famous whale fountain at the city centre of Sandefjord is now only a focus for nostalgic memories of Antarctic whaling and the great days when exploration was coupled with business, and many remote parts of the Antarctic coastline were first sighted from the deck of ships from this small port.

Last year Norway sent only one expedition south with one factory ship, five catchers and 384 men—a sad decline from former years. Norway believes that present prices for whale oil are too low and the cost of expeditions too high to make whaling an economic proposition. Now the last Norwegian Antarctic whaling company has announced it will send no more expeditions, and thus leaves the field free to its recent rivals Japan and Russia who will inherit its pioneer work.

## RESEARCH STATION ASSISTS AUSTRALIANS

Scientists and engineers of the Australian Antarctic Division in making final arrangements for the 1969 ANARE expedition carried out tests on new equipment at a little-known field station situated at Eltham, Victoria.

The station houses specialised research equipment for studies of the upper atmosphere, similar to that used by ANARE scientists at Macquarie, Mawson, Davis and Wilkes stations.

Although the Antarctic Division has its own laboratory in Melbourne, where new equipment is developed and constructed, the Eltham site was chosen to get away from city lights and electrical noises that interfere with the sensitive detectors needed to study auroras, air-glow, cosmic radio noise and weak fluctuations in the earth's magnetic field.

During severe sunspot activity the auroras occur closer to the equator and may be seen over Australia. Recently Division scientists showed that auroras occur similarly and simultaneously in the northern and southern hemispheres.

# NEW BUILDING FOR SCOTT POLAR RESEARCH INSTITUTE

Because of the tremendous expansion at the Scott Polar Research Institute at Cambridge, England, it was necessary to erect a new building on the limited space available on the site.

The original building, designed by Sir Herbert Baker, R.A., was opened in November 1934, and contained a museum on the ground floor, a library on the first floor, a picture gallery above and a few offices and research rooms. A formal classical block, designed in Georgian style, the small building was of attractive warm buff-coloured facing bricks with limestone dressings and a brown tiled roof.

The Institute, founded to honour the memory of Captain Robert Falcon Scott and his comrades, and designed to foster polar research, soon became world famous, and rapidly became a centre of reference and research. Almost from the beginning the premises were inadequate, and this has been particularly evident since the tremendous expansion in Antarctic research and exploration over the past decade. Few of the well-known scientists of later expeditions have failed to benefit from the work and resources of the Scott Polar Research Institute.

Soon after the Second World War the firm of architects of H. C. Hughes and P. Bicknell, of Cambridge, was consulted about extensions, but it was not until 1965 that funds for building became available. By that time the demand for space in the old building threatened to choke the work of the Institute altogether, and it was clear that the extension should be as large as could be reasonably contrived on the limited site.

After careful consideration of several designs it was agreed that to obtain the maximum use of the

ground space and to integrate attractively with the old building, a four-storey rectangular brick block joined to the existing premises by a two-storey link would be the best method. The floor area of the old building was 510 square metres, and this has now been increased to a total of 2,100 square metres, thus giving four times the space of the original building.

The lecture room has been designed for the dual purpose of housing lectures and conferences, and can accommodate audiences of up to one hundred. It is particularly suited for a continuation of the public lectures which have been a popular feature of the Institute's activities.

Because of the enormous influx of books and pamphlets on polar matters over the last twelve years the first floor, both old and new, is now virtually all library. Large sliding fire doors, normally left open, lead from the old library into the link, which is furnished with fixed book-cases forming three reading bays. The Institute has given great attention to the safe storage of the many irreplaceable documents. Various systems of air conditioning were considered for the archive room but in the end they were all rejected in favour of low-temperature electric ceiling heating and small portable air conditioning units. The room is specially protected against fire or flooding.

A well-lit map room, eight research rooms and a laboratory for geophysical work are contained on the top floor. In the basement of the main block, apart from functional store-rooms and photographic darkrooms, etc., are two cold rooms, which can be kept at temperatures down to  $-40^{\circ}\text{C}$ . These two cold rooms form

an interesting feature of the building; in order to prevent damage to the foundations they stand on electrically heated pads, and the inspection windows are surrounded with electrical filaments to prevent their becoming frosted up.

Facing bricks exactly like the original ones could not be obtained, so the external walls of the building are faced with hand-made Stamford stone bricks which are very similar in appearance. The floor of the link entrance gallery is of quartzite, which comes from northern Norway, within the Arctic Circle.

The architects found this a most interesting and enjoyable project. The premises of the Scott Polar Research Institute are the only ones in the world which have been specifically designed for the purpose of polar research. This has meant that nearly all the design problems have been unique to this building, but the difficulties have been overcome by the close and cordial co-operation between the architects and the Director and officers of the Institute over the comparatively long preparatory period.

The way they have tended to think along similar lines is shown by the economy of the plan, which is largely due to the fact that all the subsidiary rooms open off the main spaces—library, museum and map room, thus obviating passages. This form of planning proposed by the architects was welcomed by the Institute as it tends to bring people working in the building together and fosters the feeling of community which is a feature of the Institute. Likewise staff tea and coffee is served in the link gallery, so that everyone in the Institute, and many visitors, are brought together twice a day in the heart of the building.

The general contractors were Messrs. Rattee and Kett, an old-established firm of Cambridge builders with a very high standard of craftsmanship, and the building was finished ahead of schedule and within the estimated cost. Building operation began in July 1966 and the new part of the building was occupied early in 1968.

All those with an interest in and appreciation of the work of the Institute will wish the Director and his staff a long and successful association in their splendid new premises.

## PAPERS ARE ANTARCTIC CONSCIOUS

Although most newspapers give considerable coverage to Antarctic events, there would be few in the world which are so Antarctic-conscious as the two Christchurch newspaper, the "Press" and the "Star". Ever since Christchurch was selected as the New Zealand centre for Operation Deep Freeze they have reported every event of importance in polar affairs.

But their interest goes deeper than merely reporting facts, as was shown by an appreciation in the "Christchurch Star" of 3 October. Entitled "A Notable Absentee" it read in part:

"The man who was the oldest inhabitant at the Deep Freeze organisation in Christchurch did not come back this year and his many friends in this city will deeply regret his retirement. Quiet, good-natured, knowledgeable and highly efficient, Eddie Goodale has been the United States Research Programme representative for the National Science Foundation almost from the beginning of Deep Freeze and hundreds of scientists passed through his hands during this time.

