ANTARCTIC

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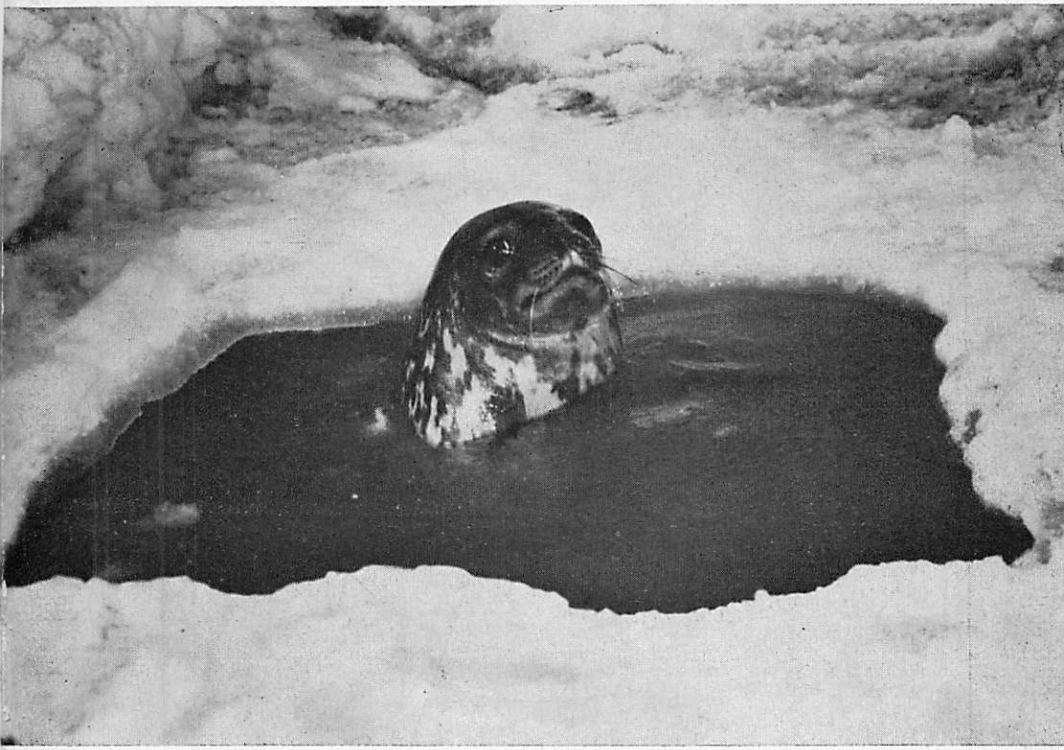
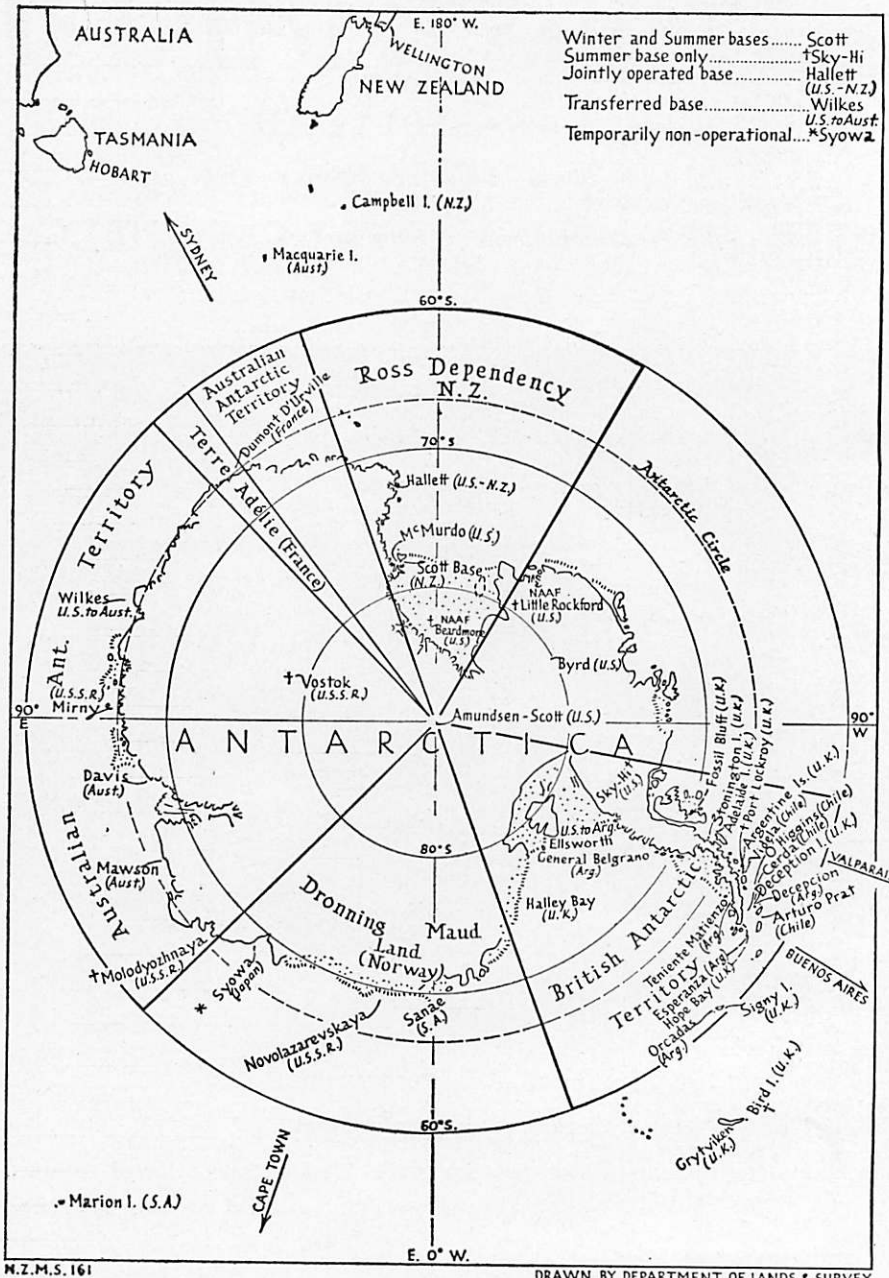


MAN HAS HIS USES!

A hole made by marine biologists saves this Weddell seal a lot of trouble.

—Official U.S. Navy photograph.

Vol. 3, No. 12 DECEMBER, 1964



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"ANTARCTIC"

(Successor to "Antarctic News Bulletin")

Vol. 3, No. 12 DECEMBER, 1964

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BASES AND MEN

Readers may be interested in the following summary of the Antarctic activities of the "Treaty Nations". Bases north of 60°S. have not been included and all figures are approximate.

	Number of Bases	Winter Personnel
Argentina	5	89
NZ:US (Hallett Station)	1	2:11
Belgium	1	14
Australia	3	62
Chile	4	39
France	1	20
Japan	1 (inoperative)	—
New Zealand	1	13
Norway	1 (not occupied)	—
South Africa	1	13
U.S.A.	4	274
United Kingdom	7	98
U.S.S.R.	4	87

Total of occupied bases: 32.
Total wintering personnel: 722.

SCIENTISTS GOING SOUTH

At the conclusion of the meeting of the **British Commonwealth Scientific Committee** at Massey University of Manawatu in late November, and a New Zealand tour, a small party of the visiting scientists visited Antarctica at the invitation of Dr. W. M. Hamilton, Director-General of the N.Z. Department of Scientific and Industrial Research, and by courtesy of Rear-Admiral J. R. Reedy, U.S.N. The visitors will be accommodated at Scott Base for approximately a week, from December 4. The party comprised: Dr. B. G. Ballard (Pres. Nat. Research Council, Canada), Mr. E. Martindale (U.K.), Mr. R. E. Radford (Dept. Tech. Co-operation, U.K.), Mr. K. A. Quagraine (Head Soil Research Unit, Ac. of Science, Ghana), Mr. R. D. Amarashingham (Dept. of Chemistry, Malaysia), Mr. E. M. Nicholson (Dir.-Gen. Native Conservancy, U.K.), Mr. E. D. A. Davis (Asst. Sec. B.C.S.C.), and Dr. Hamilton.

Accompanying the party were the following New Zealanders: the Hon. B. E. Talboys, M.P. (N.Z. Minister of Science), Mr. J. T. Andrews (Chairman Nat. Research Advisory Council), Mr. L. A. Atkinson (Chairman, State Services Commission) and Mr. G. C. Fortune (Dept. of External Affairs).

ARE YOU SAVING UP FOR THAT TOURIST TRIP TO THE ANTARCTIC?

Dr. P. G. Law is one of those who believe that the Antarctic has real possibilities as a tourist resort. He believes that the dream of a tourist liner bound on a holiday tour "out of this world" may become a reality sooner than most people think.

But if you are thinking of going, read on—

"If such a trip were advertised as sufficiently exclusive," Dr. Law is reported as saying, "one would experience no great difficulty in attracting a number of patrons **at a cost of about $10,000 (£4,500) each for a three weeks' stay in Antarctica."**

Shall we put your name down?

NEW ZEALAND FIELD PARTIES BEGIN SEASON'S WORK

Of the ten specific projects in areas ranging from Northern Victoria Land to the South Pole, which comprise the field work objectives of this summer's New Zealand Antarctic Research Programme, all but four were being vigorously implemented by mid-November.

As this issue of Antarctic goes to press New Zealand's summer programme of field work is well under way and the change-over of personnel at Scott Base has been completed.

Not all of the men listed will be spending the whole summer in the field. A few are engaged in special projects of short duration.

The first group of new men left Christchurch by air for McMurdo on October 15. Adrian Hayter, the leader for 1955, had taken over from Russell Rawle on October 8. The first relief team comprised A. L. Burrows, senior technical officer; C. Hough, fitter mechanic; B. B. Dorrington, fitter electrician; D. J. Haycock, cook, and R. Wright, storeman. With these winter-party men travelled C. H. Zwaaneveld of the D.S.I.R. who went south to inspect the all-sky cameras installed last year at Scott Base and Byrd Station.

INTO THE FIELD

The first field party of the summer season left Scott Base on October 24. Vulcanologist Dr. A. Ewart was taken by a dog sledge 30 miles to Cape Royds, and two soil scientists, Dr. G. Claridge and I. Campbell, were flown to Cape Hallett.

Dr. Ewart is studying lava flow in the McMurdo area to make comparisons with the origins of some New Zealand volcanic areas.

The soil scientists were to spend about two weeks at Cape Hallett and were helped by Scott Base field assistant David Lowe, in making short man-hauling sledge trips in the area.

CROZIER TRIP OFF

As Dr. Ewan Young is unable to go south this year, the proposed skua-study at Cape Crozier will not eventuate. B. Cope, who was to have been Dr. Young's assistant, will now participate in the Balleny Islands expedition.

LINCOLN SCIENTISTS

A two-man field party from Lincoln College left Scott Base on November 23. At Cape Chocolate and Lake Alph the soil scientists, P. Stevens and J. Williams, will investigate processes of soil formation on a sequence of different moraines. This project is related to similar work Stevens has been doing at the Franz Josef Glacier.

The party was flown the 35 miles from Scott Base to Cape Chocolate and was to be shifted in about 10 days' time to Lake Alph, 25 miles farther south. At each of these places they will trek over an area of about 40 square miles.

CHANGES

A few changes have been made in the summer programme outlined in our last issue.

The full Victoria University team was not placed in the field till November 24. University students cannot ignore examinations even when the Antarctic sirens call.

H. J. Cranfield, one of three brothers who have played a prominent part in New Zealand's Antarctic activities, is checking the penguin population at Hallett for the Dominion Museum.

PARTY LEADER CRIPPLED

Bad luck has quickly befallen the Northern Geological and Survey party. The team was flown on November 22 for 150 miles from Scott Base to Carapace Nunatak (76* 50′ S., 159° 3′ E.) on the plateau above the head of the Mackay Glacier. The same day a message received at Antarctic Division headquarters in Wellington said:

"Project 2 report Warren simple break left leg no other injuries at Carapace Nunatak Others with him position comfortable tent pitched over Warren. Helicopter left now 1415 hours with doctor and McDonald to replace Warren."

This was within an hour of the accident. And at 5.30 a.m. next day Warren, accompanied by Zwaaneveld arrived at Christchurch airport, and was admitted to Christchurch Public Hospital. His leg was fractured above the ankle when he fell a few feet. As weather conditions hampered radio contact, the party got in touch with Scott Base by using morse.

Guyon Warren is employed by the Geological Survey D.S.I.R. at Christchurch. As a member of the New Zealand component of the Trans-Antarctic Expedition, he was in the first New Zealand party to winter in the Antarctic. In February, 1957, with Gunn and Heine he climbed Mt. Harmsworth, the first major peak to be scaled on the actual Antarctic Continent. He spent a short period in the Carapace-Alan Nunatak area when he was one of the two geologists in the T.A.E. Northern Party under Lt.-Cdr. F. R. Brooke in 1957–58, and was keen to return to complete his study of the geology of the area.

The present party hope to examine the nature and age of a conglomerate rock formation at the Nunataks, where fossil plants and fresh-water crustaceans covering a geological sequence from 150 to 300 million years have been found. Their intention is to man-haul their two sledges the 20 miles to the Allan Nunatak before being air-lifted to Mount Fleming, 75 miles on the way back to Scott Base.

In order to maintain the team at four-man strength, I. B. McDonald of the wintering party, a very experienced mountaineer, will temporarily join the Northern Party. The other members of this party are Dr. P. F. Ballance, Dr. W. A. Watters and Dr. J. A. Townrow, a botanist from Tasmania.

As well as studying the conglomerate referred to above, the geologists will examine its relationship to rocks above and below. Some of the sandwiching rocks contain thin seams of poor quality coal with abundant leaf and tree-trunk fossils. Carbonaceous beds with leaf impressions are also present in the Mount Fleming area. Dr. Townrow will collect specimens for subsequent detailed laboratory study.

GEOLOGISTS' RANGE

Le Couteur's party was due to get into the field in early December. On November 26 it was reported that Ford was preparing the party's equipment and that Le Couteur and Lucy had placed a dump for the party at 82° 35′ S., 156° 20′ E.

EMPEROR ROOKERY FOUND

John Cranfield reported from Hallett on November 9 that a Bishop Museum entomologist and a New Zealand biologist, with the co-operation of U.S. Army helicopter crews, had found a previously unknown Emperor penguin rookery and six new Adelie penguin rookeries in the vicinity of Cape Hallett.

The Emperor rookery is computed to contain 11,600 chicks. It is situated under Cape Roget, which is at the northern end of Moubray Bay in Victoria Land, about 20 miles from Hallett Station.

At the Coulman Island Emperor penguin rookery, the count showed 21,000 chicks. One of the new Adelie rookeries, on Foyn Island, the largest of the Possession Islands, contained approximately 60,000 penguins. The previously known rookery on the Possession Islands contained approximately 300,000 birds.

FOSSIL PUZZLE

Antarctic history has links with the geological work to be done by a field party that left Scott Base on November 12.

When both Scott and Shackleton were sledging up the Beardmore Glacier they gathered rock specimens containing coral-like fossils.

Such rock samples were found on sledges at the tent where Scott's party died, and accompanying notes explained where the rocks were collected.

The fossils have been dated to be about 600,000,000 years old — the oldest ever found in Antarctica. Called "archaeocyathids", these fossils are also known in the Soviet Union and Australia.

During the 1960–61 summer season, geologist Malcolm Laird found similar fossils in a limestone formation on part of the Holyoake Range, north of the Nimrod Glacier.

Laird was unable to obtain complete information on the rock formation, so he is now leading a four-man party in the area. The party were flown by U.S. VX6 Squadron aircraft to a site near the Nimrod Glacier, 400 miles south of Scott Base.

During the next two and a half months in the field they will use motor toboggan-drawn sledges to cover an area of about 2,000 square miles. Other members of the party, Dave Massam, John Chappell and Graham Mansergh, will assist in working out where the fossilised limestone fits in, in relation to other rocks of the area.

The party also will study a series of lower lying rocks in which are low quality coal seams, and they will geologically map the whole area.

This work will be made possible by observing the exposed face of the 5,000 ft. high Cambrian Bluff, at the southern end of the Holyoake Range, that has been eroded by the Nimrod Glacier.

After six and a half weeks the party will be airlifted across the 15-mile-wide Nimrod Glacier to gain a knowledge of the geological structure on both sides of the glacier and plot the extent to which the fossilised limestone continues south.

When this shift is made, Mansergh will be replaced by David Lowe.

Since the party will be in the field until next year, at a spot about halfway between Scott Base and the South Pole, some Christmas "cheer" is packed with their supplies as well as a six-inch Christmas tree.

ALL-SKY CAMERAS BEING CHECKED

New Zealand-built "all-sky cameras" are being checked after their first winter in the Antarctic. They were designed at the Physics and Enginering Laboratory of the D.S.I.R., Gracefield. (See "Antarctic", March, 1964, p. 384.)

Apart from the prototype, built at the laboratory, they have been manufactured by a Wellington electrical engineering company. Five of these cameras are being used at Antarctic stations — one at Scott Base, another at Byrd Station, and one at each of the Australian stations — Mawson, Wilkes, and Davis.

In Antarctica these cameras photograph the aurora from March through to about September. As well as giving information on upper atmosphere happenings all-sky photographs help tell the type and quantity of radiation being received by the earth.

The Antarctic climate has caused the film movement to jam and the skywards transparent dome to fog over. In counteracting these problems slight modifications have been made to the cameras at Byrd Station and Scott Base by Mr. Zwaaneveld, an officer of the P.E.L.

Because of the Antarctic's low humidity the film curls. More power has been fed to the spool that winds the film onwards and pressure plates have been added to press the film flat against the lens base. To prevent condensation in the transparent dome Mr. Zwaaneveld has added a moisture collecting trap to the camera units. Warm air on a closed circuit is blown through the dome, but now before entering the dome it passes through a metal box at outside temperature where any condensation occurs.

THE SCIENCE LABORATORY AT SCOTT BASE.
Photo: Guy Mannering.

BIOLOGISTS BUSY

Biologists from the University of Canterbury are working for the fourth consecutive year in the McMurdo area. **Dr. B. Stonehouse** and technician I. Harkess went south on November 1 and were replaced after University exams by **I. Spellerberg, J. Hay** and **G. Yeates.** M. S. R. Smith, a Ph.D. student who wintered at Scott Base in 1963 will be seal-marking for a short period. Most attention will be given to further observation of Adélie penguins and to measures for penguin and seal conservation.

BURSARY STUDENTS

Hay and Yeates are the first students to be assisted under the fund established by the Canterbury Branch of the New Zealand Antarctic Society.

SCOUTS

The three Queen's Scouts to work in the Antarctic this summer, D. O. Crerar, W. W. Janssen and B. K. Service, are to go South on H.M.N.Z.S. "Endeavour" scheduled to leave New Zealand on December 6 on her first voyage of the 1964–65 season. All three boys are 17 years of age and were carefully chosen from a very large number of qualified applicants, a dozen of whom were interviewed in Wellington for the final selection.

"Four more males have joined the New Zealand Antarctic Research Programme force at Scott Base," reports John Murphy, the P.R.O. They are the four sons of Virgo and Podge, born on November 16. They are the first dogs to be born since about June and are progressing well under the care of surveyor Bill Lucy.

New Zealand Expedition to the Balleny and Ross Sea Islands

A more determined attempt is to be made this summer to examine in some detail the Balleny Islands, on which several brief landings were made last season.

The "assault" will be made by 14 New Zealanders with the assistance of the U.S.S. "Glacier", the U.S. Navy's most powerful icebreaker, during January, February and early March next year. The exact timetable had not been finalised at time of going to press, but in general terms the plan is to spend about a fortnight at the Ballenys, and shorter periods at Cape Adare, Robertson Bay, the Possession Islands, Moubray Bay, Coulman Island, Franklin Island and Beaufort Island.

NEW ZEALAND TEAM

The party will be led by **Elliott W. Dawson** of the Oceanographic Institute. With him in the Marine Biology and Oceanography group will be **J. C. McDougall, J. G. Gibbs** and two technicians, one of whom will also be the expedition photographer. Other scientists will be the magneticians **N. Roberts** and **D. G. Innes,** geologist **B. C. Waterhouse,** and two terrestrial biologists. The surveyor will be an experienced man who has wintered at Scott Base, **M. R. J. Ford,** and he will have a capable assistant.

