ANTARCTIC

A NEWS BULLETIN

published quarterly by the

NEW ZEALAND ANTARCTIC SOCIETY

SCOTT BASE

THE NEW ZEALAND STATION ON PRAM POINT.

On the right the pressure ridges where the Ross Ice Shelf meets Ross Island. In the background Mount Erebus.

Photo: J. R. Claydon. Copyright: Trans-Antarctic Expedition.

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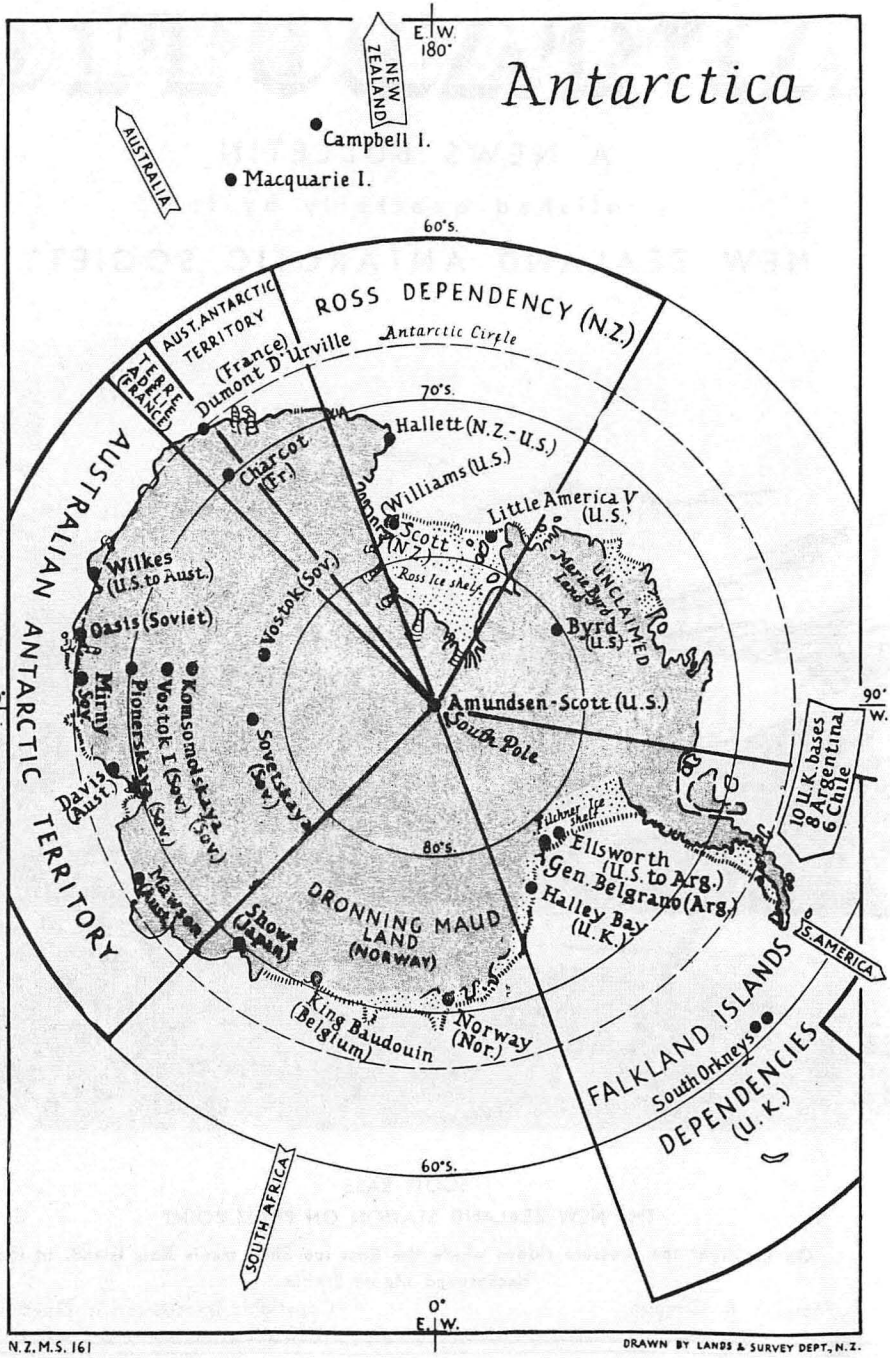

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"ANTARCTIC"

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Editor:
L. B. Quartermain, M.A., 1 Ariki Road, Wellington, E.2, New Zealand.

Business Communications, Subscriptions, etc., to:
Secretary, New Zealand Antarctic Society, P.O. Box 2110, Wellington, N.Z.

WASHINGTON CONFERENCE

The twelve nations which have been engaged in scientific work in the Antarctic met in conference in Washington commencing on October 16, in response to an invitation first issued by President Eisenhower in May, 1958. The participating nations were Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the Soviet Union, the United Kingdom, and the United States of America.

There was complete agreement to continue the peaceful scientific co-operation which was so notably successful throughout the International Geophysical Year, and to ban the use of Antarctica for military purposes, with an inspection and control system to ensure compliance with this agreement.

More difficulty was experienced in securing unanimity on the banning of nuclear tests in the Antarctic; the Latin-American participants in particular demanding complete prohibition, and some other nations favouring the premission of tests, purely for peaceful scientific purposes and only if all the interested countries agree.

With some reservations by a few countries as to wording, the Conference agreed to the indefinite "freezing" of territorial claims.

New Zealand's delegation was headed by Mr. A. D. McIntosh, Secretary of the External Affairs Department, until the arrival of Mr. Nash, Prime Minister.

The treaty was signed on December 1. It does not imply the renunciation of any previously asserted claims to territorial sovereignty.

Nuclear explosions and the disposal in the Antarctic of radioactive waste are prohibited.

ANTARCTIC SYMPOSIUM AT BUENOS AIRES

New Zealand had two representatives at an Antarctic Symposium which opened at Buenos Aires on November 17. They were Dr. Trevor Hatherton, of the Geophysics Division of the Department of Scientific and Industrial Research, who was chief scientist for the New Zealand International Geophysical Year programme, and is at present in California on a Commonwealth Fund Scholarship; and Mr. K. J. Salmon, a radio engineer in the Civil Aviation Administration, Wellington, who was scientific leader at Hallett Station during 1958. They presented papers on aurora and seismology.

All aspects of Antarctic research were studied, including biology, geology, glaciology, oceanography, as well as the particular sciences studied during the I.G.Y.. It was the first full-scale scientific conference on Antarctica since the end of the I.G.Y., though an informal meeting of scientists was held in Wellington in February last year. More than 150 scientists from the twelve nations concerned with Antarctic research are participating in the conference.

The Argentine Government met the costs of two delegates from each nation taking part. This generosity enabled New Zealand to be fully represented at Buenos Aires.

NEW ZEALAND SNO-CAT PLUNGES INTO HUNDRED FOOT CREVASSE

Tragedy has struck the New Zealand geological and survey party exploring by dog-team and sno-cat 180 miles south of Scott Base.

On Thursday, November 19, dog teams and sno-cats were camped together, held up by bad weather, on the Ross Ice Shelf about fifteen miles south of Cape Selborne (80° 20′ S., 160° 50′ E.), a prominent projection of the Victoria Land coast forming the southern entrance to Barne Inlet. Gunn, leader of the dog-sledging group, with Couzens and Lowery of the sno-cat party, set out at 11 a.m. in one of the two sno-cats to reconnoitre towards the coast, only about six miles away, in the hope of carrying out geological work.

About midday, only half a mile or so from camp on a level snow surface and with no warning whatever, the sno-cat plunged backwards into a crevasse some nine feet wide and 100 feet deep, but completely covered by drifted snow. Lieutenant Couzens was killed, and both Gunn and Lowery were injured. As they could not communicate with their camp or with base, the two survivors had no hope of reaching the surface.

SEARCH PARTY

When on Friday morning they had not returned to camp, Robb, leader of the sno-cat team, became alarmed and set out with the other sno-cat in search of the missing men. At 8 a.m. he discovered what had happened.

Robb's sno-cat tuned in on the United States Victoria Land traverse party, who relayed the message out. The news was picked up by a plane carrying Admiral Tyree on a polar flight, which flashed it to McMurdo Base and from there to Scott Base.

A United States Otter and helicopter with a doctor immediately flew out, and landed at the scene of the accident at 3.20 p.m., over 27 hours after the sno-cat had plunged through.

Wise and Matterson continually went into the crevasse to free the survivors and to supply them with hot drinks and food. Lowery was brought to the surface at 5.30 p.m. and Gunn half an hour later.

They were flown by helicopter to McMurdo and put into the base hospital where they received attention before leaving by United States Constellation aircraft for Christchurch, where they were admitted to hospital. Both men were found to be suffering from spinal injuries and frost-bite.

The sno-cat was a complete wreck. All food and equipment that could be recovered was brought to the surface.

OUTLINE OF PLANS

The combined dog-sledging and sno-cat journey which was so tragically interrupted by the sudden plunge of one of the sno-cats into a hidden crevasse was part of a long term programme in which, during the next few years, New Zealand explorers will fill in most of the blank spaces on the map of the Ross Dependency.

THE DOG TEAMS

The first party away, consisting of three dog teams, was led by **B. M. (Bernie) Gunn,** M.Sc., of Dunedin, who was geologist with the 1956-58 expeditions. With him were **Captain P. J. Hunt,** a Wellington-born surveyor who has been serving with the British Army in Cyprus, and **G. J. Matterson,** a Christchurch surveyor and mountaineer.

R. I. Walcott of Dunedin was so keen to get to the Antarctic that he worked his passage to the United Kingdom in 1954 to join the Falkland Islands Dependencies Survey. He spent two years with the Survey, driving dog teams with British survey parties at Hope Bay. He has

been studying geology at Auckland University. Until Mr. Walcott joined the team his place was taken by **K. C. Wise,** who wintered over throughout 1959 at Scott Base.

SNO-CAT PARTY

The second group, with the two sno-cats bought earlier this year from the Trans-Antarctic Expedition, was led by **Murray Robb** of Timaru, who was maintenance officer with last year's wintering party at Scott Base.

The other surviving members are J. H. Lowery, of Dunedin, a geologist who has spent some years in Australia with the Bureau of Mineral Resources at Canberra, and D. R. Goldschmidt, an Englishman and a surveyor with the Lands and Survey Department, Auckland.

Lieutenant Couzens, an engineer, was driver of the second sno-cat.

IN THE FIELD

The three dog-teams, each consisting of nine fully trained huskies, left Scott Base at 11.15 a.m. on November 2, each sledge loaded with 1,000 lbs. of food and equipment.

The sno-cats rumbled out of Scott Base on November 7, each "cat" hauling some four tons of cargo.

Both parties travelled across the Ross Ice Shelf, following in the footsteps of Scott and Shackleton on their journeys towards the South Pole. The New Zealanders, however, kept closer to the Victoria Land coast, in an attempt to explore an area which has previously only been seen from far out on the "Barrier".

PROGRESS REPORTS

At first Gunn's dog team party found the going good, and the surface excellent. But when Gunn reported on November 6 that camp had been pitched south-east of Minna Bluff between 78° 45′ S. and 78° 50′ S., he added that the going had been rough, with much sastruggi.

On November 17 Gunn, over-all leader of the party, radioed that his dog teams were 15 miles south-east of Cape Selborne. The party had been prevented from getting in to the Cape by very large crevasses. The sno-cats, he said, were in sight. The average travelling day for the dogs had been 20.4 miles.

Robb next reported that the sno-cats, moving in towards the coast ahead of the dog teams, were camped at the northern end of a small bay about eight miles south of Cape Selborne after crossing two very big rises which, said Robb, should not trouble the dogs. Their dead reckoning position was 80° 33′ S., 164° 4′ E. The snow surface was very smooth, and seemed suitable for a plane landing.

It was intended to fly out crevasse-bridging materials to the party. Both teams were at that time reported well, and regularly carrying out their scientific programme.

INTO THE UNKNOWN

From Cape Selborne, which is about 180 miles south of Scott Base, the dog-teams were to work inland into Victoria Land, and then south for 100 miles, approximately 40 miles from the coastline, to the vicinity of Mount Albert Markham. This group was to carry out geological and topographical surveys, and possibly make a gravity survey.

At the same time the sno-cats were to work along the ice-shelf itself, southwards, working in towards the coast wherever possible, and also carrying out work in geology, gravimetry and mapping. Contact was to be made with the dog-team parties in Beaumont Bay or further south.

Both dog and sno-cat parties were expected to be at Cape Wilson, north of Shackleton Inlet, by the end of the year. This is about 320 miles south of Scott Base. By this time the R.N.Z.A.F. Antarctic Flight should be air-borne and was to support the geological and survey programme.

From Shackleton Inlet the sno-cats would return north across the ice-shelf, examining en route the glaciological lay-out established earlier.

From January 1 the dog teams, assisted by the Antarctic Flight, were to make a reconnaissance of the area between the Nimrod Glacier, flowing into Shackleton Inlet, and the great Beardmore Glacier, the route to the Pole discovered by Shackleton in 1908. They would also carry out as much geological work

and topographical mapping as possible. The general purpose of this reconnaissance was to prepare the way for a more detailed study of the area in the 1960-61 summer, when exploration will be extended to the Beardmore Glacier itself and the areas further to the east.

Throughout all these journeys regular meteorological observations would be maintained. All were to have returned to Scott Base by mid-February.

Two members of the party, Captain P. Hunt and Mr. G. Matterson, will winter over at Scott Base to prepare for an early start in the 1960 season, and the balance of the party will return to New Zealand.

PLANS DISRUPTED

These plans have of necessity been considerably altered by the death of Lieutenant Couzens, the injuries to Gunn and Lowery, and the wrecking of one of the sno-cats.

Lt. Cdr. Lennox-King visited the scene of the accident and forwarded reommendations for the modification of the plans.

The second sno-cat is being left temporarily till a more opportune time to return it safely to base.

All the men now in the field at this spot will work with the three dog teams under the leadership of Mr. Murray Robb, who had been leader of the sno-cat party.

FLIGHTS PLANNED

Weather permitting it is intended to fly the party (complete with dog teams and equipment) by United States Otter aircraft approximately 20 miles east to a crevasse-free area on the ice shelf.

From here they will be picked up by an R4D aircraft and flown approximately 120 miles south to Cape Lyttelton, which is just south of the Nimrod Glacier.

The party will be undertaking topographical and geological work, operating in the coastal mountains between the Nimrod and Beardmore Glaciers instead of, as originally planned, between Barne Inlet and the Nimrod Glacier. They will eventually be flown back to Scott Base by R.N.Z.A.F. Beaver aircraft.

Lieutenant Thomas Couzens, who was 28 years of age, was born in India. His home was in Christchurch. He had been in the Royal New Zealand Armoured Corps for ten years. He served for two and a half years in Korea, where he operated tanks in snow and ice conditions. He had extensive operating and maintenance experience with all types of tracked vehicles. Stationed at Waiouru, he was released by the Army to serve as a driver on one of the sno-cats.

Lieutenant Couzens was a keen and experienced alpinist, and a civilian parachutist. He had studied geology and zoology at the University. He was unmarried.

