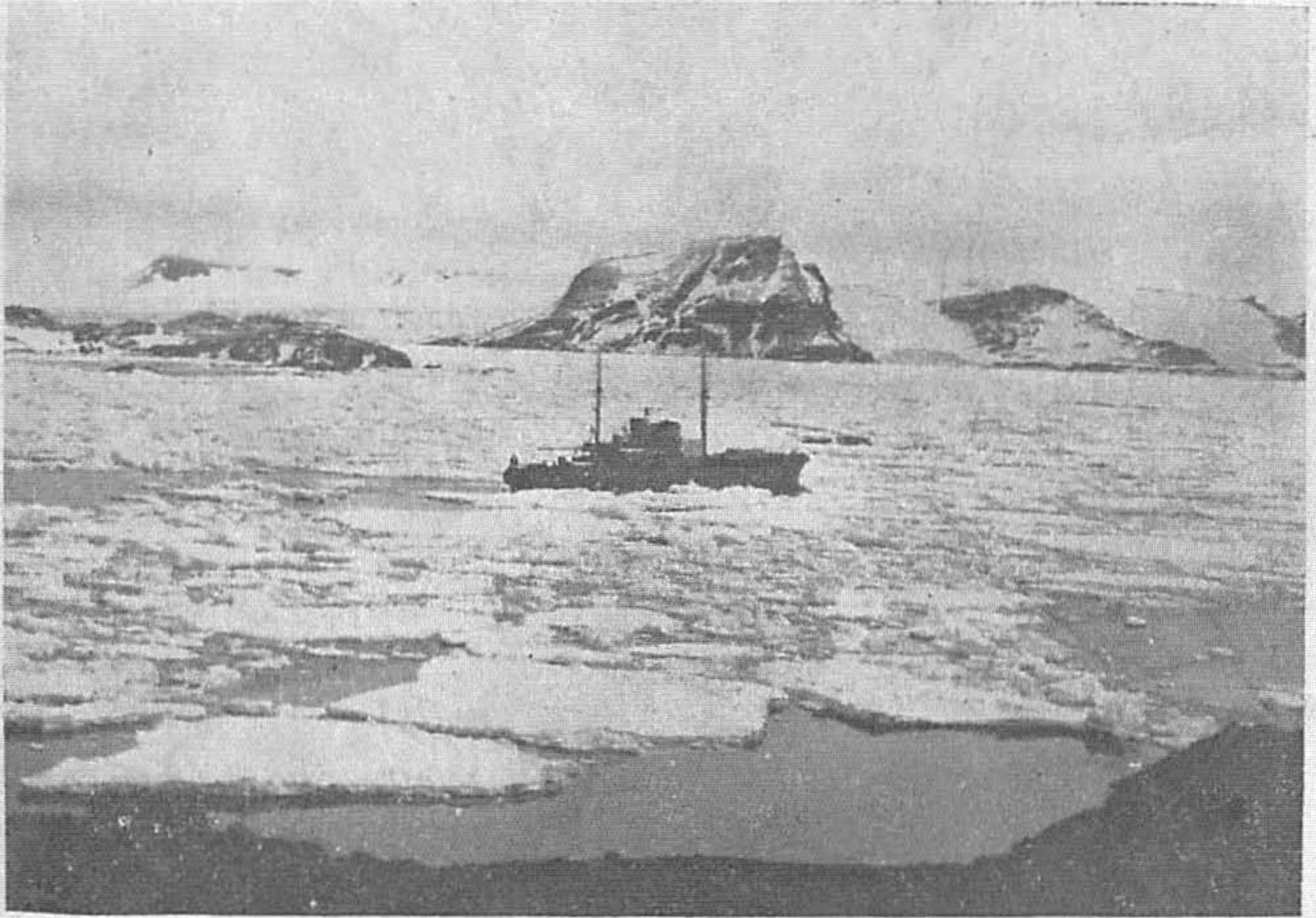


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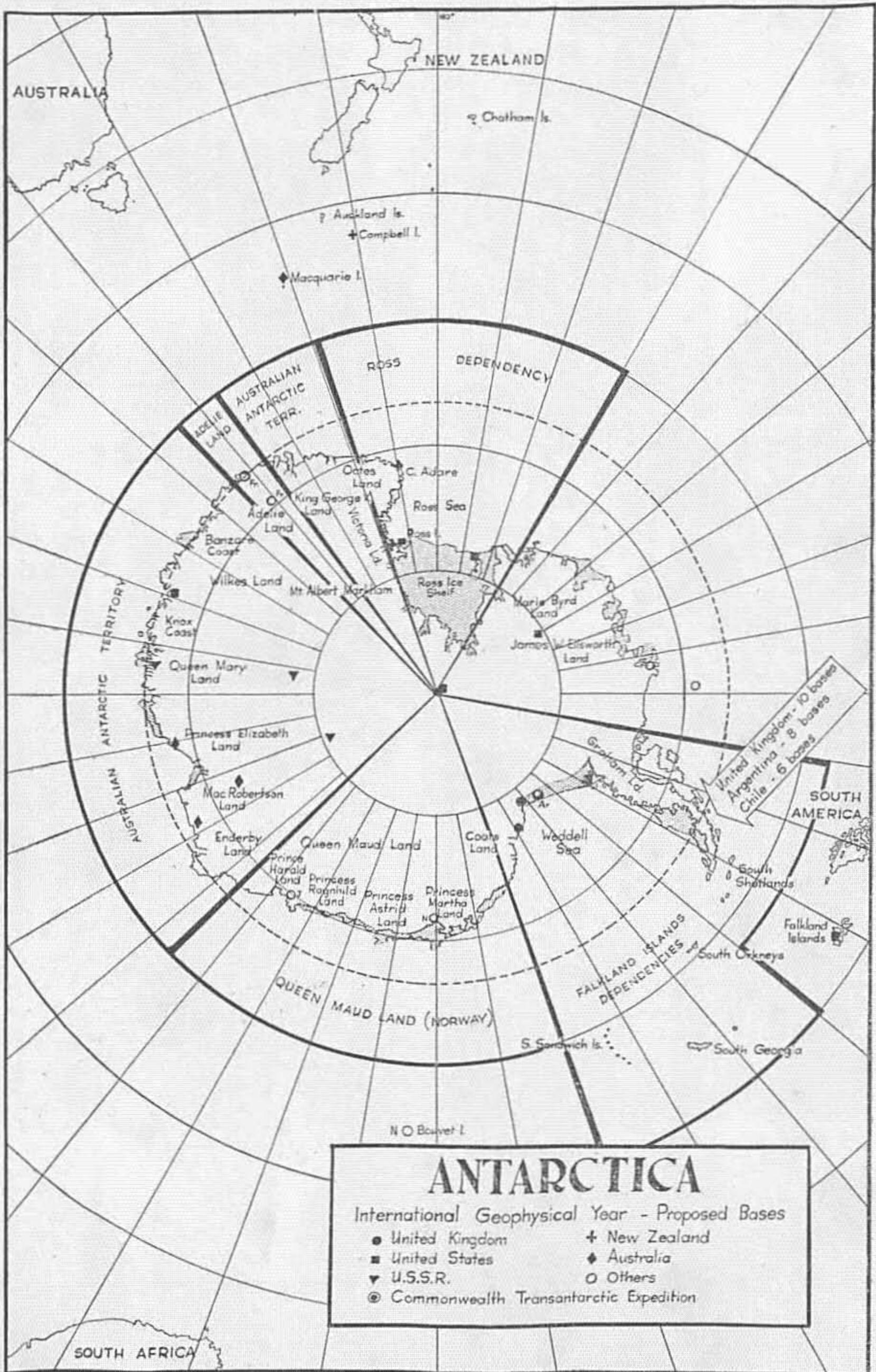
NEW ZEALAND ANTARCTIC SOCIETY



THE "ENDEAVOUR" IN ANTARCTIC WATERS

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DECEMBER, 1956



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New Zealand Expedition Prepares To Leave

The New Zealand component of the Trans-Antarctic Expedition, under Sir Edmund Hillary, together with the New Zealand I.G.Y. team under Dr. Trevor Hatherton, is due to sail from Wellington on December 15 in H.M.N.Z.S. “Endeavour.”

Both parties will occupy Scott Base, which it is anticipated will be erected near Butter Point in McMurdo Sound.

The **SUMMER PARTY** has been completed by the selection of the following:

Dr. J. F. Findlay (38), Pahiatua, Medical Officer.

Mr. J. Hoffman, a technician in Geophysics Division of the D.S.I.R., explosives and drilling expert.