THE BALLENY ISLANDS

The oceanographic work around the Balleny Islands will include continuous echo-sounding both inshore and offshore and dredging and trawling at selected stations. A running survey will be made along both sides of the island chain. A magnetometer will be streamed at all times when the ship is under way. Shore biological and geological collecting will be carried out at all points where landings can be effected, using helicopters or landing craft. Astro-fixes and survey for ground control of trimetrogon photography are required, and the surveyor and his assistant, both experienced alpinists with considerable Antarctic experience, will be landed at selected spots for periods of up to 24 hours.

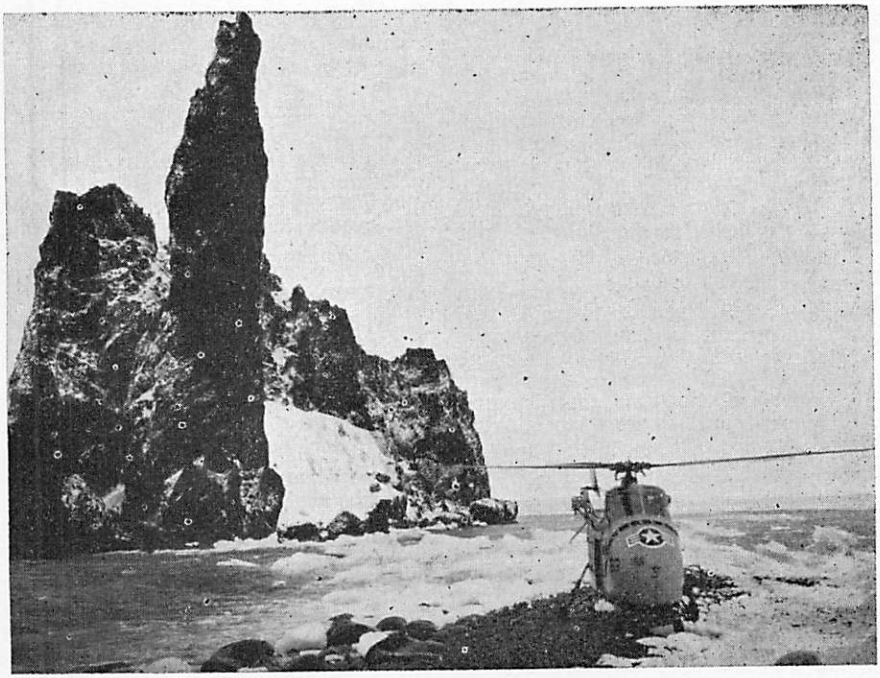
The U.S. authorities plan to map the islands with trimetrogon aerial photography and asked New Zealand to provide a surveyor to obtain ground control astro-fix stations.

Eight terrestrial and marine biologists from the United States and Australia will also take part in the expedition.

ROSS SEA ISLANDS

At the other islands a shorter programme of offshore biological stations, shore collecting of biological and geological samples and in most cases astro-fix and survey will be attempted. During the crossings from site to site biological stations will be made as required and in most cases the proton magnetometer will be streamed. Special attention will be given to the submarine ridge which is believed to link the Balleny region with Macquarie Island by way of the Hjort Seamount. It is hoped to cross the ridge completely each time about 30 miles apart from about 1,500 to 2,000 fathoms on each side. Similar work, to the extent that time allows, will be done along the North Macquarie Ridge linking Macquarie Island and New Zealand.

An extensive programme of Nuclear Sampling is planned, two-gallon precipitation samples being collected at all islands and other places of special interest, as well as at every five degrees of latitude between the Balleny Islands and New Zealand whenever precipitation occurs. Ship to shore party communications will be by field-sledge radio sets for two-way voice and WT communications.



LANDING ON THE BALLENYS

U.S. helicopter lands New Zealand scientists on spit between Sabrina Island and the Monolith, March 1964.

Photo: Guy Mannering.

CARRY ON, SAILOR!

A Biblical message crackled between Navy Office in Wellington and Scott Base — and all over a sailor's beard.

The hirsute matelot was 22-year-old Leading Cook B. D. George, proud possessor of what a naval spokesman described as "a monstrous red beard".

Preparing to return to civilisation after the winter, he signalled his parent "ship", the landbound Navy Office:

"Request permission to continue shaving. Discontinued June, 1962.'

He thus complied with an R.N.Z.N. ordinance that, to prevent sailors merely missing a shave for several days or weeks, they get permission to begin growing beards and, if needs be, again to start shaving.

The Navy Office signalled back: **"See Ezekiel chapter 5, verse 1."**

It reads: "And thou, son of man, take thee a sharp knife, take thee a barber's razor and cause it to pass upon thine head and upon thy beard."

SEARCH AND RESCUE

Inspector L. D. Bridge of Police Headquarters, Wellington, made his seventh visit to the Antarctic when he spent some weeks at McMurdo in October assisting in the training of the U.S. team there under Antarctic conditions. As Captain Bridge, he was Leader at Scott Base during the 1960–61 summer. With him as instructors on the present course are W. Bevan, R. Scott, A. Cookson, J. Ede and P. Bielski. The course is organised by the Federated Mountain Clubs of New Zealand in co-operation with the Antarctic Division.

KEEPING WATCH ON THE BEACON SATELLITE

The launching from the Vandenberg Air Base of Polar Ionospheric Beacon Satellite S-66, referred to in "Antarctic", Vol. 3, No. 9 (March issue), was unexpectedly delayed and the satellite did not actually go into orbit until October 10.

At Second Crater, 1,000 yards from the Auroral Radar station on Arrival Heights on the Hut Point peninsula five miles from Scott Base, George Lewis, assisted by technician Tom Hetherington, had his instrumentation ready, and a trial run during three orbits of the satellite produced data which was transmitted to Dr. J. E. Titheridge of Auckland for confirmation that all was in order.

The satellite is orbiting the earth at an angle of 80° with respect to the equator, at a height of 890 to 1,105 km. Once during each orbit it comes over 80° S. latitude and is above the horizon to an observer at Second Crater. As the satellite's period of revolution is 104.8 minutes, there are approximately 14 orbits per day.

MESSAGE RECEIVED

The continuous signals which it transmits, passing through the ionosphere before being recorded at the receiving stations at Auckland, Wellington, Invercargill, Campbell Island and Second Crater, provide information on ionospheric density and on any irregularities in the ionosphere. Part of the programme is the recording of the slow, regular fading which is known as Faraday Rotation.

Signals are sent out on frequencies of 20, 40 and 41 mc. and these are recorded on revolving drums by three separate receivers. The recording is, of course, automatic, but the Scott Base observers visit the wanigan receiving-station approximately every second day to ensure that the instruments are functioning correctly and to make any necessary adjustments, as well as to make the periodical change of record roll.

Lewis and Hetherington have returned to New Zealand after their year at Scott Base, but the recording is being carried on by G. Jones of the 1965 Scientific team at Scott Base.

While the observations require the attention of a qualified scientist and a skilled technician, the data recorded is forwarded to top-level physicists and mathematicians whose task it is to draw conclusions from the data recorded.

At the Second Crater wanigan a record is made also of the small pulsations in strength and direction of the earth's magnetic field.

H.M.N.Z.S. ENDEAVOUR

New Zealand's Antarctic tanker "Endeavour" will make two cruises to McMurdo as well as an oceanographic cruise in sub-Antarctic waters this summer.

She is due to leave Lyttelton on December 6 and to rendezvous with the U.S.S. "Mills" at sea in 60° S. between December 10 and 12. Arriving at McMurdo on December 20 she will unload and leave again on the 26th, arriving at Lyttelton on January 5.

The oceanographic cruise will extend from January 11 to February 5. Work will be concentrated on the margins of the Campbell Plateau.

"Endeavour" is scheduled to leave Lyttelton again for the Antarctic on February 12 and to reach McMurdo on February 20. Leaving the Antarctic again on the 24th she is to rendezvous again with the "Mills" about the 28th, and arrive at Lyttelton on March 4.

Oceanographic work will be carried out on the two supply voyages. A magnetometer will be towed along selected meridians.

"Endeavour" is commanded by Commander P. R. H. Silk.

SUMMER PARTY

J. M. Lee will serve as Radio Operator at Scott Base while Ted Gawn has a week or two in New Zealand before returning to the Base for his third Antarctic winter.

OCEANOGRAPHY

Oceanographic work this summer will comprise three projects:

(1) During the two supply cruises of H.M.N.Z.S. "Endeavour" a scientific party of three men from the Physics Department, Victoria University of Wellington, will carry out Total Magnetic Field and Seismic Profile measurements, involving the use of a proton magnetometer and an explosive seismic profiler.

On the first trip (December 1964) the programme will be implemented by **S. T. Reid,** a Physics Honours student, and two assistants. For the second trip (February 1965) **D. I. Ross,** junior lecturer in Physics, will be in charge of the oceanographic programme. The aim is to complete the magnetic record previously obtained, which has provided convincing evidence of the existence of a regular sub-bottom magnetic anomaly pattern across the South Pacific Ocean and the foothills of the South Pacific Ridge. The purpose of the seismic profile measurements is to obtain a detailed record of the sub-bottom ...strata ...down... to... the basic rock, which might be several miles below the sea bottom.

(2) Between the two supply cruises, "Endeavour" will make a special oceanographic cruise extending from January 11 to February 5. The cruise leader will be **I. N. Estcourt** of the N.Z. Oceanographical Institute, and he will be assisted by **K. B. Lewis, R. J. Singleton, I. D. Slater** and one other still to be selected.

The main purpose of the cruise will be to carry out echo-sounding runs in an east-west band from the vicinity of the Snares Islands as far as the Bounty and Antipodes Islands: then to carry on with more echo-sounding runs in a south-westerly direction from the Antipodes towards Campbell Island. The object is to define the shape of the northern and eastern edges of the Campbell Plateau. Very little is at present known about the area close to the Antipodes and in the vicinity of Campbell Island.

During these voyages, opportunity will be taken to collect sediment samples and to examine the bottom-living animals in selected areas.

(3) Balleny Islands Expedition: When the ship is standing off the islands, biological stations, involving dredging and trawling for bottom-living animals and sediments, will be carried out, particularly in Moubray Bay, Robertson Bay and off Cape Adare. If bottom conditions prove suitable similar work will be done over the Cape Adare Bank (68° 71′ S., 171° 30′–172° 30′ E.). From 65° northwards, the objective will be to plot the course of the submarine ridge presumed to link the Balleny region with Macquarie Island by way of Hjort Seamount.

SCOTT'S HUT AT HUT POINT

The Antarctic Division, with the co-operation of the Antarctic Society and the Commander U.S. Antarctic Support Activities, proposes to complete this summer the restoration of the hut erected by Captain Scott's first ("Discovery") Expedition on Hut Point, McMurdo Sound. The old hut, which is only a few hundred yards from the main American base of McMurdo, was cleared of ice and snow last summer (1963–64) by four volunteers from the Antarctic Society. A surprising quantity of stores and equipment was found buried in the ice of 40 years and more, and carefully stored awaiting a decision as to its disposal.

The Huts Restoration Committee requested Messrs. Quartermain and Gibbs (leaders of the Restoration parties of 1960–61 and 1963–64 respectively) to confer on the best way to restore the hut to its expedition-time appearance while at the same time making it available for inspection without the danger of damage or pilfering. Their recommendations were adopted by the committee and are to be implemented during December 1964–January 1965. This work will be in the hands of Mr. Gibbs and Mr. Rodney Smith, a qualified architect who was one of Mr. Gibbs's team last summer. Help will be afforded by one of the Scott Base carpenters and by members of the American Support Force.

The proposal is to restore the hut to the appearance it had when occupied under conditions of great hardship by members of the Ross Sea Party of Shackleton's Trans-Antarctic Expedition in 1916 after the survivors' return from depot-laying in the far south.

WINTER PARTY

A few more details about the men who will be wintering over at Scott Base during 1965.

For the Leader, **Adrian Hayter,** see June issue; and for **J. E. (Ted) Gawn** and **Brian M. Judd,** who have wintered at the Base before, see "Antarctic", September 1963.

A. L. (Buzz) Burrows (45), Senior Scientist, was born in Christchurch and attended Waitaki Boys' High School and Marlborough College. After clerical work in Blenheim he was on war service in Greece, Crete and the Middle East, and joined the D.S.I.R. in 1947. He has travelled extensively on magnetic field work throughout the Pacific Islands and the sub-Antarctic and was in the winter party at Scott Base throughout 1958. He is married and has four children.

Scientific Officer **D. L. Foster-Lynam** (22) was born in Greymouth and educated at Greymouth Technical High School 1956–58. He is an L.A.C. at the R.N.Z.A.F. Station, Whenuapai. On the completion of his Senior Technician's Course in 1962 he was posted to Singapore and Thailand. A keen skin-diver and Rugby and water polo player, his home is now in Christchurch. He is married.

Scientific Officer **G. L. Jones,** B.Sc. (22), is a Dunedin boy now working at the Physics and Engineering Laboratory, Gracefield. He attended Waitaki Boys' High School in 1958–59 and Otago University 1960–64, gaining his degree in Physics. He is single.

T. E. Sanson, B.E., also a Scientific Officer, is 38. Born at Te Awamutu and a pupil of Hamilton Technical High School, his home is now in Hokitika, where until he resigned to go south, he was a science teacher at Westland High School. Previously he was for three years an assistant electrical engineer with the N.Z. Electricity Department. After study at the School of Engineering, Ardmore, and the University of Canterbury, he gained his degree in 1951. He is a keen soccer player and his hobbies include photography, geology, bee-keeping and house-building. He is a married man with three children.

J. Calvert (30), photographer, is an Englishman by birth. He served his apprenticeship in photography till 1953 and then became a photographer in the R.A.F. till 1955, after he rejoined his old firm. He came to New Zealand in 1963 and is employed in Christchurch as a Press photographer.

D. R. C. Lowe (30), field assistant, was born in England and educated at London. He came to New Zealand in 1949 and his home is now in Auckland. He is single. A very experienced mountaineer, Dave Lowe has been until his appointment a Ski Facility Operator at Ruapehu.

I. B. McDonald (24), the other field assistant, was born in Christchurch where he still has his home. He was educated at St. Andrew's College and Christchurch Technical College. He is married. A keen and experienced climber, he has won national honours as an ice skater .

B. B. Dorrington, fitter-electrican, who is 23, was born at Howick and attended Thames High School 1954–58. He was an Electrical fitter apprentice at H.M.N.Z. Dockyard, Auckland. He is single.

C. E. Hough (29) fitter-mechanic, was born and still has his home in Gisborne, where he attended the local high school. He is a fitter employed by the Ministry of Works.

R. C. Wright (29). storeman, was born in Dunedin, where he attended King Edward Technical College for two years. He is very keen on tramping and deer-stalking, but found time to build his own house, unaided. He is a married man with two children.

D. J. Haycock (37), cook, was born and educated in England. He served in the Royal Marines 1945–48, one year on active service. Then, after a period in hotel management, he became a chef in the R.N.Z.A.F. from 1958 to 1964. He is married.

SOIL RESEARCH

The two New Zealand soil scientists, Claridge and Campbell, flew from Scott Base to Hallett on October 28. During a fortnight's stay they man-hauled a light sledge to examine a number of areas within a radius of a dozen miles of the base — Luther Peak, Cape Christie, Felsite Island, Redcastle Ridge — collecting samples and sorting out the soil and weather pattern where outcrops and bare ground occurred. They ascended a 6,000 ft. peak on the ridge behind Luther Peak and from here sighted an apparently "possible" climbing route to the summit of Mount Herschel (11,900 feet).

Mosses and lichens were found in abundance in the basin between Luther Peak and the sea.

Two electronics trainees at the Physics and Engineering Laboratory, Gracefield, **C. Batterbury** and **J.** Talbot, travelled on "Endeavour's" first cruise, and are to spend about six weeks at Scott Base to become familiar with the scientific equipment and its operation.

Also on "Endeavour" are sea cadet Petty Officers **K. J. Howland** (Tauranga), **B. M. Hirst** (Wellington), **A. Rogers** (Wellington) and **D. W. Stuart** (Nelson).

FOUR M.P.s

Four Members of Parliament are likely to visit the Antarctic this summer as the guests of the United States Operation Deep Freeze.

They are Messrs. A. Dick (Nat., Waitaki), D. S. Thomson (Nat., Stratford), B. P. MacDonald (Lab., Dunedin Central), and Mr. J. Mathison (Lab., Avon).

ACKNOWLEDGMENT

The photograph in our last issue of the crew of the "mercy flight" Hercules came to us by the courtesy of the Lockheed Corporation.

HALLETT TO CLOSE

As forecast, Hallett Station is to become merely a summer research and air operations centre. This change, envisaged for some time, has been precipitated by the disastrous fire which destroyed much of the scientific equipment and records during the winter.

Miller, of the 1964 wintering team, and R. C. Martindale were flown to Hallett to assist D. Rowles in the dismantling and packing of the New Zealand scientific equipment for return to Scott Base or New Zealand. All three men returned to Scott Base on November 10.

Begun as a joint scientific effort for I.G.Y. in 1957, Hallett has been an important link in the upper atmosphere physics chain; as well as serving as a communications relay station between McMurdo and New Zealand and as an alternate landing facility for U.S. aircraft. Its maintenance as a winter research station is, however, too much of an undertaking for its scientific contribution to justify, so it is to become a summer only facility, manned still by both countries.

The first flight in to Hallett this summer was made on October 3, when Admiral Reedy flew in by Hercules from McMurdo. On October 27 a wheeled Hercules en route from Christchurch to McMurdo touched down on the sea-ice and landed cargo.

'COPTER CRASH

On November 8 a U.S. Army UH1B helicopter crashed when attempting to land on a 13,400 ft. peak in the Admiralty Range forty miles from Hallett. None of the four occupants was injured. They were immediately picked up by an accompanying helicopter and flown back to Hallett. A fortnight later a Hercules transported a replacement helicopter from Christchurch to Hallett.

NO TIME FOR HIBERNATION A LEADER REFLECTS

by RUSSELL E. RAWLE*

I flew to Ross Island with some nebulous ideas about the probable effect upon men of the extreme cold and dryness of that latitude, and of the mental stresses imposed by the isolation of an Antarctic night.

I had read what, in 1914, Sir Raymond Priestley had written upon "The Psychology of Exploration". With satisfaction I had noted that what he described at the "catastrophic phase" seemed to apply to tough seaborne or overland expeditions of the past heroic age. This phase, surely, was unlikely to be encountered in a summer season of air-supported modern adventure; but could the "Polar madness"—which Sir Raymond directly associates with hard times—be expected to creep upon a winter party well found at Scott Base?

The possibility of a mild outbreak of irresponsibility likely to attract disaster such as fire could not be excluded. How then to avoid these hard times and so avert the further hazards they generate? The answer seemed to be—hibernate, as much as you can!

What a glorious prospect—to hibernate! To escape modern rat-racing in the arms of Antarctic silences; to "encourage ample reading and reflection and stimulate the full elaboration of first thought" (a).

Covet the opportunities of Summer field parties to curl up like huskies during blizzards if you like; but don't expect to hibernate at Scott Base in winter any more than during continuous daylight of Summer.

The trouble seems to be that throughout the precious Summer days all strive to achieve targets set for the Summer Scientific programmes. In this we developed a positive attitude of mind regarding work out-put; so that by winter the habit of working overcame the tendency to find reasons why not to work—an Antarctic failing I am told. When winter reached us, though bodily urges were towards lethargy, to preserve mental and physical fitness we kept mentally and physically occupied and avoided excess of eating and drinking. Everyone faithfuly shared in base chores, inside and outside the base; we moved abroad in dark and twilight regularly when weather permitted; we busied ourselves with work programmes as well as our specific duties, and from July onward, rather disconsolately took stock, for resupply purposes, of the many things at Base.

Few of us read many books, but there were a lot of films to see and American colleagues to entertain—and that took time. Some of us yearned for the quiet of Scott's and Shackleton's huts where temperatures were lower but noise levels zero and some hibernation probable.

As Postmaster I can attest that outward mail was not heavy. This may have been directly due to an efficient telephone service which destroyed all sense of isolation. The East German Border, even was at hand to be called if wanted—our masters in Wellington were close at hand by radio.