THE OLD HUTS

The New Zealand Antarctic Division hopes to take the necessary steps to ensure the restoration and preservation of the historic huts in the Ross Dependency: the Borchgrevink and Campbell huts at Cape Adare (1899-1900 and 1911-12), Scott's first hut at Hut Point (1902-04), Shackleton's hut at Cape Royds (1907-09), and Scott's Cape Evans hut (1911-13).

Mr. Athol Roberts, Information Officer at Scott Base, has been asked to report on the work required, and has visited the three huts in the McMurdo Sound area for that purpose. He reports that Scott's hut is packed inside with snow and ice, and that it will be a problem to clear it all out without damaging interesting relics which may be inside.

MEN OF MANY WORDS

The first Constellation bringing mail from the Antarctic to arrive in New Zealand this season carried 60,000 letters for all parts of the world. This averages 300 letters a man for the six months since the last mail arrived.

New Zealand Field Parties Range Far And Wide

In addition to the main southern geological and survey team, parties of New Zealanders are at work on widely varied projects in many parts of the Ross Dependency. These were outlined in the September issue of "Antarctic". Further details as well as news of the progress of the various parties can now be given.

PENGUIN WATCHERS

Mr. G. Caughley, who was to have led the small biological party at Cape Royds during this summer, has been unable to go south, and his place has been taken by Ewen C. Young, lecturer in biology at the University of Canterbury. Young was flown to Royds by U.S. helicopter to join R. H. Taylor, who had been living in Shackleton's old hut for three weeks. Till Young's arrival, Taylor was assisted by Eric Wedgewood as field assistant. Mr. Wedgewood wintered over as cook at Scott Base.

Taylor and Wedgewood had set out from Scott Base at 11.50 a.m. on October 22 with three dog teams to cross the 27 miles of sea-ice to Cape Royds. They were accompanied by four companions. Cape Evans was reached at 5 p.m. on the same day. Here three tents were pitched on the shore just in front of Scott's hut. The night was windy. At 9.30 a.m. on November 23, the teams set off for Cape Royds—or two teams did. The third sledge capsized in pressure ice and had to be unloaded. The other teams had not seen the mishap. Suddenly the dogs made off with the empty sledge across the ice of McMurdo Sound. The weather was poor and visibility only about 200 yards. The two unfortunate sledgers followed the sledge tracks for seven miles, and then found the dogs enjoying a rest. By the time the sledge had been re-packed it was 3.45 p.m., and their worried companions were anxiously awaiting them at Cape Royds.

The support party reached Scott Base on their return at 5.30 p.m. on November 24.

ALPINE CLUB PARTY

As announced in our last issue, an expedition organised by the New Zealand Alpine Club will this summer carry out scientific and mapping work in completely unexplored territory in southern Victoria Land. This party comprises scientists, engineers and surveyors and will use man-hauled sledges during its two months in the field.

The party comprises: R. W. Cawley (leader), B. L. Smith, P. L. M. Bain, C. N. Tyndale-Biscoe, N. C. Cooper, B. J. McGlinchy, M. I. Bolt, R. C. Olliver.

After being flown to McMurdo Sound in United States aircraft, the party moved off on November 18, hauling sledges with full field kit, for a night's camp on the ice-shelf to test equipment.

The expedition, with all equipment, will be flown by American transport to the foot of the Beardmore Glacier, where they will leave 40 days' food and fuel supply as an emergency (The first four flew in on November 24.) They will then proceed with man-hauling sledges to establish an advance depot, arriving there about December 15.

From the advance depot it is planned to carry out geological and topographical surveys within a 25-mile radius.

The expedition will leave the advance depot about December 26, arriving at the Beardmore depot about January 13. From here they will be flown out by R.N.Z.A.F. Beaver aircraft.

UNIVERSITY PARTY

A group of five scientists left New Zealand by air early in November to spend about three months in the dry valleys of Victoria Land. The expedition has been organised by the Victoria University of Wellington and the members will work in the Wright Valley and University Valley (formerly called Victoria Dry Valley) lying inland from Marble Point.

The Leader, Dr. R. W. Balham, the biologist-meteorologist, is no stranger to Antarctica since he wintered-over with the New Zealand Trans-Antarctic party, 1956-58, making several field journeys, including one brief visit to the dry valley area. The deputy leader of the party is R. H. Wheeler, a geographer who will be responsible for the surveying. The two geologists, G. Gibson and T. Allen, with a geophysicist I. Willis, complete the team. This is their first visit to the Antarctic.

The expedition will continue the geological, geophysical and biological work commenced in the Wright Valley last summer by the successful four-man Victoria University team led by Dr. Colin Bull, extending the area covered to the north-west. As before, the party will explore the area on foot after being transported into the valley system by United States Navy helicopter. Using light equipment and small two-man tents, they hope to complete the topographical and geological survey of the 2000 square mile ice-free area.

A major task will be the detailed sampling of the many thousands of feet of geological formations for paleomagnetic studies, since preliminary studies on specimens collected by Dr. Bull have proved to be of great scientific interest.

Prior to leaving New Zealand, Dr. Balham expressed his gratitude for the support received from the University of New Zealand Research Grants Committee, the Antarctic Division of the D.S.I.R., the Ross Dependency Research Committee, and in particular the United States Navy.

HISTORY IN ROCK

In a report to the Council of the University, Dr. C. B. B. Bull, leader of the Victoria University of Wellington Expedition, 1958-59, discusses tests carried out in collaboration with Mr. E. Irving at Canberra on magnetic rocks discovered by the expedition.

The tests indicated that the dolerite samples from the Antarctic area were of the same age as dolerite samples from Tasmania that Mr. Irving was working on.

"If this is the case," said Dr. Bull, "then at the time of the formation of the dolerite, Australia and the Antarctic continent were joined, with Tasmania occupying the northern end of the Ross Sea.

"Irving considers the Antarctic collection to be the most significant suite of rocks measured in the last seven years or so."

Dr. Bull intends to write up the results with Mr. Irving for presentation at a conference of the International Union of Geodesy and Geophysics in Helsinki next June.

It is also intended to make collection of samples a special subject for the 1959-60 expedition.

ANTARCTIC FLIGHT

The Antarctic Flight, R.N.Z.A.F., to operate from Scott Base in support of field parties this summer, will consist of: Sqn. Ldr. Jeffs, commanding officer; Flt. Lt. Cranfield, pilot; Flt. Lt. Rule, pilot; Sgt. Tarr, engine fitter; Sgt. Ferguson, airframe fitter; Corporal Boag, airframe fitter; L.A.C. Johnstone, engine fitter; L.A.C. Hodson, communications fitter—air.

Cranfield and Tarr were members of the Trans-Antarctic Expedition, 1956-58. All have undergone intensive training for Antarctic work during the past few months.

The Flight is scheduled to travel to the Antarctic on U.S.S. "Atka" on December 3.

WHY SHE LEAKED

Deteriorated caulking in the hull planking caused the leak which forced H.M.N.Z.S. "Endeavour" to cut short her recent cruise in the islands and return to New Zealand.

SCOTT BASE TO BE ENLARGED

The biggest construction programme in the Ross Dependency since Scott Base was established in 1957 will be undertaken this summer when work begins on a hangar, a powerhouse and a building for auroral radar at the New Zealand station.

The Ministry of Works is sending to Scott Base a nine-man construction party in December, and aims to have the buildings ready for use by the end of February.

Leading the party will be Mr. Randall Heke, of Christchurch, who was foreman when Scott Base was built. Seven of the nine men will be New Zealand Army engineers.

The hangar for the Auster and Beaver of the R.N.Z.A.F. Antarctic Flight is the largest of the three new buildings. A prefabricated structure, it will hold both aircraft with their wings on.

HEATED WORKSHOP

Perhaps the most welcome feature will be the heated workshop built inside the hangar. Previously, all maintenance on the aircraft had to be done in the open.

The components were made in Australia, and will be sent to McMurdo Sound from Lyttelton in the "Arneb". The steel framework and plywood and canvas lining will be comparatively easy to assemble, but the series of footings, or foundations beneath the walls, may present a difficulty. These will be made up of timber sleepers sunk at least four feet into the ground, which at Scott Base consists of perma-frost—rocks cemented together by hard-packed ice. Therefore, cutting out the footing holes will be like cutting through solid rock.

Blasting is one solution, but a series of explosions could so easily upset the delicate scientific equipment in the main buildings less than 100 yards away that the Architects' Division is investigating every possible alternative.

GENERATOR HOUSE

The new generator house will become part of the Scott Base building and accommodate two new 45-kilowatt generators. Now on their way from Britain, these 2¾-ton generators will replace the smaller machines which provide power for the base. They will be shipped south in H.M.N.Z.S. "Endeavour".

The building, which will be shipped in pre-cut form, will incorporate a workshop and garage space for a snocat, and will provide "heated" storage for five days' emergency supply of kerosene for heating and engines. "Heating" in this case means the all-purpose kerosene will be maintained at a relatively high temperature between freezing point and 0 degrees Fahrenheit.

Teamwork and careful preparation in construction will be essential, since the construction party have only a few weeks in which to finish the buildings. They will be working under difficult conditions at the best of times, and serious delays could be caused by bad weather.

Particularly important will be the marshalling in New Zealand of all components down to nuts and bolts, ensuring all the materials are available, and seeing that they are correctly crated and marked before they are loaded for the Antarctic.

WORK AT BASE

August was a good month at Scott Base with clear skies and low winds. This enabled much outside work to be done, with the returning daylight revealing something of interest every day.

On August 2 about 20 small birds were sighted below 1000 feet over the Base, heading approximately south.

Considerable attention has been given to the movement and character of the ice shelf. A set of prominent stakes was placed on each side of the tide crack in front of Scott Base. The snow pit on the shelf was more clearly marked; the placing of many oil drums on the barrier for aircraft markers had

made the ice-movement drums sometimes difficult to identify.

The whistler programme has been maintained. During magnetic storms the frequency of whistlers is greatly reduced. Weak dawn chorus was occasionally heard during September.

On August 20 there was a record low temperature of —62.9°F. A comparison of meteorological data with data recorded at McMurdo, two miles away, has shown that for the eight months ended August 31, 1959, temperatures at Scott Base were consistently lower than those at McMurdo. At Scott Base the highest September temperature was 5.9°F. (Sept. 2) and the lowest —44.7° (Sept. 19).

During August two dog teams were brought up to field standard, led by Fido and Bowers, and the nucleus of a third team was developed under Blue. In consequence it was decided to send three teams on the southern journey instead of two.

AURORAL RADAR

To extend the investigations by the Dominion Physical Laboratory of the New Zealand Department of Scientific and Industrial Research, of upper atmosphere physics, especially the aurora, an auroral radar station is to be erected on Arrival Heights at Hut Point, McMurdo Sound.

A site 500-600 feet above sea level was chosen and surveyed during August, and the "Endeavour" will take south a radar set with three di-pole directional aerials, two of them 54 feet in height. This will enable the radar beam to be reflected from the ice, just as the beam from the Invercargill station in southern New Zealand is reflected from the sea.

Although the station will be unmanned, the radar equipment will be serviced once a week and housing will be furnished and provisioned in case a technician or maintenance officer is stranded there.

Three electrical transformers for the station have been supplied by the Auckland Power Board in response to a request from the D.S.I.R. With their help power will be supplied from the American Base at McMurdo two miles away.

As long range radio communication depends on waves bouncing off the bottom of the ionosphere and non-interference from such phenomena as the aurora, these investigations are potentially of great practical value, apart from their scientific interest.

The auroral section of the New Zealand programme at Scott Base will be carried out in co-operation with the United States. The Americans will provide a man and equipment: New Zealand will provide men, equipment and base facilities.

WINTER PARTY FOR SCOTT BASE

The following thirteen men have been selected to winter over at Scott Base throughout 1960. Almost all of them are already at the base or in the field, transport having been supplied by U.S. aircraft.

Lieut. Commander James Lennox-King, R.N.Z.N.: Leader. An Aucklander, aged 45, married with two children, Lt. Cdr. Lennox-King, while Resident Naval Officer at Christchurch in 1955-56, was closely associated with the United States Navy's Operation Deepfreeze, and in January-February, 1957, was the R.N.Z. Navy representative with the U.S. Task Force in the Antarctic for seven weeks, visiting McMurdo Sound and Little America. During the Second World War his service included a period with Arctic convoys. He is a Fellow of the Royal Geographical Society.

F. A. McNeill (49), Senior Technical Officer. Mr. McNeill was born at Lauriston, Mid-Canterbury, 49 years ago. Educated at Methven District High School and at Ashburton High School, he joined the D.S.I.R.. In 1936 he spent a year with the Magnetic Survey in the Northern Territory of Australia, and then rejoined the D.S.I.R. During the war he worked on air-borne radar and electronics at Wigram and later at the Defence Development Section at Canterbury College. More recently he has specialised on radio development and electronics at the Dominion Physical Laboratory, Lower Hutt.

D. W. Holmes (22), Hamilton.

C. A. Jenness (21), Lower Hutt.

J. G. Taylor (21), Naenae.

D. W. Webster (21), Petone.

The above four young technicians are all employed at the Dominion Physical Laboratory, Lower Hutt.

Dr. Colin A. Bailey (25) of Masterton: medical officer. Dr. Bailey was born in Adelaide, and came to New Zealand in 1957. He is a house surgeon at the Masterton Hospital, and will not reach Scott Base until January.

P. A. Yeates (38) of Wellington, radio officer. Mr. Yeates was radio officer at Scott Base in 1958.

C. W. S. Kennedy (28), maintenance officer, of Christchurch. Mr. Kennedy is a diesel fitter with the New Zealand Railways. He served in Korea from 1952 to 1955, his period of service including five consecutive winters.

R. J. Buckley (23) of Wellington, maintenance officer. Educated at St. Patrick's College, he is a trained electrician of wide experience, and a keen climber and skier. He has been a leading hand in the Navy Reserve.

W. Mee (41) of Blenheim, cook. Mr. Mee has had 25 years' experience as a cook and baker, including 18 years in the merchant navy, and considerable periods in "5-star" hotels.

Two members of the geological party at present exploring the Victoria Land coast far to the south of Scott Base will also be wintering at the base. They are—

Captain P. J. Hunt (30) of Wellington. Captain Hunt, a surveyor, has been serving with the Royal Engineers since 1948, his service including lengthy periods in Korea, Malaya and, recently, Cyprus. As a member of the Oxford University Spitzbergen Expedition in 1953 he has had Arctic experience.

G. J. Matterson (22) of Christchurch, surveyor. Mr. Matterson is an experienced alpinist as well as a qualified surveyor.

A. R. Roberts has been appointed information officer for the summer season. During this period, Scott Base has many visitors to be looked after—600 visited the base during 1958—a busy post office to maintain, and many Pressmen to satisfy with news of New Zealand activities. Mr. Roberts will relieve the base staff and summer working parties of these tasks. He is well known in mountaineering fields, is manager of the tramping, mountaineering and skiing equipment branch of a Wellington sports firm, and was leader of the New Zealand Alpine Club's first Himalayan expedition in 1953.

Visitor Injured

A dislocated shoulder was suffered by Mr. J. H. George, M.P. for Central Otago, when he fell into a crevasse near the pressure ice just off Pram Point, the site of Scott Base, on October 30.

Mr. George, with three companions, left the United States McMurdo base in the morning in a weasel to photograph seals and study the pressure ice. On nearing the pressure ridge, Mr. George alighted from the weasel, walked a few steps, and disappeared down a crevasse.