Construction Group

Mr. Randal Heke (28), Ministry of Works, Christchurch, foreman of the building works. Mr. Heke has had wide experience in supervising building projects on Niue Island and the Chatham Islands as well as in New Zealand.

Mr. Ronald R. Mitchell (32), Ministry of Works, Wellington, architectural assistant. He has been associated with the planning of Scott Base since its inception.

Chief Petty Officer Zane Price (27), Hawera, of H.M.N.Z.S. “Philomel”, Auckland, shipwright artificer.

Chief Petty Officer Eric Voison (28), who comes from the Channel Islands and is now also on the “Philomel”, shipwright artificer.

Electrician’s Mate (1st Class) K. J. Boyd (23), R.N.Z.N.V.R., Wellington, electrician.

Lance-Corporal Noel Sinclair (23), Auckland, stationed at Papakura, carpenter-joiner.

Lance-Corporal Ernie Beconsell (23), Blenheim, stationed at Christchurch, electrician.

Lance-Corporal Albert Edwards (35), Waverley, stationed at Linton, carpenter-joiner.

COVER PICTURE

R.R.S. “John Biscoe” (now H.M.N.Z.S. “Endeavour”) leaving R.I.D.S. Base H. Signy Island, South Orkneys, Coronation Island in the background. (F.I.D.S. Copyright. By Courtesy of Falkland Islands Dependencies Scientific Bureau.)

Endeavour Arrives

The expedition's ship "Endeavour" arrived at Wellington on October 25, and berthed at Point Howard where unloading stores and equipment to the expedition's store at Gracefield immediately began. Services personnel as well as expedition members and members of the Ross Sea Committee office staff were hard at work for several days.

Unfortunately, much damage to equipment and some of the stores was caused by water which entered the hold after a "temporary and unpredictable" fault in the pumping system during heavy weather. Some of the stores had to be replaced by air freight from England.

Some of the expedition dogs are being brought to Wellington from Mt. Cook and Auckland to be shipped in the "John R. Towle." The rest will board the "Endeavour" at Dunedin.

Sir Edmund Hillary has been appointed a Stipendiary Magistrate and postmaster, Captain Kirkwood an S.M. and J.P., and Dr. Hatherton has been granted the authority of J.P. and coroner. Previously the only officer of the Dependency was the Administrator, Captain H. Ruegg, to whom Captain Kirkwood will be deputy.

The Duke of Edinburgh will visit the "Endeavour" at Lyttleton.

Transport Plans

Five ships will take New Zealand personnel and stores to the Antarctic. In addition to the expedition's own ship, H.M.N.Z.S. "Endeavour", four United States ships will co-operate.

Scheduled to sail from Wellington on December 10 is the "John R. Towle", taking a large part of the expedition's cargo and three of the party, Messrs. G. Warren, M. H. Douglas and A. J. Heine.

The "Glacier" is scheduled to sail from Lyttleton on December 10 with 16 men of the expedition, Messrs. J. E. Gawn and E. S. Bucknell of the Base Party, Messrs. R. H. Orr, H. N. Sandford, W. J. P. McDonald, V. B. Gerard and L. H. Martin of the I.G.Y. group, and several of the summer support party.

The "Endeavour" will leave Wellington on December 15 for her port of departure, Bluff via Lyttleton and Dunedin with all except three of the main wintering party on board, also the remainder of the summer support party. Captain H. Ruegg will also sail on the "Endeavour".

U.S.S. "Curtiss", expected to arrive in New Zealand about mid-January, will not carry any of the New Zealand Expedition's personnel to the Antarctic, but will take meat for the expedition. M. Paul Emile Victor, the noted French polar explorer, Group-Captain R. Dalton and Mr. L. B. Quartermain will travel with American expedition members on the "Curtiss" as observers for France, Australia and the New Zealand Antarctic Society respectively.

I.G.Y. WORK

Mr. John Hanessian, executive officer of the United States I.G.Y. Committee, who is responsible for the organisation of the American scientific programme in the Antarctic, was in Wellington for a few days in October, and was of very great assistance to the New Zealand I.G.Y. Committee. He facilitated, for example, the acquisition of auroral equipment to be installed at Invercargill, equipment which will be of great value to New Zealand scientists during the I.G.Y. period.

WEATHER CENTRAL

The New Zealand Meteorological Service has selected **Mr. E. G. Edie** as the New Zealand representative to be stationed this summer at Weather Central, Little America V. Mr. Edie, who is 41, has been a member of the Meteorological Service staff for 16 years: he is first assistant in the general forecasting office at Kelburn.

Adare Station

The three New Zealand scientists, C. E. Ingham, J. G. Humphries and M. W. Langevad, who with nine Americans will man the new station to be established this summer at Cape Hallett, some 70 miles south of Cape Adare, are due to leave New Zealand on U.S.S. "Arneb" on or about December 10.

Mr. Humphries visited the United States during September and October to gain experience in the installation and operation of the American panoramic ionosonde equipment which is to be used at the station.

In charge of the post will be Dr. James A. Shear, Ph.D. in Geography of Clark University. Dr. Shear served in the U.S. Army Air Corps from 1941 to 1946, leaving the Service with the rank of Captain. He is at present Professor of Geography at the University of Kentucky. He is 37 years of age.

Mr. J. Glenn Dyer of the U.S. Weather Bureau will supervise the location and erection of Adare Station.

THE VETERANS

Two men associated with the "heroic age" of Antarctic exploration died recently in New Zealand.

Captain G. S. Doorly was third officer on Captain Scott's relief ship "Morning" on her two voyages to

the Antarctic in 1902-04. He was a close friend of "Teddy" Evans, then second officer of the "Morning"; they had been cadets together on the training ship "Worcester." Gerald Doorly came out to New Zealand in 1905 and joined the Union Steam Ship Company, 21 of whose ships he was subsequently to command. In 1925 he joined the Port Phillip (Melbourne) pilot service, from which he retired in 1945. He returned to New Zealand, where he had two married daughters, but his health failed and he died in Wellington on November 3.

Captain Doorly was the author of "The Voyages of the 'Morning'", "In the Wake" (an autobiography), and several other books.

Several members of the Council of the New Zealand Antarctic Society attended the funeral service in St. Paul's pro-cathedral, the President and Secretary were among the pall-bearers, and the Society sent a floral tribute.

Howard Ninnis died in Dunedin on August 1. An Englishman by birth, after seven years on Admiralty service, he joined Scott's "Terra Nova" expedition in 1910, but an injury necessitated his return to England from Capetown. He engaged in motor and aero undertakings until selected as a member of Shackleton's Imperial Trans-Antarctic Expedition in 1914. As a member of the Ross Sea party he was on the "Aurora" throughout the 45 weeks' drift. Arriving in New Zealand, he continued to work for the Expedition and served as paymaster, and secretary to Captain J. K. Davis. He later accompanied Shackleton as secretary organiser on a lecture tour of New Zealand, Australia, the United States and the United Kingdom. Rejoining the Royal Navy in 1917 he was commissioned, but in 1925 returned to New Zealand and resided here until his death this year.

SHACKLETON BASE PREPARES

The eight men of the British Trans-Antarctic team who wintered under primitive conditions at Shackleton Base near Vahsel Bay after the hurried departure of the "Theron" early this year were able to vacate their sno-cat crate on September 20 and move into one end of the hut.

As all the coal was lost and paraffin has to be conserved it is impossible for more than a part of the hut to be heated. This is done with paraffin stoves, though sometimes waste wood from packing cases is burned in the empty grates.

The first rhombic aerial for the main transmitter has been constructed and erected and one of the 6 kw. diesel generators has been installed. As a result it has been possible to bring the transmitter into operation and to establish direct radio-telephone communication with the United Kingdom.

The generator, weighing half a ton had to be dug out from the snow and towed 8ft. to the surface by tractor or weasel before being man-handled into its place.

Before this the vehicles had to be dug out and "de-winterised".

Dog Sledging

On September 29 Blaiklock and Goldsmith left Shackleton on a short dog sledge journey to survey the coast where it joins the Filchner Ice Shelf and to find seals for dog food, since the greater part of their winter stock had been lost when the ice broke up. The dogs have been fed largely on the concentrated dog pemmican which is normally reserved for inland journeys.

On October 8 they returned, having travelled 80 miles in rather low temperatures. Some survey work was accomplished and a number of seals, some of them with pups, were seen. In addition, they saw 10 live Emperor penguins and one dead one on the sea ice in Vahsel Bay.

One wonders if these birds had wintered there or whether perhaps they were survivors from the rookery of 10,000 birds at Halley Bay, 200 miles to the north, for some weeks ago it was reported that this rookery was dispersed when the sea ice broke up early.