Is it unusual then, that a gentleman in Cambridge should think that to be in haste to catch the mail at Scott Base, was strange? Yet we were in great haste to catch the historic mid-winter mail that flew out on June 26, 1964.

Many of us have had the promised day-long sleep since we returned to New Zealand. None of us developed Polar madness. For my part I still have to absorb the remarkable substance of Pierre Tielhard de Chardin's "Phenomenon of Man" which Admiral Reedy recommended to me in Antarctica—the idea place in which to read it—had I time to do it.

(a) Huxley re Pierre Tielhard de Chardin.

* Leader, Scott Base, 1963–4.

Fifteenth French Expedition Leaves for Adelie Land

The French team to occupy Dumont d'Urville Base during 1965 left Paris by air on November 30 and will board the expedition relief ship "Thala Dan" at Hobart.

Preparations for the relief of Base Dumont d'Urville and France's sub-Antarctic Island stations had been in full swing for some time before this issue went to press. Every effort has been made to allow for as long a summer working season as possible at all stations.

The summer party is under the direction of Paul-Emile Victor, who is accompanied by M. P. Roland (Chief Administrator of Terres Australes et Antarctiques Francaises) and Colonel Pedoya, a professor at the Practical Training School of the Army Health Service.

The wintering team numbers 20, half of them scientists, and is led by Claude Lorius, veteran of many French Greenland and Antarctic expeditions. Others with long Polar experience are Dr. P. Dumas and mechanics Marc Bongiovanni and Jean-Marie Peillet, while five men have wintered on the Kerguelen Islands.

SPECIAL PROJECTS

The scientific programme of the new expedition comprises for a start the rebuilding of the geomagnetic and seismological stations, and the cosmic ray installations. The biologists' main task will be the banding of 6,000 penguins and other birds. The customary air-glow and meteorological observations and ionospheric soundings will be continued.

During the summer (December 1964 and early 1965), 27 other men will be stationed on Terre Adelie, some carrying out drilling of the ice bordering the continental plateau, marine biological studies and topographical surveys, others engaged on building and repair work about the base. During this period of relatively favourable climatic conditions, two main scientific buildings will be erected as well as two light shelters. This relief team will also have to erect a barracks building designed to increase the capacity of Dumont d'Urville during the coming years.

RECONSTRUCTION WORK

Already the task of renewing the Dumont d'Urville base has made good headway. The new generator has gone into service and the first of the two new planned laboratory buildings should be completed during the summer.

This laboratory will have separate rooms for meteorology, magnetism, seismology, cosmic rays and natural radioactivity.

The material for the erection of the second laboratory will be unloaded. This building is planned to house a biological laboratory, an auroral station, and a workshop for precision engineering work. Some rooms will remain for the workers in other disciplines as the need arises.

A radiosonde balloon-launching shelter will be erected with a sliding roof giving an opening four metres by five — the whole top of the shelter — to allow the largest possible space for the launchings. A cold storage room with a capacity of 50 cubic metres for meat is also envisaged.

"THALA DAN"

The necessary building materials were loaded on the "Thala Dan" at Le Havre on October 15–17. Captain V. Pedersen will command the vessel for the fourth year. The only shore-team members to travel on "Thala Dan" from France to Australia will be the two men engaged on

the oceanographical programme: Gerard Pelissier (radio-active fall-out, sampling and filtrating of air), and Piere Le Morvan (whale and sea-bird observation and migration studies). M. Victor and the winter and summer parties will join the ship at Hobart. "Thala Dan" is expected to reach Terre Adélie about mid-December.

As soon as unloading is completed, both summer and winter teams will be quartered in the various buildings on L'Ile des Petrels. The ship will leave for Melbourne and will cary out Australian station reliefs: an experiment in co-operation within the framework of the Antarctic Treaty. En route, "Thala Dan" will touch again at Terre Adélie and will disembark a few more technicians and scientists (four for the winter team, three for the summer party). During the voyage a magnetic survey will be made for the first time between Australia and Terre Adélie.

When the Australian stations have been relieved, "Thala Dan" will return once more to Terre Adélie in early March and will take back to France the members of the 14th Expedition and the present summer party, 45 men in all.

During the homeward voyage as far as Australia, then on to Europe, by way of the Indian Ocean and the Suez Canal, the same scientific observations will be made as on the outward voyage.

ALGAE STUDY

R. Delepine, algologist, left Paris on October 15 on his way to Melchior Island (64° 20′ S., 62° 59′ W.) in the Graham Land portion of the Antarctic Peninsula. At Montevideo he will join an American biological expedition which is to work on the island.

PROGRAMME

The scientific programme for the coming year comprises work in Geomagnetism, Ionosphere, Aurora and Airglow, Cosmic Rays, Radioactivity, Seismology, Glaciology and Biology.

The period available for full-scale summer work by all hands will extend from December to March, the period between the two voyages of the relief ship. "Thala Dan" will carry an Alouette II helicopter to facilitate the work programme.

During the summer it is planned to mount a plateau traverse aimed to provide valuable data in glaciology, topography and biology, as well as to prospect for a suitable site on which to erect the 70 m. antenna for the future ionospheric station.

14th EXPEDITION

The wintering team under Jean Marin seems to have carried out the normal scientific observations without mishap, while also seeing to the fitting up of the laboratories erected in the early months of 1964.

Although October was notable for some heavy snowfalls, spring brought the usual animation to the base with the arrival of the petrels, the skuas, the birth of the young seal pups and the arrival of the first contingents of Adélie penguins, who always greet their human companions before setting about the re-occupation of their rookeries.

REUNION

Lord Shackleton, son of Sir Ernest Shackleton, sponsored in June a gathering of survivors of his father's 1914-16 "Endurance" expedition. A radio broadcast had been made appealing for names and addresses. The reunion was held at the House of Lords to mark the 50th anniversary of the departure of the expedition from London. Among the six veterans present were Dr James McIlroy (84) and Mr William Bakewell (75) who travelled specially from the United States, with his daughter, for the reunion.

THAT GERMAN AGAIN

The Deutsches Institut fur Auslandsforschung has informed that mine of Polar philatelic information "Dill Reports the News" (874 Bad Neustadt/Fraenk, Saale, Martin Luther Str. 28, West Germany) that the private expedition still being organised by Dr. Herligkoffer "will not start before November 1965".

Russian Geologists Prepare for Tenth Antarctic Expedition

The first group of the 1964–65 expedition left Russia on the diesel-electric vessel "Ob" on November 30. The 300-strong expedition includes the well-known Polar explorer Mikhail Ostrekin.

The motorship Estonia left Leningrad on December 4 carrying 160 members of the expedition, led by the new director of Mirny observatory, Ivan Petrov.

It is probable that in due course Molodezhnaya will become the principal Russian station. This will not, however, be in 1965 or 1966. The Soviet "metropolis" is still Mirny, despite some newspaper stories.

This year extensive traverses like those of the 1963–64 summer are not planned. The major programme of scientific activity is that associated with the International Quiet Sun Year.

GEOLOGISTS' PLANS

In the Antarctic Section of the Institute of Geology the monograph "The geology of Queen Maud Land" is being finalized for publication. Also, the 10th Soviet Antarctic expedition is being organized under the leadership of D. S. Solov'ev for research in Enderby Land near Molodezh Station. The detachment is being provided with new equipment and will have at its disposal two aircraft — one light and one heavy — and they will operate within a 300 km radius from Molodezh. This 10th expedition is in a way a jubilee expedition. It will have to continue the work begun and carried on by the previous nine expeditions. Geologists took part in all these expeditions.

Only 600,000 square kilometres of the Antarctic are free from ice. So far, 200,000 km² have been explored by the geologists of various countries. The Soviet "share" is about 70,000 km². The Soviet explorers first of all studied and described the crystalline base of the great Antarctic shelf. It turned out to be the same as that of the other continents — Australian, African, South-American and Indian. Antarctica is the largest charnockite region of the world (charnockites are the oldest granites on earth whose age is estimated between 500 million and 2 billion years). The geological history of the Antarctic base was studied: its origin, its plutonic processes and its rocks. It was also found that the base was rich in some interesting fossils.

HOW OLD ARE THE ROCKS?

Recently more than 300 tests have been carried out to determine the absolute age of Antarctic rocks. It has been established that the oldest rock (2 billion years) is a granulitic crystallite schist and the youngest (9 million years) is old lava from the extinct Gaussberg volcano.

Many other interesting finds have been made. One of them was an 8 kg. iron meteorite. It has also been established from various experiments that the thickness of the earth's crust in the southern regions reaches 15–20 km., while in the oceans surrounding the Antarctic it is only a few kilometres.

RUSSIAN MAPS

In December of this year an International Geological Congress will be held in Delhi where the Soviet scientists will present their papers on Antarctic charnockites, the origin of its crystallite base and also the absolute age of its rocks. Here for the first time will be shown the geological and structural maps of the Antarctic compiled by the Soviet scientists.

(Compiled from an interview with Prof. M. G. Ravich, Assistant Director, Institute of Antarctic Geology.)

CZECH PART

Late in October an unusual piece of luggage was forwarded to Leningrad from the Czechoslovak Academy of Sciences. It was equipment for the study of aurorae and magnetic fields to be used by the Czech scientists, Joseph Skok and Stefan Pinter, who are taking part in the new expedition.

PLANS FOR 1965

At Vostok, in the area of the South Geomagnetic Pole, 15 men under A. Shirochkov will undertake research in meteorology, ionosphere, aurora, radio-waves, the earth's magnetic field, cosmic rays, etc.

The wintering party at Mirny will be headed by I. G. Petrov, a geographer and a very experienced Polar explorer. As well as participating in many air and sea expeditions to the Arctic regions he was a member of the drifting research stations "SP-2" and SP-4".

Working with the Russians this year will be men from the German Democratic Republic, Czechoslovakia, Hungary, Poland and Japan, while the exchange of scientists between the Soviet and American expeditions will continue.

Mirny will transmit meteorological reports to the whaling factory-ships Sovietskaya Ukraina, Sovietskaya Russiya, Slava and Jurig Dalgorukij.

HEADED FOR VOSTOK

Late in October a sledge tractor-train consisting of nine heavy tractors and nine sledges left Mirny carrying 400 tons of food supplies, equipment, fuel and lubricants the 1,500 Km. to Vostok. En route the convoy was to re-open Komsomolskaya for seasonal work. A radio-operator-meteorologist and a mechanic were to remain at Komsomolskaya. The convoy was under the command of E. Zimin.

It was reported on November 18 that the convoy had reached Komsomolskaya, roughly halfway between Mirny and Vostok. The train had travelled 860 Km. The vehicles were being overhauled here before carrying on to Vostok.

THE WIND EXPLAINED IT

Antarctic wintering-over men, says a Russian writer, have learned to use the wind as a compass: in the evening it always blows from the south owing to the discharge of cold air from the Antarctic ice-cap towards the ocean.

The party making the journey to Molodezhnaya under Andrei Kapitza last summer was very surprised, therefore, when passing through the centre of the "white spot" of Queen Maud Land, heading north, to find that they were travelling *against* the wind for several days on end.

After several periods of seismic sounding they made the discovery of a high (3,000 m.) sub-glacial mountain ridge reaching out to the ocean. This then was the secret. The extraordinary head wind meeting the explorers was a katabatic wind for which the mountain ridge was responsible. The wind had helped them to discover high mountains buried under the Antarctic ice.

TRACKING THE WHALES

Whalers of many countries have long marked whales with non-corrosive metal tags. Hundreds of marked whales have later been killed, including many marked in Antarctic waters, and the information thus afforded about the whale migration has been tabulated. Marked whales have been found as long as 30 years after the marking.

This, however, has given no information about where the whale has been in the meantime. Russian oceanographers now have a plan to track marked whales. They propose to fit the markers with miniature radio transmitters which will be operated by the thermal energy of the whales themselves.

Two whales met. One said to the other:

"Who was that woman I saw you with last night?"

"That wasn't a woman," said the other. "That was one of those gorgeous submarines."

AUSTRALIA MAKES IMPORTANT BASE CHANGES

WILKES STATION TO BE REPLACED

The Australian Government has decided to build a replacement for Wilkes Station in the Antarctic because of the deteriorating condition of the existing station, which is impairing the efficiency of the operation there and which increasingly presents a risk of fire. The new station will be built at a good rocky site about a mile from the existing station. It will be designed to cater for the same range of scientific and technical activities as are conducted at the present station. The work on the new Wilkes will commence when the station is relieved in January, 1965, and is expected to take up to four years to complete. The transfer from the existing station will be effected when the new station is completed.

It will be recalled that Australia had accepted custody of the equipment and installations at Wilkes Station from the United States, without charge, under an agreement between the two Governments signed on 4th February, 1959. The United States Government has been informed of the decision to replace the station at Wilkes.

DAVIS TO CLOSE

Along with the decision to build the replacement for Wilkes Station it has been decided to close Davis Station next February when the 1964 Party is picked up for return to Australia. Davis Station will, however, be left in a condition ready for immediate reoccupation and operation should this at any time become desirable. Normally about twelve men have been stationed at Davis.

STAFFING FOR 1965

With one less station the ANARE complements at the continental stations will be:—

Mawson: 27. Officer in Charge, Brian C. Z. Woinarski.

Wilkes: 24. Officer in Charge, John H. Lanyon.

In each case this includes 4 weather observers, 4 physicists, 6 radio staff, a glaciologist, a medical officer and a surveyor, the others being technicians and tradesmen. The Mawson team will leave Melbourne on M.V. "Nella Dan" on or about December 22; the Wilkes team on "Thala Dan" about January 5.

COME AGAIN!

Twenty of the men comprising the 1965 teams at Australia's three stations are going down for the second time. Five are making their third tour.

THE ANARE STATIONS

With the pending closing of Davis station it is opportune to list the stations in full.

Mawson 67° 36′ S., 62° 52′ E. established 1954.

Wilkes (admin. control taken over from U.S.A., Jan. 1959) (66° 16′ S., 110° 32′ E.).

Davis (68° 35′ S., 77° 58′ E.). Est. 13 Jan., 1957, to be closed end Feb., 1965. Scientific obs. will cease 31 October., 1964.

Macquarie I. (54° 30′ S., 158° 57′ E.) See under Sub-Ant. Islands.

Automatic Weather Stations

Lewis Island (66° 06′ S., 134° 22′ E).

Chick Island (66° 47′ S., 121° E.).

THE LAW RECIPE

The question *"What mixture makes the best Antarctic man?"* was put to Phil Law, Director of the Antarctic Division, Australian Department of External Affairs.

The Law recipe puts love of the job in first importance, followed by unselfishness, tolerance, optimism ("pessimists I avoid like the plague"), a sense of adventure and an avid curiosity.

SPRINGTIME AT THE BASES

MAWSON

August at Mawson was one of the worst months ever for blizzards, with 22 days of gale-force winds and drift snow. The strongest wind was 98 m.p.h., the average wind was 29 m.p.h., the lowest temperature minus 20.5° F. The impossibility of forecasting this bad weather was proved when meteorologist Stalker, together with Whitehouse and Warhaft, were caught out on a short dog-sledging trip; the visibility on leaving being ten miles, but on returning only ten yards. The same sudden blizzard caught Brocklehurst, Williams and Miller, who were halfway to Fisher Nunatak on a day trip, but were forced to spend three days sitting out the bad weather in a snowtrac. The weather held up preparation for two field trips.

On September 1, spring was heralded by two rare days of perfect weather, with calm and no cloud, resulting in much colour film being used.

DAVIS

In early August, Davis Station had the longest blizzard for the year when it continued to blow for six days, even removing sea ice which was well over four feet thick. So once again water was quite close to the camp, bringing with it seals and petrels. Svensson decided to try his hand at fishing but, after digging a hole through newly-formed ice, his only catch was one tiny shrimp, plus visits from many seals who used his hole as a breathing hole.

The trip to Platcha by Goodall, Griffin and Whelan for the further clearing of the rock road on to the Plateau, turned out to be a wasted effort when later in the month a snow drift was found, up which the snowtrac was able to drive straight on to the Plateau from the sea ice. A short trip to Ellis Fjord, then to Platcha via the Plateau, gave the three men a taste of pitching tents and camping in a blizzard.

At Davis, night skiing achieved some popularity when flare paths lit the snow slopes below the camp for some men to try these adaptations to their sport.

Two men from Davis suffered from frostbitten toes following a field trip inland on the plateau in the second week of September. The men were operating at 68° 30′ S., 24 miles east of Davis, laying a supply depot. Temperatures dropped overnight to minus 40° F. and the wind rose so that they unable to start their snowtrac vehicles next day. Confined to their tent for two days two men were frostbitten by the intense cold.

The frostbitten men were Trott, Officer-in-Charge at Davis, and Goodall, of Rochester, diesel mechanic. The third man in the party, Bakker, radio operator, escaped injury.

When they were able to start the snowtrac two days later the party returned to Davis to receive medical attention.

WILKES

Apart from a few unpleasant blizzards, the longest one lasting six days, Wilkes weather in August was very pleasant. The highest wind gust was 109 m.p.h. and the lowest temperature minus 18° F. ,

ORDEAL IN BLIZZARD

Michael Bonnici, Weather Observer at Wilkes, had a narrow escape from death in early September. As part of his duties he was struggling across the 80 yards separating the balloon hut from the rawin hut in a heavy blizzard when he tripped and lost his bearings in the darkness of the storm. The blizzard lines provided to assist men moving between buildings were buried in the snow. Struggling against the high wind Bonnici floundered around in the deep snow for five hours. He was just at the point of exhaustion when by sheer luck, he collided with the sferics hut, 100 yards east of his objective, and recognised it.

This is Bonnici's story of his five hours lost in the snow:

"The trouble started after I left the met. hut to walk 80 yards to the balloon hut to make an observation.

"All of a sudden the weather struck. In a matter of seconds visibility was zero, winds of 90 m.p.h. started to howl and, incredibly, I was lost.

"While I was floundering around I found an abandoned crate. I scooped out the snow with my hands and crawled inside to rest and try to work out what to do. ,

"I set out again and made three or four unsuccessful sorties. Then I found a length of rope half-buried in the snow.

"I tied the rope round my waist, fixed it in place with a rusty nail from the packing case — I thought my fingers were too frozen to untie a knot — and tied the other end of the rope round the packing case.

"Off I went again with the rope but I still couldn't find anything. The rope started to get buried under the snow that was falling and I was getting scared and desperate.

"I started to cry. . . . I couldn't move the rope. I slipped and fell on to the sea ice and sank up to my waist.

"I managed to drag myself to safety up the rope and then I suddenly saw the outline of a hut just beyond the end of the rope.

"I didn't know whether the hut was just in my imagination or if it was a nightmare. I knew if I found the hut wasn't there it would be the end.

"I took the chance and stumbled to the hut — boy, was it a relief!

"It was one of the radio huts and I managed to contact the main camp and tell them I was OK and to call off the search.

"Then I collapsed."

"I must have blacked out," he said. "The next thing I knew was waking up in the camp hospital eight hours later swathed in bandages, and surrounded by hot water bottles."

Ice Dome could be Antarctica in Miniature

On November 11, O'Leary, leader of the ANARE party at Wilkes station, left with five companions and five vehicles on an Antarctic journey of two months' duration over the Plateau. The other members of the party are Whitworth, seismologist; Simmons, radio technician; Rogers, radio operator; Hulcombe, diesel mechanic; and Jones, mechanic-driver.

Traverses carried out by ANARE men from Wilkes station over the past four years have revealed an ice dome rising to about 4,500 feet above sea level and centred about 70 miles to the south-east of the station. The Wilkes dome is of special interest to glaciologists as its shape and glacial behaviour are considered in many ways to be characteristic of the Antarctic continent, which has the very large area of 5½ million square miles and is now generally held to be a huge ice dome. It is hoped that studies of the very much smaller Wilkes "model", with an area of only about 7,000 square miles, will enable glaciologists more clearly to understand the great ice mass economy of Antarctica as a whole.

On September 23 of this year, a four-man party, led by K. Budnick, surveyor, set out again for the dome with two vehicles and a large caravan. His companions were P. Morgan, glaciologist; J. O'Shea, radio operator; and R. Hall, diesel mechanic. From the centre of the dome they headed north to a point about seven miles south of Cape Poinsett and then westerly to Cape Folger and Wilkes. During the journey, the party measured the height of the ice surface, erected stakes to enable parties in later years to measure snow accumulation, and made gravity measurements. They returned to Wilkes after a successful journey on October 29.