"For ten years he dealt effectively with the stream of scientists and scientific equipment bound for Antarctica and with the data and specimens being returned through Christchurch to laboratories back in the United States. He also aided in the co-ordination of American and New Zealand Antarctic programmes, and altogether was one of the key figures at the advanced headquarters of the United States Naval Support Force in Christchurch. . . ."

Readers will recall that in "Antarctic" of June 1968 Les Quartermain also paid a tribute to the work of Eddie Goodale.

## New U.S. Officer-in-Charge At Christchurch

U.S. Navy Commander Elvin G. Lightsey Jr. of Delhi, Louisiana will relieve Commander Lauren M. Johnson, on December 7, as Officer-in-Charge of the U.S. Naval Support Force, Antarctica Advance Headquarters in Christchurch. Ceremonies will be held at the headquarters.

Commander Lightsey, who reported to Christchurch at the end of November, is a graduate of Northwestern State College in Louisiana. He entered Navy Officer Candidate School in May, 1953, and was designated naval aviator in November, 1956.

Since that time Commander Lightsey has served in various commands. He has held positions as Flight Instructor, Material Officer, Assistant Anti-Submarine Officer and Administrative Officer. His last post, prior to reporting to Deep Freeze, was as Administrative Officer for Fleet Air Wing-3 in Brunswick, Maine.

In his new job Commander Lightsey will be responsible for maintaining station facilities for the Christchurch end of Deep Freeze operations.

Commander Lightsey is married with two children — Elvin II and Richard. The Lightsey family is now residing in Christchurch.

Commander Johnson, who has been Officer-in-Charge since July, 1966 has been ordered to Norfolk, Virginia as the Officer-in-Charge of the Naval Air Logistic Control Office, Atlantic. While there he will be responsible for co-ordinating U.S. Atlantic Fleet airlift requirements.

### BRITISH VESSEL TO EXPLORE SCOTIA SEA

With her Timaru-born, Christ's College-educated captain in command, the British Antarctic Survey's ship, "Shackleton", is southward bound

once more, this time to spend a great part of the season exploring in the Scotia Sea. Captain David Turnbull, sailed on the very day that "The Times" announced Government approval of the expenditure of \$4 million for the new ship to take over from the "Shackleton".

On this voyage, for the first time on a British ship, the "Shackleton" is carrying some of the equipment which will make her successor the most modern scientific laboratory afloat. This includes a special navigational aid developed by the United States Navy for Polaris submarines, which uses satellites launched by the American Department of Defence to obtain a fix on a ship's position of accuracy of 100 yards.

Called the Magnavox navigation system the equipment costs about \$50,000. It was supplied with the agreement of the American Government, and a second set of equipment has been bought by the National Institute of Oceanography for their research vessel, "Discovery".

The new navigation system should help a research team from Professor Donald Griffith's Department of Geophysics, Birmingham University, in the exploration of continental ridges on the floor of the Scotia Sea.

### YOUNGEST PERSON TO VISIT THE ANTARCTIC

A 12-year-old boy left Canberra, Australia, on November 8, to make history as the youngest person to visit Antarctica.

He was Bill Crook, Jr., — eldest of three children of the U.S. Ambassador to Australia (Mr. William H. Crook). Young Bill accompanied his father on a week's tour of McMurdo and Byrd Stations.

Other members of the Ambassador's party included the head of the Australian National Capital Development Commission (Sir John Overall) and Australian novelist Thomas Keneally.

American Embassy officials said that young Bill had spent most of his free time reading anything he could find about Antarctica.

## AUSTRALIANS PLAN ICE-YACHT

Two Melbourne men, Lou Bela, 40, and David Cowan, 23, plan to build the first Australian ice-yacht. The men are training for jobs in the senior observer radio of A.N.A.R.E. They will sail in the "Nella Dan" on January 28 from Perth to Davis Base. Bela is a former radio technician and Cowan an industrial radiographer. The sport of ice-yachting has received a big boost with the design of the DN-60 Ice Yacht in Europe. In America and on the Continent one can buy an "ice-yacht" or "ice-scooter" for between \$250 and \$500.

The two men consider that the eleven men at Davis will greatly enjoy the sport when the ice-yacht arrives.

## ELEVENTH SUMMER IN ANTARCTICA

A New Zealand petrologist, now working in America, arrived at McMurdo in the last week of November to begin his 11th summer probing the ice.

He is 36-year-old Mr. A. J. Gow, a former lecturer at Victoria University, Wellington, and formerly of Blenheim.

Mr. Gow first went to Antarctica in the summer of 1957-58 on a year's contract with the United States Army cold regions research and en-

gineering laboratory. He has worked with the laboratory ever since, going south each summer.

He now lives with his American wife and two children in West Lebanon, New Hampshire, U.S.A.

## NON-STOP FERRY ACROSS SEA-ICE

Fuel and supplies for Vanda Station were ferried across the sea-ice of McMurdo Sound from Scott Base in mid-December in a non-stop shuttle lasting four days to beat the ice break-out.

A team of three manned the former Trans Antarctic Expedition Sno-cat, towing two heavily-laden sledges, on each of the 20-hour trips of 70 miles to the Wilson Piedmont Glacier above the Bay of Sails and return. The shuttle service was an all-out effort to get as much fuel and supplies to the glacier and save on US helicopter time.

The station is scheduled to be opened by the Governor-General of New Zealand, Sir Arthur Porritt, on January 9. It was hoped that most of the supplies would be able to be transported overland to the new station, however the first tractor train was unable to find suitable vehicle access off the Wilson Piedmont Glacier into the Wright Valley. Fuel and supplies as well as two Fergusson tractors were lowered over the edge of the glacier by wire rope. A US helicopter was used to uplift the former Cape Royds Hut from nearby Hogback Hill. The hut, which forms the main living quarters at Vanda, has now been completed. The electrical work, too, has been completed as has the erection of a wind generator. The fuel and supplies at present being dumped on the glacier will be ferried up to the valley by a Fergusson tractor.