His companions found he was about nine feet below the surface. The crevasse was approximately four feet wide, and the snow and ice was so unstable they feared he might plunge down much further.

They hastily tied their scarves together, and Mr. George was brought to the surface suffering considerable pain. On arrival at McMurdo, he was found to have an anterior dislocation of the right shoulder.

AT CAPE EVANS

Captain Scott's magnetic hut at Cape Evans may be "occupied" again. When Young was flown to Cape Royds, "Buzz" Burrows, the geomagnetician at Scott Base, was landed by the helicopter at the site of Scott's old camp and inspected the magnetic hut. He hopes in the near future to occupy the hut for one night and take magnetic observations from the actual pier used by Scott's expedition, as he did once before in February, 1958.

Scientists Study Antarctic Soils

The two-man soil survey party (see "Antarctic", September, 1959) flew to Scott Base in late October and is now at work in the McMurdo Sound-Taylor Valley area.

The party comprises Mr. J. D. McCraw, a pedologist from Central Otago, and Dr. G. G. C. Claridge, a physical chemist from the Soil Bureau Laboratory, Wellington. The two men travelled by tractor to Cape Evans and Cape Royds on November 3, returning on November 8. After a visit to Cape Hallett they left on November 19 in company with Ward and Sandford for Cape Chocolate, travelling in two tractors for a week's work in that area.

The tractors were expected to return to Scott Base about November 25, but McCraw and Claridge will stay in the field till mid-December. They will then man-haul their sledges 15 to 20 miles to Marble Point, from where it is planned to fly them back to base.

The pioneer work undertaken by these two New Zealand scientists is described by Mr. R. E. R. Grimmett in an article in the D.S.I.R. Newsletter.

"Until the IGY project was inaugurated, the Ross Sea Dependency was an unattainable location for the study of soils and soil-forming processes, and in fact it was generally considered a realm of ice where the only exposed land surfaces were of bare rock either too steep to hold ice, or headlands between the glaciers where sea birds and mammals bred in such numbers as to prevent any possible development of plant life or accumulation of covering materials other than guano.

"The discovery however of extensive dry valleys left by melting and retreating glaciers has now provided a new perspective and a terrain where pedological studies are both possible and desirable. Lichens and mosses grow in some places and as they die are initiating the first stages of the organic cycle in soil formation. Other factors in soil formation are operating, such as physical weathering of the rock by moving ice, by freezing and thawing, or by wind; and chemical weathering and leaching by percolating water.

" 'Permafrost' soils, those permanently frozen in their deeper horizons below the topsoils, such as occur over vast stretches of northern Canada, have not so far been mapped or studied in detail in southern polar regions. Will Mr. McCraw find soils of this type in the dry valleys, or are the soil-forming processes under, at most, a scanty covering of mosses and lichens, too rudimentary as yet to have made any visible impress? Here perhaps Dr. Claridge, whose special study has been the chemical changes under varying climatic and other environmental factors, may be able to supplement visual observation with chemical and physical studies of the samples he will specially select and bring back to New Zealand.

FOSSIL SOILS

"Another fascinating field to explore relates to soils that must have covered some parts of Antarctica during previous periods when the ice melted, and higher forms of plant life including even beech trees, as proved by the finding of fossil remains, grew there. Most of these old soils will have been swept away by glacial action, but in some areas portions may have been preserved beneath recent lava flows, terminal moraines of glaciers, or rock falls from mountain sides. Such fossil soils, can they be found, would give an idea of the changes that may be expected to occur in the next few hundred years, should the present melting of the ice continue. They also would be of interest to compare with soils at present found under beech forests in New Zealand and southern Chile.

"Special samples will also be collected of mosses and lichens and the layers of rock or soil immediately under them for study by the soil microbiologists. What kinds of

fungi, bacteria, and microscopic animals, if any, are living on and breaking down the dead remains of these lowly plant communities, and how do they compare with those found elsewhere? The specially collected samples will be frozen and sent back to New Zealand in that condition.

WHERE SEA-BIRDS NEST

"In addition to the stay of some weeks in Taylor Valley it is also planned to make shorter trips from Scott Base to some of the rocky islands and headlands where sea-birds have nested for countless generations, piling up layers of guano, feathers, dead birds, fish remains and other debris, often many feet thick. Some of the lower layers are over a thousand years old. Has there been any microbiological activity during this time, and are there any changes found that would be expected from micro-organisms now inhabiting the surface layers?

"Should time and opportunity permit, Mr. McCraw and Dr. Claridge will attempt to make a sketch map of the Ross Dependency illustrating soil conditions, utilising all the geological and other scientific and geographical information assembled by this and previous expeditions, and superimposing on it soil data obtained by spot examinations in selected areas believed to be representative of the various terrains."

"ENDEAVOUR" HAS ROUGH TRIP SOUTH

H.M.N.Z.S. "Endeavour" left Dunedin on October 6 on the first of her Antarctic cruises for this summer and encountered bad weather almost from the outset. Because of the rough conditions the full schedule of scientific work could not be completed. Work with dredges, trawls and grabs was done in several hundred fathoms of water, sediment samples and bottom dredges being obtained between New Zealand and 57°S.

Calls were made at both the Auckland and Campbell Islands. The underwater camera developed by Government scientists for surveying the Cook Strait cable route was used for oceanographical work during the voyage. Wind gusts of up to 85 knots were recorded.

The scientific party comprised Dr. D. E. Hurley, leader; R. P. Willis, D. G. McKnight and A. Langford, technicians, of the Oceanographic Institute; C. A. Harlen, technician.

"Endeavour" returned to Dunedin on October 19. The vessel is scheduled to leave Wellington for McMurdo Sound on December 27, taking south the new Scott Base party as well as the bulk of the replacement stores. Mr. G. W. Markham, Superintendent of the Antarctic Division, will also be on board.

ROSS SEA CRUISES

The following will comprise the oceanographic and sea seismic party for "Endeavour's" Ross Sea cruises: Lieut. R. Adams, leader; R. A. Garrick and J. S. Bullivant, scientific officers; R. G. Jenkins, technical officer; E. C. French and C. A. Harlen, technicians.

ARTIST ON THE ICE

A second New Zealand artist has been given the opportunity, as a guest of "Operation Deep Freeze" to record his impressions of the Antarctic. He is Mr. Donald R. Neilson, of Wellington, who last year won a Kelleher Prize merit award. He spent ten days at McMurdo Sound in October. While there he was commissioned to paint a plaque commemorating the six men who lost their lives in the Globemaster crash near Hallett Station in October, 1958.

The earlier New Zealand artist visitor was Mr. Peter McIntyre.

AFTER THE PARTY

The party of 13 at Scott Base exchanged visits fairly frequently even throughout the winter night with the Americans at McMurdo. But one New Zealander will not forget the aftermath of one such visit. While driving back home in his weasel he was suddenly thrown out as the vehicle tipped in a crevasse. Inadequately clothed he had to stagger 100 yards to the Base in temperatures about 50 below.

"He just made it but collapsed as he stepped inside," reports Rod Hewitt, the New Zealand party leader. "He was just about a solid block of ice. We had to shove him half into the oven to thaw him out."

DEEP FREEZE 60 A FULLY MECHANISED PROGRAMME

Ships, aircraft, sno-cats and weasels are already on the move mounting the massive United States assault on Antarctica for 1959-1960. But no dogs.

The eight dogs which had been kept at McMurdo from the original forty taken to the Antarctic for Deep Freeze I have all been turned over to the New Zealanders at Scott Base. So the last team has been unhooked at McMurdo and the picket line on the slope below the camp is silent.

It is considered that the occasions when sled dogs can do the job better than any mechanised vehicle are too few to warrant the continued upkeep of a prime mover which, unlike a tractor, has to receive regular maintenance whether it is used or not. The smaller U.S. bases, where dogs might have their place, are all in the interior, where seals are absent, so that dog-food would be a problem. In a valedictory salute to the dogs, the Bulletin of the U.S. Antarctic Projects Office says, "The New Zealanders, who have had great success with dogs, will undoubtedly get good service out of these veterans of ours."

SHIPS MOVING

Ship operations began when the USS "Peterson", replacement for the USS "Brough", assumed her ocean station between New Zealand and Antarctica at the end of September ready for the first flights in October. The picket-rescue destroyer "Peterson" hoped to anchor a weather "fish" about 1100 miles southwest of Invercargill, to transmit weather reports to Invercargill and Christchurch during Operation Deepfreeze flights to Antarctica.

An electronics technician with the American National Bureau of Standards, Mr. Roy Allison, said that the 35-foot canister "fish" would transmit wind speed and direction, barometric pressures and air and water temperatures. It was proposed to moor the "fish" as close as possible to the ice in about 600 fathoms by an anchor and 7000 feet of plastic cable.

Apart from Invercargill and Christchurch, reports of the automatic station would be picked up by the weather stations at Campbell and Macquarie Islands and by the United States Navy at McMurdo Sound.

Adverse weather foiled the "Petersen" in her attempt to anchor the weather station. The ship had to assume her ocean station and weather reporting duties without the additional weather station to augment her reports with information from 300 to 400 miles to the south-west.

Four similar weather stations will be placed at strategic points on the Antarctic continent to aid flight operations.

BELLINGSHAUSEN SEA

Both the American and Russian expeditions will probably attempt to penetrate the Bellingshausen and Amundsen Seas this summer.

The United States expedition will set out in two icebreakers in late January and, if successful in reaching the shore, will conduct limited scientific investigations.

It is possible that a summer camp will be set up and stocked with fuel and rations so that planes can fly there from Byrd airfield.

Plans were made for the Russian ship "Ob" to attempt to penetrate the seas last year but they were not carried out. It is possible that the attempt will be made this year. Rear-Admiral Tyree says that there will be no race. His predecessor, Rear-Admiral George J. Dufek, had received grand co-operation from the Rusians and he was sure that this would continue.

MARBLE POINT AIRFIELD

The United States Navy has drawn up plans for the construction of an all-weather commercial airfield in the Antarctic, authoritative sources said in Washington on October 11.

It would form an air link between South America, South Africa, Australia and New Zealand.

The Navy report was said to estimate the cost of the project, providing runways with an initial length of at least 5000ft. at about 100,000,000 dollars.

If the United States decided to go ahead with the scheme, it was stated, discussions on joint financing might be held with other interested nations.

All action on the report would be delayed until after the results of the 12-nation conference on the future of the Antarctic.

The airfield would be built at a site on Marble Point, about 40 miles from McMurdo Sound.

Officials said that the report, completed after a two-year study, was in two parts. One part dealt with transportation aspects in Antarctica and the future development of the region. The second part dealt with the engineering problems involved in constructing the airfield.

DUFEK'S PREDICTION

Admiral Dufek, now retired from active duty, declined to discuss the substance of the report when questioned in Washington, but he said that he had predicted for several years that commercial airlines would be making flights by way of the South Polar route before 1970. This would link up South America, Africa, Australia and New Zealand and help promote population growth and industrial expansion in the Southern Hemisphere.

Admiral Dufek acknowledged that an airfield at Marble Point was feasible from an engineering standpoint. He also said that any all-weather airfield in the Antarctic should be designed for commercial as well as scientific use.

SENATOR'S VIEWS

Senator Henry M. Jackson of Washington, the first U.S. Senator to visit Antarctica, arrived at the U.S. Naval Air Facility, McMurdo Sound, on October 15. He flew to Antarctica aboard a C-124 Globemaster on a resupply mission from New Zealand for a week-long stay as the guest of Rear-Admiral David M. Tyree.

Senator Jackson is a member of three U.S. Senate committees interested in Antarctica. He expressed his desire to see a year-round airbase established on the Antarctic Continent. "I am particularly interested in the early development of a year-round commercial airport in Antarctica, which will open up air travel between New Zealand, Australia, South Africa, South America, and Asia," he said. He added that jet aircraft would need a refuelling station in the Antarctic to make such trans-polar air routes possible. "At Marble Point," said Senator Jackson, "an air strip can be laid out on land, which is necessary for a year-round station, rather than on sea ice such as at McMurdo."

AIR OPERATIONS

With an enormous amount of cargo to be flown into the various inland bases the air operations from McMurdo were under way by October 1.

Aboard the first United States Navy Skymaster which landed at McMurdo Sound was the commander of Deepfreeze 60, Rear-Admiral David M. Tyree. For the 191 men who had wintered in the Antarctic, the Skymaster's arrival was their first sign of civilisation in over six months. The plane brought them a pile of mail, fresh vegetables, fruit, meat and other stores.

The passage south of the three Globemaster aircraft of the United States Air Force was delayed for several days by bad weather. With 1500 tons of cargo to be dropped on 150 flights it was necessary for the operation to be run on a 24-hour basis. Alternating flight crews kept the Globemasters operating around the clock on supply-dropping missions to the South Pole and Byrd Stations.

Nothing had been landed at the South Pole station for 294 days when the first Globemaster air-drop was made on October 19.

Three days earlier the season's first Antarctic air-drop by the Globemasters was made over Byrd, a 27,000lb. cargo for the station. The Navy also made its first landing of the season away from Antarctic stations on October 16 when Lieutenant E. D. Dryfoose landed his ski-equipped Skytrain at the top of the Skelton Glacier with gear for the traverse party.

ATOMIC POWER DELAYED

A nuclear reactor to provide domestic power in the Antarctic would not now be ready by 1961, Rear-Admiral David M. Tyree said in Wellington recently.

It was generally accepted in the United States that the difficulty and cost of getting ordinary fuel to the Antarctic inland were such that nuclear power should be produced there, Admiral Tyree said.

However there was such competition for a share in the United States financial appropriation that the establishment of an Antarctic reactor could not be provided for by the target date 1961.

He still hoped that at a later date a major reactor would be installed at McMurdo Base, and smaller reactors at two inland stations.

WOMEN SOON?

The barriers of masculine resistance are crumbling and it appears that American women will soon be allowed to visit Antarctica.

The decision is not final, but on the basis of information from both naval and scientific sources it appears that the first contingent may land at the start of the 1960-61 Antarctic summer.

All of the women would probably work at McMurdo Sound, returning home before the winter starts. Several women correspondents might also be permitted to go south.

SCIENTISTS

Most of the women would do scientific research, but at least one would be a Navy nurse. According to naval sources it is felt that if any women are sent down, there should be at least four.

During the preparations for the coming summer, several tempting research projects had to be rejected simply because those proposing to do them were women. This seems to have been the straw that finally broke the back of naval resistance.

When the seven bases built by the United States in Antarctica were set up for the International Geophysical Year of 1957-58, it was not thought worth while to undertake the added work necessary to accommodate women for a project of such limited duration.

Now, however, the United States is embarked on a long-range programme of Antarctic research. The facilities at McMurdo Sound are being developed sufficiently to handle women without great strain.

FIRST VISITS

The first woman known to have landed there was Caroline Mikkelsen, wife of the Norwegian whaling captain, who landed with her husband on February 20, 1935.

Subsequently, the wives of two American explorers, Finn Ronne and Harry Darlington, wintered at Marguerite Bay. The Russians normally carry women scientists on their Antarctic ships, though none are known to have stayed for the winter.

VETERAN'S VIEWS

Mr. Charles Bentley, University of Wisconsin seismologist, who spent two years at isolated Byrd Station, said, "It's time to find out how women would fit into Antarctic life.