O'Leary's party will set out initially for a point 50 miles south-east

of Wilkes. From this point they will carry out a traverse along six parallel lines, each about 100 miles long and ten miles apart, measuring the thickness of the ice and the height of the bedrock at ten-mile intervals by seismic and gravity methods. By early January, this party is expected to return to the dome and split into two groups, one travelling to Cape Folger, erecting stakes, measuring the height of the ice surface and taking gravity readings, the other following the route of the earlier glaciological party, led by Budnick, but making seismic soundings.

When the last of this year's parties returns to Wilkes in late January, the total distance traversed this summer by ANARE men based on Wilkes will have been about 1,000 miles.

PROGRAMME FOR 1965

Included in the ANARE programmes for 1965 are:—

Traverses from Wilkes station within a 240 km radius to study ice thickness; station interval 30 km.

Geology of MacRobertson, Kemp and Enderby Lands. Extension of geological mapping at a scale of 1:250,000 by several parties transported by ship-borne helicopters during 1964–65 summer. Collection of specimens for paleomagnetic measurement and age determination. Along the Enderby Land littoral, trimetrogon aerial photography and radar altimeter flights by ship-borne Beaver aircraft during summer of 1964–65.

Vestfold Hills: Continuation of geological studies during 1964–65 summer.

TOKYO TO MAWSON

Bob Lachal, who rowed No. 3 in the Australian eight at the Tokyo Olympics, is a member of the new team for Australia's Mawson Station. He is to be the assistant cook. Bob didn't think he would be able to get back in time for the week of intensive training which began on October 27, but he managed to get an early plane and, as he told a reporter, "It's been quite a rush, but I made it."

JAPAN PREPARES FOR 1965-66

The Japanese Government having finally decided to re-open Showa Base in the 1965–66 summer as a permanent base, the National Antarctic Committee of the Science Council of Japan is pushing ahead with its preparations, as well as with the publication of the data and conclusions resulting from the work done at Showa Base from 1957 to 1963.

Last summer Captain Honda and two other officers travelled on a United States ice-breaker in order to observe American Antarctic operations. Japan's own ice-breaker is in course of construction and is expected to be ready for use in September 1965, in good time to play a vital part in the re-activation of Showa Base. The ice-breaker will be of 5,000 tons basic displacement, 100 m. long, 22 m. wide and has a speed of 17 knots. The ship will have 12,000 h.p. diesel-electric engines. She will carry three large helicopters.

BIOLOGY

The third symposium on Antarctic Biology was held at the offices of the Science Council of Japan on February 29. 35 scientists participated.

PUBLICATIONS

As is usual, responsibility for the scientific programme, both preparatory work and the subsequent recording and publication, is shared among the scientific institutions mostly concerned with the disciplines involved: Upper Atmosphere Physics (geomagnetism and earth currents, ionosphere, aurora and airglow, cosmic rays), Meteorology, Earth Science (seismology, gravity, geology), Glaciology, Oceanography, Geochemistry and Biology, as well as Logistics and Cartography.

23 numbers of the "Antarctic Record" have now been published, containing articles in both Japanese and English, and in addition, a considable number of special scientific reports have been issued independently as well as those published in various scientific journals.

RETURN OF THE SUN HERALDS BUSY DAYS AT SANAE

The South African station SANAE is situated on the Princess Martha coast of Queen Maud Land at 70° 18′ S., 2° 21′ W., 52 m. above sea level. The personnel wintering over number 13. Programmes are carried out in Aurora, Geology, Geomagnetism, Glaciology, Gravity and Ionospheric Physics. In addition, Cosmic ray and Airglow observations are made during the relief voyages of the motor vessel "R.S.A.".

Medical and physiological research will be discontinued during 1965, but efforts will be made to re-establish these research programmes on a more satisfactory basis during 1966.

The reconnaissance mapping of bedrock geology and geomorphology of the Ahlmannryggen and Borgmassivet, Western Dronning Maud Land will be continued. Samples for geological, palaeomagnetic and age determination will be collected.

Additions to the glaciological programme will include studies of the deformation of the ice shelf at the inland boundary, the rate and volume of discharge of ice streams and melting at the base of the ice shelf.

The inland geophysical traverse will be extended beyond 72° S. Oversnow traverses are planned from SANAE to the Trolltunga glacier tongue on the meridian of Greenwich, and to the grounded areas to the south-east of Norway Station.

Special efforts wil be made to reach maximum possible heights in radiosonde soundings, as part of the IQSY programme.

BUSY DAYS BEGIN

The South African Weather Bureau reported in November: with the reappearance of the sun, outside activities at S.A.N.A.E. are increasing. Although August with a mean temperature of —30.3° C. was the coldest month of the year, there were already 35 hours of sunshine recorded. September was very little "milder" with —29.4° C. but the sunshine hours shot up to 85 hours. October showed the usual rapid warming up with a mean temperature of —18.1° C. and 163 hours of sunshine. Back are the dark goggles to protect the eyes against the glare of the snow.

Good weather enabled the men to supplement their dwindling diesoline supply by digging out sufficient drums to last until the new team arrives. The digging provided much-needed exercise to the men after the long inactivity of the winter. A thorough spring-cleaning of the base was also undertaken.

On August 24, geomagnetist Robertson, geologist du Plessis and diesel mechanic Jay departed on a geomagnetic survey. Their trip took them to the old Norwegian base, various ice rises, numerous buktas and the sub-station.

SIGNS OF SUMMER

During September the unusual phenomenon of snow crystals falling from a clear blue sky was observed. On a journey to Polarsirkelbukta, it was found still frozen over but patches of open water were observed further out to sea. Some new icebergs were observed which, together with old familiar ones, presented a breathtaking view on a clear day. Although the base is 22 km from the buktas, one can see the whole coastline very clearly on a day with strong mirage.

The seismic programme is progressing satisfactorily. During January, three short period and three long period seismometers were installed at S.A.N.A.E. The short period instruments are giving good results but the long period ones are disappointing. Apart from earth tremors, interesting disturbances were recorded, probably due to movement of the ice shelf. The final analysis of

the seismograms should produce some very interesting results.

From about the middle of November S.A.N.A.E. will be enjoying the midnight sun. Already the brightest stars can only be seen with difficulty and final astro-fixes are being carried out.

Large numbers of Antarctic petrels have been circling the base and towards the end of October, during a heavy snowfall, the temperature rose to —2° C.

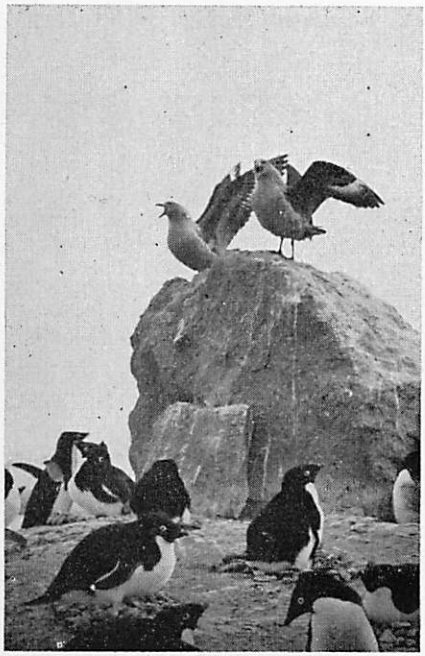
CREVASSE

A severe setback forced the geomagnetic survey party to return to the base without completing its proposed task. About one kilometre from Polarsirkelbukta on the normal route, the snow bridge covering a probably newly-formed and thus unknown crevasse, collapsed disastrously and swallowed up the caboose, a sledge and two men of the field party, Bernie Booyens and André du Plessis. Fortunately the Muskeg had been detached after the first crack was noticed. Using the Muskeg, Jay and Robertson were able to rescue the others from 30 feet down in the 20 feet wide crevasse and fortunately there were no injuries. Ezekowitz and the base doctor Traut went to their aid with the dog sledge, taking spares for the defective Muskeg. The doctor treated the men for shock where necesary. Two days later van Zyl and a party salvaged all the important equipment from the caboose.

It now appears that Polarsirkelbukta is unsafe for offloading purposes and another bukta will have to be found. With this in mind as well as pursuing further glaciological study du Plessis and Ezekowitz will soon leave on a short trip with the dog team.

COSMIC RAYS

The cosmic ray research programme conducted by Kuhn comprises the following: a neutron monitor, a riometer, and high altitude balloon flights. The neutron monitor is used to determine both erratic and cyclic time variation of solar cosmic rays. The riometer measures the signal strength of radio noise originating from the sun and stars. The signal strength recorded gives a measure of the density of the ionosphere and lower atmosphere. During a balloon flight two neutron counter tubes are sent up. Pulses recorded by these tubes and atmospheric pressure readings are transmitted back to earth. From this data a profile of intensity against pressure can be determined for neutrons in the atmosphere. Although the first flight was launched successfully, signals from the apparatus faded before a really substantial height was reached. Further flights are planned.



SKUAS ON WATCH: PENGUINS ON GUARD.

Photo: Guy Mannering.

The men are all looking forward to Christmas and the arrival of the relief ship. Ezekowitz is staying on for another year. On October 10 the annual Kruger Day "Bisley" was held and, despite bad weather and a cold breeze, Booyens won the competition with an 84 per cent performance.

Belgian-Dutch Expedition's Plans for 1964-65 Summer

Reconstruction of Roi Baudouin Base prevented the 1964 expedition from carrying out any extensive summer programme, but it is planned this summer to recommence and extend the programme initiated in 1960.

The "Magga Dan", scheduled to leave Antwerp on December 6 carrying men of the Sixth Expedition (counting the expedition of Adrien de Gerlache in 1897–9 as the first), sailed on schedule.

The 16 members of the 1965 expedition and the 19 summer personnel were on board. As observers Baron G. de Gerlache (chairman of the Belgian-Dutch Antarctic Committee) and M. van der Essen (Ministère des Affaires Etrangères) accompanied the team. The 1965 expedition (leader Bogaerts) will essentially continue the programme of the 1964 expedition.

A summer programe, extending at most over the few weeks between the arrival of the expedition ship and its departure again for Europe, will provide an opportunity for specialist research men attached to various scientific institutions to be absent from the universities, etc., while they pay a short visit to the Antarctic. The majority of such specialists will join the ship at Capetown, after flying out from Holland or Belgium.

Among the projects planned for the 1964–65 summer are the following:

Photogrametry. Aerial photography of the Sor Rondane Mountains 200 km. from the Base. Aerial photography of the coastal area between the Japanese Showa Base and the Russian Novo Lazarev Station.

Aircraft for this project are available and the programme will be implemented by the Belgian Military Geographic Institute and the Belgian Air Force.

The stations of the 1959–1960 expeditions wil be resurveyed giving additional information on the movement of the glaciers. The party travelling by vehicles will also be supported by a helicopter of the Belgian army. The later will also be standing by in case of rescue operations during **the photogrammetric flights.** (3 men, leader A. de Ligne.) Oblique photographs of the coast and of parts of the Sor Rondane are planned.

Geology. In the Sor Rondane Mountains and eventually the Belgica Mountains, (a) the study of the glacial morphology of the region, (b) petrogenesis (the origin of rocks) and tectonics (earth movements) in relation to petrography and strict order of past geological events already carried out in the laboratory. The geological team will be flown out to the mountains.

Terrestrial Magnetism. Total intensity measurements during the voyage out and back.

Paleomagnetism. Collection of rock samples in the mountains.

Oceanography

(a) between Capetown and Leopold III Bay. Continuous record of air and sea surface temperatures; measurement of the horizontal current; collection of plankton, especially in the area of the convergences.

(b) at Leopold III Bay. Complete hydrographic station throughout 24 hours — temperature, salinity, oxygen and hydrogen ion determination; continuous record for 36 hours by satellite buoy of thermal data in the first 20 metres; fixed point measurement (36 hours) of surface currents and of currents at 100 and 200 metres; bathythermography; new tide measurement — 36 hours; plankton and micro-plankton; primary productivity in situ by C^{14} and

chlorophyll; record of sources of biological origin by acoustic buoy; dredging and trawling.
(c) between Leopold III Bay and Capetown. Same programme as on outward voyage.

This oceanographic programme will be carried out by the Royal Belgian Institute of Natural Sciences.

AT BASE ROI BAUDOUIN

This year the general scientific programme will be considerably extended. In meteorology, for instance, radio-sonde balloon launchings will be undertaken. The geomagnetic programme will be amplified by the installation of a proton magnetometer.

Dogs will not be used. They will be replaced by Polaris toboggans.

One Belgian will participate in the United States "zig-zag" traverse, extending over the summer months of several years. This ambitious journey from the South Pole is expected to end at the Belgian Base in three years' time.

Reports from the Belgian-Dutch party which has wintered at Base Roi Baudouin make it clear that health and morale have been excellent, in spite of the fact that telephonic communication, satisfactory in the previous year, has not this year been possible. Luc Cabe's team is expected back in Belgium about March 15.

The minimum temperature recorded during the winter was —45° C., while a maximum wind velocity of 75 knots was recorded.

VETERAN BACK AGAIN

Among those in the summer party at McMurdo, engaged in upper atmosphere research, will be veteran Canadian explorer Sir Charles S. Wright, of the Pacific Naval Laboratory, an expert in radioscience. As C. S. Wright, he was Captain Scott's physicist in the 1910–13 British expedition, took part in several field sledging journeys, and was leader of the search party which found the bodies of Scott, Wilson and Bowers.

TRANSLATIONS

From time to time "Antarctic" has been indebted for information to the **Soviet Antarctic Expedition Information Bulletin,** and has at times quoted from this valuable publication. Up to the present 46 numbers have appeared, at irregular intervals since 1958. The American Elsevier Publishing Company has now published for the American Geophysical Union the first 20 numbers in an English translation; vol. 1 comprising numbers 1 to 10 and vol. 2 numbers 11 to 20. The library of the Antarctic Division, D.S.I.R. has copies of these volumes as well as the original bulletins in Russian, 1–46. Each number as a rule contains about a dozen original papers resulting from Soviet Antarctic research in geology, glaciology, meteorology, biology, oceanography and other disciplines, as well as more general notes.

A third volume, numbers 21–30, is expected to be published shortly. The translations of subsequent numbers, however, are being published in a different format. There will be six issues, two of the original Bulletins to an issue. So far three of the new two-bulletin translations have appeared, comprising numbers 31–32, 33–34 and 35–36. The price for the six issues will be $36.00, or $7.50 for individual issues.

The Translation Service of the N.Z. Department of Internal Affairs has produced as "Plant Life in the Antarctic" an English version of an article by G. Follmann first published in Die Unschau in Wissenschaft und Technik, February 1964. This paper outlines the botanical results of the 17th Chilean Antarctic Expedition. Enquiries should be made of the Technical Information Officer, Information Service, D.S.I.R., Wellington.

SYMPOSIUM

The organisers of the Eleventh Pacific Science Congress to be held in Tokyo in August 1966 have suggested that an Antarctic Symposium be held during the Congress.

News From the British Bases

An unusually early start was made on the spring field work in Graham Land. A party left Stonington in July to return to the east coast to continue geological, geophysical surveys. They are making excellent progress and have recently received some air support from Adelaide Island. The occasions when the weather is suitable for flights across the plateau are rare.

EARLY START

Those due to work in the region of George VI Sound assembled at Stonington in August. Some were already there, the remainder sledged over from Adelaide. The advance party set out over the sea ice but found it weak in places. Although they got safely through to Fossil Bay, the leader deemed it inadvisable for the main party to follow, and they returned to Stonington. Fortunately, the aeroplanes made the transit from Deception to Adelaide in mid September as planned and no time was lost in flying the main group down to join the advance party at Fossil Bluff.

One of the aeroplanes suffered damage in a gale, but this was repaired with very little interruption to the programme.

Winter temperatures at the bases were fairly low. This fact coupled with the amount of pack ice remaining off the west coast of Graham Land in the autumn, pointed to a possible difficult ice season ahead. However, an exceptional thaw in October caused an early break up in the north and prospects are now a little brighter.

SUMMER PLANS

Most of the field work in 1965 will be in continuation of the current programme. The one new project is a geological study of the region of the Seward Mountains which will start in the spring of 1965.

During the summer of 1964–65 there will be detailed hydrographic surveys in the South Orkney and Argentine Islands areas. Geologists and a biologist will make landings and observations in the course of the South Orkney programme.

New constructions will be a living hut at Deception Island and a fuel oil storage tank at Signy Island. The former will be built of moulded plastic sections, successfully tried at Signy last season. (See below.)

JOINT SURVEY

A joint hydrographic survey of the South Orkney islands in the Antarctic will be undertaken by the British Antarctic Survey and the Royal Navy.

The Royal research ship John Biscoe will be used. It is due to sail from Southampton on October 29.

NEW HOME

British scientists and technicians on Deception Island will soon be living in a new fibreglass home.

The home will be taken by the research ship Shackleton leaving Southampton on October 8. On board will be two Scottish carpenters who will erect the new building to replace the hut erected many years ago by whalers.

B.A.S. men have lived in one of the whaling huts probably erected between 1920 and 1930 since the Base was established in 1944. At that time there were two of the dormitory buildings standing, both in excellent condititon. The first party occupied the best one, but it burnt down in 1964. No one was hurt and it was fortunate they had another hut to move into. This was gradually renovated and has been very satisfactory as a living hut.

At last, however, time is taking toll and rot has set in along the back wall. "Oddly enough," says Mr. J. R. Green, B.A.S. Operations Officer, "we have had a job persuading people at the base that the time has come to make a move, such is the appeal of atmosphere."

B.A.S. STATIONS

As readers may well be confused by the listing of Stations by letter ("Base B" etc.), we again provide a list of B.A.S. Stations to be occupied in 1965, from north to south.

Base H. Signy Island. 60° 43′ S., 45° 36′ W.
Base B. Deception Island. 62° 59′ S., 60° 34′ W.
Base F. Argentine Islands. 65° 15′ S., 64° 16′ W.
Base T. Adelaide Island. 67° 46′ S., 68° 55′ W.
Base E. Stonington Island. 68° 11′ S., 67° W.
Base Z. Halley Bay. 75° 31′ S., 26° 42′ W.

There is also a Summer Station Base KG at Fossil Bluff, 71° 20′ S., 68° 17′ W., and a Meteorological Station operated by the Falkland Islands Dependencies Government is located at King Edward Point on South Georgia.

Hope Bay, Base D, was closed on February 15 of this year.

The number of men to winter over at the various bases in 1965 is as follows: Base H, 12; Base B, 11; Base F, 16; Base T, 11; Base E, 20; Base Z, 30.

SOME SPECIAL PROJECTS

Considerable survey work is planned for the 1964–65 Summer. This includes the extension of the Tellurometer-theodolite traverse of George VI Sound northwards from Fossil Bluff, the reconnaissance and survey of the central plateau of the Antarctic Peninsula between 70° and 72° S., and a continuation of the survey of Tottanfjella. A reconnaissance will be made of the coastal area from Cape Legoupil (63° 20′ S.) to Sterneck Island (64° 11′ S.) in preparation for the completion of the systematic survey of this part of the Antarctic Peninsula within the next few seasons.

A seismic refraction survey will be made on Bransfield Strait and across the Scotia Ridge between the South Shetland Islands and South Orkney Islands.

At Base H a detailed programme of research on sub-littoral marine algae will be carried out. At Base H a programme of research on fishes, especially Notothenia spp., will begin. In the field of Soil Science, a new programme on the effect of frost in releasing nutrients in the soil will begin, while microbiological and mycological studies of soil will be concluded. A new programme of penguin embryology will begin.

At Base B a study will be made of the Antarctic Tern.

1984?

Dr. Phillip Law's "Sir John Morris Memorial Lecture" at the Hobart Town Hall on October 28 was entitled

ANTARCTICA — 1984

Dr. Law forecast jet passenger services to the Antarctic from South Africa, South America, Australia and New Zealand, underground mining cities lit by simulated sunshine generated from nuclear power, small hovercraft used as taxis and massive harvests from the protein-rich oceanic plankton to feed a starving world. He spoke of navigational and approach aids erected on stilts 30 feet above the snow, and of hangars and workshops buried beneath the snow surface.

Heavy tractor trains were envisaged hauling mineral concentrates from underground treatment plants at mines unceasingly worked throughout the dark winter months, and experimental trials of giant hovercraft ore-carriers — unlikely, however, to have been perfected by 1984.