# NEWS OF THE SUB-ANTARCTIC ISLANDS

## CAMPBELL ISLAND

(NEW ZEALAND)

Mr Brian Smith, the Officer in Charge at Campbell Island has forwarded by radio telephone the following notes on activities on the island:

"The evening of 1 October, 1968 saw the M.V. 'Holmburn' entering Perseverance Harbour with eight quiet and reflective persons on board. Very little was said but most were deep in thought. Servicing itself went off well despite the burden of some 370 drums of diesel, an increase this year due to anticipated extra power requirements. This year's party have settled in remarkably quickly, and if the situation to date is any indication we can look forward to a very successful year.

"The project which has eclipsed all else so far is the erection of a new hut to house D.S.I.R. equipment. In the initial stages this necessitated the resurrection of a home-brew pile driver to drive six inch square hardwood piles through 11 feet of peat to bed-rock. The gadget was just not built for this purpose and broke down a few times every day. The building of a helicopter landing pad has also occupied our time and the 25 piles for this were driven within our first week here. All credit must go to Ross Staples for his steady work in taking over from this stage right through to completion. The transportation of very heavy prefabricated sections for the new building to the site above the Hostel was no mean task, requiring ingenuity and not a little

hard work. Some of the sections were carried by full Expedition manpower, not without incidental humour such as the mechanic disappearing down a hole. The three roof sections must have weighed about one-third of a ton each and the task of raising these into position was wondrous indeed. However the building is to the stage of painting the interior; the next thing to look forward to will be the erection of necessary aerials. The edifice has been named Aurora House commemorating its known research purpose and having a little dig at Civil Aviation Headquarters. It is logical therefore that the walkway yet to be constructed to it should be named Plimmer Steps. The official opening is scheduled for January 8, 1969, the first visit of H.M.N.Z.S. Endeavour this season.

"The visit of U.S.C.G. Southwind on November 25, 1968, was highly successful and very enjoyable: stores transfer was accomplished by a combination of helicopter and landing craft and heralded the departure of Ionosphere Observer Ross Staples and the arrival of replacement Iain Lynn. I was very sorry to see Ross go as he has been an excellent team mate. The Americans could not do enough for us and went far beyond the call of duty. Our thanks will be to them for a bountiful table at Christmas."

### CORRECTION

The following corrections should be made to the September issue (Page 147):

Senior Met. Observer should read B. V. Maguire.

R. J. Taylor's designation should read Met. Observer.

J. N. Walden will now be staying for full expedition and the asterisk should be deleted.

### MACQUARIE ISLAND (Australia)

In November most of the personnel on Macquarie Island took the opportunity of having their last look around the island; several expeditions setting off for the large Royal penguin rookery at Hurd Point and the scenic coastline at Caroline Cove, at the southern end of the island.

## ITALIANS AT SCOTT BASE

Four Italians left Christchurch International Air port on November 15 for Scott Base, where they will gain knowledge and experience of the scientific work being undertaken by the New Zealanders in Antarctica.

The visit followed a decision by the Ross Dependency Research Committee earlier this year that some support should be given to small groups from non-Treaty countries, provided that logistic support was available. The Italians had set up a Committee to investigate the possibility of their country ultimately participating in Antarctic expeditions. Mr R. B. Thomson, Superintendent of the N.Z. Antarctic Division, later visited Rome where he had discussions with top-ranking Italians who were interested in the project, and as a result an invitation was extended to four Italians to work at Scott Base this summer.

The group is being led by Italy's best-known alpinist, Carlo Mauri, who spent some time at Scott Base last season and participated in the

ascent of Mount Erebus. Other members of the party include Alessio Ollier, leading guide and alpinist, Ignazio Piussi, one time champion skier of Italy, and Dr Marcello Manzoni, geologist. Mauri and Ollier will work with the Victoria University geological party as field assistants for a period of from six to eight weeks in the Boomerang Range area, and will provide the necessary alpine experience to support the Victoria University party. Piussi and Manzoni will assist New Zealanders in the construction of Vanda Station and the scientific investigations to be undertaken in the Dry Valley area.

While in the Antarctic, Mauri and Ollier who are also experienced movie photographers, intend making a documentary film which they hope will be of assistance in enabling Italians to gain a knowledge of Antarctic conditions.

Later the four men will be together and will work with New Zealand field parties for the last few weeks before they return to New Zealand in early February.

CHARLES UPHAM, V.C., WITH SCOTT BASE TEAM.



# MAPPING THE LAST CONTINENT

By DENYS RAINEY

The peaceful occupation of Antarctica as a result of the 1957-58 International Geophysical Year and consolidated by the signing of the Antarctic Treaty is well enough known.

Part of the scientific studies carried out has been the surveying and mapping of the Continent, and New Zealand's contribution compares favourably with other nations' work in this field.

With the completion of reconnaissance mapping in the 1963-65 season, 150,000 square miles had been surveyed by New Zealand field parties and at this stage 36 maps have been published leaving only four maps at

the printing stage. These four will be printed within the next few months and the coverage of the 40 maps will be from west of the Matusевич Glacier (latitude 69° S., longitude 156° E.) to the (Isaiah) Bowman Glacier at latitude 85° 30' S., longitude 162° W., extending from the coastline to the west of the Trans-Antarctic Mountains and the 'featureless' Polar Plateau.

## The Early Years

New Zealand's active entry into Antarctica began with the 1955-58 period of the International Geophysical Year and the primary objective was the choosing of a site for a New



WALLY HERBERT WORKING ON MAP.

Zealand base. This was closely linked with the task of selecting a feasible route through the mountain barrier to provide the most direct travel back to the McMurdo Sound area for the impending traverse of the continent by the Trans-Antarctic Expedition. Scott Base has been New Zealand's first home in Antarctica for more than a decade and the "escape" route for Sir Vivian Fuchs' traverse party—the Skelton Glacier—was the first area to be mapped by New Zealanders. Prior to this, maps had labelled the feature Skelton Inlet.

The Skelton Glacier survey, therefore, as events proved, was the forerunner of New Zealand survey and mapping endeavours and it was not long before the programme became established, sophisticated and, more important, acknowledged as an accepted item of New Zealand's participation in Antarctica by successive New Zealand Governments.