"There seems no reason why women should be excluded. Next summer some may be sent to McMurdo. It is one of the bases nearest to civilisation and we have some biological work to be done in the dry valleys nearby.

"That work can and probably will be done by women.

"We were very comfortable there but we lacked something," he recalled. "We all thought: 'Why not take our families down there?'

"There is nothing wrong with the living quarters. The only point is finding out how women would react."

PRE-ANTARCTIC CAMP

Seventy scientists assembled at a camp in Shenandoah National Park, Virginia, for four days of final briefings before representing the United States in the 1959-60 assault on Antarctica. At the September camp, talks were given by many leading American scientists including Dr. A. P. Crary, the chief scientist of the U.S. Antarctic Research Programme, Dr. T. O. Jones, of the National Science Foundation, and Dr. Harry Wexler of the U.S. Weather Bureau.

Six of those being briefed hardly needed it for they will spend their second year on the continent. The groups of men who will be confined in some of the most isolated camps in the world met for the first time in the series of comfortable cottages. Each group was assigned a cottage so that members could become acquainted. They came from universities and colleges and from a number of United States Government agencies.

ACTIVITY AT U.S. STATIONS

POLE STATION

Official flag raising ceremonies at the South Pole Station were held on September 24 at 8 a.m., local time, marking the official sunrise which occurred at 7.18 p.m., September 23, Greenwich time. The temperature was hovering between minus 65 and minus 70 degrees with the wind between 15 and 30 knots as 16 men, seven civilian and nine military, trudged the 1000 yards to the geographic pole from their now snow-covered station to raise the Stars and Stripes over the bottom of the world.

This was the first time that the United States flag had flown from this site since March 21, which marked the official sunset at the Pole. For the last six months the wintering-over party at this station had seen no sunlight and, except for short periods of twilight and dawn, had been in absolute darkness.

The honour of raising the flag was bestowed upon Norman Engle, Chief Builder, USN, and Clarence McKenny, civilian meteorologist. While the civilian members stood at attention, the military group performed the flag salute and at least two faces became rapidly white in the icy wind.

This ceremony not only marked the start of a new year-long day, but it also meant that, after eleven months of complete isolation, a new Deep Freeze group was on its way and that therefore home was only just three short months away.

During the winter, camp remodelling proceeded. The barracks and lavatory facilities were redone earlier in the season and work was under way on the mess hall during May, with most of the lumber coming from the bone-yard: scrap boxes and broken boards that had to be selected in the dark at —89°.

As a result of conservation measures, it appeared that the fuel supply would be adequate until the resupply-drops this summer.

POLE NEWSPAPER

A new rival to "Antarctic" has appeared. This is the "Sastrugi Star", published daily at the South Pole by Willis S. Jacobs, geophysicist.

MIDWINTER

A remarkable mid-winter's feast and celebration was enjoyed by all 17 of the station's personnel. The major contribution to the success of their festival was made by the chef de cuisine, Donald A. Kitchen.

A major problem at the Pole is that of supplying enough snow to the melters for the water needs of the station. Twice a week over 5 tons of snow must be dug by hand in temperatures of 90 degrees below zero and winds of 20 miles per hour, all at an altitude of 10,000 feet above sea-level.

The frequent breaking of the

overhead supports across tunnels and caches and in the buildings has raised doubts as to the safety of the camp for another year. Some of the cache areas built this year have become dangerous to walk through. A Jamesway, used for sleeping quarters, was evacuated on January 31 because of a caved roof. Part of this building was replaced by a building constructed of timber received this year and indications through June suggested that this building would not stand through the rest of the year. Most of the other buildings showed similar problems of sag and collapse. All the available timber had been used for props, along with all of the available pipe, and stacks of oil drums had begun to be used.

PENGUIN AT THE POLE

A real but frozen—and dead—penguin has at last reached the South Pole—to substantiate in some measure the popular misconception about the presence of penguins there.

The frozen penguin was contributed by the civilian scientists at McMurdo Sound and was included in a supply air-drop. The men waiting at the pole searched for 20 minutes for the bird and eventually found it among the snow dunes with a cigarette in its beak.

Some of the 17 men who have been at the isolated station for nearly 11 months had never seen a penguin.

TRACTORS AT POLE

A nine-ton tractor dropped over the South Pole early in November from a Globemaster landed upright and was in use within half an hour of landing. On October 20 a tractor of the same weight was dropped, but this landed on its side and was not put into operaetion quite so soon.

The two tractors will be used to retrieve supply drops and to prepare an ice run-way at the pole ready for next year's operations.

Everyone who serves a tour of duty in Antarctica "goes a little nuts", including men in summer support groups, says Dr. E. Hedblom, now completing his fifth assignment with Operation Deep Freeze.

BYRD STATION

After a long winter, Byrd Station is bustling with activity in preparation for the coming summer operations. The outside work was ahead of schedule despite temperatures of 40 to 60 below zero. Heavy tractors began by digging out sno-cats, food and equipment to be used on the traverse which left the station on November 1.

FIRST AIR DROP

A Globemaster flew the 800 miles from the ice runway at McMurdo to Byrd Station on October 16 to make the first air-drop of supplies in the Antarctic for the 1959-60 season. The drop brought in 700 pounds of mail and 200 pounds of fresh food, the first received by the wintering-over party of ten scientists and technicians and 14 Navy specialists since the beginning of the winter night. The food, mail and 13 tons of oil and gasoline were all recovered without the loss of so much as a single egg.

There was some nice naming in the aircraft crew making this welcome air-drop. The crew included M/Sgt. J. H. Laughter and A/2d D. W. Fruit.

"LITTLE ROCKFORD"

A Skytrain on October 18 landed eight Navy men to re-open the Naval Auxiliary Air Facility "Little Rockford" at approximately 79° 35′ S., 152° 56′ E., which serves as a weather station and radio location point for aircraft flying to Byrd, and as an emergency landing strip for aircraft returning from Byrd to McMurdo.

Of the eight men specially selected for this assignment, all well experienced in cold weather operations, six have wintered over at various stations in the Antarctic. They will be relieved by a new crew about December 1. The facility will be manned until about March 1.

A foot-long Russian dart marked "Return to Moscow" fell from the carcase of a whale being flensed at a West Australian whaling station in August. Russian scientists will later tell the Australians where the whale was marked.

INTERNATIONAL TEAMS ON OVER-SNOW TRAVERSES

The personnel of the traverses planned for the present summer by the United States Antarctic Research Programme, one across Victoria Land, the other from Byrd Station to the Amundsen Sea, are distinctly international in character.

Among the men making the traverses, in addition to the United States majority, are representatives from Holland, Scotland, France, Formosa, the Lebanon and New Zealand.

VICTORIA LAND TRAVERSE

On October 15, a VX-6 R4D8 Skytrain, piloted by Lieut. Earl D. Dryfoose, landed at the top of the Skelton Glacier to make the first landing on open country of the Antarctic Continent for the 1959-60 season. Brought in on the flight were food, fuel, explosives, and spare parts to establish a cache for this scientific expedition by sno-cat into Victoria Land. By October 18, four supply landings had been completed at the Skelton Glacier cache.

The traverse party itself set off from Scott Base on October 16 for the four month overland journey. Temperatures were moderate at —5°F. The party's three specially equipped sno-cats headed across the Ross Ice Shelf laden with food and fuel for 40 days. Caches and air drops will be used along their 1600 mile route for resupply. Flights to parachute supplies will take off from the Naval Air Facility, McMurdo Sound.

The leader of the party, Frans Van Der Hoeven of the Netherlands, said the trip will be for geological purposes; seismic soundings, ice cores, establishment of mapping control points, elevation readings, magnetic studies, gravity readings and weather observations are on the schedule.

Six Americans, including a navy photographer and a navy mechanic, a New Zealander and a Frenchman are also on the trip. On October 19 Al Taylor, a United States scientist, and M. Claude Lorius, the French meteorologist, joined the traverse party near the foot of the Skelton Glacier after being flown out by a DC4 aircraft from McMurdo. On the previous day the sno-cats had experienced some trouble with pressure ice, making only six miles progress.

During the traverse which is sponsored by the U.S. Antarctic Research Programme, the men will eat their two daily meals inside the "chow cat", heating them in portable gas stoves. Six of the men will sleep inside sno-cats and the remainder in tents. Scientific work and travelling will take place on alternate days.

PSYCHOLOGIST ON TRAVERSE

In addition to the rigours of the land traverse the party is also being subjected to the close scrutiny of a psychologist, William Smith of the U.S. National Science Foundation.

The psychologist's aim is to observe the tensions and irritabilities that arise when the team is nearing dangerous area—and exhilaration the men exhibit when the danger has passed.

He will be watching for the effect an air-drop of supplies will have on the party's behaviour—how they will react to fresh laundry, fresh and new foods, and new faces.

TRAVERSE ROUTE

From the top of the Skelton Glacier the party will travel into the heart of little-known Victoria Land to approximately 71 S. 140 E., then head for the rendezvous point in February with VX-6 aircraft at the top of the Tucker Glacier for return to McMurdo. The sno-cats will be cached for future use.

PROGRESS

Arnold Heine, the New Zealander with the traverse party, reported on October 23 that the party was 160

miles from Scott Base. Two days earlier the sno-cats had left Station 57 (79° 05′ S., 169° 05′ E.) and moved west towards the Skelton Glacier. The weather had been "pretty poor" with blizzards and white-outs. The surface for the last 100 miles had been very rough, and the sno-cats had been travelling in third gear at three to four miles an hour; with fuel consumption one mile per U.S. gallon. Temperatures were from —13°F. to —22°F.

"As we could not use the heaters in the sno-cats very much," he radioed, "we have no way of drying our clothes except to sleep in them . . . It is no fun sitting up on top of the detector cat watching the astro-compass in a blizzard, or driving with your head out of the window under the same conditions, trying to find the hour-old track of the sno-cat ahead.

By November 27 the traverse had reached the foot of the Skelton Glacier, 79° S., 162° 15′ E.

CHARCOT BY CHRISTMAS

Once up the Skelton Glacier and on the polar plateau the party will swing north, continuing their scientific work on a line parallel to the Victoria Land ranges lying to the east. They may spend Christmas in Charcot Station, a deserted French base 1000 miles from McMurdo Sound.

The French member of the party, Claude Lorius, said the party hoped to reach Charcot Station by Christmas and then travel about 900 miles back to the Tucker Glacier, near Cape Hallett, by February when they would return to McMurdo Sound by aircraft.

M. Lorius, who spent 1957 at Charcot Station, said it was closed down at the end of the International Geophysical Year but food supplies and equipment had been left there.

"I think I could find the base as it was well marked by the last party," he said.

The French have only one base in the Antarctic this year—Dumont D'Urville on the Adelie Coast, about 200 miles from Charcot Station. It is manned by 12 men, compared with 20 during the International Geophysical Year.

BYRD TRAVERSE

The truly international eight-man traverse party is led by Mr. Jock Pirritt, of Scotland, scientific leader at Byrd Station. As glaciologist-geologist, he seems to enjoy the cold temperatures after the heat of his last job as Chief Geologist for an Australian Oil Company in Timor. After spending two consecutive years in Antarctica, Jock will have crossed Antarctica by vehicle once the present traverse reaches the coast in the Amundsen Sea area, for he was stationed at Ellsworth before crossing to Byrd Station.

Included in the party is George Doumani, a glaciologist-geologist from Beirut in the Lebanon, and Frank (Feng Keng) Chang, in charge of seismology, from Formosa. The six American members are as follows: Bill Chapman, a topographic engineer from California, who has been on two previous traverses; Gerard Bennett, a mechanic who has spent many months in the Arctic, plus two previous traverses; the radioman-cook Keith Marks who spent the winter at Byrd Station conducting research into atmospheric radio noise; and Howard Levaux. An aurora observer in the dark months, Howard switches over to help the seismologists in the summer.

Two other Americans will join the party in the field: they are Eugene A. Boudette, a geologist from New Hampshire, and Perry E. Parks Jr., a geophysicist from Georgia.

They will continue the exploration of the area around the Executive Committee Range, first reached lost year by four members of the present traverse group. They will then swing north-west to the Mount Petras area, then to the eastern end of the Hal Flood Range, then south to mile 40 of the Army-Navy Drive and back to Byrd Station. In all the traverse will cover about 1100 miles.

The party will make seismic and geological studies of the ice along the route, record elevations of the snow surface and fix the position and elevation of all mountains and nunataks. If time permits additional surveying will be done along the coastline.

THOMAS COUZENS

who on November 19, 1959,
joined the company of those who have given their lives
in the exploration of the Antarctic.

Hallett Station

August was the coldest August yet recorded at Hallett. A new "low" of —54°F. was set. The average temperature was —24°F. Both these figures broke the existing record by 7 to 10 degrees. The weather however was clear and calm.

Auroral activity was observed on 19 of 26 nights. Observations were taken on the sea ice a mile and a half from the station. The purpose of this was to study the extent of the evening auroral displays low on the horizon (bearing 80 to 120 degrees) otherwise blocked from view by Hallett Bluff.

A weasel was lost through the ice while on a field trip scouting for seals on September 7. On the 30th, four seals were found, about four miles seaward. Branding attempts were unsuccessful owing to the cold temperatures.

The pre-fabricated hut built for the abortive Coulman Island trip (see September "Antarctic") has been erected at the eastern end of the Hallett rookery. It is intended to use it as quarters for biologists studying penguins and skuas during the summer.

Favourable September weather permitted completion of the landing strip: there was 55 per cent of the possible sunshine. Temperatures averaged —14.5°F., with a maximum of 6°F.; 11.1 inches of snow were recorded.

NEW ZEALANDERS FOR HALLETT

The three New Zealanders to winter at Hallett Station during 1960 will be

R. B. Thomson (32) of New Plymouth. Born in Raetihi, Mr. Thomson is an experienced radio serviceman, and spent the year 1958-59 as Senior Ionosphere Observer at Campbell Island. He will be the Scientific Leader at Hallett Station, 1960.

D. W. Farmer (27) of Manurewa. For six years a bee-keeper, Mr. Farmer has been a technician in the N.Z. Broadcasting Service, and during 1956-57 and 1957-58 was an ionosphere observer at Campbell Island.

R. F. Brown (33) of Pukerua Bay. Born in England, Mr. Brown came to New Zealand in 1952, after serving as an air-mechanic in the Fleet Air Arm during the war. He is a technician with the Ministry of Works.

MERCY FLIGHT CRASH

A United States Navy Dakota, landing at Hallett Station with medical aid for an acute case of appendicitis on September 15, cracked up on the ice runway.

The starboard landing gear collapsed after the Dakota touched down. The starboard propeller was ruined, and the wing will probably require replacement. Nobody was injured.

The flight was arranged for the Dakota to take the Hut Point medical officer to assist the Cape Hallett medical officer. The operation was successful.

ADELIE LAND

During the winter months the regular scientific work was carried out at Dumont D'Urville Base. In addition, the weasel and the sno-cat were checked over in readiness for the proposed traverses to points B1 and B3, five and twelve miles respectively from the base. The journeys will be chiefly for glaciological measurement purposes.

Mean temperatures during June, July and August were, respectively, —18.2, —16.2, and —17.9. The lowest temperature recorded during these months was —33.2. September brought the highest wind-speed for the year so far, 148 miles per hour.

