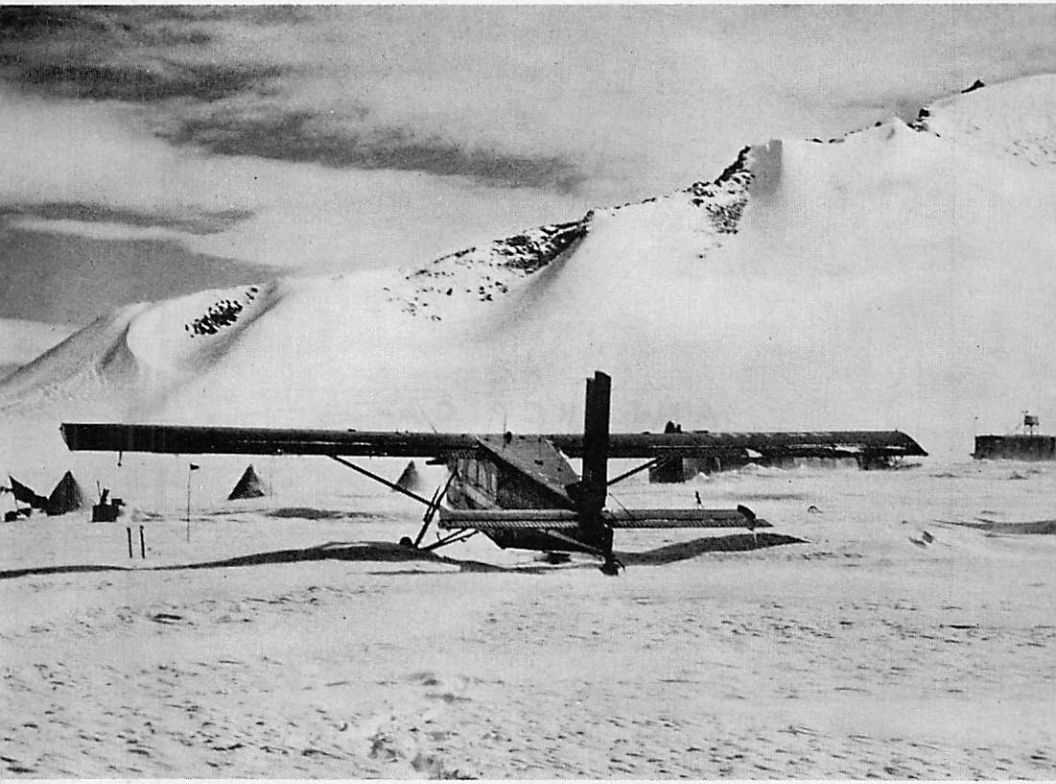
# ANTARCTIC

A NEWS BULLETIN

published quarterly by the

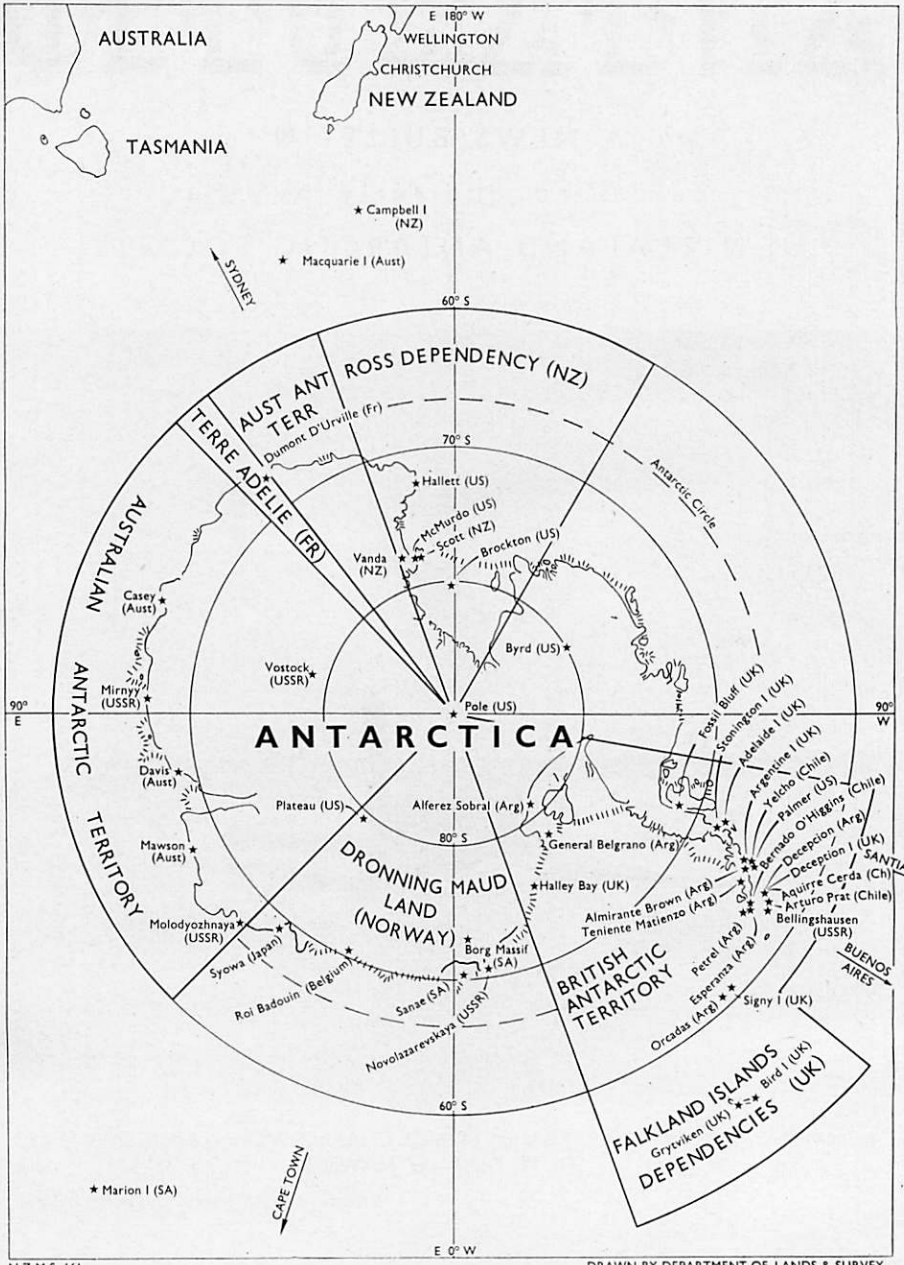
NEW ZEALAND ANTARCTIC SOCIETY



SUMMER CAMP, MOORE PYRAMID, PRINCE CHARLES MOUNTAINS, 200 MILES SOUTH-EAST OF MAWSON.

Official ANARE photo by Dr D. J. Lugg

**Vol. 5, No. 11** **SEPTEMBER 1970**




N.Z M.S. 161

DRAWN BY DEPARTMENT OF LANDS & SURVEY
WELLINGTON, NEW ZEALAND, AUG 1969
3rd EDITION

# "ANTARCTIC"

(Successor to "Antarctic News Bulletin")

**Vol. 5, No. 11** **59th ISSUE** **SEPTEMBER 1970**

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## CONTENTS



Two men who have had a close association with the Antarctic, and the expeditions that have gone south in the last 40 years, are now responsible for this news bulletin.

The editor, Mr H. F. Griffiths, who has visited the Antarctic twice, is the Dominion president of the New Zealand Antarctic Society, and a past president of the Canterbury branch. He was the founder of the Dunedin and Canterbury branches, and his association with Antarctic expeditions dates back to Rear Admiral Richard Byrd's first expedition in 1928-30. He is also a Fellow of the Royal Geographical Society and a member of the American Polar Society.

The assistant editor, Mr J. M. Caffin, was associated with Rear Admiral Byrd's second expedition in 1933-35. He has been a member of the committee of the Canterbury branch of the Antarctic Society, and is also a member of the American Polar Society. After two visits to the Antarctic he was awarded a United States foreign specialist's grant for Antarctic studies in 1963, and also did some work at the Scott Polar Research Institute.

# NEWS FROM SCOTT BASE

Spring and the return of the sun in the Antarctic mark the beginning of more outdoor activity at Scott Base in preparation for the busy summer season. In the winter darkness the team has been planning and preparing for spring journeys.

Three men from Scott Base, and one from McMurdo Station, with two dog teams and sledges made the first of the short spring journeys to Cape Evans at the end of August. They were Commander W. L. Frost, commanding officer at McMurdo Station, Chris Knott (Stratford), dog handler, Russel Powick (Westport), cook, and Peter Hide (Rangiora), photographic technician.

The four men left Scott Base on August 27 and camped the first night in the field near Tent Island. One day was spent clearing snow and inspecting Scott's hut at Cape Evans. The return journey took a little more than five hours. Only a few hours after the party returned a violent southerly storm blew up.

### MILD WINTER

Reports from the leader, R. B. Willis, indicate that the last months of winter were comparatively mild. During three brief southerlies in May a maximum gust of 67 knots was recorded. The lowest temperature was minus 41.7 degrees Centigrade on May 10, and the highest was minus 7.3 degrees on May 16.

June was not a spectacular month for weather but ended with a flourish. There was a southerly storm on June 27 and June 28. A gust of 89 knots was registered early on June 27, and the wind maintained a high average speed all day. On June 20 the thermometer registered minus 41 degrees Centigrade, and the highest temperature—minus 8.6 degrees was recorded on the windiest day.

Some of the dogs were given a run to Williams Field during the full moon period. Two died during the month, Harry from brain infection, and Stephen during an operation by the doctor at McMurdo Station.

### VINCE'S CROSS RE-ERECTED

In July Vince's Cross at Hut Point was found to have been blown down the hill. It was returned to Scott Base for inspection, and will be made secure by welding the base to steel pegs driven into the ground.

Ice coring 150 yards from the shore near the base gave a cover of nearly 6ft, which included about 2ft of compacted snow. At the same time there were open patches of water in McMurdo Sound.

The month was calm, and the highest temperature was minus 8 degrees Centigrade on July 7. The lowest temperature was minus 50 degrees on July 31.

## TEENAGE VISITORS FOR SCOTT BASE

Two scouts and a member of the Boys' Brigade will spend four to six weeks at Scott Base this season. They will sail south to McMurdo Sound in December, probably in a United States ice-breaker.

The scouts are Paul Stephenson, of Wellington, and Michael Gibson, of Wanganui. David Ross McArthur, of Invercargill, belongs to the Boys' Brigade.

The Scott Base leader, Mr Brian Porter, who announced the visit, said the boys would do a variety of jobs in and around Scott Base. The work would range from helping in scientific projects to washing dishes at the base.

# JOURNEY TO CAPE CROZIER

Four men who travelled with two dog teams from Scott Base to Cape Crozier this month to see the Emperor penguin colony and photograph the birds had a disappointing journey. Broken ice and pressure ridges prevented them from reaching the colony by dog sledge.

Attempts to walk the last few miles around Cape Crozier were abandoned when one man almost disappeared into a large crevasse. The only way they could approach the birds was by climbing over the cape. They had to be content with viewing the colony at a distance from a height of about 500ft. This did not give them the opportunity to obtain good photographs.

Chris Knott (Stratford), base dog handler; Howard Marriott (Gisborne), base engineer; Russell Powick (Westport), cook; and Ian Wilton (Wellington), radio technician, left Scott Base on September 9. They lost one day's travel because of bad weather but reached Cape Crozier with their dog teams on September 12.

On the return journey the weather was bitterly cold as the party travelled along the Ross Ice Shelf. Frosts of more than 100 degrees made sleep almost impossible, and the men were very tired and suffering from frostbitten noses and fingers when they reached the base on September 16.

## MOTOR TOBOGGANS FOR TRIAL

Two Swedish tracked motor toboggans will be shipped to the Antarctic for trials this season by the New Zealand research team. They were tested during the orientation course held for the 1970 team last month but there was not enough snow for a full test at the Army training area at Balmoral, Lake Tekapo.

Each toboggan can carry two men, and also tow about 2000lb of equipment on a sledge.

# RARE CLOUD FORMATIONS

Several men who braved 90 degrees of frost and walked from Scott Base to Arrival Heights on August 2 in the hope of seeing something photogenic were well rewarded. For about three hours from 1 p.m. they were able to watch and photograph the rare nacreous or mother of pearl cloud formation.

Peter Hide, information officer at Scott Base, reports that the cloud formation, caused by rays from the still hidden sun, appeared to glow with an inner silvery-white phosphorescence streaked with pearly tinges of green, pink, and blue. A bright orange sky provided a splendid background.

The most brilliant colours of nacreous clouds are seen when the sun is several degrees below the horizon. According to the senior science technician at Scott Base, Mr P. C. H. Graham, of Christchurch, this type of cloud occurs usually at about 100,000ft.

During the late afternoon other silvery-white clouds were observed to the north-west. These could have been the even more rare noctilucent type, at about 250,000ft. An example of this cloud was seen from Scott Base early in July.

## HOVERCRAFT TRIALS POSTPONED

The rotary-engined hovercraft being considered for use by the New Zealand research team in the Antarctic is unlikely to be tested there this season. The Antarctic division of the Department of Scientific and Industrial Research wants to see how the four-man hovercraft stands up to use in New Zealand before taking one to the Antarctic.