### Surveying

The areas to be surveyed were selected well in advance once the "establishment" was secure and after the highly successful 1957-58 season with parties operating in the Dry Valley areas, Darwin Glacier and the Miller-Marsh sector of the Queen Elizabeth Range, systematic mapping of New Zealand's area of interest was programmed.

Field parties generally comprised four men—a surveyor, geologist and two field assistants. The huskies of course were always there, though in latter seasons the "tin dogs" did assert certain claims.

The surveyor's job was to establish control stations and from these to expand control by means of rapid triangulation.

Whenever possible, reconnaissance sketch maps were prepared and all salient aerial photography was supplied. The aerial photography has been supplied by the United States Geological Survey, Washington, and flown by the U.S. Navy VX-6 Squadron under an agreement with the New Zealand Department of Lands and Survey where New Zealand survey control was supplied to the

USGS as an exchange basis. This agreement was made prior to the United States venture into surveying and mapping but we have been fortunate to receive prompt replies and service to any request for aerial photography which may have been of assistance to our mapping programme.

Lands and Survey have now been supplied with 42,000 aerial photos. Even the cost of contacting these prints from the original negatives must have been prohibitive. I would therefore request any reader who holds any unreturned photographs to forward same to the Lands and Survey—so that a full library is available for future Antarctic personnel, and to avoid the necessity of requesting duplicate prints from the States.

However, back with the Surveyor, who has now his sketch maps, aerial photography and survey gear. Ordinary field note entries are made regarding horizontal and vertical angle readings to any points of reference and supplementing this a 35 mm. camera is mounted on top of the theodolite and a complete ground panorama film is made of the country while the country is also sketched in a graph book so a tie-up between otherwise difficult to interpret field book entries can be tied in with the ground photos and field sketches after the surveyor's return to civilisation where the base manuscript map is prepared.

The ground control itself presented the main task to the surveyor and, after the 1959-60 season, the instructions were for him to observe to "daylight" stars as well as the sun for position, as in the high latitudes of operation, refraction and other factors affected normal sun observation results. The ideal observation to overcome these anomalies was to observe at least one star in each quadrant within a relatively short period of time between observations. The results were gratifying and subsequent evaluation with the USGS tellurometer traverse positions showed that both countries' independent position fixes were in close agreement.

With the completion of a survey programme, one of the main tasks remaining was the drawing of a "manuscript" map back in New Zealand. Calculation of field observation positions and the build-up of intersected points enabled a sound base for further mapping work from the aerial photography.

### Aerial Photography

The photography supplied by the USGS differs from the normal vertical coverage employed in New Zealand mapping. With vast spaces to be mapped and relatively sparse survey control it is expedient and economical and logical to use oblique photography and by employing an instrument (the photoalidade) to plot from these obliques, satisfactory results are obtained for the purpose of mapping such areas as the Antarctic.

Vertical photo coverage is, in fact, incorporated with the obliques as the planes are equipped with three cameras synchronised for simultaneous exposures so that resultant photo prints cover from one horizon to the other with overlap between left and vertical and vertical and right. The breakaway from the normal vertical pattern occurs when the flight paths are generally designed to have the principal point of one oblique lining up with the opposite oblique principal point of the return flight path and the resultant gap in vertical coverage is that which is mapped from the obliques with the aid of the photoalidade.

The vertical photos are of course used for mapping those strips so covered. With no ground control markers for the guidance of the photo-aircraft the principal point oblique pattern is in theory only and the mapping of country from obliques varies greatly in extent from nearly coinciding vertical coverage to bands of "oblique" country twenty miles in extent, though subsequent flights are often carried out to reduce this. General altitude of the aircraft is either 20 or 25 thousand feet.

### The Photoalidade

The photoalidade is used to determine heights of unsurveyed peaks

and features and, through a build-up of intersections, the position of those peaks and features based always on ground control established by the surveyor.

The identification on oblique photos of ground observed pointings is not always a simple matter, just as confidence is not always high in recognising the same features from opposing flight paths. Generally, however enough selected points are chosen to enable the rogue points to be discarded. In particularly mountainous country as many as 50 features are used on one photo. The intersecting rays used are a result of these same features appearing on successive photos—the further away the features are, the more photos can be marked up and the more reliable the intersections become.

Only three factors are required to set up the photoalidade to simulate what the camera was doing during its operation.

The plate on which the photo is placed is inclined at the same angle at which the camera was exposed, calculated from flying height determined through adjustment of that angle to established survey heights: the distance from the axis of the theodolite to the principal point of the plate corresponds to the focal length of the camera; and the photo itself is tilted to coincide with the apparent horizon line. (Each oblique photo print quotes the focal length of the particular camera being used. Other relevant data such as altimeter and time readings are given as well as date of run.) Fixed to the theodolite is a straightedge which moves with the horizontal movement of that instrument and transparent tracing material placed under the straightedge is the base on which rays are drawn from observing to the marked photo feature. All such rays pass back through the one common point—the nadir point which is the aircraft station point and these station points are shown on the map as well as ground survey points.

The rays are placed over the base manuscript drawing which by now

shows the plotted positions of the rectified ground control points and, by moving the rays so that the drawn lines pass through these pre-determined points, the further build-up of intersections to aerial observed points are pricked through to the manuscript.

A further appraisal of the photos allows the drawing in of detail to bridge the numerous plotted points and such detail as ridge patterns, land slope, crevasse and glacier patterns, rock exposure, icefalls are depicted.

When the manuscript drawing has been completed the final drawing is commenced. Sheet lines, conforming to SCAR recommendations, are used. These area based on the International Map of the World 1 : 1,000,000 sheet lines and used by most Antarctic mapping agencies. The main factors for making what may seem a further unnecessary drawing are (1) the preparation on sheet lines of a clean drawing acceptable to the standards required by the map printing authority—in our case the Government Printer. The manuscript, by the time of its completion, has usually become a real war horse with amended position determinations, intersecting pencil rays, pin pricks and so on. (2) The further opportunity for the cartographer to revise detail from still more study of the aerial photography. (3) The separation into individual drawings of the place names sheet, exposed rock, ice areas and glacier bed sheet necessary for printing.