Radio contact was maintained daily with McMurdo, Mirny and Kerguelen, weekly with Scott Base, Wilkes and Roi Baudouin Base, and twice monthly with Showa.

On July 14, France's National Day, a thick blizzard moving at 136 miles per hour confined twelve Frenchmen to their hut. They could not even hoist the tricolour in this gentle zephyr.

NEW MEN

Preparations have been completed for the departure of the tenth French Expedition to Adelie Land. Loading of the "Norsel" began at Le Havre

on October 12 and the departure date was October 18. The wintering over party of 14 for 1960 will join the ship at Tamatave in Madagascar. The Leader will be Alfred Faure, a meteorologist. Of the others, Henri Boujon, a meteorologist, wintered at Port Martin in 1950. The summer party includes Professor Bellair, geologist, and Jean Prevost, biologist, making his third visit to Adelie Land. There is also a helicopter group of three under Captain Toupelin.

France aims to maintain her Antarctic activities on a level with those of other nations, and it is estimated that approximately £400,000 will be spent next year.

On October 2 an appendicitis operation was successful performed at Dumont d'Urville Base.

The journey to Balise (Beacon) B3 on the edge of the plateau was carried out under excellent conditions. Not only was the planned glaciological work accomplished but a snocat which had been snowed up at B3 was dug out, repaired and brought back to the base.

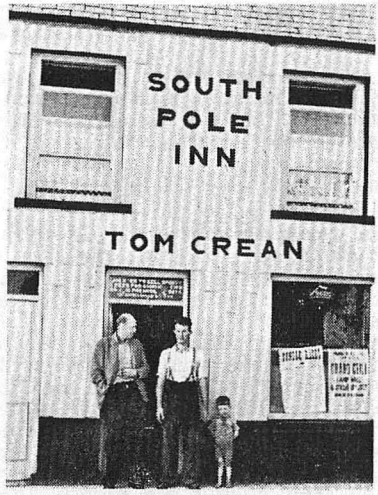
POLES AT OASIS

Oasis Station, which was occupied for a short period last summer by a six-man Polish expedition under Wojciech Krzeminski, will be reoccupied this summer by an enlarged group of ten men. The programme of work of this second expedition will be co-ordinated with the Soviet programme.

In addition to work previously carried out at the station, the Polish scientists plan to conduct gravimetric observations, to measure the carbon dioxide content in the air and to determine the radio-activity of precipitation. Ionospheric observations will be expanded and ozone measurements conducted.

(STOP PRESS)

A message from Warsaw dated November 21 says that the Polish expedition will not sail till 1960 because of an expense-cutting campaign.



When Dr. R. B. Robertson (left), author of "Of Whales and Men", was motoring htrough Kerry, Ireland, last year, his attention was caught by this inn sign. Tom Crean, famous veteran of Scott's two expeditions and of Shackleton's great 1914-17 venture, died many years ago, but the present proprietor is his nephew (centre).

Dr. Robertson writes: "When Tom returned from his last expedition with Shackleton, and achieved his life-long ambition to own a Kerry pub, he spent a long and happy retirement, re-sailing and re-sledging his famous journeys every night over a pipe and a glass of grog. In his old age he seems to have become almost as well-known in Kerry for his good nature and cheerfulness as he once was known down south for the same qualities."

—Photo: Katharine Tweed Robertson.

A MAWSON STORY

Once when the great Australian explorer, Mawson, was about to set out on a geological journey, he developed a painful abscess in the ear. "You cannot go off like that," his friends protested; "what will the doctor say?"

Mawson thought it over. "It will do my doctor good to have a holiday," he said. "I'll take him with me."

And he did.

WILKES STATION

The weather for August was generally good, total sunshine 72 hours, precipitation recorded on 18 days, total snow accumulation since the first of January, 111 inches, maximum wind gust 78 knots.

Forty-nine day old sea-ice bordered the coastline, and was 28 inches thick. Snow drifts in the station area continued to increase in size and the seismic vault was completely buried. There were almost daily sightings of giant petrels in the vic nity. These birds could frequently be observed feeding from the blubber, entrails and other choice delicacies of the 13 Weddell seals killed for dog meat. Some 200 fish were caught in a locally manufactured fish trap during the month, these specimens being kept for penguin feed during 1960, when another series of experiments and observations will be carried out on the Adelie by the resident biologist, who, incidentally, has elected to remain for a second year.

Auroral activity was observed for nine nights. The Wilkes repair shop had a most productive month with overhauls and repairs completed on the sno-cat and one weasel. Fresh water continued to be pumped from the frozen lake east of the station. Ski-ing enthusiasts enjoyed relatively good snow conditions on two weekends, which, says Dingle, "probably accounts for the increased seismic disturbances recorded during August."

IN SEPTEMBER

September temperatures were +7.7°F. maximum, —32°F. minimum, maximum wind gust 72 knots, total sunshine 110 hours. Precipitation was recorded on 19 days. The weather was generally good although surface temperatures were well below average. The 79 days old sea ice had a thickness of 34 inches and open water was within three miles of the coastline, with the western horizon clearly defined by a continuous line of pack ice.

There were daily sightings of giant petrels; one banded specimen was captured which was banded at Wilkes during April, 1957. Weddell seals were now appearing in increasing numbers and several bulls were killed; the stock pile of seal meat assures generous rations for Wilkes huskies for the next five months.

Excessively cold temperatures during the month finally sealed the water hole and another hole had to be opened to ensure water supplies for the remainder of the year.

The weasels were prepared for the forthcoming field programme between the base and the ice cap station some 50 miles inland. Penney and Underwood braved the elements to explore the islands south of Wilkes with a dog team. This sledging venture was prematurely terminated by weather and doubtful sea ice conditions. However, O'Brien Islet, Odbert Island, and the Robinson Ridge were visited.

Lengthening hours of daylight encouraged sporting activities on sea ice. Wilkes residents have successfully discovered a method of brightening cricket from the spectators' point of view; but unfortunately there are no spectators.

A BUSY OCTOBER

October weather was generally unsettled. Vincennes Bay appeared to be clear of ice but the Windmill Islands, south of Wilkes, were still joined to the main coastline by a narrow belt of fast ice.

Wilson's storm petrels returned on the fifth, skua gulls on the 12th and Adelie penguins on the 15th.

Weasels travelled some 400 miles during the month, transporting working parties and supplies to the ice cap or satellite station. Four men sampled the discomforts of the satellite station for a brief period during mid-October, but finally abandoned their work programme owing to dangerous concentrations of carbon monoxide which the power plant had introduced inside the snow tunnel and living quarters. The satellite station was again visited in late October to modify and attempt to overcome the problems encountered by the previous party. One weasel had to be abandoned 32 miles from Wilkes on the return trip with suspension troubles.

RUSSIANS BEGIN GREAT PROBES INTO CENTRAL ANTARCTICA

With the coming of spring, some of the over-snow journeys planned by the U.S.S.R. for the present season have already got under way. Meanwhile, ships are bearing members of the Fifth Soviet Antarctic Expedition towards the coastal stations of Mirny and Lazarev.

One hundred and twenty men will winter over at Mirny and three other stations. Among them are two scientists from Czechoslovakia and three from East Germany.

The expedition left Leningrad on the diesel electric ship "Ob" early in November. "Ob" is expected at Capetown about December 5, and at the Australian station Mawson about Chriistmas time.

Another diesel ship, the "Kooperatsia", was expected to sail at the end of November with further supplies. She will then bring back most of the members of the Fourth Expedition.

An unconfirmed report suggests that the Soviet Union may use its brand new atomic powered icebreaker "Lenin" to smash a way through the ice pack to set up a new base on the Thurston Peninsula, where off-shore ice has defied all previous attempts to break through.

NEWS FROM THREE SOVIET STATIONS

At Mirny in June 59 radio soundings were accomplished; mean altitude of soundings 10 miles. An installation was erected for radiosounding in strong winds and a veiling searchlight put into operation for the determination of the clouds' lower level and the upper limit of the low snowstorms. The maximum air temperature was —15° on June 3 and 4; minimum —27° on June 27. Maximum wind velocity was 33 m/sec on June 7.

A snowstorm on June 4 completely buried the earth currents pavilion. Only on June 11 the entrance to the pavilion could be cleared.

WINTER JOURNEY

On June 5 the work of the autumn-winter inland traverse was accomplished. The traverse was made on Penguins along the distance of 91 miles from Mirny. The weather was mostly overcast with strong snowstorms and snowfall. The wind was mostly south-easterly with mean velocity 20 m/sec. Maximum temperature air —18.1° on June 3; min. —41.1° on June 1. On June 25 the Penguin train, after a 78-day traverse, arrived back at Mirny. The men who took part in the traverse were medically examined. Their health was found satisfactory.

On the Drigalsky Island glaciological field observations were carried out. This party was returned to Mirny by aircraft.

On the night from June 23 to 24 a section of the barrier to the east of Cape Khmara collapsed into the sea, resulting in formation of several icebergs.

In June an exchange of information on ionosphere and aurorae was established with Wilkes Station.

JULY AT MIRNY

The preliminary processing of seismic soundings on Drigalsky Island was accomplished. Samples of ice were taken from an overturned iceberg.

Preparations were carried out for the spring-summer traverse on Penguins 91 miles inland in the direction of Vostok Station.

An operation was performed for a gangrenous appendix. Vitiminisation and quartz-lamp treatment were carried out. At Mirny and Vostok the acclimatisation of the human organism was continually studied. The general medical condition of the

wintering party proved satisfactory. The main bulk of complaints were still dental and traumatic.

Scientific contacts and exchange of scientific materials and information were maintained with other stations in Antarctica. In July a weekly direct radio exchange of scientific information on cosmic rays and aurorae (visual) was established with the Japanese station Showa.

During July preparations were being carried out for the main traverse Mirny - Komsomolskaya - Vostok-South Pole-Pole of Relative Inaccessibility-Lazarev or Mirny; and also for a traverse inland to station Vostok.

An Australian journalist claims to have heard from a top-ranking Soviet Antarctic scientist that a 12-man Russian party using three 35 ton Kharkovchanka "house tractors" expects to reach the South Pole "during the second half" of December. The Americans living at the Pole are said to be preparing a big welcome for the Russian team.

VOSTOK

At Vostok Station in June and July respectively, the temperatures were: Mean, —66.3°, —68.4°. Maximum, —53.7° (June 4), —50.1° (July 30). Minimum, —77.6° (June 2), —79.5° (July 23).

The maximum wind velocity in June was 10 m/sec. In July the wind direction was mostly SSW. Radio soundings were continued during the Polar night, with a maximum June altitude of 58,990 feet. The minimum temperature of air registered at the maximum altitude of radio sounding was —84.7°.

The instruments operated without fail even at —79.5°.

LAZAREV

Temperatures in June and July were: Mean, —18.3°, —21.4°. Maximum, —7° (June 10), —7.8° (July 26). Minimum, —36.4° (June 24), —37° (July 4).

The maximum wind velocity in June was 37 m/sec., with gusts of 45 m/sec., on June 3; 55 m/sec. on July 6. The mean wind velocity in July was 15 m/sec. The direction of the wind was in July mainly ESE. Days with storm were June 17 (6 being hurricanes), July 20 (11 hurricanes).

SPRING JOURNEYS

The Soviet expedition has already launched two journeys into the interior of the Antarctic Continent with the coming of spring.

The main expedition is travelling in three snow vehicles from Komsomolskaya, heading towards the South Pole. A tractor sledge train from Mirny reached Komsomolskaya, 540 miles south of Mirny, on October 19 with diesel fuel, food, scientific equipment and other gear for the expedition. Komsomolskaya had been closed down for the seven months during the winter.

In addition to the three powerful sno-cat type vehicles, the Russians have two caterpillar tractors and ten towed sledges. The total weight of the train is more than 400 tons.

A second group is heading for the South Magnetic Pole from Lazarev Station. On October 21 it was reported to have already travelled 130 miles under difficult conditions. The main purpose of this journey is said to be the collection of information for a map of the Antarctic.

The Russians are basing much of their exploration on aerial surveys, and parachuted supplies which were dropped during the previous month.

Five aircraft will make a series of crossings of the Antarctic to study the relief of the surface and that of the bedrock under the ice, and will fly field parties to different parts of the continent. The expedition's programme includes ice, weather, magnetic and other studies.

LONG FLIGHT

Tass reported on November 1 that a Soviet aircraft from Mirny had flown over 4,200 miles and discovered two new mountain ranges over 9,900 feet above sea level in 72°S., 16°E. The aircraft, piloted by Boris Osipov, visited several Soviet bases, including Lazarev, as well as the stations Roi Baudouin (Belgium), Shoya (Japan), Mawson and Davis (Australia). On board was Alexander Dralkin, head of the Soviet expedition. More details of this flight are given in our report from Mawson Station.

HOW RUSSIANS BUILT LAZAREV

The siting and erection of the new Lazarev Station on the Princess Astrid Coast earlier this year is thus described by L. I. Dubrovin in the "Bulletin of the Soviet Antarctic Expedition", No. 7.

"On March 10, 1959, at 6 p.m. Moscow time, the flag of the Soviet Union was raised over a new scientific station in Antarctica named Lazarev Station. The station was established in the Atlantic sector of Antarctica, on the shores of Princess Astrid Coast at 60° 58.2′ S. and 12° 55.4′ E.

69°

"Establishment and erection of the station were effected under very difficult meteorological conditions. The expedition groups and the crew of the "Ob" who carried out this operation under the direction of A. I. Dubinin, the master of the icebreaker, worked under winds of gale force and snowstorms.

"The 'Ob' left for the point where the new station was to be established on January 30. Having forced the ice belt and reached open waters, the 'Ob' followed the ice fringe westwards to the shore of Queen Maud Land. On February 2, at a point 63° 44′ E., the ship forced the ice belt and reached Mawson Station, where she left fuel stores for planes which are to fly from Mirny to Lazarev. On February 8 the 'Ob' turned southward to a shelf glacier situated to the north of Schirmacher Oasis, between 10° and 14° E.; on account of poor visibility, however, the ship was not able to resume its course until February 10, when the shelf glacier was discovered; its location appeared to be much more to the east than indicated on the map.

AT THE ICE EDGE

"The ship reached the base of the shelf from the western side and stopped at about 13° E., near an ice junction about 10-12 miles wide and four to four and a half feet thick. A few rocky mountains and nunataks were seen to the south, at a distance of 18-25 miles. No bed-rock was found under the ice at the point where the ship anchored. The 'Ob' inspected the western fringe of the ice shelf; its dimension and configuration vary very much from those indicated on the map. The inlets and bays in the shelf glacier were found to be unsuitable for permanent anchorage and for the use of aircraft because the ice barrier was nowhere lower than 50 feet. During the whole day there was a gale blowing, with a wind force 10-11 Beaufort Scale.

"During a short improvement of the weather, on February 11, a helicopter and an aircraft were used to look for a likely site for the station. Up to 4° E. no traces of bed rock were seen. The heights shown on the map at a point 4° 25′ E. were found to be ice-domes. To the west of 9° E. and to the east of the ship's anchorage, beyond the shelf glacier, many icebergs were noted, and beyond the ice junction—solid ice. The western fringe of the shelf, near its junction with the continental ice was found to be the most suitable place for the establishment of the station. A preliminary inspection showed that here could be found a section of the shelf lying on the continent. The transition from the shelf to the continental ice is here smooth, and small crevasses on the way to the continental mass can be by-passed easily.