Mr R. B. Thomson, superintendent of the Antarctic division, says that a hovercraft could be particularly useful for marine biology work in the summer. ful engines in their machine, making it Commercial Hovercraft Industries, of Auckland, now plan to fit more power-more suitable for Antarctic work.

# NEW SNOW VEHICLE

A snow vehicle with a difference made its appearance at Scott Base early this month. It has been called a "snotraveller." More correctly it is an Antarctic "bitzer," for it has been made from items salvaged from an old Tucker snocat, a crashed helicopter, various foreign snow vehicles, and locally-manufactured parts.

The base mechanic, Roger Lusby, from Roxburgh, did not find time hanging heavily on his hands during the Antarctic winter. He was too busy working on his "snotraveller," which began life as a cut-down snocat powered by a six-cylinder Continental engine from an American Weasel.

Mr Lusby rebuilt the snocat chassis to fit the engine and tracking system. The gearbox once belonged to a Canadian-built Nodwell, Swedish snotrac tracks are used for the bogie-supported rear track system, and the tracked pontoon-type steering system works on a British Rover axle in front.

All the track parts were made at Scott Base, including bogie carriers, spring supports, and front wheel carriers. Even items salvaged from a crashed helicopter have been used.

The "bitzer's" steering system is believed to be novel. Mr Lusby knows of no other vehicle with pontoon steering in which the back axle is fixed to the chassis and does not turn as the front pontoons turn.

Measuring 14ft long, 8ft wide, and 7ft high, the Lusby "snotraveller" weighs about a ton and a half. And it really can travel. It accommodates comfortably four men, and on a hard snow surface it can do 20 miles an hour. Fuel consumption is only three miles to the gallon, lower than similar-sized vehicles.

## —AND MARINE CRAFT!

New Zealand Antarctic teams will have two marine craft in McMurdo Sound this season—the University of Canterbury trimaran, and a pontoon raft which will be used by Oceanographic Institute scientists when they take samplings of the ocean floor in the sound.

The 12ft by 12ft raft has been built by staff of the Antarctic division of the Department of Scientific and Industrial Research. Early next month the raft will be be taken to Scott Base by air and assembled there.

The raft will be anchored by rope to the ice and the men on board will winch themselves along the edge of the McMurdo ice shelf. If there is open water in the sound, it is planned to use the raft to cross from Ross Island to Victoria Land.

## MT EREBUS CARD FOR CHRISTMAS

"Early Morning, Mount Erebus, Ross Island," is the title of the photograph selected by the Canterbury branch of the New Zealand Antarctic Society for its 1970 Christmas card. The photograph was taken by Mr R. B. Thomson, superintendent of the Antarctic Division of the Department of Scientific and Industrial Research.

After a lapse of two years the committee of the branch decided to produce a Christmas card. Money from the sale of the cards will go towards the society's contribution to the national Antarctic centre which will be incorporated in the new wing of the Canterbury Museum.

## THE LITERARY SCENE

Bookselling is part of the public relations business at Scott Base both in summer and winter. Sales from October 22 last year to July 31 amounted to $7,316.60. There is plenty of stock on hand for the visitors this season. It includes 6,270 copies of "Antarctica," five copies of Graham Billing's novel, "Forbush and the Penguins," 72 copies of David Burke's thriller, "Monday at McMurdo," and 81 copies of "New Zealand in Colour."

## CAMPBELL ISLAND REPORT

# *Pace Has Been Hectic On Paradise Island*

**From Peter Julius:**

"Since our mid-year report the pace has been hectic on Paradise Island. All hands have been particularly busy, although leisure time too was well spent.

The official highlight of the year was without a doubt mid-winter's day, and such can be said for the sumptuousness of the repast that the billiard table was going up for repair and servicing. (The weight of all that food was just too much for it). The following day, six hardy—or foolhardy—souls, and Peggy the dog, braved the elements for traditional mid-winter swims, held this year under cold showery conditions, with a water temperature of 40deg. A friendly sea bear entered the scene but could not match our aquatic achievements—and departed in a huff.

Our challenge to the Campbell Island pin-up, Relda Familton, and the WNTV1 staff to emulate our performance was taken up in a blaze of publicity and resulted in the raising of over $100 for the intellectually handicapped children. This was a really heart-warming experience for us all. Thank you, Relda! Your participation will long be remembered on Campbell Island.

July 7 and the USARP research vessel U.S.S. Eltanin paid a most welcome visit with mail, hardwood beams for the wharf, and some urgently needed mechanical parts. Top marks to our cook, who within ten minutes of going on board was seen with his arms around not one but three of the young ladies (research assistants) on the ship "Ostems". He stayed to pose for photographs (large question mark!) This information was speedily passed to Head Office, which promptly extended his tour here by another year to give the rest of us a chance to combat his fatal charm with the fair sex.

We have left our mark here in the wild life world as up to October the party has been responsible for the banding, re-banding or recovery of approximately 10,719 birds of various species and, considering that this is a spare time activity, we are rather proud of the result. Many specimens have also been gathered for the Dominion Museum, and other interested departments.

The complete rebuilding of the wharf took up most of the latter part of the year, but the result has been most pleasing. With the Aurora overhauled and with all the wharf buildings painted, a new white trim around the wharf and sea wall, the area looks very smart, and we hope will suitably impress the 1970-71 expedition who arrive about October 15. The new party consists of:

Mr D. J. Laws—Officer in Charge.
N. W. Brown—Senior Met. Observer.
K. F. Herrick—Met. Observer.
B. D. Monks—Met. Observer.
W. J. Stuart—Mechanic.
C. M. Brunton—Technician (Telecommunications) (summer only).
L. G. Barker—Technician (Electronics).
C. B. Means—Ionosphere Observer.
B. D. George—Cook.
M. M. O'Donoghue—Met. Observer (summer only).
M. B. Crompton—Met. Observer (summer only).

To Bryan George, whom we leave behind for another full term, and also to Clive, Mark and Mike who are summering over, we say a very grateful thanks. It was grand to work with you and we wish Derek Laws and his new team every success for a happy and fruitful year."

# University of Canterbury Plans for Summer

Since the summer of 1960-61 the zoology department of the University of Canterbury has been engaged in research in the McMurdo Sound area, using up to seven workers. This season there will be a team of ten, three of whom will work from Scott Base, and seven for varying periods at Cape Bird.

Initially the field programme was directed by Dr Bernard Stonehouse, and since 1966-67 by Dr Euan Young. He is on two years leave, and for the next two seasons the work will be directed by Professor G. A. Knox, head of the zoology department.

There is accommodation for four or five workers at the Cape Bird field station. Early this summer a small laboratory wing will be built on to the present hut by maintenance staff with the main New Zealand Antarctic research team.

A husband and wife team, Mr and Mrs E. Spurr, will spend the full season at Cape Bird. Mr Spurr, a Ph.D. student, who has spent three summers in the Antarctic, will continue his studies of the behaviour of Adelie penguins. Mrs Spurr, a B.Sc. honours graduate in zoology, will make an ecological study of freshwater melt ponds with special reference to the rotifer Philodina.

The seal research programme will be continued by Mr D. Greenwood, who is going south for his third season, and his assistant, Mr D. D. Lawrey, a B.Sc. honours student. They will be quartered at Scott Base, and will continue the annual banding, resighting of tagged seals, collection of nails, and measurements for ageing.

Dr D. Horning, a visiting lecturer in zoology from the University of California, Davis, will also be at Scott Base. He is interested in the microfauna of lichens and mosses, in particular, the Tardigrada, a group which he has studied extensively. He will visit as many localities as possible to collect lichen and moss samples.

Working at Cape Bird for the full season will be Mr J. Lowry, a Ph.D student who has already had two seasons studying the benthic ecology of Arthur Harbour, Anvers Island, off the Antarctic Peninsula. He will study the ecology of soft-bottom marine communities off Cape Bird.

Part-season work at Cape Bird will be undertaken by Mr G. A. Knight, an M.Sc. student, who will assist Mr Lowry in a general survey of the marine benthic animals of the area.

Mr T. J. Carryer, an M.Sc. student, will study the general plankton cycle and productivity off Cape Bird.

Mr J. Hilton, a B.Sc. honours student, will help with the bird research programme and Mr D. J. Smith, an M.Sc. student, will continue his studies of the Collembolum insect Gomphiocephalus hodgsoni.

## TRIMARAN TO BE USED

Members of the University of Canterbury Antarctic research unit at Cape Bird will be going to sea this summer—not in a sieve—but in an unusual craft for Antarctic waters. They will use a trimaran for marine biology studies in the sea near Cape Bird.

The use of a trimaran was announced by Professor G. A. Knox, head of the zoology department, when he described the work that will be done by the research unit this season. He said that in previous summers most of the scientific work had been on land but this season half of the team would be studying life in the sea.

A gift of $1000 from the Trans-

Antarctic Association to the zoology department has enabled the unit to have a trimaran built in Christchurch. The boat will be 16ft 6in long with a 12ft beam. It will have 144 square feet of deck space, a locker, a work table, a winch, and a hole for sampling through the deck instead of over the side.

The 15ft 6in long hulls will be thicker than normal and fitted with a brass runner along each keel. Each hull will be filled with polystyrene. Three hulls were advised because of the proposed 1300lb work-load.

Professor Knox says that when small boats are used in the Antarctic, rescue from outside sources is not usually available. Oars on a boat the size of the trimaran would not be very effective against winds from offshore, ebb tides or moving ice. So to provide a margin of safety two Japanese four-stroke outboard motors will be used.

The weight of the boat will be 1318lb and it will cost $1348.

## WOMEN FOR UNIVERSITY TEAMS

Three New Zealand women will work in the Antarctic this summer, one of them as the leader of the University of Waikato expedition. She is Dr Ann Chapman, who is unmarried.

Miss Rosemary Askin will work with the Victoria University of Wellington expedition, and Mrs Barbara Spurr, a B.Sc. honours graduate in zoology, will make an ecological study of freshwater ponds in the Cape Bird area, about 60 miles from Scott Base. She and her husband, who will study the behaviour of Adelie penguins, will live in a double arctic tent beside the hut housing the other members of the University of Canterbury expedition.

Dr Chapman's party will include five men—Dr J. F. Leader and Mr C. S. Hatton, of Auckland, Dr T. J. Brown, of Massey University, Palmerston North and Messrs B. Willoughby and P. Hogg. They will study the biology of the lakes in the Taylor and Wright Dry Valleys.

# FAILED BY 1000ft

Three men—two New Zealanders and an Englishman—returned to Scott Base on September 30 after failing by only about 1000ft to reach the summit of Mt Erebus (13,743ft), the only recently active volcano in Antarctica. Bad weather and lack of time were the cause of the failure by Messrs R. B. Willis (Roxburgh) leader at Scott Base, P. Kerr (Hamilton), a science technician, and C. Knott (Stratford), an English field assistant and dog handler.

The three men left Scott Base for Cape Royds on September 24. They could not start their climb until September 27 because of bad weather. The first day's climb took them to 4700ft where they camped near a parasitic cone. On September 28 the party decided that rather than set up a higher camp they would make a burst for the top from their 4700ft camp. They left camp shortly after 7 a.m. and by 3 p.m. had climbed to 12,000ft on the rim of a former crater.

Although the summit of the present crater was only about 1000ft higher, it was more than a mile away, and there was not enough time for more climbing. The men descended more than 700ft to their camp in the afternoon. On September 29 they continued the descent, arriving back at Cape Royds the same day with a large number of geological samples collected on the way.

## RADIO PIONEER PASSES

Veterans of Rear Admiral Richard Byrd's first expedition may remember Donald Gordon Mitchell, who died in Dunedin recently, aged 85. Widely known as "Toots" Mitchell, he was a radio pioneer, and in 1929 helped to relay messages between Little America and New York for Byrd's expedition.

Mr Mitchell was the first operator of New Zealand's oldest broadcasting station, 4ZD (later 4XD) which was run by the Otago Radio Association. He was the association's first secretary, and his links with it lasted nearly 50 years.

# WINTER TEAM AT SCOTT BASE

New Zealanders, Englishmen, and a Scot, are included in the team selected to winter at Scott Base through 1971. The youngest is 21, and two men are 48. There are ten in the team, and one field assistant will be added later from the men working at the base or in the field this summer.

The members of the winter party are:

**Brian Porter,** Leader (see June "Antarctic").

**Ronald G. Nimmo** (37), Christchurch. Senior Technical Officer. He was born in Edinburgh and has been a Post Office technician for the last seven years. Mr Nimmo has also spent several years in the electrical field.

**Murray W. Dawson** (24), Wellington. Technician. Born in Auckland, he is in the engineering section of the New Zealand Broadcasting Corporation in Wellington, and is experienced in the use of electronic equipment.

**David H. Clough** (22), New Plymouth. Technician. He is a telecommunications technician with the Post Office, and was born in New Plymouth.

**Jim S. Rankin** (39), Kumara. Base Engineer. He was born at Havelock and is a certified motor mechanic. In addition he possesses carpentry and plumbing skills.