Out at sea Dr. Law foresaw plankton-catching fleets of vessels displacing about 15,000 tons, each combining the functions of catcher and factory. He envisaged helicopters using equipment designed originally for the detection of submarines aiding each fleflet in its hunt for the plankton, and trials of giant nuclear-powered submarines able to pursue the plankton swarms, which might well supersede the surface ships.

As Dr. Law hastened to add "These things may eventuate or they may not. . . . They certainly will not come to pass unless we work to make them possible." But his basic ideas are fully supported by a leading American scientist and Antarctic planner, Dr. T. O. Jones, who wrote

Argentine Plans Announced for Coming Season

The scientific programme planned for 1964–1965 at the five permanent Argentine stations General Belgrano (77° 53′ S., 38° 29′ W.), Teniente Matienzo (64° 58′ S., 60° 03′ W.), Esperanza (63° 24′ S., 56° 59′ W.), Decepcion (62° 59′ S., 60° 43′ W.), and Orcadas (60° 45′ S., 44° 43′ W.), is to be essentially the same as in 1963 and 1964. The Naval Station Almirante Brown will be equipped as a scientific station and during 1965 will be a centre for biological and microbiological research.

During the International Quiet Sun Year the scientific programme will comprise instrumental and visual observations of aurorae, ionospheric soundings and absorption of cosmic noise, experimental colour recordings with all-sky camera complementary to those which are being carried out with a similar camera, and observations on radiation balance near the surface.

Argentine Antarctic operations for 1964–65 will be caried out by four organisations, the Argentine Antarctic Institute, the Naval Hydrographic Service, the Navy Antarctic Group and the Army.

Antarctic Institute. Officers of the Institute will supervise the fitting out of Almirante Brown Naval Base as a scientific station.

The Institute's sphere of activity will comprise Deception and Robertson Islands, Antarctic Peninsula, the Filchner Ice Shelf and the Duke Ernest Bay area. The scientific programme includes: a glaciological reconnaissance, determination of astronomical points, photographic survey of a glacier, census of glaciers, paleontological and palinological studies, collection of petrographic and biological specimens, taxidermy, collection of samples for radio-activity determination and the collection of fumarole gas samples.

In charge of the programme will be Capitan de Navio (RE) Carlos A. Perticarari. Parties will be carrying out glaciological, geological and topographic work at Decepcion, General Belgrano, Esperanza and Ellsworth Stations, the Mangrullos, Moltke and Bertrab Nunataks, Robertson Island, San Roque shelter, Puerto Parajso and Cape Longing, as well as on board the "General San Martin".

Hydrographic Service. Buoys will be placed in position and all lights and beacons will be re-charged and repaired. Decepcion and Orcadas Naval Stations will be relieved and supplied. Melchior and the Aeronaval Decepcion Station will be occupied for the summer. Oceanographical studies will be carried out in the Weddell and Bellingshausen Seas, Gerlache Strait, Mar de la Flota and the Sandwich Islands. Meteorological observations and mapping will also be carried out.

Navy Antarctic Group. A Neptune 2-P-107 carried out an ice reconnaissance on September 10 as a preliminary to the 1964–65 operations. The aircraft took off from the Aeronaval Base Comandante Espora. Crossing the Drake Strait, where all possible observations were made to determine the state of the ice, the plane arrived at the Antarctic Peninsula, flying over Esperanza Base. Immediately afterwards the access canal to Robertson Island was observed: Matienzo Base is in this vicinity. After

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recently of the factors, such as difficulty of access, which prevent the economic exploitation of Antarctic mineral deposits and the resources of the ocean from being "economically attractive" under present conditions. But, added Dr. Jones, **"It is entirely possible . . . that within a decade or two the ingenuity of man may devise methods for exploiting economic features of the Antarctic area."**

flying over the plateau of the Antarctic Peninsula and the Mar de la Flota, sacks of newspapers and mail were dropped at Decepcion and other bases.

This reconnaissance was supported by two Albatross aircraft, one operating in Drake Strait as far as Decepcion, the other retained under orders at Rio Grande. Also taking part was the tug "Sanaviron", stationed at Cape Horn, while the United States vessel "Eltanin", then working 1,800 miles to the west of the Antarctic Peninsula, assisted with meteorological information.

During this 1964–65 summer, the Aero naval Antarctic Group will comprise a Neptune P.T.V-5 and three Albatross H.U.16-B helicopters. Once the ships are in the operational theatre the aircraft will carry out reconnaissance as required, and if necessary will relieve the bases by air.

SHIP MOVEMENTS

The ice-breaker **"General San Martin"** was scheduled to leave Buenos Aires on November 9 and to call at the following bases and other locations in the course of the summer months: Orcadas, Belgrano, Esperanza, Matienzo, Almirante Brown, Melchior, Marguerite Bay, Decepcion, Isla Pedro I (Peter I Island), Puerto Belgrano. The vessel is expected back in Buenos Aires on March 28, 1965.

The **"Bahia Aguirre"** is due to leave Buenos Aires on December 7, and to return there on March 7.

Bases which are not at present being occupied will be inspected. In addition to the regular base reliefs, the Navy group will reconnoitre the Marguerite Bay and Peter I Island areas, west of the Weddell Sea, using aircraft only.

Army. The Army detachment will be responsible for the relief and resupply of Esperanza and Belgrano Bases, the relief of the shore party at Matienzo and the inspection of Corrientes Refuge-hut. It will also reconnoitre the northern part of Alexander I Island.

SPLENDID ANTARCTIC FILM

Seldom has there been such unanimous praise showered upon a film as has been enthusiastically given to the New Zealand National Film Unit's half-hour colour documentary

140 DAYS UNDER THE WORLD

From the gripping opening sequence of an early plane after the long winter touching down on the ice runway the film never loses interest. At times the excitement rises high: shots — daring shots — of an icebreaker smashing south through the ice; scenes of the life at Scott Base; rendezvous with Bob Miller's northern party in the field; the penguins and the seals; the field party men returning to base; the South Pole ice mine; humorous interludes to give light relief after the tense drama of other scenes; all magnificently photographed by Kell Fowler and Sam Grau so realistically that among the film's most ardent admirers are men who have lived it all themselves.

This film deserves the praise it has received. Make sure you don't miss it.

IN ACCORD

Reference has been made in this journal (e.g., September 1964, p. 474) to the switch-over in New Zealand Antarctic field work from long dog-sledge journeys of exploration in the tradition of Amundsen and, to a lesser extent, Scott, to the shorter-term study of particular areas by teams of specialists flown in by aircraft and air-lifted to their base again on the completion of their project.

This is parallelled in the much more extensive United States field programme. "I expect," writes Dr. T. O .Jones, "that in geological and geophysical fields the future projects will consist of research into precise problems based upon the results of the recent and present reconnaissance efforts."

SCIENTIFIC WORK PLANNED AT FOUR CHILEAN STATIONS

Chilean Antarctic activities come under the general control of the National Committee of Antarctic Investigations, but as is customary a number of organisations, mostly scientific, are entrusted with the detailed planning and the subsequent study of data and publication of results. The armed forces also play a prominent part in the implementation of the Antarctic programme, particularly in the field of logistics: transport, supply, base construction and maintenance.

This year has seen the official inauguration on May 29 of a new organisation, the Chilean Antarctic Institute, brought into being by legislation passed in October, 1963. The Institute (INACH) comes under the control of the Ministry of External Affairs but enjoys a large measure of autonomy in scientific and technical matters. The main function of INACH is to plan, direct and co-ordinate Chilean scientific and technical operations in the Antarctic. The Secretary-General of the Institute which is located in Santiago, is Vice-Admiral (R) Don Jorge Araos S.

Four Chilean bases are permanently occupied. These are:

Arturo Prat (62° 30′ S., 59° 41′ W.) on Greenwich Island.

Bernado O'Higgins (63° 19′ S., 57° 54′ W.) on Covadonga Bay.

Gabriel Gonzalez Videla (64° 49′ S., 62° 52′ W.) on the Danco Coast, at Paradise Bay.

Pedro Aguirre Cerda (62° 56′ S., 60° 36′ W.) on Deception Island.

Not in permanent occupation are the auxiliary base **Yelcho** on Doumer Island (64° 52′ S., 63° 34′ W.) and a refuge hut named **Gueslaga** much further south on Avian Island in Marguerite Bay (67° 47′ S., 68° 53′ W.).

Transport is provided by the icebreaker **Pilato Pardo,** the oceanographic vessel **BO. Yelcho** and two patrol ships **Lautaro** and **Lientur.**

PROGRAMME FOR 1964–65

Apart from the regular scientific observations a number of new projects are planned for the coming year, and a few of these are outlined here.

Cartography. The Military Geographical Institute will continue the topographical triangulation begun early this year, in order to secure precise astronomical observations previously not obtained because of bad weather.

Meteorology. The usual programme will continue at all bases. A meteorologist from the Chilean Meterological Office will probably winter at Pedro Aguirre Cerda.

Seismology. The seismological station at Gabriel Gonzalez Videla Base will need to be dismantled if the instruments develop faults which will have to be corrected in Santiago. Personnel previously trained at the Institute of Geophysics and Seismology, University of Chile, will continue the programme at General Bernado O'Higgins Base. It is hoped to install new seismological equipment at this base in 1966.

Vulcanology. It is proposed to install next year a vulcanological observatory at Pedro Aguirre Cerda Base, with a subsoil thermograph and a vertical short-term seismograph.

EARLY START PLANNED

It is hoped that the 19th Chilean Antarctic Expedition will be able to reach Antarctic waters this year before December 10. In this case it will be possible to continue the study of sea birds and terrestrial ecology begun by a biological team from the Science Department of the University of Chile. This programme will be undertaken on Nelson Island in the South Shetlands and the objective is to complete in the course of three years the observations necessary to make possible the publica-

tion of a guide and check-list of the birds of the Antarctic Peninsula and the off-lying islands.

If it proves impracticable to undertake the year's programme as early as is hoped for, the scope will be reduced and the modified project will be undertaken in whatever time is available.

SUMMER PERIOD

It is probable that a representative of the German Association for Polar Studies will accompany the 19th Chilean Expedition with a view to possible future co-operation in the fields of Upper Atmospheric Physics, Marine Biology, Geodesy (a satellite programme), Geology, Glaciology and Seismology.

The programme initiated last year by geologists of the University of Chile will be continued with special attention to coastal phenomena and the morphology of glaciers. It is planned to work on the following islands: Elephant, Clarence, King George, Nelson. Robert (Punta Prat), Desolation, Greenwich (Yankee Bay), Livingstone (Punta Williams), Media Luna, Snow and Low.

In continuation of the project assigned to Chile by the 8th International Conference on Hydrography at Monaco in 1962, the "Yelcho" will undertake **Operation Mar Chile IV** during January, February and March 1965. This calls for ten north-south runs 30 miles apart between 53° S. and 65° S. and between 75° 30′ W. and 85° W. Each 40 miles during three of these cruises an oceanographic station will be made to a depth of 3,000 metres, with bathythermographic surface temperature and bathymetric observations.

WHALING DOOMED?

An article in our last issue, published after the meeting of the International Whaling Commission in June, ended with the words: "Norway, Japan, the Soviet Union and the Netherlands were expected to start negotiations . . . on how to share the 8,000 blue whale units to which they had agreed to limit their catches next season."

The term "blue whale unit" means one blue whale or two fin whales or two and a half humpback whales or six sei whales.

The four countries, those now actively concerned in Antarctic whaling, agreed to almost total prohibition of blue-whale catching, but refused to accept the greater restriction on catches of **all** baleen whales strongly urged by the Commission's Scientific Committee. The Committee had suggested a progressive reduction in catches of baleen whales (i.e., other than sperm whales): 4,000 units in 1964–65, 3,000 in 1965–66, and 2,000 in 1966–67.

The overall limit of 8,000 units agreed to by the whaling nations for 1964–65 was therefore double that suggested by the committee of experts, and is in fact hardly any lower than last season's actual catch of 8,429 blue whale units.

As the Commission cannot compel the whaling nations to abide by the regulations, there seemed to be only one way to avoid such a depletion of whale stocks that whaling would become uneconomic almost immediately: this was for the four nations to adhere strictly, by mutual arrangement, to whatever proportion of the catch was assigned to each nation. It was generally assumed that the national allocations from the total 8,000 units would be Japan 52 per cent., Norway 28 and the Soviet Union 20. This, however, did not meet with overall approval.

Even the plan for international inspection has not been implemented.

The result is that the catastrophic decline in whale stocks is likely to be accelerated in the 1964–65 season. Unless there is a change of heart it would seem likely that each nation will be out to secure the biggest catch it can from the small stock still remaining. In this case it must be only a matter of time — a short time — before the baleen whale stocks will become so low that whaling will cease. Presumably stocks will then begin to rise again, but it could well be decades before they reach the point where whaling will again be a profitable industry.

WIDESPREAD UNITED STATES PLANS FOR 1964-65 SEASON

The United States Antarctic Research Programme (U.S.A.R.P.) for the coming Antarctic summer is almost overwhelming in its complexity and range.

Basic research will be carried on as in the past in no fewer than eight major scientific disciplines, ranging from below the surface of the land and ocean, through land-based disciplines, animal and mineral, to the air and upper atmosphere above. And each of these Antarctic-based studies will have its United States-based counterpart.

An estimated 150 U.S. scientists will travel to Antarctica in pursuit of some 50 field projects, representing 40 or more universities and scientific organisations. In addition, 17 scientists from other nations will work at U.S. stations, while a number of U.S. scientists will conduct research at foreign stations.

Foreign scientists working at the U.S. stations this season include:

At McMurdo: Dr. T. W. Gevers, geologist, from South Africa; Dr. Bruce E. Hobbs, a geologist from Australia, who will work in the Taylor Valley with fellow-Sydney-ites Dr. Clifford D. McElroy, David E. Anderson and Paul F. Wiliams; Dr. Philip D. Tilley, another Sydney University geologist; and Dr. Tetsuya Torii, a biologist from Japan who will head a five-man team whose other members, also from Japan, are Drs. Tsurahide Cho, Horoshi Fukushima, Noboru Yamagata and Yoshio Yoshida. Several New Zealanders will also be participating in the American programme.

At Byrd Station will be Sir Charles S. Wright, a physicist from British Columbia.

In the field wil be found Mr.. Dirk C. Neethling, another geologist from South Africa, who will be with a four-man party working in the Ellsworth Mountains; Mr. Olav Dybvadskog, a Norwegian geologist, will be with the Queen Maud Land Traverse, as will Dr. Edgard Picciotto, a Belgian glaciologist.

At Hallett, Dr. Dietland A. T. Muller, a German zoologist, will study penguins, while Dr. Z. Soucek, an ornithologist and zoologist from the Australian Department of External Affairs will conduct his research in the Balleny Islands from a U.S. Navy icebreaker.

NEW STATION

Major projects for Deep Freeze 64 will be the establishment of a new Antarctic Research Station, the sixth U.S. base in the Antarctic regions, on Anvers Island, the largest island in the Palmer Archipelago off the west coast of the Antarctic Peninsula (for earlier report, see Antarctic, September 1964, p. 490). This region is relatively rich in plant and animal life compared to the rest of the continent, as well as offering large expanses of exposed rock. Comparatively mild weather and long periods of daylight will enable scientists to work and travel outside for much of the year.

Acommodation for 7 USARP scientists and 16 Deep Freeze naval personnel will be available during the summer construction phase, and for the wintering over period 5 scientists and 4 support men will be housed.

The icebreaker Edisto will serve as headquarters for Seabees of Mobile Construction Battalion Six in January and February next while the Seabees modify a hut erected by the British in 1955 into a laboratory and construct a new building for living quarters.

MAJOR TRAVERSE

Second major operation this season will be the first of a series of traverses into Queen Maud Land. This exploration of the last remaining unknown region of Antarctica is planned over a four-year period, and this year's traverse is planned to cover the area from the South Pole, by a series of zig-zag routes, to the Pole of Relative Inaccessibility, some 1,200 miles in all. The main purpose of this expedition is to check the thickness of the ice-cap and it wil be effected by a ten-man party, under the leadership of Dr. Charles Bentley of the University of Wisconsin, comprising geophysicists, engineers, a glaciologist, a geomagnetician and Belgian and Norwegian scientists.

Large tracked vehicles will take the team into an area of the high ice plateau, where it will undertake research into the depth of the ice and the contours of the land beneath. The last of the four-year traverses is planned to end at the Belgian Roi Baudouin coastal station. Each year's team will be flown out at the end of its two-month sojourn in the wilds.

A paved road from McMurdo out to the Ross Ice Shelf, in the region where Scott and his two companions finally died, is to be constructed by Navy Seabees this season. The road will be an all-weather, sealed base highway with a gravel top for better grip in icy conditions.

U.S. SCIENTISTS
WINTERING OVER

Out of a total of 179 United States scientists who will be working in the Antarctic this summer, 32 will be wintering over at one or other of the United States bases. In addition, two U.S. Scientists will join the Russian summer party at Vostok, and a biologist (Dr. George H. Meyer) will winter over at the Russian station Mirny.

The men wintering will be at the following stations: McMurdo 6 (scientific leader A. L. De Vries), Byrd 9 (M. L. Trimpi), Eights 5 (J. W. Hirman), Palmer 5 (A. S. Rundle), Pole 7 (L. Aldaz).

IN FROM AUSTRALIA

Deep Freeze 1965, as comprehensive an operation as any of its predecessors, opened at the beginning of October with a flight never before attempted. On October 1 a ski-equipped Hercules of the U.S. Navy arrived at Byrd Station carrying the commander of Deep Freeze, Rear-Admiral James R. Reedy, and the director of the Australian Antarctic Research Expedition, Dr. Phillip Law, after having flown 4,420 miles from Avalon, Victoria.

This route to the Antarctic was, in Rear-Admiral Reedy's words, "the last great long-distance flight to be made on this earth connecting two continents". Equipped with 3,600 gallons of fuel, nearly twice the Hercules' normal capacity, the aircraft, piloted by Commander Fred Gallup, covered the distance in 15 hr. 39 m., and achieved a triple first in so doing.

OTHER FIRSTS

Not only was it the first aircraft to fly from Melbourne to the Antarctic, it was also the first aircraft to open a Deep Freeze by landing at an inland station, and as well by crossing the South Magnetic Pole in a temperature of —85° F. it achieved another record — no other aircraft had crossed the Pole in so low a temperature.

The landing at Byrd Station was not scheduled. The route itself from Avalon had not been chosen for any particular reason — "just for the hell of it" — and bad weather at the scheduled destination, McMurdo Station, forced the Hercules to travel 900 miles further east to Byrd, an inland, station, making its hours aloft the longest flying time ever known in Antarctica.

Rear-Admiral Reedy's opening gambit for the new Deep Freeze was a three-pronged one. At the same time, or as near the same time as weather permitted, as his Hercules left Victoria, two more ski-equipped Hercules left Harewood, New Zealand, to relieve the wintering-over party at McMurdo, and a third approach was made from Punta Arenas, Chile, to enable a photographic

survey of Anvers Island, site of the new biological station, to be made.

The aircraft from Harewood had to return after bad weather had closed visibility at McMurdo and they had not enough fuel, unlike the Avalon-based Hercules, to detour to Byrd. They did not reach McMurdo until the following day. The aircraft from Chile followed them in on October 4.

MASSIVE MOVEMENTS

The big shift of men and supplies to supply Operation Deep Freeze 1965 started soon after the initial flights carrying Rear-Admiral Reedy, commander of the Operation, and relief parties to McMurdo Station.

In three months' operations, some 500 tons of cargo are to be ferried south in 36 missions, and the U.S. Air Force detachment for the season numbers 162 men, 98% of whom are new to Antarctic operations. The job was scheduled for completion by December 15.

PLANE OFF COURSE

Large cracks in the main ice runway at McMurdo Sound in mid-October temporarily halted all flights for several days, and this delay was followed by a series of aircraft mishaps. One Hercules en route to McMurdo from Christchurch was detected, in Christchurch, deviating 100 miles off course, with a fault in its navigation equipment. The pilot of the Hercules turned back, requesting a high frequency directional finding beacon to guide him home. Christchurch Airport had no such equipment, local radio stations were off the air for the night, but U.S. Navy air controller, Guthrie Riley, who had originally discoverd the course deviation half-an-hour earlier and notified the Hercules, was not to be outdone by these circumstances. Controller Riley checked his manuals and found there was a radio station available — on the other side of New Zealand's South Island. Within another half hour Controller Riley had the station on the air, which gave the Hercules a fix until such time as its radar picked up the coastline.