The New Team

This year Dr. Allan Rogers, of Bristol University, will replace Dr. Goldsmith as medical officer, and will also carry out a considerable physiological programme.

Jon Stephenson, an Australian who has been working at Imperial College, is going as geologist, and will also study ice crystal orientation in the surface layers of the polar ice sheet. This work will be intimately connected with the glaciological programme to be carried out by Dr. Hal Lister of Newcastle University.

Geoffrey Pratt has been seconded as geophysicist to the expedition by the British Petroleum Company. His particular work will be the seismic sounding of the continental ice sheet throughout the journey. He will also be in charge of the gravity work.

Sno-cats Ready

David Pratt, the expedition's engineer, has carried out an extensive programme of modifications to the Sno-Cat tractors.

The need for many of these modifications were discovered during trials in the Norwegian mountains last June. They included the addition of various instruments, such as electrically recording thermometers for the accumulator electrolyte, pre-heaters for engines and batteries, additional and flexible aircraft-type petrol tanks, emer-

gency escape hatches, and search and rescue radio equipment in addition to normal radio transceivers.

Radio direction-finding loops have also been fitted, as well as compasses mounted to clear the worst of the vehicles' magnetic field. These are read periscopically within the vehicle cab. It has also been necessary to reweld some 440 track welds on each vehicle with special material which will stand up to the low temperatures in which the vehicles may have to operate.

To ensure against failure in the field, a light but effective electric welder powered from a Sno-Cat engine will be taken on the trans-continental journey.

The expedition will take one of the Auster ski-float aircraft that went with the "Theron" last year. It has also bought a de Havilland Otter which was flown to this country via Greenland during July. The Royal Air Force have continued to assist the expedition in every possible way. Squadron Leader John Lewis and Flight Lieutenant Gordon Haslop are again the pilots, while Flight Sergeant Peter Weston continues to maintain the aircraft.

Dr. Fuchs writes:

"It is difficult to imagine what conditions must have been like for this party of eight cramped within their packing-case home. At one end the wireless equipment was erected—the other was used as a kitchen. From the roof hung festoons of drying clothes, footgear and sleeping bags. A central table was used for all purposes and certainly there can hardly have been room to move around it. From the roof condensation or melting snow continually dripped, adding to the general discomfort.

"Going to sleep at night in the cold two-man tents outside meant that everyone had to clothe himself completely in windproofs, footgear and gloves before venturing into the dark and usually blizzard con-

ditions outside. Never before has anyone lived in tents through the Antarctic night in so high a latitude. To make three hourly meteorological observations day and night, to continue building operations, and to keep as cheerful as all the messages have indicated are great feats of both physical and mental endurance.

"Since the return of the sun on August 20, conditions have steadily improved, and recent messages have told of the many activities with which they are now occupied."

Dr. H. Lister, chief glaciologist, will spend eight or nine months with two other members of the expedition in a hut erected 300 miles south of Shackleton, primarily to test the growing or wasting of the ice cap.

ROYAL SOCIETY BASE

The relief party for the Royal Society I.G.Y. Base at Halley Bay is travelling south with the Trans-Antarctic Expedition members in the "Magga Dan" which left London on November 15. They will erect further huts and instal scientific equipment so that the base may be fully operating for the start of the I.G.Y. programme on July 1.

The new leader will be Colonel Robin Smart R.A.M.C. aged 42, Deputy Director of Army Health, Western Command. He was a member of a War Office team working in the Arctic regions of Canada 1948-49, and returned to North Canada and Alaska in 1950.

Colonel Smart will return to the United Kingdom in January 1958, but the main party will remain at Halley Bay until the end of the I.G.Y., December 31, 1958.

The new Australian map of Antarctica may be obtained from the Director, National Mapping Section, Canberra, A.C.T., at 2/- per copy.

Mawson Men Prepare For Summer Activity

The Australian party at Mawson under Mr. W. Bewsher report an almost uninterrupted programme of aerial and surface journeys.

An average temperature of -6.7 deg. F. made August the coldest month since the establishment of Mawson, with -30° F. on August 18 the lowest ever recorded there. During a severe continuous blizzard on 21st to 24th a wind run above 1,200 miles was recorded daily, with a record run of 1,502 miles on the 24th. Major damage was the collapse of the 80-foot aerial mast owing to a guy breaking. Hollingshead with the assistance of many others dismantled the broken mast, and attached guys to a new 50-foot mast which was pulled into position with the weasel. The secondary aerial worked satisfactorily, so communications were not interrupted. However, ionospheric conditions caused a radio blackout on several days.

Good weather during the first half of the month allowed much field work but little was possible later.

Flights were made to the Prince Charles Mountains, to Amundsen Bay ($67^{\circ} 40'S.$, $50^{\circ} E.$), and to a point $70^{\circ} 34'S.$, $59^{\circ} 17'E.$, as well as a local flight testing radio equipment in the Beaver.

Between August 9th and 13th Crohn and five others did a five-day journey with two weasels to Einstodingate Islet, 30 miles west of Mawson, for a geology survey. Rough sea-ice surface prevented them reaching Stanton Islets for further geological work. The weasel performed well apart from a damaged radiator which was replaced by a spare flown out by the Beaver.

The third remote meteorological station was established at Ringoya on the coast five miles south-west of

Mawson on August 7. On August 30 and 31 three men with a six-dog team visited Innerskjera Islets twelve miles west of Mawson for geology.

Steady progress is being made in all sections of the scientific programme. The seismograph was put into operation late in July and had recorded four earth tremors by September 6. The cosmic ray telescope recorded fairly extensive increases of cosmic rays on August 21. Despite the blizzard period, Bunt kept open two holes in the four foot thick sea-ice for marine studies.

Seaton built an eskimo style igloo which withstood the blizzard without weakening. With Cooper he slept there on two nights, testing equipment, including R.A.F. survival suits. Sealsteaks were added to the menu during August: these became more frequent as the approach of summer brought back more seals.

A Huge Glacier

On October 12 R.A.A.F. Pilot Officer John Seaton, flying 300 miles south-east of Mawson, discovered a huge glacier 30 miles wide and more than 100 miles long. Confined in a valley between new mountain ranges, it sweeps N.N.E. to Prydz Bay where it contributes to the nourishment of the Amery Ice Shelf. This major feature is one of the great glaciers of Antarctica. It will be further explored during the coming summer.

On October 11, Squadron Leader Douglas Leckie, flying the expedition's Beaver aircraft, flew 300 miles west of Mawson to Enderby Land

and discovered a great ice shelf extending in the form of a gulf 100 miles inland south-east of Scott Range. Though he was unable to define the western limits of this gulf, he considered that what previously was mapped as continent in the vicinity of Mt. Christensen was in all probability a large island. He recharted over 100 miles of coastline from Cape Ann to Amundsen Bay and discovered many new mountain ranges.

Four of the Mawson party—Kirkby, Bunt, McGregor and Crohn—were flown by Beaver 300 miles to Amundsen Bay. From two camps on islets in the Bay they will carry out a survey of the region.

Spring Comes To Mawson

Bewsher radioed from Mawson on October 11:

The weather during the last five weeks has been a fair sample of everything from severe blizzards to perfect calm sunny days. Early in the evening of September 8 a sunlit aurora provided a magnificent spectacle. There was a partial corona with vivid red and fairly bright green colourings.

All opportunities were taken in a wide range of field activities, but bad weather sometimes prevented results. The Beaver has already completed 13 trimetragon photographic flights with a radius several hundred miles from Mawson, areas including eastward to the Larsemann Hills, westward to Amundsen Bay, southward to the Prince Charles Ranges and SW to the new Enderby Land ranges. The areas were sometimes cloud-covered, but a large number of successful photographic runs were completed for mapping purposes. The Beaver also made two recce flights to the Amery Ice Shelf to ascertain heights with a radar altimeter, also to the Prince Charles Ranges to plan the main southern weasel journey.

The Auster made eleven further

flights, including flying personnel to field bases. Kirkby and Crohn were flown to an islet on the east side of Stefansson Bay for two days to complete the survey geological work commenced in May. Dowie and Jacklyn were flown to the Taylor Rookery for four days' observations of emperor penguin chicks. McGregor was flown to the Taylor area twice and completed magnetic observations commenced in May.

Weasels and Dogs

Apart from two trips to weather stations, the weasels were used on two sea-ice and one plateau journey. Six men on a three days' sea-ice trip reached Jelbart Glacier tongue, 40 miles west of Mawson, but a rough sea-ice surface prevented their reaching their objective of the Taylor Rookery. Three men spent two days at Mt. Henderson measuring ice movement. The other sea-ice trip was 24 miles west of Mawson to obtain a fix.