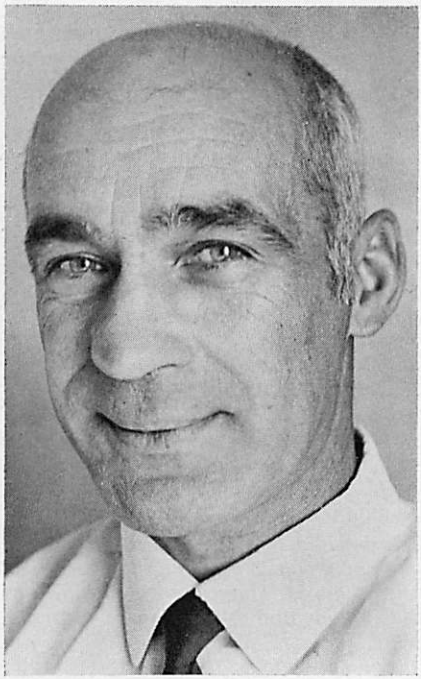
**Stewart I. Miller** (21), Dunedin. Fitter Mechanic. He was born in Riverton, Southland, and is a Post Office apprentice. Mr Miller has served as vice-president of the Otago Tramping Club.

**Robert A. McFerran** (48), Christchurch. Fitter Electrician. Born in Christchurch, he has had 30 years' experience as a registered electrician.

**Frank L. Bond** (48), Auckland. Cook. Born in Hucknall Torkard, Nottinghamshire, he served in the catering branch of the Royal Air Force from 1940 to 1946, and then worked in several hotels. When selected he was second chef at a large Auckland motor hotel.

**G. Crookes** (30). Postmaster. An Aucklander, Mr Crookes joined the Post Office in 1961 and was a radio operator in Wellington. He was transferred to Auckland in 1964 as a radio inspector.

**J. D. Windsor** (21). Radio technician. He was born in Wellington and has been a Post Office radio technician since 1966.



**MR BRIAN PORTER**
**Scott Base leader**

### TEAM MEMBERS KEEP FIT

Most of the New Zealand team at Scott Base are fitness and weight conscions, according to the leader, R. B. Willis. His May report says that a group has been walking regularly to McMurdo Station for exercise and a sauna bath.

# SUMMER SUPPORT STAFF

More than 50 men and three women will work at or from Scott Base, and at Cape Bird, during some part of the 1970-71 summer. They include teams from four universities, Magnetic Survey, the Institute of Nuclear Sciences, and the Oceanographic Institute.

### AT BASE

J. R. M. Barker: Deputy Leader.
G. W. Nation: Storekeeper.
R. P. Greers: Maintenance Officer
N. A. Ruebe: Assistant Maintenance Officer.
P. R. Christensen: Assistant Maintenance Officer.
B. A. Jackson: Information Officer.
D. Wood: Radio Operator.

### FIELD STAFF

S. J. Curreen: Field Leader.
T. J. H. Chinn: Hydrologist.
M. Riding: Field Assistant.
D. G. Roberts: Field Assistant.
G. C. Baker: Field Assistant.
P. A. Hanson: Field Assistant.
K. F. Gousmett: Field Assistant.
A. R. Eskrick: Surveyor.

### VANDA STATION

P. F. Dyer: Leader.
D. N. Randall: Senior Technical Officer.
C. G. Tunnicliffe: Technical Officer.
J. M. Waller: Meteorologist.
V. Sussmilch: Meteorologist.

### VICTORIA UNIVERSITY

Dr P. J. Barrett: Leader.
B. Kohn.
A. Ritchie.
G. Young.
R. Grapes.
D. Reid.
Miss R. Askin.
J. McPherson.

### WAIKATO UNIVERSITY

Dr Ann Chapman: Leader.
Dr J. F. Leader: Zoologist.
C. S. Hatton: Zoologist.
Dr T. J. Brown: Microbiologist.
B. Willoughby: Field Assistant.
P. Hogg: Field Assistant.

**MAJOR J. R. M. BARKER**
**Deputy Leader**

### AUCKLAND UNIVERSITY

Dr A. C. Kibblewhite: Geophysicist.
D. Jones: Technical Officer.
F. Blair: Technical Officer.

### CANTERBURY UNIVERSITY
**(Harrison Laboratory, Cape Bird)**

Prof. G. A. Knox: Leader.
D. D. Lawrey.
J. K. Lowry.
T. J. Carryer.
G. A. Knight.
D. J. Smith.
E. Spurr.
Mrs B. Spurr.
Dr D. D. Horning: Botanist.
D. G. Greenwood.

### GEOCHEMICAL PARTY

Dr P. E. Blattner: Geochemist.
I. Turnbull: Geologist.
G. Lyon: Institute of Nuclear Sciences.
I. Turnbull: Geologist.

(*Continued on page 452*)

# FIRST WAIKATO UNIVERSITY ANTARCTIC RESEARCH

By M. J. SELBY

A four-man Antarctic field trip seemed a good way of starting science at the University of Waikato. Shortly after the appointment of Professor A. T. Wilson as Dean of the new School of Science a programme of work on the lakes of Cape Barne, on the Canada glacier and the effects of salt weathering on the landforms of the McMurdo dry valleys was agreed and the four-man party of three chemists—A. T. Wilson, C. H. Hendy, J. Johnson—and one geomorphologist—M. J. Selby—was assembled.

In the Cape Barne area we mapped Deep Lake and drilled two holes through the 20ft ice to sample the bottom water for chemical analysis. A portable X-ray diffraction machine and flame-photometer were taken to Scott Base so that chemical analyses could be performed on samples of salts from the sea ice and soil before they had a chance to change their properties. This is possibly the beginning of a new phase of Antarctic research with sophisticated equipment being used on the spot.

On the Canada glacier a two-year-old drill hole was opened up again and deepened so that measurements could be made of the angle of inclination of the hole. The inclinometer consists of a series of glass tubes containing lengths of bath-plug chain. These are held in place by that quick-setting (in Antarctic temperatures) transparent cement—orange jelly.

Those members of earlier Victoria University field parties who have had much contact with Alex Wilson will be well aware of his obsession with the salts of the drier parts of Antarctica. From the evidence obtained by our party it seems that salt weathering might well be a dominant geomorphic process. We found deposits of sodium chloride in many of the caverns of the Taylor, Wright and Victoria valleys, and even larger ones in the Labyrinth. Earlier hypotheses for the origin of the Labyrinth have called upon such catastrophic events as volcanic eruptions melting vast quantities of ice, huge floods from interglacial melting, and subglacial erosion. There is no evidence in favour of any of them and the Labyrinth may well be one of the earth's oddest landforms produced by a distinctive process—salt weathering.

(*Continued from page 451*)

**NUCLEAR SAMPLING**

Dr C. D. Taylor: Institute of Nuclear Sciences.

**OCEANOGRAPHIC PARTY**

R. Heath: Oceanographer.
A. Hicks: Biologist.
N. Robertson: Technical Officer.

**MAGNETIC SURVEY**

A. L. Burrows.
D. Frew.
G. Sorrell.

# ADMIRAL CRUZEN DIES

Vice-Admiral R. C. Cruzen, who served as second-in-command in Rear-Admiral R. E. Byrd's 1939 Antarctic expedition, died recently in California. He was 72.

In his 34-year career in the United States Navy, Admiral Cruzen took part in expeditions in both the Arctic and the Antarctic. As a captain, with Admiral Byrd's expedition, he commanded the U.S.S. Bear which made a 118-day, 25,000-mile voyage without once dropping anchor.

# NEWS FROM VANDA STATION

Powdered milk tins and parts salvaged from a crashed helicopter are the main components of an elaborate apparatus built by staff of the New Zealand field station at Lake Vanda to collect dust blown during wind storms.

Extremely high electro-static discharges have been registered during storms this winter. The dust collected will permit research into a theory that the dust particles cause this, according to a New Zealand Press Association report from Peter Hide, information officer at Scott Base, last month.

The high voltages discharged during wind storms are phenomena which apparently occur only during the winter. The station's senior technician, Mr G. H. Lewis (Lower Hutt) believes analysis of dust samples may show why this is so.

Mr Lewis says he first became aware of this peculiar occurrence when the field mill measuring the atmospheric potential gradient could not register sufficiently high during one of these electro-static storms. The field mill recorded up to 800 volts per metre, and the discharge was considerably above this during the storm. Aerials in the scientific laboratory had sparks jumping up to a quarter of an inch.

To collect the dust samples which are believed to effect the electrostatic discharges, Mr Lewis and another technician, Mr R. J. McKerrow (Dunedin), have built the apparatus to do a blowing dust profile measure of the density of dust at different heights.

A 10ft vertical mast has been mounted on a helicopter rotor transmission, with a tail vane to turn the dust collectors into the wind. The five collectors are powdered milk tins, with a conical nozzle facing the wind, and a blind trap to capture the dust while allowing the wind to pass.

Samples of the dust, the larger particles of which can be felt against the skin during a storm, will be sent to New Zealand in the hope that analysis of size, density, and substance may show the cause of the extreme electro-static discharge.

Mr Lewis says that sheets of glass will be used to observe the abrasive effect of the blowing dust. The relationship of the extent of abrasion to height could be of use to geologists.

Why there should be such a high electrostatic discharge during the winter —sufficient to damage all transistorised equipment in the station—but not during the summer under similar conditions is a mystery.

Last summer the men at Vanda saw a dust devil, about 50ft across and several hundred feet high. It gave the impression of marching down the valley and went right past the station. Yet nothing was recorded on the field mill indicating it had no electro-static discharge.

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**(ADMIRAL CRUZEN** continued)

In the Second World War, Admiral Cruzen served first at the Naval War College and later in the Pacific.

After the war, he commanded an exploring expedition in the Arctic. In 1947, he again served with Admiral Byrd during "Operation Highjump"—which remains the largest expedition ever sent to the Antarctic.

Admiral Cruzen's last duty was as commander of United States naval forces in the Philippines, from which post he retired in 1954.

# WINTER WORK AT VANDA

Because of the lack of snow the Wright Dry Valley is particularly dark during the Antarctic winter, unlike other parts of the continent where snow gives a high degree of reflection. Dark rock and mountains rising to 7500ft allow only very diffused light to reach New Zealand's remote Vanda Station in the winter months.

But a darker than dark winter has not prevented the four men at Vanda from moving over a wide area to obtain data on the climate in the dry valley. They have made weekly trips to a satellite meteorological screen at the opposite end of Lake Vanda from the station. These trips involve walking eight miles return, mainly on the ice surface of the lake itself, to recover and change recording charts.

One or two trips each month to more distant screens have been timed to obtain the benefit of the moonlight. A trip to a screen on the top of a wide flat-topped ridge known as the Dais involved a walk of 14 miles and a steep climb of 2600ft.

## CLIMB BY FULL MOON

During the full moon in July a climb was made into the Asgard Range, where there is a shelter hut and meteorological screen at a height of 5000ft on the edge of the Jeremy Sykes Glacier.

Another trip during the month was made to a United States summer station on the Meserve Glacier, ten miles east of Vanda Station. Two men spent two nights there, making meteorological observations.

Perhaps it is not surprising that in his July report the station leader, H. P. Lowe, referred, under the medical heading, to foot blisters caused by footwear unsuitable for walking.

## WIND AND LOW TEMPERATURES

The meteorological programme—one of eight scientific programmes at Vanda—has shown a change in the weather pattern compared with last winter. There has been much more wind, and the temperatures have been higher. On July 31 the temperature dropped to minus 53 degrees Centigrade. Last winter the lowest temperature recorded was minus 57 degrees.

Men of the Vanda team know what low temperatures are like. They have slept inside a polar tent erected on the ice of Lake Vanda when the temperatures have been as low as minus 51 degrees. At the same time they tested radio equipment in lower temperatures.

May was a windy month at Vanda, and also a busy month for the team. The weather was relatively warmer, the highest temperature being minus 3.1 degrees on May 18 and minus 45 degrees on May 28. The four men of the team had some leisure time. They occupied it learning to type, writing, painting, and learning to play a guitar. Other activities included photography, radio, sewing, and a darts game with the men on Raoul Island in the Kermadecs, which Vanda lost after a close run.

The men are not cut off from the world entirely at their tiny station. They talk to Scott Base frequently by radio, and listen to music from tape recordings and the radio. The news is rebroadcast to them from Scott Base.

Winds up to gale force with a maximum of 72 knots were experienced in June. The highest temperature was minus 0.0 degrees on June 2 and the lowest minus 44.3 degrees on June 13.

There was little wind in July but temperatures were lower. The highest was minus 8.6 degrees on July 7 and the lowest 53 degrees on July 31. In the medical section of his report the station leader reported no cases other than frost nip, eye strain, light skin rash, minor cuts—and the foot blisters.

# JAPANESE TO WORK AT VANDA

Japanese scientists will take part in a joint research programme at New Zealand's Vanda Station in the Wright Dry Valley this season. They will study the heat balance of Lake Vanda and movements of the lake water.

Dr Tetsuya Torii, executive secretary of the Japan Polar Research Association, who announced in Tokyo that New Zealand had invited the scientists to spend three or four months at Vanda Station, said that a Japanese geochemist would study similar ice-free lakes near Showa Station on Ongul Island, off the Prince Olav Coast. The results of the two research projects would be compared.