ALL ASHORE

"The unloading of the ship began on February 14; it had to be stopped next day, however, because the freshening east wind reached gale force at 8 p.m. Visibility became greatly restricted. To withstand the wind it became necessary, in addition to ice-anchors, to use the engines. Soon the junction ice began to disintegrate. The section of ice

on which the helicopter and tractors were standing broke off and was carried away. The men caught by the gale on shore had to shelter in gullies.

"As soon as the gale passed, work on the erection of the station was resumed, but the operations were still difficult owing to bad weather. Almost every day there were gale-force winds in the region where building was going on; at times the wind turned into snowstorms. Thus on March 5, wind velocity reached 35-40 metres per second, at times 50 m/sec. The ship which was ice-bound, the ice being six inches thick, was torn away from three ice-anchors but did not drift to a considerable extent owing to the more solid ice astern stopping her.

"However, neither storms nor hurricanes prevented the men of the party from completing their task; 900 tons of various equipment, fuel and materials were unloaded on to the shelf glacier. On March 10 the erection of Lazarev Station was completed. Seven men making up the wintering party remained there with J. A. Krutchinin, aerological engineer, as leader.

INLAND JOURNEY

"While the unloading of the ship and the building of the station were going on, geologists led by Professor M. G. Ravich made a detailed study of the eastern part of the mountains on Queen Maud Land between 13° 13′ and 18° 37′ E., over a distance of 140 miles. The total length of itinerary covered by aircraft was 750 miles. Landings were made at 12 points and surveys by geologists were carried out on foot. The scientists made some geographical discoveries and collected a considerable amount of specimens. Thus, in the area of 72° 04′ S. and 18° 37′ E. they discovered mountains not appearing on the maps. In quite a few places cone-shaped jagged peaks with well-defined slopes rise over the ice shelf to a height of 1500 to 5000 feet, or 9,500 to 13,000 feet above sea-level. At a height of 8,800 feet lichens were found on stones. In rock crevices nests of stormy petrels were found.

"Important work was also carried out during this period by other members of the expedition. On the way from Mirny to Lazarev, over a distance of 2860 miles, continuous echo soundings were made, resulting in the discovery of a new sand-bank. A detailed description was made and mapping of the ice carried out during the voyage. By means of radar all icebergs encountered within a radius of 30 miles were recorded; 250 instrumental measurements of icebergs were made. Meteorological and hydrological observations were carried out regularly, as well as research into physico-chemical properties of the ice, and other work.

"The erection of the station having been completed, the 'Ob' weighed anchor and sailed northwards."

JAPANESE MOVES

The "Soya" started her fourth voyage to the Antarctic on October 31. She carried 36 JARE members led by Dr. Tatsuo Tatsumi. This number includes the third wintering team of 12 to 15 persons led by Dr. Tetsuya Torii.

"Soya" also carries two Sikorsky S-58 helicopters for transporting cargo at Showa Station. It is planned to transport 60-80 metric tons of store goods. There are two Bell 47G-2 helicopters as on the 1958-59 expedition; but in exchange for a Beaver aircraft, an amphibian motor-boat newly designed is shipped. Eleven sledge-dogs will be added to the five now at Showa Station.

The wintering team 1959-60 has chiefly carried on aeronomical observations, and the next team 1960-61 now on board the "Soya" will perform geographical researches especially in continental trips. The total distance, it is estimated, will be over 3,000 kilometers.

The average age of the 36 men in the new expedition is 31. Thirteen have had previous Antarctic experience.

"Soya" is scheduled to arrive at Showa Station on November 28 and to leave for Japan on February 21.

AUSTRALIAN STATIONS PREPARING FOR SUMMER ACTIVITIES

Australian wintering-over parties at Mawson, Davis and Wilkes have been making ready for extensive field journeys, and already a number of journeys have been made to outlying areas for observational purposes.

AT MAWSON

The weather in July and August was varied. After an unusual calm on July 24 when the wind averaged three miles per hour, came the Mawson record blow at the start of a heavy blizzard on July 28, when the wind averaged 77.7 miles per hour for the 24 hours, and gusted repeatedly over the century. The highest blast was 124 m.p.h. Total drift obscured the station for eight days with one day's respite on the 30th, when the huge snowdrifts could be tackled and damage assessed. The wind had torn a pair of aircraft floats each weighing 400 lbs. from their lashings, and hurled them against the hangar, and caused some walls to be punctured by airborne crates of stores. All such winter blizzards find ways of entering the huts, blocking flues and ventilators, breaking power lines and causing constant work and vigilance. This particular blizzard even found a way into the hollow wings of a Beaver aircraft which required three days subsequent thawing.

During the blizzard the disastrous fire recorded in our last issue occurred at Taylor Glacier. The two occupants, Norris and Onley, managed to save some blankets, and kept warm in the second small hut until a search aircraft arrived from Mawson.

The first three weeks of August were relatively warm and windy (mean temperature 7°F.). There was a fine display of Mother of Pearl cloud on August 13, coinciding with a similar phenomenon reported by Norwegians, 1800 miles away.

There was a good deal of sledging, flying and other field activities during August. Survey cairns were built on a number of islands.

September started with temperatures falling to 60°F. below freezing, and proceeded to a fortnight of almost incessant blizzard which built up huge snowdrifts. The mean temperature was 3.5°F.

October brought fair weather with a mean temperature of +10°F., a minimum of —7°F., and a maximum of +25°F. The sea ice was still more than sixty inches thick. The islands were alive with Adelie penguins and all the remote Emperor colonies now had their creches of optimistic and well developed chicks.

FLYING AND SLEDGING

October allowed 72 hours of flying, including fuel depoting runs to Beaver Lake, Casey Bay and King Edward VIII Gulf. On the last of these, in a sudden white-out, both planes made a prudent landing on sea ice at Crooked Island, and waited for an improvement in the weather. The incident fully and successfully tested the emergency gear and rations provided for such occasions.

There were also some reconnaissance flights to find suitable sites for inland airstrips. A potential strip was located at 4500 feet near Mount Twintop. A small tractor train went out to equip and establish this emergency strip.

Following several weeks' work lashing sledges, repairing tents and sewing harnesses, Budd, Macklin and Kirton left Mawson for Foldoya with two dog teams on October 17. The objects of the journey were collection of data on human physiology, counting Emperor penguins at Taylor Glacier and Foldoya, trial of certain new sledging rations, and weather observations. All objects were achieved in a journey lasting

12 days including nine of travel over sastrugi and soft snow on sea ice, covering just over two hundred miles. The return from Taylor to Mawson was done in two days. Men and dogs returned in excellent condition.

RUSSIANS VISIT MAWSON

After delays caused by bad weather, a Russian round flight between Mirny, 850 miles east of Mawson, and Lazarev, 1400 miles west of Mawson—the longest so far attempted by Russian aircraft in Antarctica—began on October 12. It was originally planned to take place before the winter.

The Russian IL.12 aircraft left Mirny in heavy drift, and with constant Mawson radio contact and the use of Mawson's radio beacon for the last 90 miles, partly through difficult white-out conditions, landed safely at Mawson at 3 p.m. The Australian party had a strip of 1250 metres clearly marked on the sea ice west of the station and provided directional flares and an escort to a prepared tie-down.

The flight continued on Monday, October 19, after bad weather had prevented flying beyond Mawson.

The Russians, including their leader, Alexander Dralkin, remained at Mawson a whole week. They joined in the normal activities of Mawson, including air operations and a short expedition inland by tractor. The plane returned to Mirny and on Friday, 16th, an IL.2 (DC3-type) aircraft with a crew of six, flew from Mirny to Mawson. They had a very rough time passing over the enormous Lambert Glacier, at one point dropping 1850 feet in two seconds, and landed at Mawson with some relief. For three days Mawson remained the only fair weather port on the coast, but on Monday the weather had improved sufficiently to allow the IL.2 to leave for its next stop, the Belgian Roi Baudouin Base.

The plane returned to Mawson from Lazarev on October 30, bringing goodwill gifts from the Belgian Roi Baudouin base. The Russians stayed only four hours before flying on to Davis en route for Mirny.

AT DAVIS

An intercom system set up between the mess room and the radio meteorological hut is a time and leg saver and also enables the men to listen to the news, as the aerial for the receiver in the mess is not as good as the one in the radio room.

A very severe radio blackout lasting from the 10th to the 22nd July isolated Davis completely from the outside world, even from its Antarctic neighbours. A seal was shot for dog food as the reserve was getting low.

On July 5, four men went by tractor and sledge to Weddell Arm on the sea ice; and on foot to Lakes Dingle and Stinear to measure the water temperature. To their amazement Lake Dingle was completely frozen to a depth of three inches and Lake Stinear was frozen in patches along the edge to about two inches.

VISITORS FROM MAWSON

On September 14, the Beaver aircraft left Mawson for Davis but had to return on account of radio trouble. However, on the next day, Sqn. Ldr. Sandercock made it and safely landed on the sea ice. With him were McIntyre, who was to stay and service the aircraft, and Lawrence, who came to repair some parts of the Mawson generating plant requiring the Davis machine tools. All the Davis men were given a flight over Soersdal Glacier, Vestfold Hills and the pleateau. On the 22nd, Sandercock and Lawrence departed for Mawson, and next day the other Beaver, flown by Fl.-Lt. Banfield, came over. Stinear (geologist) and Armstrong (surveyor) were passengers; they had an extensive programme to cover at Davis.

On the 27th Armstrong and Torckler were flown to the Rauer Islands and camped there for three days and nights getting an astro-fix. On the 31st, Braunsteffer found six species of mosses and lichens in the Rauer group.

On October 5 Davis registered its lowest temperature,—30°F.

DOMESTIC TRAGEDY

Steiger reports that "On the 7th, little Don, the male of our older two husky pups, found his way into the hydrogen shed cum maternity ward through a door which was just ajar. He was viciously killed by Nelly, the jealous bitch. We were all rather upset as he was a very friendly little fellow. Poor Jane, his sister, howled piteously for days."

On the 10th came another blizzard with heavy snowfall lasting for three days. Only one exit was left passable, the escape hatch of the sleeping quarters. The recently dug-out door of the messroom's cold porch was filled up to roof level once more.

Eventually, on the 20th, the weather cleared up enough for the Mawson men to return there. The other Beaver left Mawson simultaneously and arrived safely, bringing Bechervaise, O.I.C. of Mawson, for a visit. Bechervaise, who played an important role in choosing the site of Davis, was very impressed with the amount of snow and made several excursions into the Vestfold hills and to the nearby islands.

On the 21st and 22nd the new navigation beacon was transported and erected on Turner Island. It is visible for miles with the naked eye. Next day the last of the "Mawsonians" left.

On the 24th, Braunstaffer and Keuken with two dogs set out for Lake Dingle, Lake Stinear, Deep Lake and Club Lake to carry out measurements of temperature, ice level, ice thickness, etc. Fuller and Newman were to pick them up with the tractor and sledge at Weddell Arm in the late afternoon but owing to the confusing nature of the completely snow covered terrain, they missed the rendezvous and travelled on for several miles, eventually reaching Tryne Crossing in Long Fjord. So two footslogging explorers had to walk all the way home, doing a total of close to 30 miles.

Many man-hours were spent locating the cool store, a cave dug into a huge permanent snow drift. The entrance had been drifted over by ten feet of hard packed snow.

RELIEF PLANS

"Thala Dan" will sail for Mawson about December 31. "Magga Dan" will sail for Wilkes Station, over which Australia, by arranement with the United States, has assumed administrative control, about January 5, 1960: taking also the new party for Davis.

The new Mawson wintering party will number 20. There will be eight men at Davis and 18 new men, including three Americans, at Wilkes: the United States biologist, Penney, will remain at Wilkes a second year.

The twelve R.A.A.F. men of the Antarctic Flight will accompany the Mawson party on "Thala Dan". The Flight will be led by Squadron-Leader J. Kichenside.

MINERAL TRACES

The Commonwealth Bureau of Mineral Resources has issued a report on the first geological survey of the western section of Australian Antarctic Territory since the war. It discloses that no mineral deposits of economic importance have so far been discovered in the area, but traces of copper, iron, managnese, coal and radio-active materials occur at several places. Rock outcrops include a sequence of fresh water sediments which contain coal seams similar in age to some of the seams around Newcastle.

JET AID

A Dakota transport aircraft fitted with JATO (jet assisted take off) and equipped with skis, will accompany the R.A.A.F. Flight to Mawson in December. Twelve specially trained R.A.A.F. men will go south.

Two Trans Australia Airlines Hiller 12 helicopters will be used to find passages through the pack-ice and for survey work along the Antarctic coast. They will operate from a landing pad on the "Magga Dan's" boat deck.

STAMPS

Owing to alterations necessitated by changed postage rates, the four new Antarctic stamps to be issued by the Australian Post Office will not now be on sale much before the end of the year. The denominations will be 5d, 8d, 1/- and 2/3.

ROI BAUDOUIN

June temperatures at the Belgian base ranged from 19.4°F. on June 6 to 27.6°F. on June 25. During July winds averaged 28 m.p.h. with a maximum of 11 m.p.h. during a two-day period. Blizzards raged continuously for 22 days.

Measurements of solar radiation, at present on a small scale, are transmitted once a week to the centre at Moll in Belgium.

For glaciological research a deep hole is being dug into the ice inside the station building. The depth in mid-August was about 50 feet, and it is expected to reach 130 feet.

In a series of survival exercises, two men lived for three days in a tent without food or heat. Although the outside temperature was —4°F., the temperature inside sleeping bags was 77°F. At the end of the exercise the two men had lost the sensation of hunger; they were slightly weakened and each had lost 9lbs. in weight.

Nine men under Maquet planned to carry out an inland expedition in mid-October, the purpose being to reach the Polar plateau beyond the mountain range over 180 miles from Roi Baudouin Base. A Norwegian plane flew over this range in 1936 and the expedition of De Gerlache (1958) passed it on the north. The present team intends to advance towards the east, as a passage has been discovered there which gives access to the plateau. Some of the mountains in this range are 9500ft. in height; it has been decided to name two of them "Prince Albert" and "Princess Paola".

The Belgian Government has allotted 25 million Belgian francs for the third expedition, which will be headed by Air Force Major Derom and was to leave Belgium on November 15 aboard the Danish vessel "Erika Dan", arriving at Leopold III Bay towards the end of December. In addition to the I.G.Y. sciences, topographical and cartographical work will be carried out, as well as research in geology, geomorphology, biology and physiology.

WHALING FLEETS LEAVE FOR SOUTH

Moscow Radio reported on October 18 that the world's biggest whaling mother ship, the "Sovietskaya Ukraina", with a full whaling fleet, had left Odessa the previous day for its first season in the Antarctic.

It did not say how many ships were in the fleet, but said they included fast diesel-electric catchers, a training ship, a scientific and scouting vessel, and auxiliary vessels.

The "Sovietskaya Ukraina" is a twin-screw, three-deck vessel with an unlimited range.

Built in less than three years at the Nosenko shipyards, in Nikolayev, a Black Sea port near the mouth of the River Bug, the "Sovietskaya Ukraina" is the world's largest ship of its kind. With a displacement of 44,000 tons, 15,000 tons more than that of the "Slava", which visited Wellington two years ago, it is 218 metres from fore to aft, and stands as tall as a 12 to 14-storey building. It is equipped with mechanised processing lines and scientific laboratories.