Apart from two trips to change records of weather stations the dog team was used twice: to establish a depot at the southern end of the north Masson Range and to Mt. Hordern south of the David Range for geological survey work. Proceeding via the Masson depot the three men and six dogs reached Mt. Hordern on the second day. Then seven days overcast or blizzard prevented their obtaining a fix, but the geological work was completed. A severe blizzard delayed departure two days further until on October 9 perfect weather and an excellent performance by the dogs enabled a 25 miles return run to be made in seven and a half hours.

Bunt gained a biological assistant in the shape of a Weddell seal named Thomas who keeps sampling a tube free of ice by using it as a breathing hole. He is the only Antarctic seal with a prefabricated home. Dinah's pups are now

Southern Field Journey

During December, 1954, Dovers and two others with two weasels and one dog team journeyed inland and discovered Depot Peak after 120 miles of travel, discovered and reached Stinear Nunataks, 40 miles south and sighted an extensive mountain system now named the Prince Charles Range. In December, 1955 Bechervalse and six others in two weasels reached peak H at the northern end of these ranges after 220 miles of plateau travel. Both parties left depots en route.

This year Bewsher, Crohn (who was on the 1955 journey), Kirkby, Gardner and Hollingshead with two weasels and one dog team plan to follow this route and carry out survey and geological work in the ranges. With the knowledge gained from previous years plus recce flights in 1956 and using existing depots plus a depot established by air, they hope to proceed 275 miles further.

On November 4 Leckie landed the Beaver on the northern flank of the ranges 25 miles S.E. of peak H, and left Bewsher and Crohn to mark a clear landing strip. Twice men were flown to the camp area to assist in unloading the plane during depot laying operations but ground drift prevented the locating of the camp, and wind prevented the men there from hearing the plane. At midday on November 5 the drift wind eased, and a strip was cleared and marked. Leckie, with Sundberg and Kirkby, located the camp easily that afternoon, landed and checked the strip; then all five men returned to Mawson.

A Beaver overhaul plus blizzard conditions now delayed the operation until November 13 when Crohn and Jacklyn were flown to the camp. Leckie and Seaton alternated on seven successful flights carrying equipment, and brought the two men back on their final flight on November 15. There are

now eight drums of weasel petrol, one drum of oil, 384 lbs. of seal meat, 300lbs. of dog pemmican plus miscellaneous food, clothing, radio and weasel spares at the depot, also two drums of aviation spirit for a combined recce and photographic flight.

The first section of the route is the steepest so on November 16 Gardner and Abbs towed three cargo sledges to the Mt. Henderson area with the weasel which is remaining at Mawson, to give the field party's weasels and dogs an easy start. The intention was to leave on November 19, weather permitting, returning on approximately January 26. Cables from the party may be limited, depending on the success of radio communications.

Teams For 1957

The new Mawson party of 24 men will be headed by Mr. K. B. Mather (34) and comprises five physicists (radio, cosmic ray and auroral), a magnetician, a seismologist, a glaciologist, a surveyor, a meteorologist, two weather observers, a medical officer, four radio officers, two diesel mechanics, and a cook, as well as four air-force men.

The Vestfold Hills party numbers five, including Mr. Bruce Stinear (43), the New Zealand geologist who with Mr. Robert Dingle, the leader, was with the original Mawson party in 1954.

The "Kista Dan" after leaving Melbourne will go to Mawson, then the Vestfold Hills, where a new station will be established, then to the Windmill Islands (66°20' S., 110°15' E.) where a completely automatic weather station is to be set up. This device was built in France for 10 million francs and measures pressure, temperature, relative humidity, wind speed and direction. It runs on batteries charged by a wind generator and radios the measurements it records.

WITH THE SEABEES THROUGH THE WINTER NIGHT

The 166 Americans who wintered over, 73 at Little America V and 93 at Williams Air Operating Facility (Air Op. Fac.) in McMurdo Sound, were kept busily employed, until the arrival of the first ship and aircraft, preparing for the activities of Operation Deepfreeze II.

Aided at first by several who did not winter over, the builders at Little America V constructed eighteen structures before the winter night, working in blizzards when necessary to avail themselves of every precious hour of diminishing daylight. They have built, improved and maintained a camp that is comfortable and provides shelter for most of the necessary functions of an Antarctic expedition. Six more structures remained to be erected prior to the arrival of ships of Task Force 43.

The securing of steel fabricated beams to wooden footings was followed by the laying of insulated interlocking panels for the decks of the buildings. Wall, end and roof type panels were interlocked with deck panels, to form permanent winterised structures. As buildings neared completion a tunnel was constructed enclosing "Whitney Lane." Binding the studs were two-by-ten joists. Chicken wire and burlap were used to seal off snow and wind. Building one sealed off the north end and a large enclosure capable of sheltering even the largest vehicles sealed off the south end of the tunnel.

Similar tunnels were constructed for storage purposes. Subzero temperatures prevailed, filling beards and moustaches with heavy frost, and operations on stormy days were limited to inside work.

The last structure to be completed was the Rawin-Sonde Tower. On a 20-foot platform the tower was assembled, using "Chinese Hydraulic" — simple manpower — for

hoisting and placing the sections. In lowering temperatures and increasing winds the men worked on and could be heard singing, or laughing at some story or joke.

During the winter night much of the work was done to improve the camp, with operations centred in an improvised workshop adjacent to "Whitney Lane." Interior decorations, painting, laying linoleum and general maintenance kept the men busy during the long winter months. Each man stood regular watches and performed other collateral tasks. Tunnel patching after blizzards was routine.

During August extensive preparations were made for the construction of additional bases during the summer. Testing of communications facilities, inventorying and packaging of camp utensils and food items, construction of wanigans and light vehicles proceeded rapidly.

Spring Roars In

A temperature of -78° F. on August 9 is believed to have set an all time low for the Little America bases. The previous record of -75° F. was recorded on September 5, 1940.

A blizzard from the north-east hit the camp on August 30, with gusts up to 60 knots. On the following day the wind shifted to the west and diminished, with mostly clear skies.

A September 3 report from Little America says, "Darkening skies, falling barometer, rising temperatures and increasing wind velocity fill the immediate air with myriads

of snow flakes. Driven before gusts of wind up to 55 knots, the snow fills spaces in less than twelve hours that were dug out by crews of men with tractor dozers and shovels during a 12 hour shift. Spring has arrived at Little America.

"An average of 12 to 26 feet of snow covers materials that were left outside in storage dumps during late Antarctic fall. Most of the marking flags, standing about six feet tall, are hidden from sight.

"Photographs taken prior to the Antarctic winter give valuable clues as to the whereabouts of stored materials. Discomforts, including frostbite, have not interfered with efforts to gain valuable time for operations during the forthcoming summer season. Excessive cold has caused many costly breaks in equipment, but has not dampened the spirits of wintering-over Seabees and airmen."

September Activity

By the end of September a general clean-up and preparation for the arrival of the "summer group" was in full swing at Williams Air Operating Facility. The repairs to quonset roof panels which had sagged owing to the heavy snowfall was 75 per cent. complete. A rubber aviation gasoline tank farm had been installed near the runway to permit the rapid re-fuelling of aircraft, and the remaining 4,450 feet of fuel hose had been flushed and connected for immediate use if the alternative runway should be required. The minimum depth of ice near to the north-east edge was approximately 60 inches. The "Yog" (petrol barge) lines and chains were again extended owing to considerable tide action, but moorings were satisfactory.

At Little America crevasses had been filled in and the roadway to the Barrier completed. The recovery of materials from the snow was

still the major man-hour consumer. Eighty per cent. of Byrd Station materials had been loaded and the trail flags 10 per cent. completed. Three weasels, two four-man sleeping wanigans, eight D-8 tractors, one snow-cat and one welder mounted on a one-ton sled, were ready for the departure of the tractor train.

Airopfac Has A Blizzard

At Williams Air Operating Facility, the average wind velocity was 42 knots (47 miles per hour) for the 24-hour period September 15 at 2,000 to September 16 at 2,000. Peaks of almost 70 knots were experienced daily.

During a three-hour lull on the 16th the tractors were brought from the runway to camp for maintenance work. Drifts from three to seven feet covered the runway; this required approximately three weeks for removal. By September 16 50 per cent. of the flooding was completed. Flooding is the process by which water is poured on a snow-surface, freezing it into a hard surface for a runway for the planes. Only three days out of 18 permitted a full shift of work at the runway.

An ice reconnaissance group temporarily isolated at Cape Evans returned to camp during the lull. No corings (ice samples by large auger-type drills) were taken during this trip due to the severe weather. A group of 48 emperor penguins and some seals were encountered by the reconnaissance party.