Leader of the Japanese party will be an Antarctic veteran, Mr Yoshio Yoshido, who was a member of the Japanese Antarctic Research Expedition in 1957-58. He was at Showa with JARE IV in 1959-61 and JARE VIII in 1967-68. In addition he was a member of New Zealand summer parties in Victoria Land in 1963-64 and 1964-65.

A geomorphologist, Mr Yoshida is now an associate professor in the department of geography at Hiroshima University. With him will be Mr K. Moriwaki, his assistant, and Mr Yuki Yusa, of the geophysical research station at Kyoto University.

The Japanese plan to make continuous and automatic measurements at Lake Vanda in order to study the dynamic features of heat transfer. In addition Mr Yoshida will make a geomorphological survey near the lake.

# JAPANESE OPPOSED TO ANTARCTIC TOURISTS

Japanese polar scientists are opposed to large numbers of tourists visiting the Antarctic. Dr Tetsuya Torii, executive secretary of the Japan Polar Research Association, said in Tokyo last month that the Japanese delegation to the Antarctic Treaty nations' meeting in October is considering asking the conference to restrain efforts to open up Antarctica to tourists until scientific research has been completed.

"The Antarctic is the only continent not yet contaminated by civilised man and it offers a unique opportunity for study and research," Dr Torii told David Barber, staff correspondent of the New Zealand Press Association last month. "The question of tourism and the inevitable pollution it will bring will be a major topic at the Antarctic Treaty meeting."

# TO DIVE UNDER VANDA ICE

Russian and American scientists have dived under the Antarctic ice in the course of their work in past seasons. This season a New Zealand meteorologist, Mr V. Sussmilch who is also a scuba diver will follow their example and Mr Sussmilch will dive under 8ft thick ice at Lake Vanda to attach equipment to the ice. The equipment, and other investigations, could help solve the puzzle of why the lake is covered with ice, but at the bottom, 200ft down, the temperature is 60 degrees.

The project will be carried out while Mr Sussmilch is at Vanda Station between late December and early January. He will be one of two meteorologists at Vanda Station during the summer.

# Strange Days at Cape Bird

## POSSIBLE RESPONSE BY ANTARCTICA TO FEMALE VISITORS

*By EUAN YOUNG*

The author of the following article, Dr. E. C. Young, a senior lecturer in zoology at the University of Canterbury was the leader of the university's Antarctic unit during the 1969-70 summer. Together with his wife and three students he carried out zoological studies at Cape Bird, primarily on the behaviour of penguins and other bird-life.

Much has been said on and off about taking women to Antarctica, but very little comment has referred, as I recall, to the response of the continent herself. Being one of the few parties with some little experience in having a *Homo sapiens* female with us it seems worthwhile piecing together incidents that seemed out of the ordinary, intriguing or just plain plaguing in order to assess whether indeed any response occurred.

The series of incidents noted in this season, from our subject's arrival in Antarctica on November 11, 1969, to departure on January 26, varied from the trivial to the sinister, from the historical to the interestingly scientific. They share one common feature, however, none had really been noticed before in five previous seasons. That I became aware of their occurrence as a progression of events speaks itself of some subtle change or manifestation in the atmosphere not noted before; sufficient change to lead to their being recorded—on paper or more simply in the memory. It is worth remarking that I am not more than ordinarily superstitious.

The incidents are listed below in the order they occurred or were noted. An initial, and seemingly crucial, response occurred even before we embarked and is considered first.

**Opening of the season.** For a number of years, as far back as I can remember anyway, the summer flights have got off on schedule, on October 1—often at 0001 hours. In this year however, presumedly by special order, flights officially began 15 days later, in the middle of the month. This change, compounded by appalling weather and difficult communications, hazarded our whole operation and indicated right at the outset that an unusually awkward season awaited us.

Not that I blame anyone in retrospect: the Antarctic had simply lulled everyone into a pliant acceptance of timetabling better suited to more equable regions. I see now that it was her first obvious reaction.

**Travel.** In former years one drifted slowly south from New Zealand, being carefully conditioned during the half day or so to the transition from Christchurch suburbia to the harsh reality of living nature. In this year we lacked such fortune. We had no sooner settled down to a quiet snooze and a good book in the Starlifter when orders came to prepare for landing. What! At Invercargill? was my reaction. I am not certain that I ever overcame this initial shocking upheaval.

**Scott Base.** I have spent many happy and some not so happy days at this way station but never before have I been involved in fire alarms. In these first three days not one, but two, alarms broke into the frenzied time-filling of the stacked-up field parties incarcerated there. Surely this number of alarms, all false I may add, in comparison with none before gives the argument statistical veracity!

**Trip to the Pole.** I didn't go. Even though not wanting to I might have expected to have been sent. This seems to offer the first signs of interference by Antarctica in a moderately stable marriage.

**Delay in getting from Scott to Bird.** Delayed through weather would be the charitable, reasonable explanation, I suppose, of why, having got to Scott late, but with all our gear, we couldn't get any further. Seen in context, as one of a whole series of misfortunes, more significance should be placed on this check.

**Trip from Scott to Bird.** I consider that only very superior flying skill got us up to Bird in one piece. I have never descended from a helicopter more thankfully.

**Movement of gear to Bird.** Again, as with the trip south, the task was underestimated in the face of the intransigence now routinely expected. The difficulties were, of course, compounded by a helicopter shortage.

**Harold Low's return to Scott.** I see now why Harold was stranded with us for so long by weather: it was all to cool relations between Bird and Scott. This incident marks the first time that a somewhat sinister design was evident in her general pettishness. It says a great deal for all concerned that no success came of this attempt to cause trouble.

**Weather.** The year was notable for the number and ferocity of its southerly storms. In ordinary seasons the storms that sweep around the western edge of Mt. Erebus and come up directly from Cape Royds—often leaving Scott Base becalmed—usually pass by about two to five miles out to sea, allowing us peaceful conditions with a light north-east wind. Not so this year. Almost all storms recorded at Scott, and a few more besides, belted us during the season.

It is obvious that one of the most direct ways that Antarctica could react would be in her weather. With experience we learned to expect the worst and so reacted accordingly. It was nevertheless of interest to observe that our female member was more actively buffetted by wind than any other member of the unit and this seemed more than could be accounted for by her lighter weight exposing the same sail area of the standard clothing.

**Whirlwind, December 11.** I have never seen a whirlwind develop or move before but I had no doubt about identifying this one. It started in the gully beside the laboratory during a light northerly wind while I was down on the beach about 100 yards away. The start itself was significant; there really didn't seem to be enough general wind to rustle leaves, let alone set up half a hurricane. The site, too, raised suspicion —it was far too close to the laboratory and tent to be mere chance.

In a few moments the gentle breeze had increased violently to a whirling mass of dust and rubbish about 30 yards across. After bodily lifting the half 44-gallon drum used for burning rubbish nearly 10 yards, it slid off the edge of the cliff by the hut and passed noisily over the beach to collapse at sea. It didn't last for more than two or three minutes altogether and had almost gone before the others in the laboratory, disturbed by the onslaught of noise and shingle against the walls, rushed outside.

It seemed to me, as I watched petrified as it hurtled straight towards me from the slope, that I was being singled out especially (not that anyone else was present), as if I was to blame (which I was, I suppose) for the new presence. Anyway, after a few terrifying anxious moments as the thing moved through me, I was left shaken and dusted but unhurt. A hint of melodrama? A warning? But in the end certainly, a touch of pity appearing in a usually implacable visage as it returned me safely to the ground.

**A visit by a white skua gull, Christmas Day.** This was the most disturbing incident of the summer which, with memories of mariners and opium-ridden poets, seemed deeply swathed in significance and symbolism. This day gave the first and only sighting of what was certainly a full, white-plumaged skua. It was followed in flight above the laboratory and along the beach for a little over a minute.

Positive identification was made by Young, even though somewhat distracted, and by David Smith and Eric Spurr. Identification was based on

general shape and flight habits and more certainly from the wing flashes which showed as brilliant white against the duller white of the rest of the plumage. It was not seen again at Bird nor noticed later at Scott Base. I still feel apprehensive about what this visitation in fact heralded.

**Christmas mail and re-supply.** As usual this didn't eventuate until later in the new year and although this wouldn't normally be considered an unusual phenomenon, in this season, with its high administrative overseeing, it has a certain significance.

**Visit by Emperor penguin chick.** New Year's Day—is there something also symbolic here?—was marked by a short visit of a starving Emperor chick still partly down clad which appeared through the mist swimming on the water surface like a fox terrier. This chick was clearly dying of starvation. With flippers literally brushing the ground, it miraculously escaped predation by inches as it paddled slowly down one side of an ice floe as the resident leopard seal cruised up the other.

I am unable to interpret the meaning of this visitation. On the one hand the chick was obviously starving while on the other it miraculously missed a messy death. The two seem in contradiction.

**Visit by Elephant Seal, mid-January.** This globose seal was first noticed among the Weddells pulled up on the beach by the steam billowing from its surface in the cold sunlight. Closer inspection showed it to be almost hairless and to be more massive with a heavier, more pointed face than the Weddells. Without the steaming though I couldn't be certain I would have noticed it, in my usual state of semi-somnolence, even though passing closely by.

There seem few other records of elephants this far south—although either Scott or Shackleton saw one—and we have certainly not had one before in the years the seal beach patrols were standard practice. Again, as with the Emperor chick, I have difficulty with interpretation. That it was so far outside its usual range may well have been alluding to the improper geographic place of our member.

**Mekong River flash flood.** The Mekong River, at the north end of the beach, floods once or twice each season through ice damming the headwaters. Usually the flood simply fills the deep bed for a few hectic minutes and does no harm apart from washing out a few foolish penguin nests.

In this season the pattern critically changed so that for the first time a pair of skuas was affected. Not any old pair. That would not be worth remarking on. In this instance the pair losing an egg and chick was 153 which for the past several seasons had achieved what may well be the unique record of invariably rearing twin fledgings.

By this phenomenon it seemed as though Antarctica was demonstrating her power and our futility, but in a nasty way by demonstrating it on a much respected possession.

**Starvation of young skua chicks in January.** I have no proper explanation to account for the vagaries of skua behaviour which caused them for the first time in my experience to actively and persistently deny food to chicks which seemed too late to fledge successfully when at the same time older chicks were being well and profitably fed. We perhaps need to look again into skua ability in seasonal time-keeping.

**Conclusion.** Offhand this seems to cover the major incidents, but numerous others, too many to detail, such as an unexplained lack of porridge, a freak wind blowing only at Cape Royds on our visit there and the loss of a box of good meat in an unbelievable ice collapse add further substance to the general thesis. This thesis, after looking at all the evidence with an unbiassed, chemically objective view, states that there are good grounds for believing that Antarctica or the spirits that persist there reacted jealously to the incursion of a female member in a scientific party and that similar responses may well be expected on future occasions.

# U.S. SCIENCE PROJECTS FOR SUMMER SEASON

Two hundred scientists, including two women, will take part in the United States Antarctic Research Programme in the 1970-71 summer season. Among them will be scientists from the United States, New Zealand, Norway, Belgium, the U.S.SR., and South Africa.

The programme budget of $US7.5m is $500,000 more than last year but there will be fewer projects than last season. Research will be conducted at six American Antarctic stations and a number of field camps on the continent, aboard the research ship Eltanin in the Indian Ocean, aboard icebreakers in the Ross Sea, and at Vostok and Bellingshausen Stations by arrangement with the U.S.S.R.

The Antarctic research vessel Hero will continue work in the Antarctic Peninsula area, operating from Palmer Station during the summer. The research vessel Alpha Helix will also work with the Hero and Palmer Station but will be self-sufficient.

Support of the summer field programmes will be given from McMurdo, South Pole, Byrd and Hallett Stations. The five major programmes will be a continuation of the extensive geological and paleontological studies in the Central Transantarctic Mountains, a continuing geological and topographical survey in the Lassiter Coast area, support of a British Antarctic Survey team in the Shackleton Mountains, a Norsk Polar Institute team in Queen Maud Land, and the continuation of scientific observations at Siple Station in the Ellsworth Land sector of Antarctica.

Dr Irene C. Peden, one of the two women in the programme, will make a radio science study at the Byrd long-wire sub-station. She will be the first woman scientist to work in inland Antarctica. Mrs C. Muller-Schwarze will work with her husband, Dr D. Muller-Schwarze at Cape Crozier. They will continue last season's studies of the social behaviour of penguins.

A brief summary of each science activity follows:

**Ohio State University. Geology of the Central Transantarctic Mountains.** A geological field party of 12 men directed by Dr David H. Elliot and Dr Donald A. Coates will conduct extensive geological studies in the areas near the head of the Shackleton and Robert Scott Glaciers in the southernmost reaches of the Central Transantarctic Mountains. Glacial geology and geophysics investigations will also be conducted as part of the university's geological programme. The scientists will also work in the Wright Valley-Bull Pass area across McMurdo Sound. This will be continuation of work started in the 1968-69 season when a "rock glacier" in the north fork of Wright Valley was measured as part of an initial study of mass wasting in the valley.