### The Printed Map

The New Zealand Provisional map series is produced in two basic colours—brown for rock areas and blue for ice features, with all names in brown. The general glacier bed areas are light blue. The general symbols and features follow the recommendations laid down by the Scientific Committee for Antarctic Research with information such as flight lines, routes of expeditions, historical notes where information is available, penguin and skua areas and available relevant data.

### Conclusion

From the surveys carried out, and with the use of the aerial photos, some interesting facts emerged.

Some mountains were cut down to size by as much as three thousand feet from the early surveys of Shackleton and Scott, while positions of features shifted by 20 miles or more.

Features named by pre-IGY expeditions proved incorrect such as Cape Downshire and Cape Cotter. There is no evidence of a cape existing as Cotter so the name was retained by renaming the area Cotter Cliffs extending from Cape Hallett to Cape Wheatstone. Similarly, Downshire enjoyed a minor spill out glacier but now possesses Downshire Cliffs, a feature of some 25 miles running south from Cape Adare.

The photography also proved that Lady Newnes has to be content with a bay, the "ice shelf" though it may appear as such from sea level, is in fact a series of glacier tongues thrusting into the sea.

Most significant of all has been the mapping of previously unexplored regions with one time blank spaces now occupied by major glaciers and mountain systems.

## N.Z. TO QUIT WHALING COMMISSION

New Zealand's decision to withdraw from the International Whaling Commission on June 30, 1969, was announced by the Minister of Marine, the Hon. W. J. Scott, on December 3.

Mr. Scott said that the decision was a natural consequence of the termination in 1964 of whaling activities based on the whaling station at Tory Channel.

While New Zealand had been a member of the commission she had continually striven for conservation and rational use of the whale species in the southern Pacific and Antarctic Oceans. She had co-operated in research, and New Zealand scientists have produced a number of papers which have contributed to the fund of knowledge of whale species.

## AMERICAN TOURISTS VISIT

The United States Government Antarctic policy authorities approved the Antarctic flight of the 67 Americans on the "round-the-poles" flight which took them to every continent, and cost them \$10,000 for the 26-day flight. The polar flight was approved because it was non-recurring and non-commercial.

It was organised by the Admiral Richard E. Byrd Polar Centre, of which Commander Fred G. (Dusty) Dustin is President and Professor Edward C. Bursk is Chairman of the Committee. Commander Dustin is a veteran of six Antarctic expeditions. After meeting the cost of the tour, the funds will be used to establish a polar studies centre at Boston, Massachusetts, in memory of Ad-

miral Byrd.

When the party reached Wellington on November 21 they were entertained at luncheon at the White Heron Motel, which had an Antarctic display provided by the N.Z. Antarctic Division for the occasion. Mr. Tracey Simpson, Chairman of the Richard E. Byrd, welcomed the visitors, and the Hon. P. B. Gordon, Minister of Civil Aviation, spoke on behalf of the Right Hon. the Prime Minister.

Before flying on to Christchurch for another functions that evening they attended a short service at the Byrd Memorial on Mount Victoria at which members of the New Zealand Antarctic Society and the Byrd Fellowship were also present.

COMMANDER DUSTIN AND A. S. HELM AT BYRD MEMORIAL.



# FIRST TOURISTS CROSS THE SOUTH POLE

By TRACEY SIMPSON

I count myself very privileged indeed that as Chairman of the Richard E. Byrd Fellowship of New Zealand I was invited to accompany the founding trustees of the Richard E. Byrd Polar Centre on their history-making first tourist flight across the Antarctic Continent from New Zealand to South America.

The flight was made in the "Polar Byrd", a Convair 990 with 75 on board, which took only 4 hours 35 minutes to reach Williams Field from Christchurch Airport. This set a new record for a fast flight from New Zealand to Antarctica.

Command Pilot was Captain Hal Neff, formerly pilot of "Air Force One", the United States Presidential Aircraft. Admiral "Bud" Abbot, Deep Freeze Commander, flew with the party as co-pilot.

Those in the plane had a busy time writing letters to be post-marked at Scott Base and McMurdo.

All members of the group wore thermal boots and full Antarctic clothing which was beautifully made, mostly from synthetic materials. However, as it was warm summer weather for most of the five hours spent on the ice, the heat generated by such perfection became an embarrassment even to the heat-loving Americans.

Throughout the flight approaching and over the continent the pilot flew as low as possible to enable close-up views. The Transpolar Flight party seemed very impressed at really setting foot in the Antarctic, after having seen so much of the ice floes and the coastline from the air.

Parties were made up for escorted tours over McMurdo and Scott Base. Before setting out a brief ceremony was held at the Richard E. Byrd Memorial alongside the Chapel of

the Snows at McMurdo. At its conclusion the wife of the flight leader, Commander Fred G. Dustin, who was in the party as doctor's nurse, laid a bunch of roses (sent to her in Christchurch by the writer's daughter) at the foot of the Memorial.

All these men, who were trustees for the Byrd Polar Centre in Boston, must have realised something of the immensity of the task this pioneer they remembered had undertaken over thirty years before.

The parties were escorted around McMurdo base area (including Scott's hut). In USARP Headquarters a lecture was given by Ken Moulton on the scientific programme under way this season. Seals were basking close in on the Bay ice, which of course had the cameras clicking. The day was perfect for photography and there was no risk of lenses fogging. A breeze came up suddenly causing a drastic body temperature drop. Immediately everyone was glad of their warm clothing and recognised the dramatic weather changes that can so quickly occur.

The sled dogs and pressure ice and the New Zealand accent at Scott Base were the main features of the visit there.

I had a sense of nostalgia at revisiting familiar places five years after my previous visit as a guest of the U.S. Government. A great thrill was had from getting a slap on the shoulder and hearing one's Christian name, to turn around and be greeted by Ken Moulton, who is in charge of USARP operations this season.

A perfect take-off from Williams Field had the party on its way to the flight over the Pole. The low flying height combined with perfect sunshine, made the flight almost a scenic tour. At the moment of the Pole fly over, a toast was drunk by all in

What a contrast this plane was from the first flight over the Pole undertaken by Byrd whose memory they honoured.