Little America also experienced blizzard conditions from 16 to 19 September, with high winds and blowing snow keeping visibility near zero. Clearing began on the 20th. On September 19 the average altitude of balloon soundings, using Marshall Balloons, jumped from 41,000 to 80,000 feet, with a maximum altitude of 91,000 feet on September 23.

OPERATION DEEPFREEZE II BEGINS

The second phase of Operation Deepfreeze, as far as New Zealand is concerned, began with the arrival of aircraft from the United States.

It had been intended to fly in the seven aircraft from Christchurch to McMurdo Sound on October 15, but winds were not favourable for the 2,000 miles flight and on the 16th a single Skymaster left Harewood aerodrome at 6 p.m. On board were Admiral George Dufek and a crew of six, with one correspondent. U.S.S. "Brough" was on station and the ice-breaker "Glacier" was within radio range 1,200 miles to the east. The flight was without incident and the aircraft touched down at 7.21 a.m. on October 17.

The same day six more planes took off for the South. A second Skymaster left Harewood at 5.50 p.m., followed by a Neptune patrol bomber at 6.15. They were joined over Taieri by four Dakotas. Conditions had deteriorated and a white-out was beginning to cut visibility about the time the aircraft were expected to reach McMurdo Sound.

First to arrive, at 7 a.m. on the morning of the 18th, was the Neptune. The pilot (Lieut. D. W. Carey) elected to land visually after being brought down to 1,200 feet by ground control-approach. The ceiling at the time was 300 feet. The plane flew along parallel with the runway and downwind for about a mile and then turned back to land into the wind. Halfway downwind, the right wing dipped and the aircraft hit the ice, cart-wheeled to the left and disintegrated.

A crash-squad immediately fought its way through the snow to the plane. Three men were killed instantly:

Lieut. D. M. Carey,
Aviation Machinist Mate (1st class) M. O. Marze,
Aviation Electronic Technician C. S. Miller.

A fourth man died shortly afterwards. He was:

Captain R. Hudman.

Four men were seriously injured. Three of them, Aviation Technician R. W. Lewis, Aviation Mechanic C. C. Allsup and Sergeant R. S. Spann were flown to Christchurch by the Globemaster on October 21, and the fourth, Ensign K. MacAlpine, was flown out later. Sergeant Spann did not recover consciousness until mid-November.

Globemaster Airlift

At 5.40 p.m. on October 20 a Globemaster of the 52nd Squadron, 18th Air Force U.S.A., left Harewood airfield, Christchurch, to commence the biggest air-lift yet undertaken in New Zealand. The aircraft carried seven tons of cargo, including a battery truck and an Otter plane. There were 18 passengers, including the 11-man Marie Byrd Land trail party led by Commander P. Frazier.

A second Globemaster left shortly after dawn on October 21 carrying among its 44 passengers Dr. Paul Siple, Commander R. Hartmann (Navy Public Information Officer) and a team of correspondents.

Four other Globemasters left at four-hour intervals. Three arrived without incident at 8.25 a.m., 1.57 p.m. and 7 p.m. respectively on October 21, but the nosewheel of the "State of Washington" cal-lapsed as the plane landed at 9.30 p.m. and the aircraft slid along on her clam-shell nose-doors and main wheels to come to a completely controlled stop. No one was injured.

Air Drop At The Pole

On October 26 the first air-drop of supplies for the proposed South

Pole base was carried out. A Globemaster commanded by Major-General Chester McCarty left the McMurdo Sound air-strip at 2.30 p.m. and was over the Pole at 7 p.m. On board also were Dr. Paul Siple, who is to be in charge of the base, Colonel H. A. Crosswell, Captain W. M. Hawkes, and a number of correspondents, as well as the crew, 43 men in all.

A platform containing eighteen 55-gallon drums of oil was dropped out of the floor of the plane, supported by three parachutes. Once the envelopes of the parachutes had been hauled in, the plane circled and a "grasshopper" (an automatic weather-report transmitter) was dropped. Then, after 17 minutes over the Pole the aircraft began its 830-mile flight back to McMurdo Sound.

First Since Scott

A ski-equipped U.S. Navy Dakota piloted by Commander C. Shinn touched down at the Pole at 8.34 p.m. on October 31 while a Globemaster droned overhead on safety station. No difficulties were reported. First man to set foot on the hard dry snow was Rear-Admiral George F. Dufek. He was followed by six others.

The small party left radar reflectors and other navigational aids such as trail-flags embedded in the ice. The temperature was -58 deg. F. During the short time necessary to hack a hole for the flying of the Stars and Stripes, Captain Cordiner's cheeks and nose went completely white.

Forty-nine minutes after landing an attempt was made to commence the return flight, but the Dakota's skis were found to be frozen to the polar ice. The pilot revved the engines to full throttle but the plane would not move. Horrified watchers on the circling Globemaster then saw the Dakota suddenly disappear

in a huge cloud of smoke and flame and thought that the plane had blown up. Actually, Commander Shinn had fired four of his fifteen JATO (jet assisted take-off) bottles, but without result.

"If You Can't Get Off"

Another four bottles, and a slight tremor ran through the plane. In quick succession the pilot fired his remaining seven bottles, the plane lurched, and staggered into the air at a mere 60 knots. The spent JATO bottles and 120 gallons of petrol were dumped; the plane gathered speed, and headed for the north.

Admiral Dufek was invalided to Christchurch on November 4, suffering from a severe bronchial chill, and was ordered to bed at Wigram for two days. The Admiral told reporters that Major C. J. Ellen, commander of the supporting Globemaster had radioed over the Pole, "If you cannot get off I will crash-land alongside you and you will have a house to live in." This, said the admiral, was "mighty comforting."

A month later, two other Globemasters had trouble with collapsing nose-wheels, fortunately without serious injury to personnel. On November 28 the State of Tennessee touched down short of the runway in poor weather conditions, visibility half a mile and wind 20 to 25 knots. The nose-wheel collapsed.

The following day the State of Oregon, carrying a 17-man repair-team and two replacement engines, itself suffered a collapsed nose-wheel on landing at McMurdo Sound. Again no one was seriously hurt.

Two of the injured men, Ensign Macalpine and Technician Lewis were flown to the States late in November.

POLE STATION

The landing of a base-building party at the pole was delayed by a combination of rough weather and radio black-out which lasted nearly four days and virtually cut-off the McMurdo Sound base from the outside world. Not even Little America, only 400 miles to the east, could be reached by radio direct.

The black-out lifted and the weather improved on November 20. After a weather reconnaissance flight by Commander H. Jorda in his Skymaster, two Dakotas took off piloted by Lieutenant-Commanders Shinn and Curtis. An advance party of eight men led by Lieut. Richard Bowers and Lieut. John Tuck landed safely eight miles from the pole, with eleven huskies, a dog-sledge, several man-hauling sledges and supplies for 30 days. Meanwhile a Skymaster carrying a survival team with two parachutists flew top-cover for the Dakotas on the ice.

After the Dakotas took off again for McMurdo Sound, a Globemaster flew over and parachuted an orange-painted weasel from 1,400 feet. After 17 seconds it landed upright and five minutes later was driven off. A second drop included sledges—and newspapers.

As further bad weather made more landings impracticable, on November 25 Sergeant Richard Patton of the U.S. Air Force parachuted to the camp. An air drop specialist, he will endeavour to find out why several drops have failed owing to the parachutes not opening or becoming detached, so that the supplies buried themselves 15 feet deep in ice and snow. Sergeant Patton found three men at the camp trying to repair a snow-tractor damaged in a drop the previous week. The other five men of the advance party were believed to be near the pole, if they had not already reached it.

On November 28 a Globemaster successfully air-dropped an eight-ton tractor on three 100-foot parachutes from 2,000 feet. The tractor made a perfect landing and was seen working shortly after touching down.

The full construction team of 19 men is now at the pole.

BYRD STATION

The Marie Byrd Land trail-train under Commander P. W. Frazier was last reported 183 miles south-east of Little America. Impassable crevasses were encountered near the 200-mile point and the party had to back track 40 miles to what was regarded as the best avenue to the Rockefeller Plateau. An air and surface search failed to reveal any natural ramp from the ice-shelf to the plateau and the team was preparing a bridge.

The train of five vehicles will, it is hoped, reach its objective before Christmas. Last year a preliminary trail was established to a point about 380 miles from Little America, with fuel caches laid down every 50 miles.