**University of Witswatersrand. Paleontology of the Central Transantarctic Mountains.** Dr James Kitching will join the Central Transantarctic Mountains USARP party as an exchange scientist from South Africa. He is an experienced paleontologist and will be an excellent addition to the group in searching the area for additional fossil discoveries because the stratigraphy of areas of South Africa is quite similar to that of the Central Transantarctic Mountains area.

**U.S. Geological Survey. Geologic Mapping of Lassister Coast Area.** Four geologists and four topographic engineers led by Dr Paul Williams will continue the second stage of a planned three-year survey of the Lassister Coast area of Antarctica from late October to the middle of February. The project

area of about 13,000 square miles is along the east side of the Antarctic Peninsula between 73 and 75 degrees South and 60 and 65 degrees West. Motor toboggans will be used in the field and the party will be flown into the area by Hercules aircraft.

**Norsk Polar Institute. Geologic and Biologic Investigation of Queen Maud Land.** Mr Thore S. Winsnes will lead a party consisting of three geologists, one biologist, one glaciologist and one radio engineer to work in the Sverdrup Mountains of Queen Maud Land. The project area contains the least metamorphosised rocks of the Basement complex near to the younger unfolded sedimentary rocks from the west. It has been visited before by a sledge party from the Maudheim Base in 1951 and by Soviet geologists in about 1961. The party will measure the Jutulstraumen Glacier, study other glaciological problems, and study the biology of the mountains. Communications will be maintained with the South Africans at SANAE about 155 miles away.

**British Antarctic Survey. Geology of Queen Maud Land.** A British Antarctic Survey party of four men will spend an additional season in the Shackleton Range to complete work undertaken in the past two seasons. They will be flown across the continent from McMurdo Station to Halley Bay by a United States Navy Hercules aircraft.

## SIPLE STATION
### (Byrd Land)

**Stanford University. Magnetospheric Research in Antarctica.** Mr John Katsufrakis will lead a party of four scientists who will study magnetospheric phenomena, and investigate the solar-terrestrial relationship, using very low frequency and high frequency radio, aurora, and geomagnetic data from satellite and surface measurements. An important part of the new observations at Siple Station will be the construction of a 13-mile long dipole antenna which will be maintained above the snow surface for the life of the station.

**University of Maryland. Investigation of the Solar-Terrestrial Relationship.** Four men led by Dr T. J. Rosenberg will make a co-operative investigation of the solar-terrestrial relationship. Siple Station is near the region where magnetic field lines, which pass through the plasmapause at the geomagnetic equator, come to earth. Balloons will be launched from the station to carry detectors aloft to measure bremsstrahlung X-rays resulting from energetic electron precipitation. These measurements will be compared with simultaneous VLF measurements to learn more about, and to test various theories of wave-particle interactions. Where possible balloon launches will coincide with magnetospheric substorm activity, and with launches from other stations, specially those made at the northern geomagnetic conjugate, Roberval, Quebec, Canada.

**Bell Telephone Laboratories. Three-Axis Fluxgate Magnetometer.** A three-axis fluxgate magnetometer will be installed at Siple Station, and a group of three identical instruments will be installed in or near Roberval, Quebec, Canada. The instruments will be used in the first plasmapause conjugate experiments using the technique of geomagnetic field measurements. One of the uses of the data obtained will be in an existing international programme of magnetic studies as a function of latitude. Mr Hans P. Lie will work at Siple Station.

## McMURDO SOUND

**Stanford University School of Engineering. Electronic Systems Engineering Studies at McMurdo and Pole Stations.** Dr Michael Sites will be joined by Dr George Steuart, of the New Zealand Department of Scientific and Industrial Research in an electronic noise survey of the McMurdo Station area. The growth of activity there has resulted in contamination of the natural environment not only with electromagnetic interference but with lights, vibration, and earth currents. As a result experiments which require a low

background noise level are experiencing increasing interference. It is proposed that affected experiments be moved to a suitable low noise receiving site and a wide band data link established from the low noise site. Because of the proximity of McMurdo Station and Scott Base, development of this site should be a joint effort between American and New Zealand agencies involved in Antarctic research. Stanford will make an electromagnetic interference survey in the McMurdo Station area. Dr Sites will also visit Byrd Station and the Pole Station.

**University of Rhode Island. Trace Metals and Halogens in the Antarctic Atmosphere.** Dr Robert A. Duce and two colleagues will study the possible pollution source elements in atmospheric particulate matter at Hallett, McMurdo and Pole Stations. Metal concentrations and metal ion ratios in Antarctica will be compared with similar samples collected in the same period over the north and south Atlantic Ocean and Hawaii. These comparisons should give valuable information on the possible global transport of particulate matter to the Antarctic region. Particulate and gaseous samples will also be collected at the stations for halogen analysis as part of a continuing study of the atmospheric chemistry of the halogens. Dr Duce and his colleagues will also collect samples in Christchurch and Auckland.

**Moscow State University. Glacial Geology in Eastern Antarctica.** Dr Sergey Myakov will be assisted by a team of topographic engineers from the United States Geological Survey in a resurvey of glacial phototheodalite sites in the McMurdo area. He will then go to the Central Transantarctic Mountains for additional work with the Ohio State University team. Later he will return to McMurdo for continued investigation in the dry valleys.

**University of Wyoming. Geological and Geophysical Studies. Skelton Glacier.** A geologist, Mr Robert Flory, and another man, will work again on the Skelton Glacier about 130 miles south-west of McMurdo Station. They will be in the field for about a month.

**Ohio State University. Continuing Measurements at Meserve Glacier.** Dr Terence J. Hughes and Mr Olav Orheim will travel from Deception Island to McMurdo Station on the U.S.N.S. Wyandot and spend several days remeasuring the bore holes at Meserve Glacier.

**University of Minnesota. Status and Population Dynamics of Antarctic Seals.** Seven scientists led by Dr Donald B. Siniff will work from McMurdo Station studying seal behaviour, activity patterns and local movements, using radio telemetry and underwater television. Dr Albert W. Erickson and five assistants will work on an icebreaker in the Ross Sea to obtain data on population densities, species composition, distribution, etc. Fifty radio-marked seals will be monitored, and the scientists will be concerned also with racial affinities and heat profile studies.

**University of California, San Diego. Temperature Regulation in the Newborn Weddell Seal.** The leader of this project is Dr Douglas D. Hammond. Its purpose is to clarify some mechanisms of neonatal temperature regulation by examining special features which permit newborn Weddell seals to survive despite severe cold exposure. To determine whether there is thermo-regulation of body core temperature through vascular changes to the tail flippers four young seals and four investigators will be flown from McMurdo Station to New Zealand. Angiography to study vascular changes will be carried out at Massey University, Palmerston North. After the work is completed the seals will go to the aquarium at Napier.

**University of California, Davis. Comparative Biochemistry of Proteins.** Dr Robert E. Feeney and five assistants will conduct research on the comparative biochemistry of Antarctic birds, bird eggs, and the blood and muscle protein of Antarctic fishes. Adelie and Emperor penguin eggs collected at Cape

Crozier and fish from McMurdo Sound will be processed at McMurdo Station.

**Virginia Polytechnic Institute. Fresh Water and Marine Antarctic Fungi.** Dr R. Paterson and an assistant will begin the first stage of a proposed two-year study of the fresh water and marine chytridiaceous fungi and water moulds in McMurdo Sound. Soil samples will be taken on Mt Erebus and in the dry valleys to determine the presence of chytridiaceous fungi and water molds. Sampling of marine phytoplankton in McMurdo Sound is planned from sea ice and or boats using nets and grabs.

**Utah State University. Anti-Predator and Social Behaviour in Adelie Penguins.** Dr Dieland Muller-Schwarze, assisted by his wife, Dr Christine Muller-Schwarze and two others, will begin a second season of field work to extend observations at Cape Crozier on the effectiveness of anti-predator habits in the Adelie penguin into the latter developmental stages of the young. Experiments will continue on the responses of Adelie penguins to aerial and aquatic predators. Techniques will include the use of dummy birds to assess creche groupings, playbacks or leopard seal sounds, and time-phase film and tape recordings for pictorial and sound analysis.

**California Institute of Technology. Ecology of Antarctic Microorganisms.** Dr Roy E. Cameron and three others will work first in Southern Victoria Land and the dry valley area, and later on the Shackleton Glacier and in the Mt. Howe region. The investigation of soils at high altitudes will be continued and also the collection of pertinent data on meteorological and ecological parameters. The collaboration with the Virginia Polytechnic Institute and specialists in bacteriology, mycology and algalogy established in the first year will be continued.

**John Hopkins University. Skua Ecology and Behaviour.** Mr Roberto P. Schlatter will complete his studies of the ecology and behaviour of the south polar skua, which he started last year. He will work at McMurdo Station and Cape Crozier. These studies will reveal a great deal about the impact of the human population of McMurdo Station on skua ecology.

## BYRD STATION

**University of Denver. Investigation of Variations in Low Energy Cosmic Ray Cutoffs.** Dr James R. Barcus and three assistants will make cosmic ray measurements and analyse them to learn about the electromagnetic condition of the inner solar system and especially about near earth space which is dominated by the geo-magnetic field. Two super pressure balloon flights will be made to carry sensitive detectors to altitudes between 30 and 100 miles to study radiation which is not energetic enough to penetrate to sea level, even at high geomagnetic latitude. Measurements will be made at Fort Churchill, Manitoba, College, Alaska, and at Byrd Station.

**University of Washington. Radioscience Research at Byrd Longwire Substation.** Dr Irene C. Peden and a male assistant will investigate the morphology and evolution of the D-region ionosphere and the dielectric properties of Antarctic ice. Multiple VLF transmissions will be made from Longwire to Scott Base to understand better the D-Region and abrupt ionospheric discontinuities. From these studies may come information about the generation of acoustic and gravity waves.

## HALLETT STATION

**Iowa State University. Embryology and Incubation Behaviour of the Adelie Penguin.** Dr Leigh H. Fredrickson and two assistants will do research on the incubation behaviour and embryonic development of the Adelie penguin at Cape Hallett. Time lapse motion picture cameras and continuous temperature recordings will be used for observing incubation behaviour and establishing embryonic growth rates at different temperatures.

**University of California, Berkeley. Patterns and Effects of Chlorinated Hydrocarbons on Reproductive Capacity of Antarctic Pelagic Sea Birds.** Pollutants of both agricultural and industrial origin are now widespread in the global ecosystem and show regional fallout patterns. Sea birds are accumulating high concentrations of some of these cmpounds. Reproductive failure, due largely to eggshell thinning, has been found in the brown pelicans and double-crested cormorants of southern California. Eggshell thinning has also been found in other marine species during the past year. The proposed research by Dr Robert Riseborugh and his assistant in the Antarctic and sub-Antarctic would: (1) provide additional data on the fallout patterns of chlorinated hydrocarbons over several areas of the world's oceans from comparisons of total residue concentrations and of ratios of the different residues in sea birds which are either resident in a restricted area of which range widely in the non-breeding season; (2) continue a study of the reproductive success of populations of the Wilson's petrel near Hallett Station and Kerguelen Island. This species is one of the world's most abundant species and is now accumulating high residues of chlorinated hydrocarbons; (3) collect eggs of the Wilson's petrels and other species to determine thinning in relation to reproductive success.

## ANTARCTIC PENINSULA

A new feature of United States activity in the Peninsula this season will be the joint investigations by the National Science Foundation's research ship Hero and the research vessel Alpha Helix. The Alpha Helix is an ice-strengthened vessel of 512 tons operated by the Scripps Institute of Oceanography.

**University of California, San Diego. Physiological Studies of Fishes Lacking Hemoglobin.** This project is a continuation of similar research conducted by Dr G. L. Kooymen at McMurdo Station. Comparative physiological studies with respect to the high pressures encountered by diving birds will be undertaken at Palmer Station. A portable wet pressure chamber will be used in experiments on various species of penguins and the blue-eyed shag.

**Virginia Polytechnic Institute. Limnological Investigations of Algal Communities.** Dr Bruce C. Parker and three assistants will work from Old Palmer Station, Fildes Peninsula and King George Island in an extension of algal studies of various melt pools near Arthur Harbour last year. Deep freshwater lakes on Humble Island, Norsel Point and Fildes Peninsula will be monitored round the clock for several weeks.

**University of California, Davis. Bioenergetics of an Antarctic Ecosystem.** In a continuation of his studies of the metabolic rates of Collembola last season at Hallett Station, Mr R. M. Dunkle and an assistant, working from Old Palmer Station, will initiate an investigation of the ecological energetics of a terrestrial community on Norsel Point.

**Oregon State University. Physiolgical Ecology of Cryophilic Algae.** On Anvers Island Dr H. C. Curl, Jr., and an assistant will continue the collection and study of snow algae commenced last season.

**Ohio State University. Effects of Recent Volcanic Eruptions on Glaciers of Deception Island.** Strain net stakes will be remeasures and ice cores taken in a continuation of glaciological studies carried out over the past two years. Mr Olav Orheim, assisted by Dr T. Hughes, will collect about 150ft of ice cores. Dr Hughes will begin preliminary observation and studies for a possible future glaciological project.