On to Rio Gallegos at the southern tip of South America, the landfall there making history, in that this was the first plane to approach the American continent from the south. This was recognised by the townspeople who were waiting at the airfield in great numbers to give an excited welcome. Shops and schools were closed for the occasion.

The actual flying time from Christchurch to Rio Gallegos, 5,173 miles — was 11 hours 59 minutes. For twenty-four hours the flight was in sunshine and it was not until reaching Rio de Janiero that a sunset was seen.

## SOCIETY NEWS

### THE NEW PRESIDENT

Harold Griffith's interest in the Antarctic started when he was a primary school boy in Dunedin, when the "School Journal" in 1917 featured articles on Captain Scott and Sir Ernest Shackleton.

When at high school he went down to Port Chalmers and boarded the Norwegian whalers and talked with the crew. Meanwhile, within his limited means he was building up a library of books about the Antarctic.

In 1928 the first Byrd Expedition arrived in Dunedin, and Harold spent a great deal of time on board the "City of New York" and the "Eleanor Bolling", where he met Admiral Byrd, Bernt Balchen, Paul Siple and many others. It was forty years ago, on December 2, 1928, that the ships sailed south.

Again in 1933 he met Byrd, and in 1934 Sir Hubert Wilkins and Lincoln Ellsworth. Since 1930 he has been considering the idea of starting a Polar Society but lacked the necessary contacts. The formation of the New Zealand Antarctic Society in 1933 made him realise there was no

need for two societies with parallel interests, so after much correspondence with Mr C. E. Collins, the Society's Secretary, it was eventually decided to allow the formation of Branches, of which Dunedin would be the first. The inaugural meeting was held in May 1936, and the Branch made a good start. In 1940 the exigencies of war forced it to go into recess, and by 1945 most of the old members were dead, scattered to other centres, or had lost interest.

It was the arrival of Dr. N. E. Odell in Dunedin to take up the chair of Geology, plus Harold's interest, that reinvigorated the Branch. When Harold was transferred to Christchurch in 1954 he handed over the reins to Colin Grey.

There was no Branch in Christchurch, but Harold did the spade-work all over again with such good results that in April 1955 a Christchurch (subsequently Canterbury) Branch was formed.

Late in 1957 the Deepfreeze executives invited him to go south with a party of VIP's for eight days, then in 1961 he joined the ice-breaker Glacier for a cruise to McMurdo, during which he visited Scott's and Shackleton's huts and flew back to Christchurch.

### THE RETIRING PRESIDENT

Mr. Eric Gibbs, the retiring President of the New Zealand Antarctic Society, lives at Taihape, about as far from the sea as it is possible to get in the North Island.

Eric's interest in the Antarctic stemmed originally from his school-boy hobby of stamp collecting. When Admiral Richard E. Byrd was going south on his second (1933-35) expedition, Eric wrote to the Admiral with a request to return an envelope from Little America. This was duly done. Then in 1939-41 during the U.S. Antarctic Service Expedition, he wrote to Captain Lystad of the U.S.S. "North Star", who also sent him envelopes from the Antarctic. From this beginning grew his Antarctic

Postal History which has become probably the best collection in New Zealand, and is in world class. With this grew his interest in the Antarctic. He joined the Society, and when in 1960 a party was being selected to restore the historic huts of Sir Ernest Shackleton at Cape Royds and Captain R. F. Scott at Cape Evans, he was chosen as a member. In 1963 a further party was formed to restore Captain Scott's 1901-05 Expedition hut at Hut Point, and Eric was chosen as leader. The next season he paid a flying visit to McMurdo Sound to complete the project.

In 1966 he was elected Dominion President and held that office until this year.

### ANNUAL MEETING OF COUNCIL

The Annual General Meeting of the Dominion Council of the N.Z. Antarctic Society was held in Wellington on September 28, 1968.

#### Election of Officers:

- President: Mr H. F. Griffiths.  
 Secretary: Mr V. E. Donnolly.  
 Editor: Mr A. S. Helm.  
 Assistant Editor: Mrs R. H. Wheeler.  
 Auditor: Mr W. Summers.  
 Patron: Decision deferred until Branches can consider recommendations.

#### Honorary Life Membership

On the proposal of Mr Gibbs, Mr L. B. Quartermain was elected to Honorary Life Membership of the Society. The election was carried with acclamation.

#### Amendment to Constitution

Rule 3 has been amended to read: "The President of Dominion Council shall be appointed at an Annual General Meeting from nominations received bi-annually from Branches in rotation."

### WELLINGTON BRANCH

Wellington Branch members at the Annual Meeting heard a most informative talk from Mr. R. B. Thomson, Superintendent of the Antarctic Division of D.S.I.R., on November 27. As well as learning something of the current New Zealand programme in Antarctica, members gained an appreciation of the international flavour now attaching to Scott Base activities. Particular mention was made to Mr. Thomson's visits this year to Japan and Italy. Already the evidence is available of the goodwill and co-operation that has followed these personal contacts.

Branch officers elected for the current year are as follows:

- Chairman: Mr. L. Donnelly.  
 Treasurer: Mr. P. L. Hinge.  
 Secretary: Mr. V. E. Donnelly.  
 Committee: Messrs. J. Duggan, W. Hopper, H. Malitte, P. Wilson.

Tribute was paid to the retiring Treasurer, Mr. A. Newton, who for many years had been a most astute financier for both the N.Z. Society and the Wellington Branch.

#### Love's Labour Lost!

This season the N.Z. Antarctic Society sponsored two more members to assist with the establishment of the new Vanda Station. The two participants were the reserves who stood by the previous season, Jack Folwell of Hamilton and Frank Gurney of Christchurch. Due to the mishap to the supply train the opportunity for long and exacting labour at the Vanda site did not eventuate and the two Society members came dangerously close to being classified as tourists. However, though the "Antarctic factor" has not been eliminated despite the best laid plans the good intentions of Jack and Frank were well appreciated. The Society is indebted to the Superintendent of the Antarctic Division, D.S.I.R., Mr. R. B. Thomson, for making the visit possible. Both men thoroughly enjoyed their experience and were impressed by the work being carried out at Scott Base. It was a particularly unique experience for Jack Folwell because twice in his seafaring career he had been in Antarctic waters without getting ashore.