A "way station" for planes carrying supplies to the Pole was established on October 29 at Mt. Duncan, near the outlet of the Beardmore Glacier, 450 miles from McMurdo Sound. Earlier, a promising runway site had been chosen about five miles east of the point where the Beardmore Glacier empties into the Ross Ice Shelf. Here the ice appeared free of crevasses although the snow was too soft for use by wheeled aircraft. Searching for a possible landing place for four-engined transport planes on wheels, Commander Shinn swooped low. Suddenly one of the wing-tips struck the snow: the pilot "gunned" his engines and the plane soared. The wing-tip was slightly crumpled.

Antarctic Activities By Many Nations

In addition to the work being carried out or planned by the United Kingdom, Australia, the United States and New Zealand, detailed elsewhere, French and Russian expeditions are already at work in the Antarctic, and others are on the way.

This is in addition to the research work being carried out on a number of sub-Antarctic islands by scientists from Australia, France, New Zealand and the Union of South Africa.

Some notes follow on the activities of five of the eleven nations which propose to intensify or inaugurate scientific work on the Antarctic continent during the International Geophysical Year.

Adelie Land

M. Paul-Emile Victor has kindly supplied the following information on recent activities of the French Antarctic Expedition in Terre Adelie, organised by the French Antarctic Sub-Committee of the French National Committee I.G.Y. of which he is Chairman. The 1955-57 expedition at present in the field under the leadership of Robert Guillard will be relieved this year by a party under Bertram Imbert, who was second-in-command of the 1950-52 Adelie Land Expedition. These expeditions are organised with the co-operation of Expeditions Polaires Francaises.

Two French bases are to be set up in the Antarctic: Dumont d'Urville Base at Pointe Geologie on the Ile des Petrels, where Expeditions Polaires Francaises had already put in a base for the wintering 1952-53. This base was set up by the expedition under the leadership of Robert Guillard and the installations are now finished. Guillard with three vehicles and

seven men is now on his way over the ice-cap of the Antarctic, to set up the satellite base: Station Charcot, some 300 miles south of Base Dumont d'Urville on the ice-cap of the Antarctic, in the vicinity of the Magnetic South Pole. A cable dated October 31 gives the following information:

"Minimum temperatures: minus 21°2 C. Maximum temperature: plus 5° C. with a mean temperature of minus 11°4 C. Winds have been: maximum 65 meters per second with mean speed of 11 meters per second during the fortnight from October 15 to October 31. During this fortnight, there have been eight days of snowfall and eight days of blizzard."

By the end of October, Guillard's group had transported about 35 tons of equipment for the installation of Station Charcot, across the marginal zone of the Antarctic ice-cap to a temporary camp, some 20 miles inland. After about one week spent at the main base for maintenance and repair of certain materials, the group had started again inland at the beginning of November.

Expedition 1956-1958

Most of the men of this expedition and their 350 tons of equipment sailed from Le Havre on October 7, 1956 on board the Norwegian polar vessel "Norsel" chartered by the expedition. The route of the "Norsel" passes through Panama, Tahiti, New Zealand and Australia.

Some men, including Bertrand Imbert left later by air to join the expedition's ship somewhere on the

way and, more particularly, in Tahiti.

The leader of the expedition 1957-1959, Gaston Rouillon, will participate in the summer operations of 1956-57, in order to get a personal contact with the location of the bases where he will winter with about 20 men next year.

U.S.S.R.

According to a Soviet Press report, the Soviet relief expedition was scheduled to leave Kaliningrad on the diesel electric ships "Ob" and "Lena" and the motor-ship "Koopratsia" early in November.

The landing party this year is headed by A. F. Treshnikof, an experienced Polar explorer and former chief of the "North Pole 3" floating station. Dr. M. M. Somov will again be in charge of the whole expedition. The continental party will replace the scientific staff at Mirny, Pionerskaya and Oasis, and will set up another two scientific stations in the interior.

Vostok will be set up in the area of the geomagnetic pole, some 1,500 k.m. from Mirny, at 79°30' S.

The entire cargo will be unloaded at Mirny. Here a tractor drawn sledge train will be formed, with small prefabricated huts, scientific equipment, radio and electric station, fuel and food-stuffs.

Freight to the stations in the interior will be delivered by specially equipped aircraft.

The second new station, Sovietskaya, will be formed in the vicinity of the "Pole of Inaccessibility" at approximately 82° S. 50°60' E, 2,000 k.m. from Mirny. This station will be manned by 10 explorers.

The intermediate station of Komsomolskaya will be set up between Mirny, Vostok and Sovietskaya.

Pionerskaya has reported a temperature of 120° below freezing

point, and 105 m.p.h. winds: but the men at the station were all in good health and cheerful.

The "Oasis" station referred to above is believed to be situated at Bunger's Oasis, 200 miles east of Mirny. The "oasis" was discovered by a U.S. Navy seaplane in 1947. The name was later changed to Bunger Hills when surveys disclosed that the apparent oasis was part of the true coast where the ice-sheet had shrunken, exposing the land.

NORWAY

The Norwegian Antarctic expedition left Oslo on November 10. The original intention was to charter one vessel only, but it was soon obvious that the "Polarsirkel" of Tromso was not able to carry the total equipment alone. The chartering of another vessel, the M-S "Polarbjorn" of Brandal pr. Alesund, became therefore necessary. Both ships are Norwegian sealers. They were loaded with material for the houses, provisions, outfit for the scientific work, oil, petrol, tractors, sledges, 44 Greenland dogs and many other things.

The expedition members are the following:

Sigurd Helle (36) geodesist at Norsk Polarinstittutt and expedition leader; Jarl Tonnessen (36), chief meteorologist; Torgny Vinje (27), second meteorologist; Haakon Saether (49), physician; Torbjorn Lunde (27), glaciologist; Odd Gjeruldsen (37), scientific assistant; Bjorn Grytoyr (23), scientific assistant; Hans-Martin Henriksen (20), meteorological assistant; Niels Nergaard (34), assistant radiosonde service; Stein Sorensen (34), chief wireless operator; John Snuggerud (28), radio technician; Lars Hochlin (26), wireless operator and dog driver; Arne Hemmestad (35), mechanic; Per Larsen (45), steward. All are Norwegians.

BELGIAN PLANS

A Belgian expedition will participate in I.G.Y. activities during 1957-58. A party of fifteen men will leave Belgium in October, 1957 and establish a base on the coast of Wilkes Land, in approximately 125 deg. E., in December. No expedition has previously been based on this part of the Antarctic coastline, which is distant some hundreds of miles from the proposed American base at Vincennes Bay on the Knox Coast (110 deg. E.) and from the French Adelle Land Station (145 deg. E.). The area has been surveyed from the air by earlier Australian and United States expeditions.

Should a landing in the vicinity of the proposed base-site prove impracticable, it is intended to establish a temporary base for the winter near 20 deg. E., between the Norwegian and Japanese bases in 0° and 40° E respectively.

The Belgian Government has allocated a credit of 40 million Belgian francs, which will be supplemented, it is anticipated, by contributions from major scientific organisations. The expedition will be transported on a Scandinavian polar vessel which has been chartered by the Government.

The personnel will comprise: two meteorologists, an ionospheric specialist, a geo-magnetician, an expert in atmospherical optics, a glaciologist, a surgeon-biologist, two wireless operators, two mechanics, a photographer, a cook and a dog-expert, under the leadership of M. Gaston de Gerlache, who is the son of Baron Adrien de Gerlache, leader of the Belgian Antarctic expedition of 1897-99 which in the "Belgica" was the first expedition ever to winter in the Antarctic.

Most of the expedition members have already been selected from numerous volunteers. A special construction party of carpenters, electricians, etc., will go south on the ship and return early in 1958.

BOOKSHELF

"THE LONELY SOUTH," Andre Migot, London, Rupert Hart-Davis, 206 pp. ill. Translated from the French by Richard Graves. New Zealand price 21/-.

The author of this very readable book was drawn to the "lonely south" by his love of solitude. Stifled by Paris after seven years in China and Tibet, he volunteered and served for twelve months (January 1953-January 1954) as medical officer and biologist at the French station on the Kerguelen Islands.

Life at the well-established base, Port aux Francais, is described with verve and candour. The fact is not glossed over that personal relations were in time severely strained; but "personalities" in the unkind sense are not allowed to intrude into the story.

Dr. Migot's best pages describe a four-day weasel journey round Courbet Peninsula with its wealth of bird and animal life, "a zoological garden in which all the animals of Kerguelen are represented in large numbers." This is something quite distinctive in Antarctic writing.

When the rest of the party were eagerly packing for the homeward journey, Dr. Migot seized an opportunity to go on the "Kista Dan" as an observer with the Australians under Dovers who established Mawson base in 1954. The difficulties encountered and the spirit in which the Australians met and overcame them are narrated with enthusiasm spiced with admiration.