**Columbia University. The Tectonics of the Scotia Arc.** Correlated with his recent studies on Livingston and Elephant Islands, at Hope Bay, and on the islands of the Chilean Archipelago and Tierra del Fuego, Dr Ian W. D. Dalziel will lead an international group of geologists in a project designed to examine the structure of this mobile area of the earth's crust. The party will work in the South Orkneys.

# NAVY'S LOGISTIC SUPPORT IN DEEP FREEZE 71

Scientific and support activities in the Antarctic have cost the American taxpayer, on average, about $33.1m in a year. Rear-Admiral David F. Welch, commander of the United States Navy Antarctic Support Force, expects that future American activities will continue at about the same level as in the past. He is unable to say whether the annual budget will remain basically the same because costs continue to increase, but the same level of scientific effort will continue.

President Nixon has made his decisions on future American policy for the Antarctic on the basis of a study which he called for at the end of last season. The recommendations have now been made public, but when Admiral Welch returned to Christchurch on September 25 he gave this reply to questions about any possible effects on the report to the White House: "We will not buy anything more, rent anything more, but neither will we close anything."

Admiral Welch is here for his last Antarctic season. On October he will fly south in the first of seven United States Navy aircraft which will land on the sea ice runway in McMurdo Sound, marking the official start of Operation Deep Freeze 71. This will be the beginning of the 17th consecutive year of logistic supprt by the Navy for American scientific operations in Antarctica. Later Admiral Welch will make his customary flight to the Russian Vostok Station to deliver an American exchange scientist.

Between October and March more than 2000 men from the Navy, Coast Guard, Army, Air Force, Marine Corps, and more than a dozen specialised units, will be concerned with the complex task of housing, feeding, supplying, and transporting scientists working for USARP. Ships and aircraft will bring home about 250 men who have been isolated for nearly seven months at McMurdo, Byrd, Amundsen-Scott South Pole, and Palmer Stations. By mid-summer the American population on the ice will be more than 1000.

Ski-equipped Hercules aircraft will bring fresh food and mail to Byrd and Pole Stations, probably early in November, depending on the temperatures. Palmer Station, on Anvers Island, off the Antarctic Peninsula, will be relieved by a Coast Guard icebreaker in mid-December.

Ships of the Military Sea Transportation Service will transport more than 14,000 tons of supplies to McMurdo Station. Cargo for the inland stations will be flown in by Navy Hercules aircraft.

Three Coast Guard icebreakers, the Staten Island, Westwind, and Burton Island, will cut a channel through the ice in McMurdo Sound for the two cargo ships, Private John R. Towle and Wyandot. For the second time the 35,000-ton tanker Maumee will deliver more than 5,000,000 gallons of fuel, a task that required six round trips by two smaller tankers in Deep Freeze 69.

In addition to logistic support for USARP projects, the Navy will be concerned with preparation of the site for construction of a new South Pole station. Admiral Welch said in Christchurch on his arrival that laying of the foundations is proving more difficult than expected, and the scheme is now being studied by the Naval Civil Engineering Laboratory.

The Navy will also have a new role this season—host to nearly 200 tourists who will travel to McMurdo Sound in the Lindblad Explorer. The tourists are expected to arrive in two groups—one in late January, and the other in mid-February.

# New Names Honour American Scientists

Future maps of Antarctica will carry the names of two distinguished American scientists. Two sharp mountains jutting from surrounding ice in northern Victoria Land have been called the Dubridge Range and the Handler Ridge in honour of Dr Lee A. Dubridge, science adviser to the President of the United States, and Dr Philip Handler, chairman of the National Science Board and president of the National Academy of Sciences.

Approval of the names of the features in honour of the scientists was given by the Board on Geographic Names of the United States Department of the Interior. DuBridge Range, which rises to about 7330ft above sea level, was first seen by the northern party of Scott's last expedition in 1910-1913. Since then American and New Zealand geologists have visited the area.

Handler Ridge, which is in the Victory Mountains, rises to more than 8600ft, and is bounded by the Trafalgar and Croll Glaciers. It is 80 miles west of Hallett Station.

Dr Dubridge, formerly president of the California Institute of Technology, was a charter member of the National Science Board, and served on it for ten years, including a term as vice-chairman. He and Dr Handler were informed of the honour at a dinner held in Washington to mark the 20th annual meeting of the National Science Board and the 20th anniversary of the National Science Foundation.

Photographs of the features were presented to Dr Dubridge by Dr Detlev W. Bronk, former chairman of the National Science Board and former president of the National Academy of Sciences, and to Dr Handler by Dr T. O. Jones, acting deputy assistant director for national and international programmes of the National Science Foundation.

# REPRESENTATIVE FOR USARP

In the 1958-59 Antarctic summer a 22-year-old American graduate student left Lyttelton for Wilkes Station in the ice-breaker Staten Island. This month the same man, Dr Richard L. Penney, returned to New Zealand as the representative in Christchurch of the United States Antarctic Research Programme.

Dr Penney spent 27 months at Wilkes Station on his first visit to the Antarctic, and was there when the I.G.Y. station was transferred to ANARE. He returned to the University of Wisconsin, and came back to the Antarctic in the 1962-63 season to continue his study of penguins in the McMurdo Sound area, on the Ross Ice Shelf, and at Byrd Station.

Since then Dr Penney has been an Antarctic commuter every two years. He has been at Johns Hopkins University, Baltimore, and before his appointment to succeed Mr E. E. Goodale, who became almost an Antarctic institution in Christchurch, he was assistant director of the Institute for Research in Animal Behaviour. This organisation is sponsored jointly by the New York Zoological Society and Rockefeller University.

# SCOTT BASE MEMORIAL

A brass plaque in memory of an Englishman, Mr Jeremy Sykes, who was killed last year on November 19 in a helicopter crash near Mt McLennan, about 65 miles west of McMurdo Station, will be placed at Scott Base in October. Mr Sykes, a New Zealand National Film Unit director, was one of three men who died when a United States Navy Seahorse helicopter crashed.

A service in memory of Mr Sykes will be held at Scott Base, and the memorial plaque will be placed below the memorial to Lieutenant Tom Couzens, of the Royal New Zealand Armoured Corps, who also died on November 19 ten years earlier when a New Zealand snocat plunged into a 100ft crevasse near Cape Selborne.

# THE LAST OF "THE TEN"

## Antarctic Pioneer Lives On

"The ten," of course, refers to the ten members of Borchgrevink's Southern Cross Expedition of 1898-1900 who were the first men ever to spend a winter on the Antarctic Continent. The last survivor of this historic band is HUGH BLACKWALL EVANS, a brisk and mentally alert 96-year-old living in the Alberta (Canada) town of Vermilion.

Evans was born in Bristol, England, on November 19, 1874, his father being the Rev. Edward Evans, of Bishopston vicarage. He was educated at King's School, Gloucester, but when he was about 17 he accompanied a new bishop to Canada where for a year he attended "a sort of agricultural and theological college," and then went to work on a farm. Tiring of this, he moved west into the untamed area at the very end of the railway line, where there was one train a week, and ample opportunity for hunting and travelling in little-known country.

In 1897 he returned to England, but soon went out to Australia, where he joined a sealing expedition on the brig Edward (150 tons) owned by the Norwegian-Swedish Consul in Melbourne. The expedition was financed by a cousin of Evans, a tea-planter in Ceylon, and he asked Evans to go with the expedition to look after his interests. He spent eleven weeks on Kerguelen Island before the Edward returned to Melbourne, a full ship.

Borchgrevink, a "new Australian" whose mother was English, had been south on Bull's whaling voyage in the Antarctic in 1895, and he now obtained a Norwegian whaler, had the vessel specially strengthened and fitted with a 500 h.p. engine, and secured the interest of the Royal Geographical Society and the financial backing of Sir George Newnes, the publisher. So the Southern Cross sailed as an English expedition. Evans obtained a position as assistant zoologist to Nicolai Hanson on the strength of a life-long interest in zoology. At Hobart, Evans, himself the son of an Anglican minister, met Bishop Montgomery, like himself an ardent bird-lover, and his sons, one of whom was to become Lord Montgomery of World War II fame.

**Mr Evans in 1898.**

On the voyage south, Borchgrevink relates, Evans was always looking for fun. He was the 13-stone, 6ft. 2in. "mermaid" who "in light draperies charmed everybody as Mrs Neptune" during the frolics crossing the Line. After playing several practical jokes on Hanson he was himself the victim when Hanson pointed out an Emperor penguin on the ice. Evans and Bernacchi excitedly but cautiously stalked the bird and at last made the final dash—only to find that the penguin had been killed—and skinned—by Hanson himself, who had meanwhile let the whole ship's company into the secret.

The ten who were to form the winter party landed at Cape Adare on February

17, 1899. The hut in which they lived, Camp Ridley, Robertson Bay, still stands.

The same day as they went ashore, Evans accompanied by L. C. Bernacchi, one of the other two British members of the party, climbed to the top of Cape Adare (850ft.). Says Bernacchi:—

"By climbing a ridge of craggy rocks we found the going tolerably easy, and reached the top in less than an hour. The scene before us looked inexpressibly desolate. A more barren desert can scarcely be conceived, but one of immense interest from a geological point of view. From the end of the cape to the foot of the mountain beyond, a great waste of hollows and ridges lay before our eyes—ridges rising beyond ridges like ocean waves whose tumult had been suddenly frozen into stone."

This pioneer winter was hard and long. Hanson sickened and died. Evans nearly lost his own life. On May 25 he was returning to the hut after reading the thermometer during a blizzard. He lost the guide rope, and it was only after three hours in blinding snow drift and intense cold that searchers found him and brought him into camp "in an exhausted condition and vomiting severely." On June 15 he and Bernacchi "attempted to reach the screen in vain. They had to crawl back on all fours, and arrived in camp exhausted.

But it was Evans who helped to keep up the morale of the party by the "unlimited stories" which he "kept in store for stormy days". Borchgrevink retells one of these stories in his book "First on the Antarctic Continent". He also records that at a concert on May 10 Evans sang "two songs of a comical nature".

When Hanson, who had been injured during the unloading, fell ill later in the year, Evans took over the zoological work and taxidermy for which Hanson had been responsible. Before Hanson died on October 14 Evans brought him the first penguin to return after their winter sojourn north of the pack, an event to which Hanson had been eagerly looking forward.

After the return of the Southern Cross the whole expedition proceeded south toward Ross's "McMurdo Bay". Evans was one of seven men who on February 9, 1900, made a landing on Franklin Island. The Southern Cross approached the Barrier east of Beaufort Island, skirted the ice front eastwards as far as 164°10′W., 78°34′S., and here a landing was made. The return voyage began on February 19, none too soon as the ship had to force her way through ice already three inches thick.

**Mr Evans today.**

Evans hoped to join Scott's Discovery expedition in 1901, but became impatient of a series of delays and returned to Canada. He had formed a close friendship with Colbeck, the magnetic observer of the earlier expedition, and when Colbeck was given the command of the Morning for the relief of the Discovery Evans would have gone with him had not domestic difficulties made this impracticable, to his great regret. He took up farming and eventually retired to Vermilion, where he still lives. His wife died two years ago at the age of 91. They had two daughters, the elder of whom now cares for her father. The younger daughter is married and lives close by.

All readers of "Antarctic" will join in wishing Mr Evans a happy continuance of his long life.

# British Antarctic Survey News

The Royal Research Ship Bransfield (see June issue, p. 419) was launched by Lady Fuchs, wife of Sir Vivian Fuchs, on September 4, at Leith.

The Natural Environment Research Council ordered the ship for the use of the British Antarctic Survey to relieve the seven Antarctic stations at present maintained by Britain. She will make her maiden voyage in time to reach the stations during the coming Antarctic summer.

The Bransfield, designed by Graham and Woolnough, is very strongly built to withstand the stresses of navigation through heavy ice. She is 327ft overall, with a beam of 60ft and draft 21ft. The hull is of all welded construction, the scantlings are to Lloyd's "Ice Class 1*" requirements, and the shell plating is 1⅛in thick, increasing to 1¼in in vulnerable areas. The frames are 14 to 16in apart and side tanks up to weather deck level extend from the fore to the after peak. The rounded hull form will help her to rise above pressure ice which would "squeeze" a normal slab-sided vessel. To enable her to force a way through pack ice the stem is heavily raked from above the loaded water line, to a short vertical step at the keel. Thus she will be able to charge the ice and ride up to break it with her weight.

## POWERFUL ENGINES

The main propulsion system is diesel-electric. Two engines will provide power for a single electric motor delivering 5,000-shaft horsepower. The variable pitch propeller will enable this power to be used more effectively when operating at low speeds in ice. In open water her operating speed is expected to be 14 knots with an endurance of 50 days at this speed. Bilge keels which would be damaged by ice, have been omitted but a passive stabilization system has been installed, and the main mast immediately above the bridge, provides access to a high "crow's nest" from which the ship can be controlled. There are three other conning positions, the wheel house and either bridge wing. Two radar systems can be inter-switched, and either will work a "slave" on the chart table.