# THE READER WRITES

## Sidelights of Antarctic Research

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

c/o Plant Physiology Divn.,  
D.S.I.R.,  
Private Bag,  
Palmerston North.

6 November 1968.

Dear Sir,

I have just finished reading the latest issue of "Antarctic" and was very interested in the "Tips for Photographers", p. 151. I should like to comment on the matter of "winterisation" which is recommended in the first paragraph.

Having just spent a year at Scott Base as the Auroral Technician, I was invariably called upon to "have a look" at cameras that were giving trouble. In all I dealt with 15, significantly only one during the winter, when temperatures were lowest and trouble might have been expected. The most common fault was the lack of lubrication in cameras that had been "winterised". This applied to both still and movie cameras.

My own camera, which had not been "winterised", performed without any trouble down to  $-30^{\circ}\text{C}$ . At  $-40^{\circ}\text{C}$ . trouble was experienced with the film becoming so brittle that it broke while trying to advance to the next frame, but the camera works were still operating.

"Winterising" is an expensive process and should be followed by an equally expensive "dewinterisation" on return to more temperate latitudes. So I beg anyone to think very carefully before having anything done to their camera, especially if they are only going to be in the coastal regions during the summer

months. A very good book on the subject is "Photography for Expeditions" in the "Focal Library" range by Joyce (if my memory serves me correctly).

J. S. TALBOT

### AUSTRALIAN STATION LEADERS

The leaders of the four parties which will form the Australian National Antarctic Research Expeditions in 1968-69 have now been appointed.

A schoolteacher, Mr. Edward Christopher Howells, 31, of St. Albans, Victoria, will lead the party at Wilkes Base Station which has been rebuilt.

The officer in charge at the Macquarie Island Station will be Mr. John Richard Canham, 51, who successfully led the party at Wilkes Base in 1967. Born in England, he served with the Royal Air Force from 1938 to 1960, attaining the rank of Wing Commander.

Mr. Timothy Neary Cassidy, 32, of Coopers Plains, Queensland, will lead the party at Mawson. Mr. Cassidy, who graduated as Bachelor of Science, majoring in zoology, is a lecturer at the Queensland Institute of Technology.

Mr. Nils Tonder Lied, 48, will lead the party which will reopen the Australian station at Davis, which has been closed since 1965. Born in Norway, Mr. Lied served as a radio officer in the Norwegian navy and merchant marine in World War II and arrived in Australia in 1948.

He has been a member of four ANARE expeditions. At the time of his selection as leader he was employed on aviation weather forecasting at Hobart Airport.

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## ANTARCTIC BOOKSHELF



### THE YEAR OF THE QUIET SUN

By Adrian Hayter. Published by Hodder and Stoughton Ltd., London, 1968. New Zealand price, \$3.90.

Adrian Hayter is well-known for his books "Shiela in the Wind", "The Second Step" and "Business in Great Waters". Now he has written an account of the year he spent at Scott Base as leader of the New Zealand Party for 1964-65. He did not apply for the position, and it came as a shock to him to receive a telegram asking him to undertake the task.

"The Year of the Quiet Sun" sets out, in searching fashion, the difficulties which can arise when a group of men, some of them scientists, some of them technicians and others dog-handlers, a radio officer, and a cook are thrown together to spend a long Antarctic winter away from contact with all others except the personnel of the American Base at McMurdo.

From his own account, Adrian Hayter may not have been the best leader that Scott Base has had, but there would be none who could have written so searchingly of the problems to be encountered and his way of dealing with them.

A major problem caused by the small New Zealand base being in such close proximity to the large American complex has been evident year after year ever since we built Scott Base on Pram Point only two miles distant from McMurdo.

The amount of fraternisation, the level of mutual help, and the tendency of some to sponge on others has always had to be worked out each year.

Many will not agree with his decisions — as indeed many of his group at Scott Base did not, but no one can doubt that here is a man who has convictions of what is right, and who has the courage to carry them out in the face of disapproval of some of his team.

Any VIP going to Scott Base or McMurdo should certainly read this book before leaving New Zealand, in order to learn how to conduct themselves down south, and of the reactions they are likely to meet from men who have been cooped up with a small group of companions for the long winter months and then suddenly meet people from "the outside".

Equally, this book should be compulsory reading for all, particularly the leaders, who are going to be stationed at Scott Base. Even the summer party can learn here of the problems they cause, and how they can play their part in making life a lot easier for others as well as for themselves when, full of enthusiasm for their special field of work, they arrive at the overcrowded base and find that it is not possible to proceed immediately into the field.

To the reader without any specialist knowledge of Antarctica, it will appeal as an enthralling account of life in a different environment. The book is well illustrated and contains end-maps of the territory around Scott Base.

### ANTARCTIC BIRD STUDIES

Oliver L. Austin, Jr., Editor. Volume 12 of the Antarctic Research Series, published by the American Geophysical Union of the National Academy of Sciences, 1968, Publication 1686, 262 pp., U.S.\$16.50.

Here is the latest of the 12 volumes in the splendid Antarctic Research Series, published to give a forum for writers in various scientific disciplines connected with Antarctica.

It contains eight original papers, each written by an expert in a particular field, and as would be expected emphasis is placed on the Adélie Penguins, no less than five of the articles dealing specifically with these interesting birds.

The birds of Antarctica have been known to mankind for a comparatively short period of time, less than two hundred years, and, of course, a thorough study of their habits has not been easy, for field work has been made difficult by climatic conditions. Further, until the commencement of the International Geophysical Year in 1957 the expeditions were few in number, lacked continuity, and did not normally have space for specialists in ornithology. Usually it was the doctor who, among those expedition members who had the ability, knowledge, interest and found the time to study the bird life. Among these was Dr G. Murray Levick, R.N., whose "Antarctic Penguins" is a minor classic among books on birds. But incomparably the greatest in the field was Dr Edward A. Wilson of Scott's two expeditions, who was the first to report the amazing breeding habits of the Emperor penguins in the middle of the Antarctic winter and whose interest in studying them led to "The Worst Journey in the World". Wilson was not only a keen and patient observer, but his wonderfully accurate field sketches are still without peer.