The "Sovietskaya Ukraina" will be able to handle much more raw material than the "Slava". It can freeze up to 100 tons of whale meat and liver (most valuable for its high content of vitamin A) daily and keep 1800 tons of frozen products in its cold storage sections. It has 870 production, living and cultural units including 265 well-appointed one and two-berth cabins for the crew.

DUTCH FLEET

Holland's Antarctic whaling fleet left Amsterdam on October 31 with target production instructions for about 24,000 tons of whale oil for the 1959 to 1960 season—the biggest ever set by its owners.

The fleet, comprising the 26,830-ton whaler "Willem Barendsz" and 13 catchers, will work 107 days instead of 69 in previous seasons.

Two Japanese whaling ships left Sydney for the whaling grounds on November 2.

South African National Antarctic Expedition

When the Norwegian party is withdrawn from Norway Base (70° 30′ S., 2° 52′ W.) in December, 1959, the station will be occupied by South Africa as the base of the first South African National Antarctic Expedition (SANAE).

By agreement between the two governments the scientific equipment which would have been withdrawn by the Norwegians will be purchased and the buildings and other installations which would have been abandoned at the site will be available for the use of the South African party.

VETERAN LEADER

The South African Expedition will be under the leadership of J. J. (Hannes) la Grange, who was a member of the Commonwealth Trans-Antarctic Expedition led by Sir Vivian Fuchs. His experience includes more than two years in Antarctica at Shackleton and South Ice and eighteen months on Marion Island where he was officer in charge for part of this period.

The expedition is due to leave from Capetown in the M.V. "Polarbjorn" under the command of Captain Maroe on November 28. It is hoped that its members will be at Norway Base about the middle of December, and take over the station before December 27 when, if all goes according to plan, the ship is due to sail for Capetown on the return voyage.

SCIENTIFIC PROGRAMME

The programme of meteorological observation at SANAE will be in charge of D. J. Bonnema, who is a Senior Assistant Meteorologist in the Weather Bureau and has spent a year at each of the South African stations on Gough and Marion Islands. He will be assisted by W. T. de Swardt and G. F. Strauss of the Weather Bureau and M. H. van Wyk, on the staff of the Council for Scientific and Industrial Research, who will be primarily responsible for the part of the meteorological programme concerned with the measurement of the total and diffuse solar radiation. All the usual surface and upper air meteorological observations at a first order Antarctic station will be made. In addition the wind and temperature profile in the first 10 metres above the surface will be measured, as well as snow drift.

During the first year the main concentration of effort will be on the meteorological programme but the party will also include a geologist Mr. V. von Brunn and one of its members will carry out measurements of the local and regional magnetic and gravity fields. In addition aurora observations will be made. The medical officer, Dr. A. le R. van der Merwe, will study the weight of expedition members and the influence of seasonal change on sleeping habits and rhythm. Basal metabolism and the effectiveness of various food rations will also be investigated.

The three other members of the party are: the radio technician, M. J. du Preez, radio operator N. S. Erasmus, and diesel mechanic C. de Weerdt van Lummel. They were selected from a large number of applications received in response to newspaper advertisements and the nation-wide publicity which was given to this venture.

SHIP MOVEMENTS

The Director of Norsk Polar Institutt informs us that "Polarbjorn" sailed from Alesund, Norway, on October 30 and was due to call at Capetown about November 24. The Norwegian wintering party of nine men at present at Norway Station will return home on the vessel via Capetown.

Rear-Admiral S. Mandarick of the United States Navy will embark at Capetown and go to Norway Station as an observer.

RENEWED ACTIVITY AT ALL UNITED KINGDOM BASES

The Falkland Islands Dependencies Survey (FIDS), now responsible for the Halley Bay base as well as the bases in the Graham Land area, reports on recent activities and on relief plans.

The "Shackleton" sailed from Southampton on October 5, and the "Biscoe" on the 19th. The two ships are relieving the northern bases before the "Biscoe" sails for Halley Bay in the New Year, and it is hoped that the "Biscoe" might later assist in the re-opening of Base E from which aircraft are in future to be operated. The aircraft will be taken south by the "Kista Dan" which has been chartered for one season and is due to sail from Southampton at the end of December.

SUMMER VISITORS

Sir Vivian Fuchs, the Director of F.I.D.S., and a past leader of Base E will be visiting the bases this season and will join the "Kista Dan" in Montevideo at the beginning of January. This will be the first time he has returned to the Antarctic since leading the Commonwealth Trans-Antarctic Expedition.

Also on board the "Kista Dan" will be Alfred Stephenson, who was a member of the British Graham Land Expedition, 1934-37, and is now instructor to F.I.D.S. on astro-survey and secretary of the British Antarctic Club.

Another summer visitor is Dr. Gordon Robin, who was a member of the Norwegian, British, Swedish Expedition, 1949-52, and is now Director of the Scott Polar Research Institute in Cambridge. He will be investigating the dampening effect of sea ice on wave-motion in the Weddell Sea, measurements being made with a wave recorder which has been fitted to the "Biscoe."

When the relief of the northern bases has been completed and the "Biscoe" sails for Halley Bay, the "Shackleton" will concentrate on the investigation of the structure of the Scotia Arc. This will be carried out by means of two special pieces of geophysical equipment operated by Dr. Griffiths of Birmingham University. The first of these is a proton resonance magnetometer with which continuous measurements will be made along the ship's track; the second is a Worden gravimeter which will be used to measure gravity at all landing places.

Meanwhile in the U.K., the analysis of sea ice records continues and work has now started on an investigation of all problems relating to navigation of ships in ice. Work progresses at the F.I.D.S. Department of Geology at Birmingham University, and exFIDS medical officers are writing up their results at the Medical Research Council Laboratories. Geophysical records are being worked on at the London office.

FIELD WORK HAMPERED

Most of the bases reported record low temperatures in July. Base Y on Horseshoe Island recorded an average of —10°F. for the month with a minimum of —51°F., and the Argentine Islands (Base F) recorded an average of —4°F.

These low temperatures were followed by rough weather which severely hampered field work in most areas. At Deception Island (Base B) rime-icing observations which were being carried out on a ridge near base had to be abandoned, and five field parties from Hope Bay (Base D) were held up. Nevertheless, the magnetometer survey was extended in the Duse Bay area and geologists continued work on James Ross Island.

A number of trips have been made from the Argentine Islands to the mainland, and geological survey parties from Signy Island (Base H) have worked on Coronation Island.

Several parties from Horseshoe Island (Base Y) have sledged over

to Base E, and geologists have spent over a month working in that locality. As readers of "Antarctic" will remember, Base E was closed temporarily in March when the "Biscoe" failed to penetrate the heavy sea ice in the centre of Marguerite Bay, in spite of assistance from the U.S. icebreaker "Northwind". Men from E sledged over to Y and were flown out to the ship by helicopter. Similarly, at W, 70 miles to the north, the ship was unable to reach base and on March 31 the men sledged out to the ship. During the evacuation of W one of the dogs escaped, and to everyone's surprise he turned up at Y in the middle of June looking extremely healthy and well-fed. He had been one of a team working in this area last year and seemed glad to see the men at Base but strongly objected to being put back on a span after his unbridled freedom.

At Halley Bay (Z) as elsewhere, all routine work has continued. In addition, detailed observations have been undertaken at the local Emperor Penguin rookery and egg-laying has been filmed.

RESEARCH PLANS AT HALLEY BAY

Research into the life cycle of the Emperor Penguin is to be carried out at Halley Bay. The aim will be to study the period of five months, about which little is known, during which the single chick is reared from a fledgling to a 40-lb. adult capable of fending for itself.

The male Emperor fasts for the three months during which the single egg is incubating. It seems likely that the female, who spends the incubation period away feeding, consumes enough food for both herself and the chick during the five-month nursing period. But there are many questions still unanswered. What does she feed on? Does she also feed the male?

This study will be carried out under the auspices of the Earl Grey Institute of Field Ornithology of Oxford.

Many Antarctic explorers who have suffered toothache swear that the cold weather affects the teeth, but is there genuine scientific basis for this belief? There is some evidence for thinking that the explorers' tooth troubles arise not from the cold weather but from the fact that many men who go south do not take sufficient trouble to get their teeth into repair. Another factor may be the tediousness of having to clean one's teeth with snow.

Dr. J. W. G. Pidgeon, of the London Hospital dental department, is to spend a season at Halley Bay to find out the facts. As dental adviser to FIDS he is already in close touch with Antarctic explorers' teething troubles. This year he has persuaded FIDS to have the teeth of all members of the expedition X-rayed before they depart.

ARGENTINE BASES

It is confirmed that the Argentine base, General San Martin in Marguerite Bay, was partially destroyed by fire last January, as reported in our last issue. The principal living quarters were burned down. The station is, however, being maintained, although on a reduced status. The men are occupying huts.

Argentina plans to re-locate and reconstruct the base. Major Alberto Giovannini of the Argentine Army visited the United States and Canada in October to purchase equipment for Argentina's Antarctic operations. Major Giovannini has had two periods in the Antarctic, serving as base leader at General San Martin Base and also as base leader at Esperanza (Hope Bay).

The Argentine Antarctic Institute plans a reconnaissance of the north end of Alexander I Island during the coming season.

ANTARCTIC PRE-VIEW

A movie film is to be pre-viewed on the seventh continent. Simultaneously with premieres in the other six continents, the United Artists motion picture based on Nevil Shute's "On the Beach" will be pre-viewed at McMurdo Sound on December 17.

CHILEAN BASES

Personnel to man the four Chilean bases during 1960 are: General O'Higgins Base (Army): eight men under Captain E. B. Beca; 12 men are named as returning.

Arturo Prat Base (Navy): nine men; leader, Lieut. R. T. Salvo; nine returning.

President Aguirre Cerda Base (Air Force): Captain F. M. Salas, leader. The new party numbers eight; eight returning.

President Gabriel Gonzalez Videla Base (Air Force): seven men; leader, Captain G. K. White; nine returning.

The Ministry of National Defence is considering the setting up at Punta Arenas in southern Chile of a breeding and training centre for dogs destined for work at the Antarctic bases. The main reason is to overcome the problem of transporting training personnel, food, etc., to the Antarctic during the few months when sea transport is possible.

Chile intends to replace the Military, Naval and Air Force detachments which at present man the Chilean Antarctic bases by civilian scientists. Representatives of the Universities and other learned bodies will visit the bases this summer to examine the position and advise on the future composition of the base staffs. It is unlikely however, "for administrative and other reasons", says a press report, that the bases will be wholly manned by civilian personnel in 1961.

"OPERATION SNUFFLES" SHOWING RESULTS

The team of United States Navy medical men doing research projects in the Antarctic on the cause of the common cold, "Operation Snuffles," have made some interesting discoveries, although "Snuffles" has been going for only two years.

Navy and Air Force volunteers have their throats swabbed and blood sampled every two weeks and the results are deep frozen and despatched to America for analysis.

It has been found that men in Antarctica who are not in contact with the outside world do not catch colds, but they get them as soon as the summer teams arrive from America and New Zealand, although the latter show no outward signs of having a cold when they arrive.

The isolated men at the South Pole base begin their sneezing long before outsiders arrive. Their batch of colds starts with the first parachuted supplies of the season.

Early last Antarctic winter the medical men tracked down the reason for sudden bouts of vomiting and diarrhoea at McMurdo Sound. The condensed snow water drunk by the men was responsible.

Tests showed that the water, melted from snow from the surrounding hills, carried bacteria. To counteract this the water was chlorinated and a filtration system installed. The sickness disappeared.

This finding is interesting because it had been generally believed that Antarctica had little, if any, bacteria.

Perfectly preserved tetanus spores left in the desolate snows of Antarctica more than 50 years ago by the ponies of Scott's expedition have been grown under simulated conditions in the United States.

The dormant spores were found in samples of pony excreta picked up from the snow around Scott's base camp at Hut Point.

ANTARCTIC CLIMATE

The principal climatic zones of the eastern part of Antarctica and the southern ocean washing it have been established for the first time, according to Tass.

Tass said that Professor Viktor Bugayev, of Moscow's Central Weather Forecast Institute, had a scheme which included five such zones—the high Antarctic plateau, the Antarctic slope, the Antarctic coast, drifting ice floes, and the open Antarctic waters.

Professor Bugayev, who had taken part in Soviet Antarctic expeditions, corroborated his classification of climate zones by results obtained from extensive exploration since 1956, not only along the coast, but in the heart of the continent.

SUB-ANTARCTIC ISLANDS

MACQUARIE ISLAND
(Australia)

The Hurd Point scientific outstation will close this year and the radar equipment, steel tower and generating unit will be packed for shipment ultimately to Mawson. The new recreation room has been painted in colours of sunglow, pinegreen, coral, lime and pewter.

A notable achievement during August was the relief of Green Gorge by two men who each carried four gallons of kerosene over a distance of ten miles, slept the night there and returned the following day. They intended jettisoning some of the load if their movement was obstructed but despite the uphill down dale work eight well-needed gallons were delivered.

The seal check continued on both sides of the Isthmus and North Head. Each sea leopard discovered is marked with dye to facilitate an accurate count.

September was a month of painting and still more painting. Boisterous weather in the first two weeks prevented the programme commencing until the 12th instead of the first as planned. Then intermittent dry but by no means windless weather enabled painting to continue at a steady rate interwoven with the scientific programme—wind gusts produce designs with true modern artistic touch on overalls, boots, jackets, beards and berets, with of course a craftsman's surface on all huts. The colour scheme has been: scientific huts, white with red, black or pink roof; stores, deep cream, red roof; records hut, pink and black roof; so far the prize for neatness goes to the new meteorological hut, all white with red trimmings and two red and white checkered fifteen feet square balloon release doors.

The shepherds have been busy attending to the flock of eighteen sheep during lambing. Nine ewes produced eight twins.

During the month the biological programme trebled. Having difficulty with his second pair of worn boots, the biologist matched the least worn one of the first pair with the opposite least worn one of the second pair, and got himself a brand new pair of worn boots. Hundreds of seal cows came ashore into harems along the beaches to give birth to their pups. When they arrived in thousands a census of their numbers was made.

The census of breeding seals all round the island was a team effort. The total was 35,441 cows and 4,753 bulls.

BOUVET ISLAND
(S. Africa)

During the voyage of the M.V. "Polarbjorn" to and from the new South African base on the Antarctic Continent, reconnaissance visits will be made to Bouvet Island with the object of inspecting possible sites for a station on the island.

CAMPBELL ISLAND
(New Zealand)

The new expedition for Campbell Island departed from Wellington on October 21. They were as follows: E. L. Clague, senior meteorological observer; J. P. Squibb and G. H. Cousens, meteorological observers; D. M. Souter, senior ionosphere observer; A. G. Dodds, ionosphere observer; A. G. Doran, mechanic/handyman.

Weather during unloading operations at the island was ideal. No time was lost and the servicing was completed without a hitch. The outgoing members were G. S. M. Smith, senior meteorological observer; J. R. Lamb and D. Phipson, meteorological observers; R. B. Thompson, senior ionosphere observer; J. B. Shaw, ionosphere observer; P. J. Martin, radio technician; W. R. Hare, mechanic/handyman; and D. G. Kerkt, carpenter. These men embarked on October 29 and returned to Wellington on November 2.