Dr. Migot is well served by his translator and as the book gives the first account in volume form of a feat which deserves to be counted among the important achievements of Antarctic exploration, it is one which no Antarctic-book lover should miss.

L.B.Q.

FERRAR OF THE GLACIER

During the next two summers the Ferrar Glacier will be much in the news. It will probably be up the Ferrar Glacier that the New Zealand expedition's field party will travel to establish the Mount Albert Markham depot, and, later, to meet the trans-continental party under Dr. Fuchs.

It may not be generally remembered that Dr. H. T. Ferrar, after whom the glacier is named, married a New Zealand girl and lived for the latter years of his life in New Zealand.

It seems fitting therefore that this distinguished New Zealander should be better known to his fellow-countrymen and to all those who are interested in Antarctic exploration and research. The following article has been written at our request by Dr. Ferrar's son-in-law, Mr. L. M. Forbes, with the generous co-operation of Mrs. Ferrar.

HARTLEY TRAVERS FERRAR was born on January 18, 1879, at Dalkey, near Dublin. As a young child he accompanied his parents to South Africa, later returning to England to go to Oundle School. In 1897, he gained a sizarship at Sidney Sussex College, Cambridge, and was awarded honours in the Natural Science Tripos in 1901.

He was a noted athlete: at school he was Head Boy, captain of rugby and rowing, and a successful boxer and swimmer; at University he was given a "Trial Cap", and rowed for his college.

In August 1901, three months after leaving Cambridge, he sailed as geologist to the British Antarctic ("Discovery") Expedition. He was the youngest and least experienced of the officers, a position which he found to have more drawbacks than privileges. Occasional diary entries show that, like the other civilians in the party, he found naval discipline and customs sometimes difficult to live with. He admired and respected Scott, but said that it was Shackleton's good-humoured

nonsense and fun, and Wilson's understanding that smoothed over the inevitable frictions of expedition life. In his own diary, Scott pays the most generous tribute to Ferrar's industry and enthusiasm. Ferrar writes "The kindly interest Captain Scott took in my work, and the arrangements he made for me, were more than I could possibly have expected."

Owing to the nature of his work, Ferrar was able to take part in most of the sledging journeys that were made. With Wilson and Shackleton he went on the first one undertaken, from 18 to 22 February, 1902. They sledged to White Island, and the entry in his diary for the first day runs "Shackleton, Wilson and myself left for the island at 11 a.m. after packing our pram and sledge. The pulling was fairly hard. Had a biscuit at 2 p.m. Had just time to put some more clothes on and pack up before a wind carrying snow-dust caught us. We worked against this till 12 p.m. At this time we were hardly making 6in. per step and struggling hard against the wind laden with fine snow. Our faces were coated with frozen breath and our eyes rather sore. We, however, kept warm by working. At this point a sudden cold blast 'bit' my neck and the tip of my nose. This was soon set right, but Shackleton got his wrist, ear and cheek bitten. We got up the tent somehow, and crawled in on top of each other. Shackleton's frostbites blistered, but Wilson's and mine were cured by rubbing. Got the 'primus' working and made some cocoa from melted snow. Tried pemmican but found it too rich."

At the beginning of the next season he accompanied Scott, Shackleton, Wilson, Skelton and the boatswain on a short four day journey from September 2. On September 11, he and Armitage, with four sailors, left to search for a way across the western mountains. "Armitage in charge of self, Walker, Cross, Heald and Scott left the ship at 10.30 a.m. Travelled well on ski and used the sails on the sledges as the wind was behind us." Captain Scott remarks, "The party introduced the novelty of systematically pulling on ski, at which they have been practising lately, much to the amusement of the onlookers." It was on this journey that Ferrar must first have seen New Harbour Glacier, later to be named after him. On September 19, he and Heald lost their bearings and wandered through New Harbour Valley for a night before finding camp. "Heald and I got to camp at 4 a.m. after wandering about all night. The light was bad and we had not noticed where the camp was exactly. Armitage and Walker turned up later, also having been adrift for some time. Scott and Cross had rather an anxious time . . . I was quite played out and if it had not been for Heald, I would have lain down in the snow and curled up for good."

On November 29, Armitage's "western" party left the "Discovery." "All hands had mustard and cress this morning. Armitage's party of 21 all-told and 10 sledges started at 10 a.m. on ski and sails out. Temp. 10 deg. F. Did 3¾ miles before lunch and 9½ statute miles during the day. Lovely calm evening and hot sun. Turned in at 9 p.m." Ferrar was with Koettlitz, and seven sailors, as a supporting party. They accompanied Armitage until December 9, and, before returning, Ferrar "ascended to a height of 5,000ft. Tremendous and beautiful scene of the New Harbour

Glacier and the mountains beyond." They reached the ship on December 19.

He next spent from December 29 to January 8, 1903 with Koettlitz and Hodgson on a "very pleasant little trip" to Black Island. On January 18 he and Koettlitz set out on a nine day trip to Minna Bluff and returned to find that the "Morning" had arrived with supplies and mail. His final journey was with Scott's "western" party in October to December, 1903. He, and the two men of his party, accompanied Scott's main party to the top of New Harbour Glacier then returned slowly, as Scott writes, "not because he had lingered on his way, but because he had crossed and re-crossed the glacier to examine the rocks on each side. I was quite astonished to learn the numbers of places he had visited and the distances he had traversed in pursuit of his objects, especially when I remembered that all had been done with one rickety little sledge which I knew must have broken down repeatedly . . ." It was on this journey that he discovered, near the head of the glacier, fossil remains of vegetable matter; unfortunately these could not be identified.

Ferrar returned to England with the expedition in 1904 and was awarded the Polar Medal and the silver medal of the Royal Geographical Society. In 1905 he took up an appointment in the Geological Section of the Survey Department in Egypt. He remained there for ten years and then came to New Zealand. He had been a master at Christ's College, Christchurch for a year when war broke out and he enlisted in the New Zealand Expeditionary Force. He served chiefly in Palestine, and in addition to his ordinary military duties was engaged in assembling and collating air photographs of Turkish country.

On his discharge late in 1919, Ferrar joined the New Zealand Geological Survey, working for six years in the North Auckland peninsula and for three seasons in Otago Central. For his outstanding work here and in Egypt he was awarded a Doctorship in Science by the University of New Zealand. For four years Dr. Ferrar was engaged in examining the geology and soils of the King Country with relation to deficiency diseases in stock. He had completed the field-work, and returned to Wellington less than a fortnight before his untimely death on April 19, 1932.

Western Journey, 1903

It had been arranged that Ferrar should accompany the main party for twenty-one days and then return with his own party. The sledging orders marked "A" were issued to him by Captain Scott. When, owing to sledge breakdowns, the party had to return to the "Discovery" and start again Scott issued the "B" order. This was to allow Ferrar to set out on his own and follow at a more leisurely pace. Ferrar preferred, however, to keep up with the main party as far as his turning point on the top of the glacier.

(A)

Mr. Ferrar

You will remain in company with my party until the 21st day out from the ship. During this time we shall have:

Depot (A) at Cathedral Rocks.

Depot (B) 12 days out from the ship.

From Separation Camp on the 21st day you will act independently and work your way back to the ship by stages.

Your party will consist of yourself and two men, Kennar, P. O. and Wallis, A. B.

At Separation Camp you will be provided with one weeks provision (your ready bags full) $\frac{3}{4}$ of a gallon of oil and $1\frac{1}{2}$ pints of spirit.

On reaching Depot (B) you will pick up one weeks provision for your party with $1\frac{1}{2}$ gallons of oil.

This is $\frac{3}{4}$ of the stores you will find remaining at Depot (B).

On reaching Depot (A) you will pick up one week's provision for your party with $\frac{3}{4}$ of a gallon of oil. This is $\frac{1}{2}$ of the stores remaining at this depot.

On reaching the butter depot at New Harbour Point you will take 3lbs. of the butter and as much oil as you require up to $\frac{3}{4}$ of the gallon left there.

If you find seals and wish to remain out, you can then draw as much as you require on the biscuit left at the S end of the Eskers last year by Mr. Armitage. An extra week out on this will bring your absence from the ship up to a total of eight weeks, by which time all hands will be required for work on-board. You must be careful not to take from any Depot more than your allotted share of provisions or oil.

For the guidance of your party you will have a prismatic compass. This will also be useful for taking bearings which will be of value in charting the detail of the glacier.

The **Compass** course from New Harbour Point to the ship is:

N43W or a little to the north of NW

This should be committed to memory.