OTHER MISHAPS

The failure of a JATO bottle to ignite until its Dakota aircraft was in the air, wrecked the Dakota, though not its occupants; while an Army Iroquois helicopter crashed in landing on a peak in the Admiralty Range at the beginning of November. At the end of the month a Navy Hercules reached Cape Hallett with a replacement helicopter.

Early November also brought the first Deep Freeze icebreaker on an unscheduled visit to Wellington, New Zealand, to get a replacement generator. This vessel was the U.S. icebreaker "Eastwind", the forerunner of the support operations for Deep Freeze 65 which will involve 3,000 men, dozens of ships, 35 cargo and rescue aircraft, as well as a frigate and tanker from the New Zealand Navy. "Eastwind" was followed a week later by another icebreaker, "Staten Island", also en route to McMurdo where she was to break a channel through the Sound, before continuing with hydrographic and oceanographic work, as well as exploring and surveying the coastline and offshore islands of the Antarctic Peninsula.

WEATHER STATION

It was reported on October 6 that a new weather station had been established at 81° 23′ S., 170° 45′ E. This is on the Ross Ice Shelf, about 270 miles south of Cape Crozier and 100 miles east of the Victoria Land coastline in the vicinity of Beaumont Bay. The station, to be called **Little Jeana**, will be activated each year approximately from October 1 to March 1. Beardmore station will not be activated this summer.

STATION NOTES

October's unlucky day, the 13th, upheld its reputation at the Amundsen-Scott polar station when fire destroyed a wooden garage housing three tractors.

A 10-knot wind did not, however, succeed in spreading the fire, which the 22 men on the station fought in —67° F. for 38 minutes. Even before detailed information as to extent of the damage done to the tractors had

been received, the civil engineering laboratory hangar at McMurdo was being rapidly dismantled for transportation to Amundsen-Scott to replace the burnt-out hangar. A U.S. Navy large tractor in Christchurch, undergoing repairs after its fall through the ice at McMurdo Station last season, was due to be shipped to McMurdo, whence it would move onto the Pole Station. The three tractors being out of commission was not expected to affect, noticeably, the number of planned flights to Amundsen-Scott.

AT McMURDO

McMurdo Station is steadily approaching five-star rating with the addition of facilities and conveniences.

Antarctica's first water distillation system, due to begin operation this season, will remove the need to melt (having previously dug) snow for all water requirements in the station; a sewerage plant should be working by the end of the summer; a new, modern sick bay/dispensary for emergencies; and two 100×40 ft. warehouses are also planned for this season.

A salt desert, perhaps the only feature of its kind in the world, has been reported in the Miers Valley, west of McMurdo; this could also add spice to life in the inhospitable wilds of Antarctica.

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.

N.Z. ICEBREAKER WANTED

Sir, — I am sorry to read that New Zealand is going to cease operation in the jointly operated station with the United States at Cape Hallett. This is surely the most fascinating and challenging spot on the continent of almost 6,000,000 square miles, which lends itself almost perfectly in every line for training young people in self-reliance and the art of leadership.

Unfortunately, this cannot be carried out without an icebreaker of our own. To prove this, I was at Hallett at the tail end of the summer, but in spite of this there appeared to be something like four miles of shore ice still in the sound — a carry-over from the winter that only an icebreaker could tackle. I sincerely hope that when the United States decides to cease operation there that our Government will make arrangements with them to take over the base, including all the buildings and facilities, then open up the first Outward Bound School on the loneliest continent that beckons and beckons for our youth, including our fair sex.

I look upon Antarctica as our backyard, but in peace or difficult times we can't make best use of it without an icebreaker of our own. To buy an icebreaker we don't need the money we now and again have in our pockets to rub together. But we do need to export more logs, wool, etc. . . . The Japanese are building an icebreaker for themselves at the present, for building a base in Antarctica next year in the Norwegian sector. — I am, etc.,

FRANK ALACK

Nelson, September 28

THIS ISSUE

ends "ANTARCTIC", volume 3.

Have you the twelve numbers ready for **Index and Binding?**

Spring in the Sub-Antarctic Islands

MARION ISLAND
(South Africa)

Marion Island is situated in 46° 52′ S., 37° 51′ E., south-east of Cape Town.

A biological expedition will be proceeding to Marion Island in December. Some of the party, after a quick reconnaissance of Prince Edward Island in March 1965, will return to South Africa but a botanist and an ornithologist will remain on Marion Island for a full year of observations, until March 1966. Among the projects planned are: collecting fauna and flora, plant ecology (distribution, chromosome numbers, pollination, mapping), pollen analysis, influence of animals on vegetation, introduced weeds and animals (cats), soil types, etiology of breeding birds, ringing of birds, including colour-marking of species intended for further intensive study, ethnological and life-history studies of selected species, especially the soft-plumaged Petrel complex.

MARION NEWS

Theo von Ludwig reports that August has been a very cold month; they had some heavy snowfalls and at one stage experienced a real blizzard with drifting snow and zero visibility. Everybody on Marion Roberts hammered together a trumpet to call the family for meals and seems to be making something. this diabolical instrument is rapidly driving Oubaas, the dog, round the bend. The Met. men constructed a model steam engine which actually works. In view of the general tendency to put on weight, people can be found at odd hours doing physical jerks and lifting weights. Some men have already given up this uneven struggle against overwhelming odds.

In September and October the days were getting longer. The island teemed with baby penguins and sea elephant calves, while the baby albatrosses were already shedding their down. Very strong winds were recorded on September 23 and 24 with wind speeds up to 60 m.p.h. and gusts up to 90 m.p.h.

The 31 laying hens are apparently thriving on the island and are producing up to three dozen eggs per day. The men are at a loss what to do with this deluge and they have even tried mixing eggs in the bread dough with very pleasing results.

When the R.S.A. leaves in December to take the sixth S.A.N.A.E. south, it will touch at Marion to land a party of scientists including, among others, an ornithologist, a geologist and a surveyor. These scientists will stay on the island until the next relief of the Marion staff arrives which will be about March 1965.

GOUGH ISLAND
(South Africa)

The mountains were still covered in snow at the beginning of October but spring was unmistakably in the air with an average of four hours sunshine per day.

Sergeant Bouwer, the medical orderly, broke an arm during October. He was evacuated by the research ship R.S.A. which was at the time engaged in carrying stores to Tristan, under charter to the U.K. Colonial Office. It is planned to send a relief medical officer to Gough shortly.

CAMPBELL ISLAND
(New Zealand)

Once again the "Holmburn" was the servicing vessel for Campbell Island. After a very pleasant and calm trip south, she arrived at Perseverance Harbour at 4 p.m. on November 1, with unloading starting at 5 p.m. on the same day. Right throughout the servicing calm weather was experienced, which is unusual for Campbell Island. Five of last year's team returned to New Zealand.

The new expedition has settled in well after the departure of the "Holmburn", and all are looking forward to their first visitor, the U.S.S.

"Mills", which should arrive on November 20.

This year's party has also an intensive works programme and a few maintenance repairs to be done. Carpenter Dough Herkt, while in the Island last year, built a magnificent bar in the lounge, which is in constant use.

The official visitors at the servicing were Group Captain Marsh, Principal Medical Officer, Dr. J. F. Gabites, Assistant Director of the Meteorological Office, and Mr. P. H. Saunders of the Department of Civil Aviation. These officers carried out their Department inspections respectively.

Two of last year's meteorological observers, E. D. St. Croix and P. M. Ingerm, will remain at the station.

Now on Campbell Island are the new officer in charge, C. M. Clark (Christchurch) who has had two tours of duty at Raoul Island and one at Campbell Island; D. Carron and K. C. Kibblewhite (Christchurch and Wellington, ionosphere observers), and G. Surrey (New Plymouth, cook).

MACQUARIE ISLAND

(Australia)

Gadd and Reid, after their regular Saturday morning jaunt to the Plateau to service recording equipment, pioneered a new return route via the western scree slope to Hasselborough Corner. The same pair, with Stair, departed in wild conditions on a week's walkabout, banding albatross chicks and counting fur seals; they branded elephant seals on the way.

Leader Robert Nunn writes:

"By the time you read this it will be officially spring. What this may mean in terms of weather, who knows — we usually leave this to the Met. but our animals friends are in no doubt about it — the skuas are back at the kitchen door, the gentoo penguins are looking out for nest sites and large veteran male elephant seals again recline on the beaches and in the wallows awaiting their fate and the chance to assert their beachmastership. After the blizzard conditions of the last month we have ordered better weather from the Met. this month because we hope our motto will be — If it doesn't move, paint it."

Weather report for the past month: Maximum temperature 43.6° F.; minimum 22°F.; maximum wind gust 72 m.p.h.; 246 points of rain; snow on 14 days and hail three days; 43.8 hours of sunshine.

The team for 1965 numbers 18, plus one man, a technical officer (biology) who will remain on the island only till March. The officer in charge will be C. Bruce Ellwood. The new party will leave Melbourne on the "Nella Dan" on December 2.

KERGUELEN

(France)

The relief time-table has been drawn up so as to allow for as lengthy summer programmes as the climate allows. The islands relief ship is the French cargo vessel "Gallieni" of Messageries Maritimes, which will relieve the parties at Kerguelen, Crozet and Nouvelle-Amsterdam between December 6 and January 20, and again between February 28 and March 23. "Gallieni" carries two Alouette II helicopters.

There will be 38 men in the summer parties at the three island stations. Wintering over at Kerguelen will be 57 men.

The need for reconstruction of the base at Port-aux-Francais is becoming more and more apparent because of the requirements for the scientific research which is steadily growing. A new ionopheric research station will be constructed during the coming summer, and a new transmitting station should be finished during the year. The use of teletype makes it essential to separate transmitting and receiving plants from each other. Work on the installation of a new fuel storage tank will begin in the course of the year.

It will be necessary to install an 80m. antenna pylon at the new station erected for ionospheric research. With this addition, Port-aux-Francais is now one of France's most

complete and most modern geophysical centres. This summer six specialists will be working on this project.

The meteorological programme comprises routine observations and a whole group of research projects dealing with high altitude currents, etc.

SUMMER PROJECTS

The photographic coverage of Kerguelen will be incomplete until the north of the island, the part farthest from Port-aux-Francais and having the most unfavourable climatic conditions, has been covered. This summer a camp will be established on the Loranchet Peninsula to serve as a helicopter base. The helicopters will also serve to facilitate the necessary geological survey of this area.

A seismologist will oversee the installation of the new seismological pit near Port-aux-Francais. This will make possible the closing down of the Point Molloy station which is 18 km. from the Base and the maintenance of which called for considerable hard work.

A visitor during the summer will be Dr. Brian Roberts of the Scott Polar Research Institute.

LES ILES KERGUELEN IN WAR-TIME

The excellent occasional journal T.A.A.F. (Terres Australes et Antarctiques Francaises), number 26, has an interesting article by Gracie and René Delepine on the French sub-Antarctic Kerguelen and Crozet Islands.

During the 1940–41 summer three German raiders used Kerguelen as a commerce-raiding base.

"Atlantis" harried British shipping in the Atlantic and Indian Oceans for eight months before heading south for a much needed re-provisioning and overhaul. Arriving at le Bras de la Fonderie, Kerguelen, from the north-east on December 14, 1940, ten men disguised as civilians cautiously reconnoitered the old settlement of Port Couvreux, finding nothing more belligerent than a sea-elephant. But as "Atlantis" now moved cautiously up towards the more sheltered (and concealed) Bassin de la Gazelle, she struck an uncharted rock and was held firm for three days. Then during a storm she was rocked free, and was successfully repaired.

On Christmas Eve a Silesian sailor named Hermann fell while painting a funnel, fractured his thigh, and died four days later. A cross surmounting a pyramid of rocks marks the most southerly German burial place of the Second World War.

The "Atlantis", now to all appearances a Norwegian cargo-ship "Tamesis", made north again on January 10, 1941, after 26 days in le Bras de la Fonderie.

At Port Jeanne d'Arc the names of members of the crew of the **"Komet"** (HK45) may be seen on the buildings with the date "March 10, 1941". "Komet" and "Pinguin" had received orders to rendezvous with a supply vessel, the "Alstertor", on March 9 at 49° S., 66′ W., east of the Kergulens. At the time "Komet" was in the Ross Sea in an attempt to cripple Allied whaling fleets, but met only the Japanese fleet.

A preliminary visit was made to the Kerguelens on March 6–12 and the crew sampled — without enthusiasm — the inevitable Kerguelen menu of rabbit and Kerguelen cabbage. The rendezvous took place on the 12th. A sudden storm next day drove all three ships to the shelter of the Bras de la Fonderie before heading for warmer climes.

The third German raider to make use of Kerguelen was the **"Pinguin"** (HK33). This ex-merchant ship operated in the South Georgia area and on January 13–14, 1941, without firing a single shot, captured 14 whaling vessels (factory ships and chasers) with their invaluable cargoes of whale-oil. These vessels were taken back to Germany by special crews except for one chaser, Pol IX, which was now put to scouting for Allied victims instead of whales. Then, east

of Kerguelen, accompanied by "Alstertor", "Pinguin" made rendezvous with "Komet" on March 12 and both vessels remained in the Bras de la Fonderie and the Bassin de la Gazelle for 10 days. Great care was taken to see that nothing whatever remained to show that the Germans had been there. On May 8 she was sunk by H.M.S. "Cornwall" near the Persian Gulf.

"Atlantis" met her fate on November 22, 1941. "Komet" returned safe and sound to Hamburg on November 30, only to be sunk on her second raid, on October 13, 1942.

ILES CROZET
(France)

The Crozet wintering party 1965 will number 12. The present team is hard at work installing the flying-fox with its workable capacity of five tons. As the erection of the planned seven buildings has already been completed, everything should be in readiness for a quick operation as soon as "Gallieni" arrives.

The laboratory for studies in magnetism provided by the I.Q.S.Y. Committee is to be installed in the building which has been erected for the purpose.

Observations will continue to be recorded and transmitted by the automatic station.

TEN AGAINST BIG BEN

THE SOUTH INDIAN OCEAN EXPEDITION TO HEARD ISLAND

After several days' delay due to bad weather and the uneasiness of Shipping and Transport Department officials, the one-time Tasmanian crayfishing schooner "Patanela" left Sydney on November 5 en route for Heard Island and high adventure.

The expedition, the first Australian private Antarctic expedition since Mawson's BANZARE voyages in 1929–30, is led by **Major Warwick M. M. Deacock,** F.R.G.S. (36), a veteran alpinist and a member of the ANARE expedition on Heard Island in 1963. The strong 10-man team, only seven of whom were on the "Patanela" for the first leg of the journey, to Albany, includes three New Zealanders who have all had climbing experience in the Southern Alps and elsewhere. They are **Colin Putt,** B.E., B.Sc. (37), surveyor and marine engineer; **R. Phillip Temple** (25), biologist, and **John R. Crick** (22), assistant provisioning member. Five members besides Deacock have had previous sub-Antarctic experience; **Dr. Grahame Budd** (35), **Dr. Malcolm Hay** (26), **Dr. Russell Pardoe,** M.B.E. (31), **Edwin J. Reid** (27) and the skipper, **Major H. W. Tilman,** O.B.E., D.S.O., M.C. (66). Major Tilman, who will not be attempting the climb, is famed as mountaineer, navigator and author. He led the 1938 Everest expedition. Tenth man is **Antony Hill** (24). The Patron of the expedition is Sir Edmund Hillary.

RUGGED ISLAND

Heard Island, 53° 10′ S., 73° 35′ E., was the site of an Australian sub-Antarctic base from 1947–54. It is 23 miles long and 13 miles wide. The island lies south-west of Fremantle and is only 900 miles from the Antarctic Continent. It is dominated by the massive bulk of Big Ben, which rises to 9,005 feet and has so far hurled back every attempt to conquer it. The climate is notorious, with winds over 100 m.p.h. common, and with heavy precipitation of snow and rain. Movement over the crevassed ice which covers 90 per cent. of the island is particularly dangerous because of the almost continuous blizzard conditions.

In 1963 an ANARE party of six men spent six weeks on the island carrying out a scientific programme. An attempt to scale Big Ben ended 1,500 feet from the summit, Mawson Peak, and the climbers, who included Deacock and Budd, were snowbound for several days and were lucky to escape with their lives.

WEST AND SOUTH

From Albany the course will be west on approximately 30° S. before reaching across the prevailing westerly winds farther south to the Kerguelen Islands, a 2,400-mile voyage. The expedition expects to reach Heard Island about six weeks to two months after the departure from Sydney.

"Patanela" is a 63 ft. long, 16 ft. beam gaff-rigged schooner with 2,000 sq. ft. of working sail and a 165 h.p. Rolls-Royce diesel engine. She has a displacement of 45 tons. Of robust, all-steel construction, the ship has proved herself on a voyage to Macquarie Island. She is fitted with two-way radio echo-sounder and automatic pilot.

The landing on Heard Island will be from a mile off-shore through surf, using inflatable rubber boats powered by outboard motors. Each member will wear a diver's wet-skin suit to combat the cold should he be washed off. As Heard offers no known safe anchorage, it is thought likely that only six men will make the landing while the other four take "Patanela to the Kerguelen Islands, 300 miles away for the two months during which the main party is ashore. There is some hope, however, that adequate shelter may be found at Winston Lagoon and soundings will be made from the ship's tender. Shore-ship communication will be by portable wireless and two extendable 50 ft. dipole masts will be erected on Long Beach.

LYING IN WAIT

The shore party will begin climbing immediately after establishing its base at Long Beach. For 1,500 feet they will follow a volcanic ridge up to the glacier immediately behind the beach, and then climb another glacier until they reach 4,000 feet. Here it is hoped to establish a camp on the first day. Then if the weather holds they hope to be able to climb another 4,000 feet to a point from which the final assault will be made. From the first camp, the climbers will follow a steep glacier pass 100 yards wide, the key to Big Ben, then strike up another glacier and make for a plateau only 1,000 feet from the top. This is a filled-in volcanic crater surrounded by peaks, of which Mawson Peak is the highest. One of the three will be on watch each night to wake the other two if the weather relents. They are prepared to wait up to three weeks ready for an immediate summit strike, if there is prospect of a few hours' good weather. Two hours will be needed to race up another glacier and a deeply crevassed slope to Mawson Peak and to raise the flag on the summit.

SCIENTIFIC PROGRAMME

In addition to the climb, the party has a comprehensive programme in biology, geology, glaciology, vulcanology and human physiology. A census will be made to establish whether the fur seals and King penguins are in fact rehabilitating themselves on Heard Island. As Heard is the only sizeable sub-Antarctic island free of introduced predators, and the original vegetation is therefore intact, great interest attaches to the collection of insects that will be made. The inadequately-mapped south and west positions of the island will be surveyed.

Oceanographic work on the voyage has been planned in co-operation with the Indian Ocean Biological Centre and other institutions. The voyage will be through waters where little oceanographic work has been done.

It is hoped to make the first landing on the McDonald Islands, 27 miles west of Heard Island, and to raise there the Australian flag before the expedition returns to Australia in February 1965.

FINANCE

Each member of the party has contributed £300 to the funds, and it is hoped to raise the £18,270 estimated cost by news and film rights, books and magazine articles, donations, etc. The Mount Everest Foundation and the Trans-Antarctic Fund have both made substantial grants. If the expedition shows a profit, none of it will go to the members but repayment will be offered of funds received from non-profit scientific trusts and foundations.

TO CROSS SOUTH GEORGIA

BRITISH COMBINED SERVICES EXPEDITION

The ten-man Combined Services South Georgia Expedition left London by air on October 26 for Montevideo. A few days later the party travelled on the ice-patrol ship H.M.S. "Protector" via the Falkland Islands and on November 16 landed at King Haakon Bay on the west coast of South Georgia. An attempt will be made to verify the exact route followed by Shackleton, Worsely and Crean in their crossing of the mountainous island to secure the rescue of their companions left on Elephant Island following the trapping and sinking of the "Endurance" in 1915.