There were surprisingly few beards this year, but one outstanding hair style-beard combination earned comment in the daily Press. The officer in charge, P. G. Poppleton, and the cook, R. G. Rae, arrived in New Zealand shortly before the other outgoing expedition members for a brief spell prior to serving a second tour of duty with the 1959/60 expedition. Both men returned to Campbell Island on U.S.S. "Petersen" on November 20.

The scientific and general station work programmes for 1958/59 were completed in a very satisfactory manner. This year's operations will see the installation of new ionosphere equipment and preparations for the installation of new power plant in 1960/61.

The tragic loss of M.V. Holmglen with her officers and crew who so recently carried out the Raoul and Campbell Island servicings has deeply shocked past and present expedition members and head office staff, and our deepest sympathy is extended to all concerned.

(Notes kindly supplied by Civil Aviation Administration.)

WILL ICE-CAP GROW?

In the Soviet Antarctic Bulletin, No. 8, Professor Morris Eigenson, of the Lvov Ivan Franko University, writes that the Antarctic expeditions conducted in the course of the International Geophysical Year have made it necessary to revise old ideas concerning the Antarctic ice-cap. This ice-cap, regardless of whether Antarctica is a continent or an archipelago, represents a unique physico-geographical formation.

The Banger oasis amid the great mass of Antarctic ice, is an indication that the climate is becoming milder in the South Pole regions.

Professor Eigenson writes that he has attempted to forecast the centenarian changes of the sun's activity. According to this forecast, in the coming decades it will decrease more or less sharply. For the Antarctic regions this means an end to the rise in average temperature and, possibly, a drop in temperature. This, in turn, will lead to the growth of the Antarctic ice shield.

WHAT LIES BELOW THE ICE?

The route of the forthcoming inter-continental trek by the fourth Soviet Expedition may be partially changed in an attempt to verify a hypothesis that may prove important for further research into the geography and geology of the Antarctic. According to Prof. P. S. Voronov, staff geologist of the First and Fourth Soviet Expeditions, a vast zone of meridional faults of the earth's crust exists in the central sector of East Antarctica, approximately along the 75th meridian of east longitude, between Olaf Prydz Bay and the South Pole.

These faults break up the area into a series of blocks which are either very low or highly elevated and form a band-like system of depressions and mountain ridges under the ice that can be traced from the ocean coast to the South Pole.

This supposition, advanced in mid-1958, was originally based on analysis of the peculiarities of the relief map of the Continent and its continental shelf in the Prydz Bay area, and also on the latest data about the relief of the Antarctic ice-sheet, obtained by the Second and Third expeditions in 1957.

The probability of this zone was corroborated by the block character, great length and meridional direction of the Prince Charles Range and also of the entire western coast of the bay. The under-ice southward continuation of this range, expressed by a zone of crevasses on the surface of the ice-sheet, was traced to 77° 48′ S. and 66° 10′ E.

Soviet explorers have founnd along the eastern slope of the Prince Charles Range a deep depression under the ice of the Antarctic Continent. The depression is 700 metres deep on the ice-sheet and continues in a meridional sleeve along the bottom of Prydz Bay.

By air survey, members of the Third Soviet Expedition discovered a series of mountains directly to the south of the Prince Charles Range reaching up to 3200 metres above sea level.

MOUNTAINS UNDER THE ICE

Further southward within the limits of the same zone, the seismic sounding of the ice-sheet of the Antarctic, carried out last December along the line Komsomolskaya Station-Pole of Relative Inacessibility, revealed an ice-covered mountainous area between 72° E. and 92° E., rising up to 3100 metres above sea level. In its central part the explorers found a depression under the ice, which is almost 100 km. wide and the bottom of which is more than 1000 m. below the surrounding mountains.

Thus, the supposed zone of block mountains and depressions has been well traced from Prydz Bay to 80° S. There is ground to believe that it continues further southward up to the geographical pole. The most convincing proofs of this could be probably obtained by seismic sounding of the ice-sheet in the Eastern Antarctic along the 84th parallel between 60° and 100°.

WHAT FUCHS FOUND

In this connection, it is of particular interest that Sir Vivian Fuchs reported discovering under the ice-sheet of the South Pole a depression approximately 80 km. wide, the bottom of which is 1500 m. lower than the under-ice mountains which surround it and the altitude of which reaches 2300 m. In the light of this, the depression and the mountains should evidently be regarded as the terminal area of the supposed system of meridional block mountains and depressions of the central sector of the Eastern Antarctic.

If this hypothesis is fully confirmed, then a new system of depressions and high block mountains will be marked on the map of the Antarctic in the area of 75° E. The size of this area will not be smaller than the Antarctic Horst, which also stretches in the meridional direction.

If this is so, then we can conceive the Eastern Antarctic as two gigantic bowl-like depressions fringed by high mountains along the coast and separated by the block structures of the central sector of East Antarctica.

It is also possible that the continuation of this zone of block structures of the earth's crust will be found in the central sector of West Antarctica, where there is the vast depression of the Amundsen Sea in the area of 105° W. and the meridional ridges which border it.

The gigantic faults of the earth's crust with a meridional direction are characteristic of other areas of the globe, too. Thus, a whole system of meridional faults is being revealed on the surface of our planet, girding it from pole to pole and reflecting some global regularities in the late stages of the earth crust's development.

MAGNETIC POLES MOVE

The earth's two magnetic poles will be moved a little northward on a new map to be published early next year by the United States Navy's Hydrographic Office.

Since the old isogonic map was published in 1955, the North Magnetic Pole, north of the Canadian mainland, apparently has moved about 100 miles due north.

The South Magnetic Pole will now be shown near Adelie Coast, Wilkes Land, in Antarctica. Its new position will be about 100 miles north and west of the 1955 location.

Officially the 1960 South Magnetic Pole will be at Lat. 67.1 degrees S., and Long. 142.7 degrees E.

Although some movement of the poles themselves is believed to have occurred, the apparent movement may be a result of better instrumentation for measurement.

But in 1841 when Ross discovered Victoria Land, the estimated position of the South Magnetic Pole was 76° S., 145° 20′ E. When David, Mackay and Mawson of Shackleton's expedition reached the Pole, the first to do so, on January 16, 1909, the position was 72° 25′ S., 155° 16′ E.

BOOKSHELF

"ANTARCTICA", by Frank Debenham; London, Herbert Jenkins, 264 pages, ill., N.Z. price 31/-.

If you want the whole thing, 'All About Antarctica', in one quite small volume, this is your book. Professor Debenham belongs to the Heroic Age of Antarctic exploration: he was geologist on Scott's Last Expedition. But he has ever since maintained a close interest in and association with Antarctic exploration and research: he was the first Director of the Scott Polar Research Institute. When a man of his experience and wisdom who is also a sound and lively writer sets out to summarise for us what he has learned over the years about the Antarctic, we can be sure of a first-rate book.

We have first of all what is surely the best brief account of the history of Antarctic exploration yet written. In 100 pages Professor Debenham provides an authoritative, comprehensive and well balanced story: except that perhaps Shackleton deserves more than two and a half pages for his 1907-09 expedition, seeing that Borchgrevink gets the same, and Scott's "Discovery" expedition four pages. The accounts of all the many expeditions, however, are clear and interesting, their value is shrewdly assessed, and credit is freely given wherever credit is deserved.

This historical section is followed by "A Look at the Continent" and at the ocean around it, and this in turn is followed by a chapter entitled "Man on the Continent": 20 pages of wise and witty comment by a man who knows a very great deal about it.

The final 50 pages deal with the actual and potential value of the Antarctic, the problem of sovereignty, and an all-too-short section on "Mind and Motive in the Antarctic". Perhaps Professor Debenham will give us one day a whole book on this: it would be a notable contribution to Polar literature, in fact, to the literature of exploration and of adventure as a whole.

This book can be wholeheartedly recommended not only to the general reader but to the enthusiast who has already browsed widely in the growing library of Antarctic books.

"90° SOUTH" by Paul A. Siple, G. P. Putnams Sons, New York, 384 pages, illustrations, many in colour.

The major portion of this absorbing book, by an American scientist who first went to the Antarctic in 1928 as a boy scout with Byrd and was a prominent member of every subsequent "Byrd" expedition, is devoted to a description of the planning, construction and occupation of the United States South Pole station. Dr. Siple was scientific leader at the station throughout 1957.

No one knows the Antarctic better, and though there are minor inelegancies in his style, he tells the story of a great and successful venture from the inside with gusto, humour and candour. He does not gloss over the friction between Byrd and the Task Force authorities, or between navy men and scientists, but he shows understanding and charity.

Lt. John Tuck, the Navy support leader who shared command with him, and with whom he might easily have been at loggerheads, says in the foreword, "Knowing and working with him, a grand friend, teacher and solid inspiration, was indisputably the most valuable aspect of my two years in Antarctica."

It is a moving experience to live on intimate terms with these dedicated scientists and tough seabees as they carried through a job which many had prophesied could only end in disaster and death. And to live with them is exactly what Dr. Siple in this fine book enables us to do.

"L'ESPLORAZIONE DELL'ANTARTIDE", by Silvio Zavatti, U.T.E.T. Turin, Italy: 370 pages, 3500 lire.

This handsome and lavishly illustrated volume is written by the Director of the Polar Geographical Institute of Italy, himself an explorer of the sub-Antarctic. Those who can read Italian will find in it

a comprehensive, well-balanced and authoritative coverage of the story of Antarctic exploration from the days of Magellan and Drake to the Trans-Antarctic Expedition and the I.G.Y. The illustrations, 230 of them, are well chosen and finely reproduced, and there are numerous small but useful maps.

To illustrate the scope: two pages are given to Shirase's Japanese expedition, six to Borchgrevink, ten to the "Discovery", 18 to Shackleton's "Nimrod" Expedition, 20 to Amundsen and 30 to Scott's Last Expedition. There is an interesting nine-page summary of the Trans-Antarctic Expedition with a shrewd but friendly assessment of the parts played respectively by Fuchs, "Lo Scienziato", and Hillary, "Lo sportivo neozelandese".

"ENDURANCE: SHACKLETON'S INCREDIBLE VOYAGE," by Alfred Lansing: London, Hodder and Stoughton, 287 pages. N.Z. price 25/-.

This new account of the grim experiences of Shackleton and his 27 companions after "Endurance" was crushed by the ice of the Weddell Sea will sometimes exasperate you, sometimes infuriate you, but always hold your interest.

Lansing, making use of much material tracked down by Margery and James Fisher, authors of "Shackleton", has reconstructed the story on a broad basis, enabling us to witness the events not just through the eyes of the "Boss" or "Skipper" Worsley, but as they were seen by all the men whose diaries have been made available, and by the survivors who have been interviewed.

The result is an absorbing book, vivid, racy and well-balanced. The sequence of events and their significance are made clear by lucid narration, judicious quoting of diaries and concise explanation where needed.

Why then the exasperation? Because Lansing, especially in the introductory section, has sometimes over-written a story that is gripping enough, in all conscience, without any such journalistic embellishments as, "her immense timbers . . . . screamed as the killing pressure mounted."

And why the infuriation? Because Lansing has seen fit to broadcast the weaknesses in many of these men, weaknesses which under the intolerable strain of one of the most harrowing experiences, long drawn-out, explorers have ever had to suffer, became serious and dangerous faults: or seemed so to men whose own nerves were tautened almost to breaking point. Shackleton, Worsley, Wild, the Fishers, knew of these weaknesses, but thought it better to say little if anything about them. Lansing has had no such kindly scruples. One can only hope that the men concerned, or their surviving dear ones, will not read this book; and that other readers will remember the appalling strain under which both the men and their companions were suffering.

L.B.Q.

MYSTERIOUS LIGHT

A mysterious phenomenon was observed in the midst of the Antarctic night, in Western Antarctica, on the Ross Ice Shelf at a distance of one kilometre from Little America.

On a clear moonless night on May 29, 1958, just after a strong snow storm, members of the wintering party who were standing outside, observed some noiseless flashes of bright white-yellow light, of a light greenish hue, at the very surface of freshly formed snow drifts, between rows of sledges arranged in a line of straight rows. The snow drifts were high.

Some of the men thought that these lights were produced by flashes from photo bulbs; however, it was soon ascertained that these had not been used at that time.

Identical phenomena were observed on the same day at the French station Dumont-Durville, situated at more than two thousand kilometres from Little America; members of the French Antarctic party told us about it soon after, in a radio conversation. Radio-communication during that period was very poor.

In all probability these phenomena are connected with static electricity which collects in the lower atmosphere of Antarctica, where great dryness of the air and the profusion of tiny snow crystals carried by the wind over the continent favour the creation of conditions producing strong discharges; the noise, quite strong, might not have been heard by men wearing heavy fur bonnets. Some scientists are inclined to connect these phenomena also with the state of the electric and magnetic pole of the earth.

—(P. D. Astapenko in the Bulletin of the Soviet Antarctic Expedition, No. 8.)

THE SUN-DRENCHED ANTARCTIC

The sunniest spot on earth is neither the Sahara nor the Sudan but the frozen continent of Antarctica.

Soviet meteorologists, after nearly three years of daily measurements, report that at a height of 12,000 feet on the "ice cupule" of Antarctica the intensity of solar radiation is 1.81 calories a square centimeter a minute.

This is the greatest intensity ever recorded anywhere on earth, the Russians assert. "By contrast," says the report, "it may be noted that in the temperate zones the intensity is only a little more than one calorie a square centimeter a minute."

WHY THEN SO COLD?

However, the Antarctic sun does not produce much heat, since its rays hit the surface at an acute angle. Ultraviolet radiation also is very high in Antarctica because the air is clear and there are many sunny days.

The scientists say that the extremely low temperatures of Antarctica are restricted to a relatively thin layer of the atmosphere about 2000 to 3000 feet thick. Above this layer the air warms up by as much as 35 degrees. This phenomenon is called the surface inversion.

"Therefore," says the report, "the air masses moving from Antarctica to the Equator do not generally have as low a temperature as might be expected.

"Scientists have long known that the southern hemisphere is colder than the northern hemisphere. Until now this has been explained by the influence of Antarctica. A contrary conclusion now has been reached. Actually Antarctica itself exists because the southern hemisphere is, per se, colder than the northern hemisphere."

MEMORIAL TO BYRD

A memorial statue honouring the late Rear-Admiral Richard E. Byrd has been approved by Congress in a joint resolution and signed by the President. The bill authorises the National Geographic Society to erect a memorial on government owned land in Arlington County, Virginia.

The memorial will pay tribute to the architect of United States Antarctic operations, who aso played a large role in establishing the United States International Geophysical Year programme in Antarctica. The memorial will also emphasise the mutual benefits derived from years of high level relationship between Admiral Byrd and the National Geographic Society.

An eight foot statue has been designed by Felix de Welden who was previously responsible for the Iwo Jima and Red Cross memorials. Four or five months will be required to cast, burnish, and complete the statue. The figure depicts the Admiral in full cold weather dress and will be mounted on a pedestal of rare Italian white marble. The base of the statue will simulate a snow field.

The design has been approved of by the National Geographical Society, which sponsored the memorial campaign, and also by the Byrd family. It will be located beside the Memorial Avenue on the Virginia side of the Memorial Bridge.

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.

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