Keep a good look out on the health of your party. Examine gums and legs periodically and should scorbutic signs appear it is advisable that you should return to the ship forthwith.

You will be provided with a separate medical bag and at the Separation Camp you will take the repair and tool bags of the supporting party.

Your party should take ski boots and one spare pair of finnesko.

The Alfonic rope (36gms.) and ice axes will be turned over to you for work on the upper glacier but these you must leave on your

return at Depot (A) for use in case the Advance Party has to retreat by Descent Pass.

The placing and observing of glacier marks must be arranged on the outward march as also the disposal of the measuring tape lead and line, etc.

In the margin I note some details of food allowance to guide you in consumption of contents of weekly bag.

R. F. SCOTT.

(Notes in margin, below).

Biscuits: 4 per day per man.

Daily Per Tent

Oatmeal: 8 spoonfuls.

Pea soup: 6 spoonfuls.

Cocoa: 4 spoonfuls.

R. Ration: 6 spoonfuls.

Sugar: 63 lumps (large or small).

Pemmican: a little over $\frac{1}{2}$ of a slab for each meal (2 meals a day).

Chocolate: 6 sticks per week per man.

Salt: ready tin full lasts a fortnight.

Pepper: ready tin full lasts four weeks.

Oil can: lasts 10 days.

Spirit tin: lasts 11 days.

At Depot (A):

2 tins marmalade, replace 3lbs. plasmon.

1lb. grated cheese, replace 1lb. cheese.

(B)

"Discovery", Winter Quarters.
Oct. 25, 1903.

Mr. Ferrar,

Under the altered conditions you are now at liberty to proceed with your exploration of the western Glacier at once.

You can draw such allowances as you need for reprovisioning your party from the Solitary Rocks Depot but do not unless you can help it take more than:

6 units (6 weeks for your party) from the Solitary Rk. Depot and—

Kerguelen Today

M. Heurgon, head of the Administrative Bureau responsible for French Antarctic possessions, kindly forwards us information on the present position on Les Iles Kerguelen.

"The rule of the winds is quite violent, the annual mean being about 33k.m. per hour, with gusts reaching 150 and even 200 k.m. per hour. But these are relatively short and can be forecast several hours ahead. Experience with helicopter flights during 1956 has proved that the Kerguelen archipelago is practicable for aircraft. A class A aerodrome is about to be established. The completion of this project will enable the air routes linking South Africa and Australia to be shortened by 2,000 k.m.

"The sea-elephants form enormous flocks totalling, it is estimated, over 200,000, and could become the basis of a profitable enterprise (a production of 2,000 tons of oil per year could be anticipated), without endangering the existence of the stock.

"The vegetation varies according to whether one considers the rabbit-free islands, which are green the whole year round in the lower areas, or the mainland, which the rodents turn into a desert from May to October. Acaena grass, tussock, camomile and the Kerguelen cabbage are greatly appreciated by the domestic ruminants. On the non-devastated islands, sheep can exist all the year round in their native state.

2 units (2 weeks for your party) from Depot (A).

See that you are acquainted with the weekly allowances in order to make a correct division of the store bags, biscuit and fuel.

You must be back onboard the ship with our party by December 12.

R. F. SCOTT.

"Fields of giant sea-weed border the coasts. So great is their denseness that they interfere with navigation and represent an industrial potential not to be despised.

"Port aux Francais today comprises a first-rate radio station, meteorological services, an observation centre for the origin of atmospheric electricity, a base for ionospheric studies, a hospital, a central electrical station and comfortable living quarters which in 1957 will shelter 100 men.

"A seismological station has been set up 10 k.m. from Port aux Francais. To improve the living standard of the population, a large farm has been established where there is a flourishing stock of sheep, cows, pigs and poultry. Attempts are being made to rear reindeer and ponies.

"A horticultural station where many kinds of vegetables are grown in large quantities, both outside, in cold frames, and in glass-houses, assures enough vitamins to maintain the members of the station in robust health.

"So a little boldness and perseverance have transformed "the island of Desolation" into a habitable land, a result which a few years ago looked like a Utopia.

The relief ship "Gallieni" en route for Kerguelen left Tamatave, Madagascar on October 30 and reached New Amsterdam on November 7. Bad weather retarded the unloading of stores.

The staff at Kerguelen is being strengthened to facilitate the rapid construction of buildings to house the men who will leave France next April to prepare the island air-strip and to engage in I.G.Y. activities.

Macquarie Island

Ian Adams reported on October 3: "A very full and interesting month has passed. The weather has been excellent and increasing daylight has allowed maximum out-

side activity. Several field trips have been carried out and judging by the vigour of the participants, our mode of living has not diminished our physical fitness.

"One and all are keenly interested in the local wild-life. Harems of up to 600 female elephant seals have been formed and a short stroll gives us ringside seats to battles between huge bull seals fighting for proprietorship of a harem. The month's major biological activity has been the formation of a suicide squad who dash into these harems to catch selected seal pups in order to get daily weights. The clinical methods involved are objected to fiercely by both mother and young. It is found that the bonny babies increase four stone in five days."

New Zealander Ian Adams reported on November 5: "This year we were required to measure the exact distance between two aurora cameras situated at each end of the island. This involved climbing thirty different peaks and making twenty theodolite readings at each, but so unpredictable is our weather that up to six visits have been made to a peak before suitable visibility occurred. Naturally all who assisted in this work were jubilant when it was recently completed.

"The weighing of seal pups has ended but not before our radio supervisor lost the seat of his trousers to an irate mother. The pups have left their mothers and it is amusing to watch them practising swimming and fighting in the manner of their grown-up brothers. Early in the year our doctor noticed that the muscles, bones and internal organs of seals were very similar to those of humans. His research into the comparison was completed by a five day dissection of a seal which weighed approximately one ton.

"After being in daily contact by morse with our sister station, Mawson, throughout the year, radio enthusiasts were rewarded by one successful voice contact."

Campbell Island

This year the annual relief takes place in two phases. The first phase covers the transport to the island of prefabricated buildings and the construction party of 12 to carry out the job. The M.V. "Holmglen" left Wellington on October 31 and arrived at the island on November 5, returning on November 9. The second phase covers the normal annual servicing together with the supply of all the new furniture, scientific equipment, etc., for the new station.

Relief operations on phase one were completed in record time when 450 tons of prefabricated buildings and equipment were unloaded and transported to the building sites in 54 hours. Weather was miraculously perfect for four days; nevertheless those responsible for the "on the spot" organisation, namely, the Campbell Island staff and the Captain of the "Holmglen" and his officers and men, deserve every compliment.

Phase two will be completed by December 6 if the weather is kindly. When the rest of the construction party returns, two carpenters, an electrician and a mechanic will remain on the island. During Mr. Poppleton's temporary absence from the Island for medical attention Mr. H. A. Coleman, the Senior Ionosphere Observer, has taken over as Acting Officer in Charge.

The strenuous work programme for 1956 has been kept up to date by dint of hard work of a well-knit organisation, and the preparations for the foundations of the new Meteorological Station were completed by the time the construction party arrived.

Visitors

Campbell Island has received several visits by U.S. Operation Deepfreeze ships and these visits have been warmly welcomed. The U.S. authorities have been most co-operative and have carried personnel, stores and mails both to

and from Campbell Island. This Island is becoming a regular meeting place of U.S. ships passing up and down from New Zealand to Antarctica.

During the I.G.Y. the additional shipping and aircraft of U.S. "Operation Deep-freeze" require many forecasts and valuable assistance will be given from Campbell Island in this respect so that the meteorological reporting programme will be extended considerably during that period.

The I.G.Y. for Campbell Island is going to be a very busy time for everyone concerned, but other interests such as bird life, marine life, and photography will still be pursued and every encouragement will be given to the staff to maintain these interests. The staff for 1957, in addition to the Officer in Charge, will comprise:

R. M. Smith (senior), J. W. Caskey and W. J. Stirn; meteorological observers.

J. B. Thompson (senior) and D. W. Farmer; ionospheric observers.

K. R. Brown, who is already on the island, cook.

W. J. Whitley, mechanic-handyman.

J. D. Jamieson (2nd term) and W. West, carpenters.

A. R. McIntype, electrician.

Mr. H. A. Coleman of the island party, speaking by radio-telephone to "Antarctic" on November 30, said that the new building had been fully erected except for a few minor details three days after the actual construction work (on previously prepared foundations) had begun. It is hoped that the job inside and out, will be completed before Christmas.

Several trips had been made to see the penguins on the south coast, where the rock-hoppers had come ashore to rest three weeks before and were now sitting on their eggs. The elephant-seal colonies had broken up, and there were quite a number of pups five or six weeks old.

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