In addition to this history-remaking journey, the expedition, led by Lieut.-Cdr. M. K. Burley, R.N., aged 36, plans to carry out scientific work in the little-known Allardyce Range and to climb the unconquered Mt. Paget, just over 10,000 feet and the highest peak on the island. Geological and survey work will be carried out in the remote Royal Bay area, the map of which is believed to be very inaccurate.

The team comprises three men from the Army, three from the Air Force, two from the Royal Marines and two from the Navy. Six are officers, three w.o.s and sergeants and one an aircraftman. There are two surveyors in the party, a geologist, a zoologist, a cryptologist, a medical officers and photographers. Deputy Leader is Sq. Ldr. A. H. Back, A.F.C., M.A., R.A.F.

The first task will be to establish dumps by helicopter at strategic points. The "Protector's" helicopter will then land the party at the site of Shackleton's "Peggoty Camp" and Shackleton's route will be retraced, it is hoped by the end of November.

Most of December and early January will probably be spent in the Kohl-Larsen plateau and Allardyce Range area, including assaults on several unclimbed peaks. Survey work will then occupy the time prior to re-embarkation on "Protector" about the middle of March.

EARLY DISAPPOINTMENT

Their first discovery was that one of the worst winters on record had extensively damaged whaling installations and sunk six whale catchers. As a result, neither sealers nor whale catchers will be available for the sea passage from Grytviken to Royal Bay in January.

Undismayed, the explorers set to work and quickly set up stores dumps round the Island. To make this possible, H.M.S. "Protector" had to navigate in ice-strewn uncharted waters. Skilful flying by the pilot of the ship's helicopter in adverse conditions helped to complete this difficult task.

Soon after landing in South Georgia, Lieutenant Commander M. K. Burley, R.N., leader of the expedition, laid a wreath on the grave of Sir Ernest Shackleton.

(STOP PRESS)

A press release of December 2 states that the party has covered Shackleton's track "in all details".

TEN YEARS OF ANTARCTIC CO-OPERATION

The year 1966 will see the completion of ten years of one of the most remarkable efforts of international co-operation in human history, the decade following the commencement of the International Geophysical Year in 1956. At the eighth meeting of S.C.A.R. (The Scientific — originally Special — Committee on Antarctic Research), the Committee of I.C.S.U. (the International Council of Scientific Unions) which perhaps best symbolises the co-operation between the "Antarctic nations", a committee was set up to consider how this decade of fruitful working together might best be marked.

BOOKSHELF

SOUTH. MAN AND NATURE IN ANTARCTICA. Text by Graham Billing; illustrations editor, Guy Mannering; A. H. and A. W. Reed. 78 pp. text, 207 illustrations (158 in colour). N.Z. price 42/-.

Billing and Mannering have set out primarily to depict the Antarctic scene, and this has surely never been better done. As a comparable book one thinks of "The Great White South"; but while few if any of these photographs equal those of Ponting at his best, Ponting could not draw on the resources of colour as the 30 or so photographers contributing to this book have done. The result is a truly remarkable photographic record of Antarctica, the Antarctica that so many New Zealanders know; its ice and its land; the animals, the men and the machines. The owners of this book will want to look at it again and again, many with a deep longing to see these things once more for themselves. In no other book has the Antarctic as man sees it today been brought so thrillingly to the eye.

In his interestingly and ably written text, Graham Billing has endeavoured to describe not only the Antarctic scene but the purposes and methods of the men who work in this vast laboratory, in language which will be intelligible to the ordinary man. To a very large extent he has succeeded, and where it has been necessary to use specialist terms an unobtrusive explanation is often added ("protons, atomic particles ejected by the sun"). Some chapters inevitably make heavy going — who could make upper atmosphere physics intelligible to the layman? — but the sections on the Ice, the Sea and the Animals make delightful as well as informative reading.

During his summer as New Zealand Public Relations Officer at Scott Base, Billing absorbed an immense amount of knowledge by his own close observation and in his talks with the scientists and the far-travelled Antarctic explorers whom he met. The information that is pertinent to the scope of this book he retails in a way that the layman can understand, generally with ease, occasionally only if he puts his mind to it and his interest holds. To illustrate the facile touch which is characteristic:

"In the Antarctic mountains many of the geological formations are easily distinguishable. Flat-topped or sharp-peaked nunataks or rock outcrops stick up in the ice-sheet bearing the marks of glaciation from an age when the sheet was many thousands of feet thicker. Their sheer sides reveal rock strata in many-coloured bands, the pale gold of Beacon sandstone sandwiching black dolerite or overlain by red lava flows. A split rock may reveal the fossil leaf of the Glossopteris, pollen grains or shell. A boulder-littered hillside may bear a forest of fossil tree stumps. In North Victoria Land the nunataks can be seen as ice-eroded island remnants of the great Kukri Peneplain, once the deposition bed of the Paleozoic age Antarctic river sediments."

In these 78 pages then we have a readable encyclopaedia of general Antarctic geographical information. (It is a pity there is no index to facilitate reference.) It is in no sense a history. In fact, care is taken not to mention the names of recent explorers at all; the only place names mentioned are of features named long ago. The book being what it sets out to be, this is all to the good. There are a few minor misleading statements ("the unheated huts of the polar heroes") and it is hard to reconcile "The Antarctic world is black and white" with the photographers' glowing colours later in the book. But such slight blemishes are hardly noticed in a volume which — if you can afford it — you will delight to own.

L.B.Q.

"ANTARCTICA"

This successor to the N.Z. Antarctic Society's volume "The Antarctic Today" is at the page-proof stage, and should be published by Methuens in about February, 1965. The editor is Dr. Trevor Hatherton of Wellington.

SOUTH FROM NEW ZEALAND, An Introduction to Antarctica. L. B. Quartermain, with contributions by Dr. T. Hatherton and Prof. R. H. Clark. Govt. Printer, Wellington, N.Z. 78 pp., ill., maps. Price 5/–.

(Reviewed by R. H. Wheeler)

For an investment of N.Z. 5/– this little book on New Zealand's slice of Antarctica[1] offers the greatest return of any book on that continent. It assures us in the preface that it is written for the layman and for once a promise of this type is carried out. The text is clear, to the point and simplified for lay consumption without resort to emotion or the condescension that occurs in many publications. The format throughout is pleasing and utilitarian and the 33 illustrations, ranging from the historical to modern-day scientific age, are a well chosen collection.

The claim that it is designed for enquiring children is less substantiated unless the children be senior secondary pupils — it is the difficulty of understanding Antarctica, a continent of the scientific age, that is the cause of this, not a lapse of the contributors.

For the purpose of this book the 'scientist' is a layman too. He won't find his specialisation here (after all he has his journals) but he will find his interests represented and dealt with in historical perspective, an aspect often neglected by the specialist and ignored in many general Antarctic accounts. This is the Ross Dependency story with emotion and adventure properly laid aside, for the book is in the solid field between formal history and the adventure story.

The content is two halves, from the Ross Dependency's first beholders to the air age initiated by Byrd (up to p. 40); and the age of the scientific occupation beginning with IGY, 1957–58. The lay enquirer not interested in history will find the second half of the book satisfying his first enquiries covering New Zealand's sector of Antarctica. However in this part much of the gusto leaves the text and the pace and interest slows with the detail of the last seven years. For those who have visited Antarctica, however, this half offers a good general coverage of latter-day activities and the short account, necessary in such a booklet, is satisfyingly full. The recent history of the area is complex, due to the nature of the expeditions and wintering parties very scrappy, but the writers have avoided imbalance.

Hatherton in just four pages has given a neat account of the scientific work of modern occupation and expeditions. In "Mapping the Dependency" is another concise account, this time of the exploratory work. But under the sub-heading of 1963–64 it veers from the title to a thumbnail history. Under the heading "University Antarctic Expeditions" the personnel and work of Canterbury University could well have been included instead of being submerged in two other places in the text.

There is still need for a lay topgraphic description of the Dependency — in this account the eastern side is almost ignored and not illustrated in the maps. There is no explanation given for the concentration of history and exploration in the western sector of the New Zealand sector, which is the result of the favourable topography and structure. The geologists' work is mentioned but their contribution to the explanation of landform is not included. The men from the "land uplifted high" have lived and worked in just that same type of territory in Antarctica and which by sheer chance lies largely within the Ross Dependency.

However the reviewer endorses the adequacy of this modest but worthwhile booklet. There are many books on Antarctica these days but this one, with its special niche in the Antarctic story, will be shamed by none of them and has a place in each Antarctic collection.

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[1] The sub-title "An Introduction to Antarctica" is not quite true, as the preface says, the book deals in the main with "that historic sector of the Antarctic which lies south of New Zealand".

NO PLACE FOR MEN. Peter Mulgrew. A. H. and A. W. Reed. 199 pp., ill. N.Z. price 25/-.

Peter Mulgrew is well remembered as one of the five New Zealanders who carried out their assigned task of laying depots for Fuchs's crossing party in 1957 so efficiently that they had time on their hands, and went on to become the first men to reach the South Pole by surface travel since that other indomitable five, Scott's Polar party, in 1912. A few years later he was again a member of a Hillary team, the Himalayan Scientific and Mountaineering Expedition 1960–61. The aim was threefold: to climb the 27,790-foot Makalu without oxygen, to seek out the elusive yeti or "abominable snowman", and to carry out research into the physiology of high-altitude climbing.

In a disarming preface the author disclaims any official status for his book as a "full account" of the expedition; it is his personal story only. By any criterion it was for him a tragic story. When within a few hundred feet of the summit, from which the first assault party of tough, experienced climbers had been thrown back, "absolutely exhausted, covered in frost and utterly beaten", Mulgrew suddenly collapsed, gasping in agony, smitten by a pulmonary thrombosis. His devoted companions somehow got him down to a lower camp from where he was flown by helicopter to a Mission hospital, but not before he had suffered such severe frostbites that eventually, back in New Zealand, both his feet had to be amputated, and an addiction set up by the abnormal doses of a pain-killing drug had to be fought and conquered. Such ancillary complications as the loss of a considerable portion of his fingers, severe pulmonary infection requiring drastic treatment, and his concern about the future means of livelihood of his wife and children, are merely mentioned in passing.

Truly, "In times of danger and difficulty on a mountain a man taps unsuspected reservoirs of spiritual strength" — his own words. Eleven months after the ordeal on Makalu Sub-Lieut. Mulgrew returned to the Navy and an active, useful life which included a return to the mountains where he had looked death and despair in the face, and won through.

Peter Mulgrew tells his story with the modesty his friends would expect from him. But there is no **mock**-modesty; his hospital experiences as well as the events on Makalu are frankly told, and they are grim enough. The amazing thing is that page after page ripples with humour. ("Ukrein spent some time trying to restore circulation to my frozen hand but with little success. He finally held it over the flame of a candle and as I could feel nothing, held it so close that by the time I realised the delicious aroma was me, the skin on two fingers was hanging in burnt shreds.") Surely no-one without Mulgrew's ebullient spirit, looking back on the series of disasters which dogged the expedition, could find so much in them to laugh about, could regard them as just so many buffets from the mountain, blows which beat them back but daunted them not at all. "It was as though a great adventure, rather than a misadventure, had at last ended."

This book is not only a fine contribution to the literature of mountaineering, it is a deeply-moving addition to the noble literary record of "the hardihood, endurance and courage" which Scott saw in his companions and of which he wrote in his Last Message to his Countrymen.

L.B.Q.

QUICK BEFORE IT MELTS. Philip Benjamin. Gollancz. 247 pp. N.Z. price 22/-.

This is the fantastic story of an American magazine writer dispatched against his will to an assignment "on the ice": his adventures, bibulous and amorous, in "Chichi", where all the girls pronounce "yes" as "yeese", and all the men wear greenish-black suits; and his adventures in the Antarctic — chiefly at

McMurdo! He knows nothing and cares nothing about science — or for that matter, about the Antarctic — and spends much of his time feuding with a fellow-correspondent and an incredible Admiral. You will not turn to this book for information; it is unashamedly frivolous. Perhaps three quarters of the action could have taken place just as well in the Sahara or New York. The Antarctic settings and characters, allowing the humorist his right to selection and exaggeration, are genuine enough (Mr. Benjamin spent a summer on the ice). Whether the story is as funny as P. G. Wodehouse is quoted as finding it must be left to the reader, with the help of this sample, which has been pruned of its uninhibited enlisted-man language.

"By this time the Admiral was beside himself. . . . 'What is it! he roared. 'Tell me, goddam it, sir!'

"Once again Santelli's face was alight as he leaned forward again. 'Suppose,' he said very quietly, 'suppose we charter a commercial airplane to bring down a load of replacements, and suppose that plane carries ordinary, regular, female stewardesses. . . .'

"Some thiry yards away, in the sick-bay hut, Dr. Jonas Prettybone heard an unusual noise. He cocked his head and listened for a moment, frowning, and then shrugged. 'Probably one of those seals barking,' he said to a hospital corpsman. 'Wonder what it'd be doing so close?' He went back to painting a Seabee's throat with Merthiolate.

"'Admiral, it would only be for a few hours — maybe not more than an hour even,' Santelli said. 'And think of the drama of it!'"

But, for the purposes of Mr. Benjamin's story, the two delectable Christchurch girls were stormbound at McMurdo for a week. . . .

L.B.Q.

PUBLISHED IN NEW ZEALAND

A New Species of Doryllium (Nematoda Dorylaimida) from Auckland and Campbell Islands. G. S. Grandison. N.Z. Jnl. Sc. 7 (2), 1964: 169–73.

The Cape Hallet Adelie Penguin Rookery — its size, composition and structure. Brian E. Reid. Rec. Dom. Mus. 5 (4), 1964: 11–37.

Mapping in the Ross Dependency. M. R. J. Ford. N.Z. Surveyor, XXIV (3), 1964: 389–94.

Later Geological History of Hut Point Peninsula, Antarctica. H. W. Wellman. Trans. Roy. Soc. N.Z. Geology, 2 (10), 1964: 147–54.

Archaeocyatha from the Shackleton Limestone of the Ross System, Nimrod Glacier Area, Antartica. D. Hill. Trans. Roy. Soc. N.Z., Geology, 2 (9), 1964: 137–146.

Thickness of the Earth's Crust beneath the Pacific-Antarctic Ridge. R. D. Adams. N.Z. Jnl. Geol. Geophys., 7 (3), 1964: 529–42.

BIOLOGY OF THE ANTARCTIC SEAS. Milton O. Lee, Editor. 77 pp., illustrations, maps and diagrams. American Geophysical Union of the National Academy of Sciences. List price $10.00.

This splendidly produced volume, the first of the Union's Antarctic Research Series, comprises seven original papers on marine biological research in Antarctic waters, and a Catalogue and Bibliography of Antarctic and Sub-Antarctic Benthic Marine Algae. Included are two papers by J. S. Bunt on Primary Productivity under Sea-ice, and a paper by Donald E. Wohlschlag on Respiratory Metabolism and Ecological Characteristics of some Fishes, all of which have special reference to the waters of McMurdo Sound.

The Union invites workers in all phases of Antarctic research to submit papers for possible publication in this series, and this volume closes with a page of detailed "Information for Authors". Papers should be submitted to:—

American Geophysical Union
Antarctic Research Series,
Suite 506, 1145 19th Street, N.W.,
Washington D.C. 20036. U.S.A.

NOTABLE ANTARCTIC COLLECTION

One of the most enthusiastic "Antarctic men" in New Zealand is Mr. Eric R. Gibbs of Taihape, who was well-known as a philatelist specialising in Antarctic material before he first visited the Antarctic himself as a volunteer Antarctic Society member of the Huts Restoration party in 1960. He returned to the Antarctic in 1963 as leader of the team restoring Scott's Hut Point hut.

We are pleased to be able to give a brief description of the remarkable collection of Antarcticana which Mr. Gibbs has gathered together, in the hope that as well as being of general interest it may put him in touch with other enthusiasts to their mutual benefit.

The collection is housed in a special room of the Gibbs home near Taihape, on the sheep farm which occupies Mr. Gibbs's attention when he is not corresponding with his world-wide circle of pen-friends or helping to preserve old Antarctic huts for posterity.

The collection comprises postal and non-postal material. The Antarctic postal history section comprises covers (envelopes), stamps, postmarks, cachets, autographs of Expedition members (some of these are on letters and some on covers, photographs and news cuttings. In all there are well over 3,000 different items, and these range from a signed letter of Lieut. Charles Wilkes, USN (The Wilkes Exploring Expedition, 1838–42) until the present day. Amongst the "heroic age" era are items from the:—

1901–04 British National Ant. Expd. (Capt. R. F. Scott)
1902–03 British Relief Expedition (Capt. W. Colbeck)
1902–04 Scottish National Ant. Expd. (Dr. W. S. Bruce)
1907–09 British Antarctic Expd. (Sir Ernest Shackleton)
1910–12 German South Polar Expd. (Dr. W. Filchner)
1910–13 British Antarctic Expd. (Capt. R. F. Scott)
1911–14 Australian Ant. Expd. (Sir Douglas Mawson)
1920–22 Shackleton-Rowett Ant. Exp. (Sir Ernest Shackleton)
1928–29 Wilkins Ant. Expd. (Sir Hubert Wilkins)
1928–30 Byrd Ant. Expd. (Admiral R. E. Byrd)
1929–30 Wilkins Ant. Expd. (Sir Hubert Wilkins)
1929–31 B.A.N.Z.A.R.E. (Sir Douglas Mawson)
1933–35 Byrd II Ant. Expd. (Rear Admiral R. E. Byrd)
1934–37 British Graham Land Expd. (John Rymill)
1936–37 "Discovery Investigations" (Cdr. T. J. Hart, R.N.)
1938–39 Ellsworth Ant. Expd. (Lincoln Ellsworth)
1939–41 U.S. Antarctic Service Exp. (Rear Adm. R. E. Byrd)

More recent material comprises items from the 1955–58 Trans-Antarctic Expedition and Operation Deepfreeze Expeditions, etc. The collection has been entered in philatelic exhibitions both in New Zealand and overseas in order to let interested folk view some of the items. In every case where awards have been made the collection has won one. The one which Mr. Gibbs most prizes is the highest award in the Antarctic section of the 1960 London (England) International Philatelic Exhibition.

It has only been possible to build up a collection such as this through the generous assistance of people connected with the Antarctic, many of whom have visited the area. Should any readers have any Antarctic material which they think may fit into this collection and which they wish to dispose of, Mr. Gibbs would be most grateful for an offer. His address is: P.O. Box 164, Taihape, New Zealand. An item missing from the non-philatelic section is number 11 of the "Antarctic News Bulletin", the cyclostyled predecessor of "Antarctic". This number is out of print and Mr. Gibbs would very much like to obtain a copy in order to complete his Bulletin Series.

Mr. Gibbs is also keenly interested in the sub-Antarctic Islands — Auckland Islands, Campbell I., Heard I., Macquarie I., etc.

ADELIE PENGUIN ROOKERIES IN THE ROSS DEPENDENCY

ROWLAND H. TAYLOR*

The Adelie Penguin is one of the commonest Antarctic birds and numerous studies have been made of its life-history and behaviour. Although breeding rookeries have been found all round the Antarctic coastline, many are not well known and surprisingly little acurate information exists on their relative size. One purpose here, is to draw attention to this gap and stimulate further observations and records from any one who has the opportunity to visit little known parts of Antarctica.

Adelie Penguin rookeries in the Ross Sea region have recently been discussed in articles by Austin (1957) and Harrington (1960). Austin recorded thirteen breeding places: Cape Adare, Duke of York Island, Possession Island, Cape Hallett, Coulman Island, Wood Bay, Inexpressible Island, Franklin Island, Cape Crozier, Cape Bird (three rookeries) and Cape Royds. Harrington omitted Duke of York and Coulman Islands from his list, but included Beaufort Island and "a large number' 'of rookeries in the Balleny Islands.

The present note results from a search of early Antarctic literature as well as accounts of the most recent expeditions,, and reference has been found to twenty-two Adelie Penguin rookeries in the Ross Dependency (see map). These are summarised in Table 1, together with published population estimates and key references. The following discussion is limited mainly to the lesser known and doubtful rookeries, and to omissions in earlier reviews.