Two marine biological laboratories lie under the helicopter deck aft. Fire precaution systems conform to the latest Intergovernmental Maritime Consultative Organisation (IMCO) regulations, and on each side she carries sufficient life boats to accommodate all on board.

The cargo capacity is some 120,000 cu. ft. in three separate holds, and the 50ft after hatch will facilitate the carriage of large, bulky items. A 5-ton crane is fitted forward, and a 15-ton Speed Crane derrick aft.

The Bransfield will carry a crew of 36 officers and men (all in single cabins), and 62 expedition members (in 15 four-berth and 2 two-berth cabins). All living accommodation is above the weather deck and is fully air-conditioned.

## NAME HONOURS PIONEER EXPLORER

The name Bransfield was chosen to honour Captain Edward Bransfield who in 1819 was the first man to chart a portion of the Antarctic mainland. Relatively little is known about him. Born between 1782-4, either in Cork or County Cork, he was probably pressed into the navy in 1803, and served in numerous ships during the war against Napoleon. By 1813 he was a midshipman and in 1814 was awarded his master's certificate by Trinity

House. At this time he was described as "an assiduous officer, an excellent navigator and a good pilot."

In 1817 he wrote to the Admiralty describing his methods of calculating longitude and sought an appointment as master of any vessel sailing on a voyage of discovery in order to try it out.

He was sent to the Andromache, (Captain Shirreff), which patrolled the waters between Valparaiso and Callao in Chile. In 1819 a British sealing captain, William Smith in the Williams had discovered the South Shetland Islands, taking possession of them in the name of George III. In December that year Captain Shirreff chartered the Williams and sent her south manned by Bransfield (in command) and three midshipmen, to survey the new land. Bransfield made the first charts of "New South Britain," as the islands were originally called, then sailing further south he charted a stretch of coast on which he noted "high mountains covered with snow" in the vicinity of what is now known as Mount Bransfield. This constituted the first definite charting of any part of the Antarctic mainland.

Unfortunately Bransfield's original log has been lost, but his Antarctic discoveries are commemorated by Bransfield Strait, Mount Bransfield on Trinity Peninsula, and Bransfield Island. This was his last naval assignment. After completing a number of commercial voyages he retired to Brighton, where he died in October, 1852.

### COASTAL VESSEL FOR SOUTH GEORGIA

The British Antarctic Survey's small coastal vessel (see June issue) was launched on August 25, at Middlesbrough. The vessel has been named Jane in commemoration of the brig Jane, of 160 tons, which was the ship in which James Weddell reached 74° 15'S, 34°16'W in 1823—a position further south than any vessel had then attained.

The overall length is 52ft 10in, her beam 17ft and she is powered by twin 100-horse power diesel engines which give a service speed of 10 knots. She is being fitted with a full range of modern radio and navigational equipment, and will accommodate a maximum of 9 scientists and crew. She will operate throughout the year from the Survey's scientific station at Grytviken, South Georgia, and provide support for field parties of surveyors, biologists, geologists and glaciologists and will also undertake a limited marine zoological programme, for which a fully equipped laboratory had been provided.

As soon as she is fitted out, the Jane will sail from Middlesborough to South Wales, from where she will be shipped to Buenos Aires. She will then sail, in stages, down the coast of South America and across to the Falkland Islands, which is a distance of some 1,100 miles, and thence to South Georgia which is another 800 miles.

## DECEPTION ISLAND ERUPTS AGAIN

Reports from several stations indicate that Deception Island erupted again on August 13. The Russian Bellinghausen" Station on King George Island, South Shetlands, reported 100 per cent ash cover and a strong smell of sulphur. The Chilean Captain Arturo Prat Station, Greenwich Island, South Shetlands, also reported a fall of ash and a sulphurous smell from the direction of Deception. The Chilean General Bernado O'Higgins Station at Cape Legoupil on the northern tip of the Antarctic Peninsula, and Argentine Petrel Station on Dundee Island, both reported electrical storms in the direction of Deception. Seismograms at the British Argentine Islands observatory off the west coast of the Antarctic Peninsula show a large shock on August 12 and about 50 separate onsets on August 15.

Fortunately, there is no one on Deception at the moment, the Argentine, British and Chilean bases all having been closed down after the February, 1969 eruption.

# Soviet Antarctic News

Molodezhnaya Station on the coast of Enderby Land will replace Mirny this season as the main Soviet base in Antarctica. Mirny, situated on the coast of the Davis Sea in the Indian sector of the Southern Ocean, has been the main base of all Soviet expeditions since 1956.

An extensive programme of research in the Antarctic and its surrounding seas is planned by the Russians this season, according to a Novosti Press Agency report. Scientific studies will be continued at the Bellingshausen, Vostok, Mirny, Novolazarevskaya and Molodezhnaya Stations.

A sledge and tractor train will make a traverse from Mirny to the South Geomagnetic Pole. Members of the train will deliver suppies to Vostok and conduct scientific observations. They will also continue the setting up of permanent automatic magnetic variation recording stations along their route.

There are also plans for large-scale geodesic surveys to be conducted for the first time in the area between Molodezhnaya and Novolazarevskaya Station, which is in Queen Maud Land. Geological and geophysical studies will be conducted in this area.

This season's expedition will provide Soviet and international weather services and ships in Antarctic waters with detailed hydro-meteorological information. Aqualung swimmers will make round-the-year hydro-biological observations in the area of Mirny, and scientists on Soviet research vessels will be engaged on oceanological, geophysical, aero-meterological, hydrographic, and ice studies, in southern waters.

### NEW STATION ESTABLISHED

A new Soviet station, Leningradskaya, on the Oates Coast, will be in operation this season. It is the sixth Russian base in Antarctica, and is about 200 miles from the joint New Zealand-United States Hallett Station.

When the Russians announced the establishment of Leningradskaya Station earlier this year, they described it as a "temporary operating coastal Antarctic station." The Novositi Press Agency says that comprehensive studies will be conducted on the Oates Coast. A report in "Izvestia" last month said that scientists at Leningradskaya would be assisting in a programme of observations of the boundaries of the eastern and western regions of Antarctica.

"Izvestia" also described the new Soviet Antarctic "capital," Molodezhnaya, as a satisfactory large settlement well protected from cold winds which would have little drifting snow. The report said that meterological rockets would be launched from the station, and the provision of a powerful radio centre was almost completed.

Molodezhnaya's main street, according to "Izvestia," is almost a mile long.

## VXE-6 SQUADRON HAS OWN MUSEUM

Antarctic Development Squadron Six, United States Navy, has been associated with Operation Deep Freeze since the beginning. VXE-6 in Navy shorthand, is best known to thousands of New Zealanders by the ski-equipped Hercules aircraft which it operates between Christchurch and McMurdo Station, and on the Antartic Continent each season.

But thousands of Americans have become familiar with the name VXE-6 because the squadron has its own Antarctic Museum at Quonset Point, Maryland. During the American winter when the squadron is in the Antarctic its public affairs staff has streams of visitors to deal with from October to February.

# Soviet Excitement at Bellingshausen Visit

Ernest Hemingway is one of the favourite authors of Russians, and his books are widely read in the U.S.S.R. So it is not surprising that the men at Bellingshausen Station on King George Island, off the Antarctic Peninsula, were wildly excited when the Ob arrived in April this year.

A Russian journalist, Vladimir Sanin, visited Bellingshausen Station later as a tourist aboard the Antarctic cruise ship, Lindblad Explorer. In a Moscow newspaper article, accompanied by a photograph which could not be reproduced here, he explains why the Soviet scientists were so excited. His story is called: The History of a Photograph. Extraordinary Meeting on Waterloo Island.

Before telling you the history of this photograph—a little excursion into geography, Sanin writes:

One hundred and fifty years ago the expedition of Bellingshausen and Lazarev opened the Antarctic Peninsula, which place, and the surrounding islands, they secured by a "christening ceremony". One of the islands, the Island of Waterloo, on King George Island as it is sometimes called, shelters the Bellingshausen Soviet Antarctic Station.

Antarctica—the austere continent. A few days before I had received a radiogram from friends at the Vostok Station; there it was already 70 degrees below zero. But the Antarctic Peninsula which separates Tierra Del Fuego from Drake Strait, will at some future date be exactly like the Antarctic, and this does not seem far off to those who man the place.

In the summer months there are usually plus temperatures on the peninsula and when things become so quiet in this "paradise" of gale-force winds and snowstorms one has the impression that the Island of Waterloo with its penguin population—those web-footed, well-protected and intelligent birds—was landed in the Antarctic by virtue of a geographical accident. And this unique climatic paradox, on an icy continent, brought the American vessel Lindblad Explorer to the Bellingshausen Station with some tens of tourists on board.

To obtain a glimpse of the legendary Antarctica, with as much excitement and adventure as possible without risk to life, the tourists emerged on to the shore.

The head of the station, Igor Mikhailovich Simenov, explained the transport arrangements to the guests and they set off to photograph the penguins and the sea elephants.

All the details of my story were told to me by the station surgeon, Genardi Gusavov; it began when the diesel ship Ob brought a group of people to the Antarctic station at the beginning of April last year, dropping its anchor in the Bay of Waterloo.

"I came running out of my hut and walking towards me was an elderly woman," the surgeon said.

"She asked me in English whether I knew where to find the doctor. Thanks to the friendliness of the American microbiologist, John Crumam, who is spending the winter on our station, I had a fair amount of practice in speaking English and we communicated without difficulty.

"This elderly tourist did not want medical help but "photo-help". Someone had recommended me to her as an expert on photography. We fell into conversation. She said she had come to

see Antarctica and was very sad that she was making the trip alone, without her husband.

"Ernest had liked travelling very much. He had been a famous American author, she said. I had a premonition. "Hemingway?" I asked hopefully. "Yes"—she was surprised. "And you are Mary Hemingway?" I exclaimed. "Yes" —she was even more surprised. Quite frankly I was for a moment nonplussed and didn't know what to do. Mary Hemingway looked at me and smiled. I apologised and ran off to get the others.

"An Estonian, Ern Kreen, a scientific colleague, when I reached him with the cry, "Mary Hemingway herself is sitting on my steps!" waved me away. "Stop raving—I know your penchant for practical jokes" he said.

"But, on seeing my face, he ran towards the steps. "Are you really Mary Hemingway?" he asked. Our guest was already laughing. "Truly?" he repeated.

"Ern rushed off to his room and brought back an Estonian book of Hemingway stories and gave it to the widow. Then, afraid that this esteemed apparition would vanish, he began to take photo after photo of our famous guest.

"Then came the rush. In one minute, all the men had found out who was on the station—Mary Hemingway herself, the wife of a famous, and one of our favourite authors. All the other tourists were quickly abandoned. Simenov immediately arranged to load the lunch table with the best food we had. And, completely charmed with such a welcome, our guest sat with us for a long time in our mess-hall.

"She told us that Hemingway had always had a great interest in our country. He had wanted to travel there and had valued very highly the patronage of Russian readers. She herself had already been in the Soviet Union once and had hoped that this time—but it was not meant to be. . . .

"The men took her autograph and presented her with many souvenirs and photographs. They hastily took her all over the island and acclaimed her as one of the "highest class" much to the envy of the other tourists in the group who didn't get even a tenth of the attention that fell to Mary Hemingway."

On this note Gusavov completed his tale.

# DEEP DRILLING OF ICE PLATEAU

Soviet scientists have drilled 1300ft into the ice of the Polar Plateau at Vostok Station and extracted an 800ft core in which they hope to find volcanic ash, space dust, and probably spores and bacteria preserved in the cylinder of ice. The ice core, cut into 16ft lengths and housed in a special refrigerator, was brought to Leningrad by the Ob.

A Tass News Agency report in the "Moscow News" last month quoted Leonid Dubrovin, a senior research associate at the Arctic and Antarctic Institute in Leningrad, as saying that the scientists at Vostok had been able to extract ice samples from a depth of 1300ft with the help of a new thermo-drill of Soviet design. The drill was developed jointly by Antarctic scientists and mining institute specialists.

The new high-frequency drill can cut complete cross-sections through any depth of the icecap, according to the Russians. It consists of concentric electrodes which melt the ice by high-frequency heating. The unmelted column of ice in the centre is then floated to the surface by a dense dielectric fluid.

The corer is fitted with an automatic direction control to keep it on a preset course, and field trials at Vostok have shown that its simplicity, speed of sinking, and reliability in low temperatures promise well for operations in Antarctica.

Glaciologists will be able to read the history of the ice in the test area from the structure of the core. As well as being able to plot a complete cross-section of the ice-cap, they hope to collect samples of "fossil air" from cavities in the ice.

**STOP PRESS**

# SIX PLANES FLY SOUTH

Five United States Navy ski-equipped Hercules aircraft and one Super Constellation flew from Christchurch to McMurdo Sound on October 8 for the official start of Operation Deep Freeze 71. The seventh aircraft—the veteran Super Constellation Pegasus—had to make an emergency landing in zero visibility and heavy driving snow. It slewed off the sea ice runway, and the right wing was torn off.

Pegasus had a crew of 12 and 68 passengers aboard. Fortunately only five were slightly injured. They were treated in the McMurdo Station dispensary. In a snow storm the winds gusting up to 40 miles an hour the captain of the aircraft, Lieutenant-Commander C. R. Graue, had to make six low passes over the runway before putting the Pegasus down. He had fuel left for only 40 minutes' flying.