After Wilson's death there was little done until the end of World War II when Dr W. J. Sladen, an English surgeon and ornithologist, made pioneering studies on the penguins of the Falkland Islands Dependencies. Dr R. A. Falla, of New Zealand, also became an expert on Antarctic birds.

Now, in this latest important book, a gifted band of American ornithologists has proved that there is still unparalleled opportunities in the

great Antarctic bird rookeries for those who are prepared to work along modern lines.

The first paper, by W. L. N. Tickell, compares the author's field research work on the wandering albatross with the published works of others on the royal albatross, showing that apart from differences in the number and location of breeding islands, no differences in oceanic distribution are apparent between the species. Of singular interest are the unique breeding cycles of the great albatrosses which he describes and explains.

Madison E. Pryor, in the second article, describes the seven species of birds which nest on Haswell Island, varying in numbers from the 63 South Polar Skuas to 35,000 Adélie penguins. Other birds studied were the silver-grey fulmar, Antarctic petrel, Pintado petrel, snow petrel and Wilson's storm petrel. A colony of 18,000 Emperor penguins also nested on the sea ice near the island. Except for the skua, Pryor found that the numbers in 1962 for all species were considerably in excess of estimates made in earlier years. Each species is dealt with, covering time of arrival, the breeding season, brood mortality, a count of numbers and various other aspects.

"Territorial and Social Behaviour in the Adélie Penguin" is the subject of the paper prepared by Richard L. Penney. The objective of this study was to explore territorial and social behaviour in the breeding biology of the penguins. Emphasis has been placed on the physical and social aspects of territorial behaviour and on the importance of individual recognition in pairing and parent-offspring bonds. A small rookery near Wilkes Station, consisting of about 2,700 adults grouped in 14 distinct colonies, was chosen as the study area. Half the occupants were marked with numbered flipper bands, and details on territory location within the rookery, pairing, and breeding success were determined for several hundred birds for portions of three successive breeding seasons.

It is interesting to note that as the birds grow older they show a progressive increase in their attachment to particular colonies and territories. Fifty per cent of the birds retained their mate in succeeding seasons, and 99 per cent of breeders returned to their previous colonies. Young birds tended to nest on the periphery of established colonies.

Dietland Müller-Schwarze studied the activity distribution throughout the day of the 100,000 members of the Adélie colony at Cape Hallett. He covered general activity prior to mating; the ecstatic display of the males; adults walking over the ice to and from their feeding grounds; adults swimming to their feeding grounds, and the general activities of the chicks. A midday minimum activity, when the light amplitude was on the average 200 times greater than at midnight, was noticeable in all forms of activity. This seemed to be connected with the birds' upper limit of tolerance.

A team of five scientists from the College of Agriculture, University of California, studied the egg and blood serums of the Adélie penguin at Cape Crozier and in laboratory tests and compared them with those of other avian species. Their study constituted an introductory programme on the comparative biochemistry of the Antarctic penguins. Eggs of the Adélie were incubated and penguin chicks were successfully raised. Feeding experiments were conducted for a 10-day period. An interesting section deals with the palatability of penguin eggs.

At the Cape Hallett rookery, Donald S. Douglas, of the George Washington University, made a study of the salt and water metabolism of the Adélie penguins. To carry out tests it was necessary to develop techniques of handling, restraining and experimenting that permitted all experiments to be carried out by a single person.

Feeding preferences of the Adélie penguins at Cape Crozier, Ross Island, is the subject of William B. Emison's paper. Field studies for 1964-65 and 1965-66 were carried

out, and a technique was devised whereby food could be removed from the stomachs without harming the birds, thus making possible the collection of a large number of samples. The Adélies nesting in the Ross Sea region were found to feed on small marine organisms that swarm in the upper layers of the water.

The final paper deals with the USARP bird-banding programme for the period 1958 to 1965. It has maintained three special areas of activity, international co-operation through providing bands to other countries in support of their own specialized ornithological studies; support of USARP research workers following their own research problems; and support of Johns Hopkins University programmes in three main locations, South Georgia, Ross Island and the Falkland Islands.

The book is profusely illustrated, contains many diagrams, tables and maps, and has excellent bibliographies in each section.

This volume is a significant contribution to the scientific knowledge of Antarctica, and shows that the new generation of observers are as dedicated as those in the past.

## JAPANESE TV COVER

The Japan Broadcasting Corporation (Nippon Hoso Kyokai), which is the only public broadcasting organization in Japan to operate a nation-wide radio and TV network, is sending a reporter to the South Pole. There he will meet the 9th Japanese Antarctic team which is making a trans-polar trek from its Showa Base to the Pole, a return trip of 6,000 kilometres, cover the scene and give world coverage of this historic event. Mr Norio Kumabe was the man chosen for this assignment, and while waiting for the Japanese team to arrive he will also cover Scott Base, which has already twice featured in programmes by the Japan Broadcasting Corporation, and make a visit to Vanda Station where he will make a colour film for showing in Japan.

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Volume 3, number 7	number 5

Some other issues are in very short supply. Copies of available issues may be obtained from the Secretary of the Society, P.O. Box 2110, Wellington, at a cost of 50c per copy meanwhile. Indexes for volumes, 1, 2 and 3 are also available, 30c each.

Copies of our predecessor, the Antarctic News Bulletin, are available at 50c per copy, except for numbers 9 and 10. The copies of numbers 1, 2, 3, 4, 7, 11, 17 and 18 are authorised reprints.

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## The New Zealand Antarctic Society

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

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

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

You are invited to become a member. **South Island** residents should contact the Canterbury secretary, **North Islanders** should contact the Wellington secretary, and **overseas** residents the secretary of the New Zealand Society. For addresses see below. The membership fee includes subscription to "Antarctic".

### New Zealand Secretary

Mr. V. E. Donnelly, P.O. Box 2110, Wellington.

### Branch Secretaries

Canterbury: Mrs. D. Braxton, P.O. Box 404, Christchurch.

Wellington: Mr. V. E. Donnelly, P.O. Box 2110, Wellington.

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