Austin (1957) included Coulman Island in his list of Adelie rookeries on the basis of Scott's account of seeing (on 13 January 1902) a "colony of penguins" towards the northern end of the island, although "even with glasses it was impossible to distinguish the individuals" (Scott 1905). Harrington (1960) disregarded this record and did not discuss the possibility of Adelies breeding there. In December 1958 the entire coastline of Coulman Island was examined by a helicopter from U.S.S. "Glacier" and the only penguin rookery seen was a hitherto undiscovered one of Emperor Penguins on the north-west side (Harrington 1959). It could be argued that Scott saw a group of Emperors from this rookery; however, Wilson (1907) refer to an Adelie rookery seen "on the northern slopes of Coulman Island", an unlikely site for Emperors to congregate. Obviously, the status of Adelie Penguins at Coulman Island requires further investigation.

Wilson's summary of Adelie rookeries seen during the National Antarctic Expedition 1901–4 reads: "Our nearest large rookery of Adelie Penguins was that which was already known at Cape Crozier, . . . From the ship also we landed to investigate the rookery at Cape Adare on January 9th, 1902. From the ship again we sighted rookeries on the northern slopes of Coulman Island, on the southern slopes of Cape Jones, on the southern shores of Wood Bay, and on Cape Bird. There was also a small rookery . . . on the headland now called Cape Royds" (Wilson 1907). Oddly enough, Scott, Wilson and Ferrar, all members of the same expedition, each published a slightly different list of places where Adelies were found nesting. Unfortunately for present day biologists, these early explorers and naturalists placed relatively little importance on recording breeding colonies of the more common Antarctic species.

Wilson's record of an Adelie rookery "on the southern slopes of Cape Jones" has been overlooked in other reviews. Wilson must have sighted it on 14 January 1902, when,

* Animal Ecology Division, D.S.I.R.

according to Scott (1905) "we entered the strait between the island [Coulman] and the mainland and found it to be considerably narrower than was expected, so that we soon approached the high land of Cape Jones on the other side".

It is widely believed that the Cape Hallett rookery was first discovered by the ice-breaker, U.S.S. "Edisto", in February 1956 (Austin 1957, Harrington 1960). However, a much earlier sighting was made from the whaler "Antarctic" on 20 January 1895; "In one place off Cape Hallett ,however, there appeared a beach with a penguin colony" (Bull 1896). The Beaufort Island rookery has also been considered a recent discovery (Sladen and Goldsmith 1960, Harrington 1960, Caughley 1960), but in a paper on the birds of the Ross Dependency, Ferrar (1928) who was geologist on Scott's "Discovery", includes Beaufort Island on a short list of Adelie breeding places. In his report on the field geology of the expedition, Ferrar (1907) states that Beaufort Island was seen "from many points of view"; and during the same expedition a seaman from the "Morning" landed at the south end of Beaufort Island (Doorly 1916), so there was ample opportunity for the rookery to be discovered, though for some reason no record was published until Ferrar listed it in 1928.

Ferrar (1928) also refers to Adelies breeding at Granite Harbour and, although many later expeditions to the area have not confirmed this, it is possible that a small rookery still exists near there. Scott (1905) mentions the sheltered and snow free nature of parts of the area, but in his detailed account of the trip ashore there is no mention of penguins although he comments on seals and nesting skuas.

Harrington (1960) suggested the possibility of a second rookery in the Wood Bay area since he saw "on a U.S. Navy aerial photograph, that a light-coloured area ,similar to guano staining, is visible near sea level on the northern slopes of Mt. Melbourne on the southern side of Wood Bay". However, Borchgrevink (1901) describes the rookery found on 6 February 1900 as being "about 20 miles west" of Cape Washington, Bernacchi (1901) places it "at the foot of Mount Melbourne", and Scott (1904) also sighted a rookery on the "southern shore" of Wood Bay on 21 February 1904. These early accounts tally with the location described by Harrington, and all four records appear to be of the one rookery.

Doubt must exist of the validity of records of three rookeries (Cape Jones, Coulman Island and Granite Harbour) given only passing mention in early accounts and of which no further details are known. Some rookeries may have become extinct since first recorded. If so, this could probably be checked, for abandoned nesting areas found 50 years ago can still be seen near Cape Royds. Two other rookeries, Wood Bay and Duke of York Island, are well documented but have not been inspected since 1904 and 1911 respectively, and although the other seventeen have been visited since 1955, for most only very rough population estimates are available (see Table 1).

No doubt other rookeries await discovery in various parts of the Ross Dependency for much of the coastline has yet to be examined in detail. No rookeries are known, apart from Duke of York Island, on the several hundred miles of coast west of Cape Adare; nor from the coast of King Edward VII Land, east of the Ross Ice Barrier. It is possible that none exist in the latter area. Scott (1905) describes the "customary ice-cliff of varying height which marked the coastline," and in January 1902 he saw bare rock in only a few places. Siple and Lindsay (1937) considered that the relative scarcity of Adelies visiting the Bay of Whales compared with more westerly Discovery Inlet could indicate an absence of rookeries for several hundred miles to the east of the Ross Ice Barrier.

With increasing international cooperation and activity, the time is approaching when an Antarctic wide survey of both Adelie and Emperor

TABLE 1. ADELIE ROOKERIES REPORTED FROM ROSS DEPENDENCY

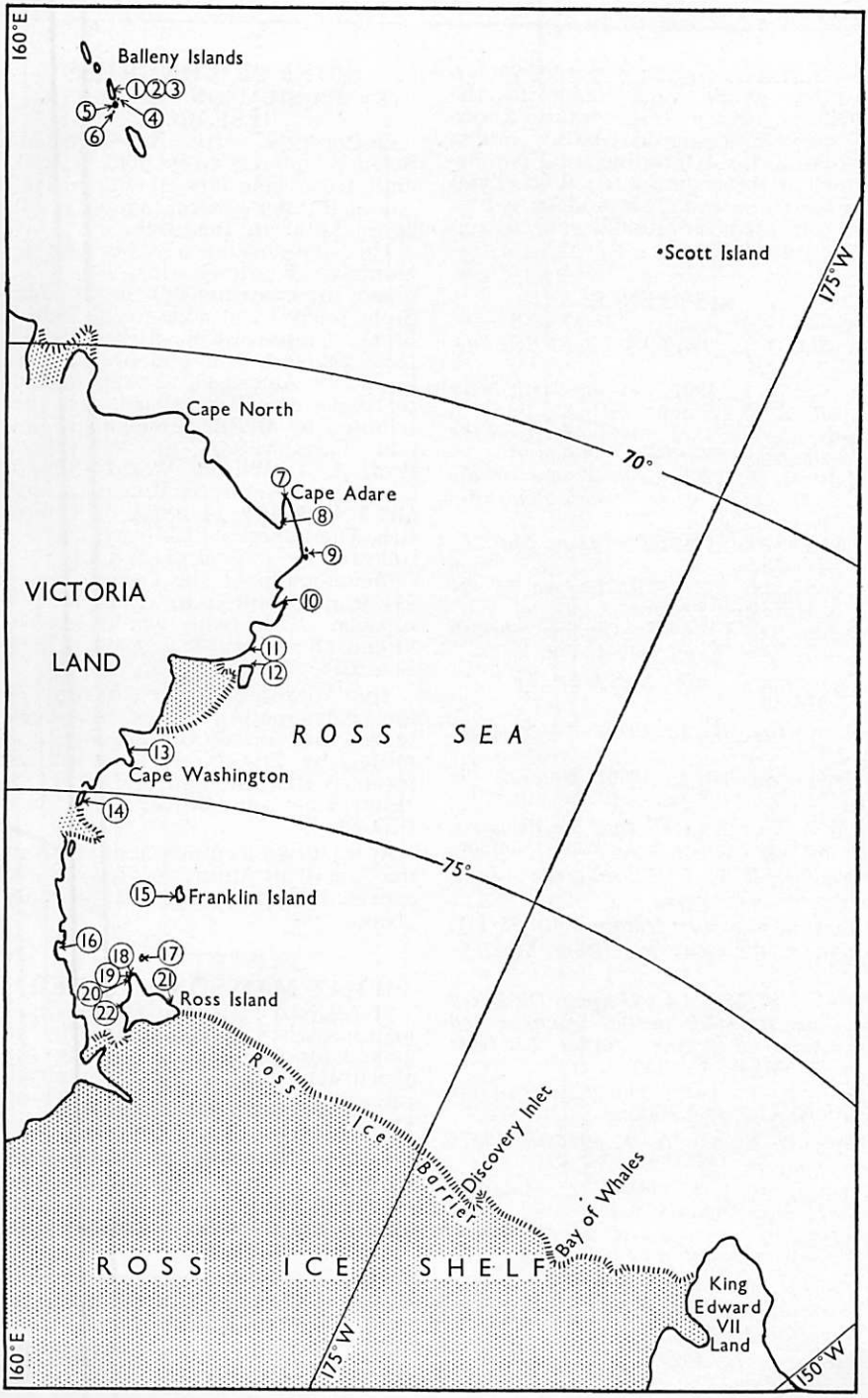
	Rookery	*Extent**	*Population Estimates and Key References*
1–3.	Buckle Id., Balleny Is.[1]	Small	"Small" colonies (Sladen 1964).
4.	"Lowlying islet", Balleny Is.[1]	Small	"Small" colony (Sladen 1964).
5.	Sabrina Islet, Balleny Is.[1]	Small	"Several thuosand birds" (Sladen 1964).
6.	Monolith, Balleny Is.[1]	Small	"A mere handful of birds" (Sladen 1964).
7.	Cape Adare[1]	Large	750,000 birds (Levick 1914). 75,000–100,000 pairs (Austin 1957). 700,000 birds; 289,500 breeding pairs (Reid 1962).
8.	Duke of York Island	Small	"A small colony" (Levick 1914). 1,000–2,000 penguins (Priestley 1915).
9.	Possession Island[1]	Large	"Inconceivable myriads of penguins" (Ross 1847). "Thousands of penguins" (Bull 1896). 50,000 pairs (Austin 1957).
10.	Cape Hallett[1]	Large	25,000–30,000 pairs (Austin 1957). 150,000 birds; 62,000 breeding pairs (Reid 1964).
11.	Cape Jones	Small[2]	Presence reported (Wilson 1907).
12.	Coulman Island	Small[2]	Presence reported (Wilson 1907).
13.	Wood Bay	Small	"A small penguin colony" (Borchgrevink 1901). "Small Adelie penguin rookery" (Scott 1905).
14.	Inexpressible Island[1]	Small–medium	"A small rookery" (Levick 1914). "A small penguin rookery (Priestley 1915). 15,000–20,000 birds reported by R. Hewson (Anon. 1963, and unpublished report N.Z. Antarctic Division).
15.	Franklin Island[1]	Large	"Very many penguins" (Borchgrevink 1901). "Thousands of penguins" (Doorly 1916). "Very large rookery" (Harrington 1960).
16.	Granite Harbour	Small[2]	Presence reported (Ferrar 1928), possibly in error.
17.	Beaufort Iseland[1]	Medium	15,000 pairs (Caughley 1960).
18.	North Rookery, C. Bird[1]	Medium	12,000 pairs (Austin 1957). 24,000 pairs (Caughley 1960).
19.	Middle Rookery, C. Bird[1]	Small	5,000 pairs Austin 1957). 1,000 pairs (Caughley 1960).
20.	South Rookery, C. Bird[1]	Medium	20,000 pairs (Austin 1957). 16,800 pairs (Caughley 1960).
21.	Cape Crozier[1]	Large	250,000 pairs (Austin 1957). 65,000 pairs (Caughley 1960).
22.	Cape Royds[1]	Small	1,700 pairs (Caughley 1960). 1,600 pairs (Taylor 1962). 1,250 pairs (Stonehouse 1963).

NOTES: Rookeries are lilsted according to latitude from north to south.

* Small: under 5,000 pairs. Medium: 5,000–25,000 pairs. Large: over 25,000 pairs.

[1] Rookery visited since 1955.

[2] Extent not reported but probably small considering nature of coast, etc.


160°E
Balleny Islands
1
2
3
4
5
6
Scott Island
175°W
Cape North
70°
7
Cape Adare
8
9
VICTORIA
10
LAND
11
12
ROSS SEA
13
Cape Washington
14
75°
15
Franklin Island
16
18
17
19
21
20
22
Ross Island
Ross Ice Barrier
Discovery Inlet
Bay of Whales
ROSS ICE SHELF
King Edward VII Land
160°E
175°W
150°W

rookeries should be possible. Such a survey would add much to the present rather fragmentary knowledge of breeding distribution, and is essential for estimating total populations of these species. As Reid (1962) has pointed out, it would be a first step to a conservational approach in Antarctic biology.

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SCIENCE CONGRESS

SYMPOSIUM ON ANTARCTIC RESEARCH

During the 11th New Zealand Science Congress to be held in Auckland from February 11 to 17, 1965, one of the ten general symposia will be on **Antarctic Research.**

This symposium will be held on Monday, February 15, 3–5 p.m., under the chairmanship of **Dr. Paul Siple,** scientific attache to the United States Embassies in Australia and New Zealand, and one of the best known of America's veteran Antarctic explorers. Papers will be contributed by **Dr. B. Stonehouse,** Animal Conservation in Antarctica; **Prof. A. T. Wilson,** World Climate Control by Antarctic Processes, and **Mr. J. H. Miller,** Mapping of Antarctica. The papers will in each case be followed by general discussion.

Membership of the Congress (fee £3) is not limited to scientists but is open to all who would like to attend (Secretary T. J. Bayliss, P.O. Box 5358, Auckland).

The Antarctic Society, as one of the "participating bodies", has been represented on the organising committee by Lt.-Cdr. J. Lennox-King, formerly in command of H.M.N.Z.S. "Endeavour", and leader Scott Base 1959–60.

At least two leading scientists from the American Antarctic projects are expected to be present at the Congress.

WHAT MAWSON WANTED

"I realised . . . what Douglas had in mind when he said that what he looked for in choosing men for the expedition was not so much physical strength as mental stamina—a man's outlook on life. The physical part would be required as a matter of routine, but a man's own mental resources, these are more important."

Lady Mawson in "Mawson of the Antarctic."

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* Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, U.S.A., and U.S.S.R.

A DELEGATE AT SCAR

[We are indebted to *Mr. J. Holmes (Bob) Miller*, one of New Zealand's best known and most experienced Antarctic men. and an ex-President of the New Zealand Antarctic Society, for this report of the Eighth Meeting of SCAR, 24–28 August, 1964, at which he was the New Zealand delegate.]

This VIIIth meeting of the Special Committee for Antarctic Research (a special committee of the International Council of Scientific Union) met in Paris this year following the meetings in former years at such centres as Moscow, Canberra, Cambridge (UK), Wellington, Boulder (US), and Capetown. The meetings were held in the buildings of the School of Geographic Sciences attached to the French National Geographic Institute. The gathering was attended by delegates from each of the twelve member nations* and 49 further observers and advisers, either from the member nations, related organisations and committees, or as in the case of the Netherlands representative, from a nation active in Antarctica by virtue of joint participation with Belgium but not yet a member of SCAR. It was paradoxical that the meeting should coincide with a minor heat wave yielding the hottest day of the 1964 summer.

The conference opened with the first plenary session on formal business, dealing with such matters as reports on data exchange, reports from other scientific organisations such as COSPAR, IQSY, WMO, and IUGG, receiving the financial report, and generally delegating action on all matters to the ad hoc meetings of delegates held on each of the days during the wek. At the first plenary session the election of officers was held for the only rotational vacancy, that of secretary. Dr. G. de Q. Robin, the United Kingdom delegate, was unanimously re-elected. This session also considered the Resolutions of the Third Antarctic Treaty Consultative Meeting and referred such resolutions to either the ad hoc meeting of delegates or those resolutions affecting conservation to the Working Group in Biology.

FUTURE MEETINGS OF SCAR

Over recent years New Zealand has felt that now that SCAR has laid down the general principles of International Scientific co-operation in Antarctica and that during the years these principles have become widely accepted as a practical working basis of co-operation, meetings of SCAR need not be held annually as heretofore. Less frequent meetings would ensure a saving both for SCAR finances which must meet the travel expenses of permanent officers and for the member nations. Even more important than the outlay for travel expenses is the factor that the smaller nations with incessant calls on the time of the key scientific men find it most difficult to send to SCAR meetings the most appropriate people. In order to have at SCAR the person to best contribute to the business of a particular Working Group, many of the smaller countries have not sent their permanent delegates for some years. Accordingly New Zealand had given due notice of a proposal that in future SCAR meetings be held every two years. After considerable debate the final plenary session adopted the recommendation that IX SCAR be held in Santiago, Chile, at a time to be arranged between June and August, 1966.

Then, when the effect of a two year interval could be assessed, further decision on future meetings could be taken.

FINANCIAL

SCAR is supported by contributions from the participating member bodies on an asessment fixed at an early meeting. In the case of New Zealand the member body is the Royal Society of New Zealand. On the basis that national contributions remained at the present level SCAR finances were expected to show a credit balance of some $4,000 by the end of 1964.

* (See foot last column.)

REVIEW PAPERS AND CONTRIBUTIONS

VIII SCAR adopted a practice of receiving review papers or viewing topical films during the early afternoon sessions of each day. The theatre being the coolest area in the Conference buildings assisted in the appreciation of these presentations.

Among these were:—

"Antarctic Survey and Map Production Methods", R. B. Southard (U.S.G.S.).

"Chilean Antarctic Institute", Admiral Araos (Chile).

"Radar Profiling of Ice Thickness", G. Robin (U.K.).

"Stratwarm Phenomena in Antarctica", H. R. Phillpot (Aust.).

"IQSY in Antarctica", T. Nagata (Japan).

"Developments in Antarctic Biology", M. W. Holdgate (U.K.).

"Capetown to McMurdo Flight", R/Admiral J. S. Reedy (U.S.N.).

WORKING GROUPS

Working Groups in all disciplines were established at the early meetings of SCAR and at each SCAR meeting selected Working Groups have held formal meetings. It has been endeavoured to ensure that each such group meets at least once in every three years. At Paris the Working Groups met in the disciplines of Biology, Geodesy and Cartography, Meteorology, and Geomagnetism. In the discipline of Oceanography an ad hoc meeting of as many interested and appropriate people as possible was held. Undoubtedly by far the greatest benefit to accrue from SCAR meetings is that which emanates from the business conducted by the Working Groups. The achievements of the Working Groups by dint of days of discussion, deliberation, and decision account for almost all of the effort contributed by delegates and advisers. In particular was this so at Paris in the disciplines of Biology and Meteorology. None worked more incessantly or to better purpose than did Dr. Holdgate and Dr. Rubin in leading their respective Working Groups.

The group in Biology was passed a legacy from the Treaty Powers Consultative meeting, in being asked to amplify in detail the "Agreed Measures for the Conservation of Antarctic Flora and Fauna". This was in addition to coping with the normal business of the SCAR programme in Biology, and still left with the group the matter of compiling a detailed report on Antarctic Biology for SCIBP (Special Committee for International Biological Programme), consideration of a report on Human Adaptability, and consideration of the important question of the introduction of pelagic sealing. On this last question the group's findings are progressive and liberal, insisting that while pelagic sealing may proceed under a mechanism of control by parties to the Treaty, yet scientific records of sex, reproductive condition, and age be kept, preferably by biologists on the spot. In particular was this to apply to the little known breeding biology of the crab-eater seal.

The Working Group in Geodesy and Cartography, M. Leclavere and Mr. B. P. Lambert as chairman and secretary respectively, has a heavy load of work throughout the years between meetings in arranging the interchange of published maps, map data, and mapping programmes. In this respect Mr. Lambert has been exceptionally efficient. None the less the meeting of the Working Group was a heavy one with a full attendance of all member countries. As well as receiving reports of the progress of each nation, a very full study was made of many recently developed control survey techniques with a possible Antarctic application.

The chairman of the group in geomagnetism was Prof. Nagata of Japan and his group worked solidly through its subject material and related geophysical topics.

Any association of Antarctic experts must benefit the nations which are represented but this is an expensive luxury for the nation concerned unless the conclave is organised for a searching study of positive subject material. Without doubt the Working Groups of SCAR provide just this degree of organisation.

The New Zealand Antarctic Society

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

You are invited to become a member.

BRANCH SECRETARIES

Wellington: W. J. P. Macdonald, Box 2110, Wellington.
Canterbury: Miss Helen S. Hill, Box 404, Christchurch, **or** 194 Knowles St., Christchurch 5.

"THE ANTARCTIC TODAY"

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

Ionosphere Research (J. W. Beagley).
Meteorology (A. R. Martin).
Aurora Australis (I. L. Thomsen).

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

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