The first Hercules to land shortly after 8 a.m. brought long-awaited mail, fresh fruit and vegetables for the Americans, and the New Zealanders at Scott Base, who had been isolated for nearly seven months. On the first aircraft were Rear-Admiral David F. Welch, the naval support force commander, Mr R. B. Thomson, superintendent of the Antarctic Division, D.S.I.R., and Mr Brian Porter, new leader at Scott Base.

## HER LITTER WAS A SURPRISE

Uglen, a husky bitch surprised the men at Scott Base when she gave birth to five pups on September 29. Only three weeks earlier, showing no signs of pregnancy, she had completed a 100-mile journey with a dog team from Scott Base to Cape Crozier and back.

The base dog handler, Mr C. Knott (Stratford) received his surprise by radio. He was one of a party attempting to climb Mt Erebus.

Such surprises are not uncommon in the Antarctic. Way back in 1947 a Labrador husky bitch named Monkey with Finn Ronne's expedition was flown into the field—probably the first dog to be carried by air—to replace a bitch that the Weddell Coast sledge party had found, to their surprise, to be about to have pups. This husky bore three puppies which, in her excitement, she ate.

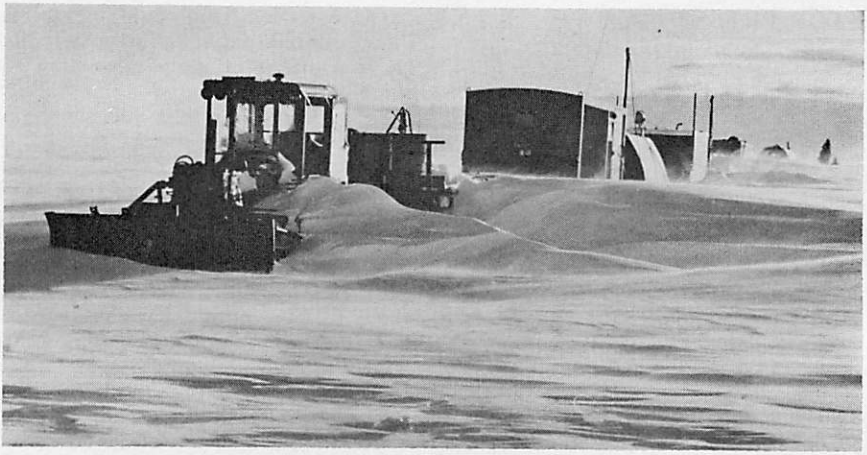
One night Monkey tried to join Major K. S. Pierce-Butler, the F.I.D.S. leader in the trail party at the advanced base, Keeler. She was put out, dug a tunnel under the tent and wormed her way in again. The next day she gave birth to six healthy puppies.

## LITTLE YORKSHIRE!

There will be three Yorkshiremen at Scott Base this season. They are the leader, Brian Porter, the deputy-leader, Major Jim Barker, who was born at Catterick, although his father was a New Zealander, and he has been in this country since 1959, and Peter Hanson, maintenance officer and carpenter, who comes from Leeds.

Major Barker, who will be at Scott Base for the summer, has been based in Christchurch as second-in-command of the 2nd Battalion, Royal New Zealand Infantry Regiment. His father was a New Zealander who joined the British Army in 1911 and served with the Royal Corps of Signals, which has its depot at Catterick.

After service with the Suffolk Regiment, and then with the Devonshire Regiment and the Fiji Military Forces in Malaya, Major Barker came to New Zealand in 1959. He joined the Regular Force and served again in Malaya with the 1st Battalion, Royal New Zealand Infantry Regiment. Then he was appointed adjutant of the National Service Training Unit at Waiouru. In 1967 he was posted to the Southern Military District.



Vehicles of an Australian National Antarctic Research Expedition glaciology party on the Antarctic Plateau south of Casey. The base at Casey was originally Wilkes Station, which was transferred to the Australians early in 1959.

Official ANARE photo by R. Anderson

# SCIENTIST NEW DIRECTOR OF AUSTRALIAN DIVISION

Mr Bryan Rofe, B.Sc., M.B.E., Principal Research Scientist from the Weapons Research Establishment in South Australia, will be provisionally promoted in the Commonwealth Gazette to the position of Director, Antarctic Division, Department of Supply, in Melbourne.

The Minister for Supply, Senator Sir Kenneth Anderson, announced his promotion in Sydney on August 5.

Mr Rofe, 52, is a graduate in science from Adelaide University. In World War II he joined the Royal Australian Air Force as a meteorologist and was discharged in 1945 with the rank of squadron leader. He was awarded the M.B.E. for outstanding leadership.

The scientific work of the newly-formed Weapons Research Establishment attracted Mr Rofe from the Bureau of Meteorology to Supply in 1948. His background in meteorology and experience on trials planning led him to be selected in 1958 to initiate and develop a programme of investigation of the upper atmosphere, using sounding rockets fired from Woomera and Carnarvon.

Senator Anderson said that Mr Rofe had achieved an international reputation for his work in upper-atmosphere research. He was the author of a number of papers on research in this field and was a member of the Australian National Committee for Space Research.

"In recent years Mr Rofe has been invited to undertake two important tasks of international standing in connection with upper-atmospheric research," said Senator Anderson. "He has been requested by the World Meteorological Organisation to organise, as rapporteur, a series of experiments and trials at the Thumba Range in India in 1972 involving a comparative study of sounding rockets developed by a number of countries.

"Mr Rofe has been nominated by Australia as a representative on the International Scientific Committee of the United Nations for Space Research and has been appointed to a working group

(*Continued on page 475*)

# ANTARCTIC BOOKSHELF

## PETROGENIC VARIATIONS WITHIN SUBMARINE BASALT PILLOWS OF THE SOUTH PACIFIC ANTARCTIC OCEAN BY T. P. PASTER

Ph.D. dissertation presented at department of geology, Florida State University). Contribution No. 27.

This well written publication, with good diagrams, tables and photographs, is the result of studies made on nine basalt pillows dredged by the *U.S.N.S. Eltanin* from eight widely separated localities in the Southern Pacific Ocean. The petrography, whole rock chemistry and magnetic variation in the pillows have been studied.

Petrography shows four texturally gradational zones occurring over a minimum distance of three centimetres from the outside of the pillows. These are defined inward as; hydrated glass; unhydrated glass; variolitic zone; and aphanitic zone. Chemical analysis of the unhydrated glass or variolitic zones of the pillows indicates that they are slightly undersaturated tholeiites. There is a relative decrease in total iron and magnesium with a corresponding increase in the other constituent oxides from the glass and variolitic zones to the crystalline core of the pillows. The magmatic intensity and susceptibility, including the unstable magnetic components, of the pillows, can be correlated with the size of the opaques and the oxidation state of the iron present.

Other important problems discussed are: the origin of ferro-manganese concretions derived from basalt flows; the problem of vesicularity in relation to the depth of water; hydration, serpentinization and chloritization in the pillows. The author's conclusions are supported by previously published data.

The scope of the publication is restricted owing to the lack of major or trace element analyses of the minerals present and to the lack of trace element abundances for the unaltered parts of the pillows. Both aspects could have added considerable weight to the chemical arguments put forward. Lack of any specific physiographic and geological data with the dredged pillows, and their association with ice rafted debris, make it a debatable point whether or not the pillows are a true representative of submarine flows on the deep ocean floor.

The strength of this study lies in the elucidation of the extent of post-eruptive changes in submarine basalts—the recognition of which is of prime importance in determining the original composition of a possible parent magma. A great deal of valuable and comparable information has been provided by the author and this volume will no doubt serve as a useful source of information, both substantiated and problematical, on submarine basalts in general.

R. H. GRAPES,
Department of Geology,
Victoria University of Wellington,

(*Continued from page 474*)

on a project concerning the detection from space of the pollution of the earth and its environment. Both these tasks are a recognition of Mr Rofe's scientific standing in upper-atmosphere research and allied fields."

Senator Anderson said that Mr Rofe would bring considerable scientific and managerial experience and ability to this important position in the Department of Supply.

# *Future of Scott Base Now Being Studied*

Scott Base, New Zealand's main station in the Antarctic since 1957, was once a very advanced base. Now it is becoming somewhat outdated, and its future is being studied in relation to the country's scientific needs for the next five years or more.

Mr R. B. Thomson, superintendent of the Antarctic division of the Department of Scientific and Industrial Research, said after his return to Christchurch from the Antarctic that the base buildings are in reasonable condition but the resolving of their future cannot be left indefinitely.

A report on the future of the base is being prepared for the D.S.I.R. and the Ross Dependency Research Committee. It will cover the state of the buildings, physical requirements and locality.

Mr Thomson says that questions to be considered are whether the present base should be enlarged, torn down and rebuilt or constructed elsewhere, where it is in the most desirable place for scientific research, and the effect on logistics of any future change in location.

The buildings at Scott Base cannot be expected to last forever, says Mr Thomson. The last new building added to the complex was erected in 1961. Maintenance costs are increasing annually, the size of the research party has increased in recent years, and accommodation problems have arisen.

A lack of adequate laboratory space for the scientists is the most serious problem of all. Another pressing problem is the demand for accommodation in the summer. Normally there is sleeping accommodation for 40 men; now in the summer more than 60 have to be accommodated, and this is undesirable.

Mr Thomson hopes to see a rebuilding programme spread over the next five or seven years. This would be preferable to a major financial commitment all at once at the end of this period.

Buildings at Hallett Station are in very good order. This station, operated only in the summer, is shared jointly with the United States.

## Historic Huts and Memorials

Preservation of historic monuments in Antarctica will be one subject discussed at the sixth Antarctic Treaty consultative meeting which opens in Tokyo on October 19. This subject was raised in Paris two years ago.

All the treaty nations have drawn up lists of possible historic sites. New Zealand's list contains nine items, all in the Ross Dependency.

The earliest in the list is the Southern Cross Expedition's hut built in 1899 at Camp Ridley, Cape Adare. The grave of the zoologist, Nicolai Hanson, who was buried on Cape Adare, has also been proposed as an historic monument.

### Campbell's Igloo

Three huts, an igloo, and three crosses are in the New Zealand list. It includes Scott's huts at Hut Point (1902) and Cape Evans (1911), Shackleton's hut at Cape Royds (1908), and Campbell's igloo on Inexpressible Island (1913).

The earliest cross was erected on Hut Point (1904) in memory of Seaman T. Vince. The others are the cross placed on Obseration Hill in memory of Scott, Wilson, Oates, Bowers, and Evans, and the cross at Cape Evans in memory of the men in Shackleton's Ross Sea party.

# U.S. POLICY CHANGE FOR ANTARCTIC OPERATIONS

Changes in the financing of United States operations in the Antarctic have been announced by President Nixon. Under a new directive all financing and management of the American Antarctic programme will be taken over by the National Science Foundation, which will have its budget increased accordingly.

In the past, the financing of the programme has been divided between the National Science Foundation, which has financed and managed the scientific programmes, and the Departments of Defence and Transportation, which have provided the logistic support.

The increase in the National Science Foundation budget, however, will not cause a net increase in the total United States Federal budget, because the foundation will be assuming budget items formerly attributed to the Departments of Defence and Transportation.

President Nixon called for a report from the Antarctic policy group several months ago. The report issued from the White House reaffirms a continuing American interest in Antarctica and in the scientific work undertaken on the continent in co-operation with the other 11 nations which are signatories to the Antarctic Treaty.

Because the American effort in Antarctica is primarily scientific in nature, and in order to achieve maximum effectiveness in developing a national programme, President Nixon has decided to consolidate financing and programme management responsibilities for all activities within the National Science Foundation. He has directed the three agencies concerned to begin now the orderly transfer of administration and budgetary responsibilities.

In his statement President Nixon noted that United States policy in Antarctica includes several objectives. They are:

To maintain the Antarctic Treaty, and ensure that this continent will continue to be used only for peaceful purposes and shall not become an area or object of international discord.

To foster co-operative scientific research for the solution of worldwide and regional problems, including environmental monitoring and prediction and assessment of resources.

To protect the Antarctic environment and develop appropriate measures to ensure the equitable and wise use of living and non-living resources.

President Nixon says that United States interests in Antarctica extend back 150 years. It was then that Nathaniel Palmer, of Stonington, Connecticut, made the first known sighting of Antarctica. The national exploration by Charles Wilkes in 1840 charted 1500 miles of the Antarctic coasts. In this century the well-known exploits of Rear-Admiral Richard E. Byrd, Dr Laurence M. Gould, and other explorers and scientists have constantly attested to the United States interest in Antarctica.

Referring to the Antarctic Treaty, President Nixon says it has provided an effective framework for the continued peaceful use of the area by the 12 nations conducting research and working together on the continent where national differences are no barrier to practical and mutually beneficial co-operation.

Science has provided a successful basis for international accord.

# "ANTARCTIC"

is published quarterly in March, June, September, and December. It is the only periodical in the world which gives regular up-to-date news of the Antarctic activities of all the nations at work in the far South. It has a world-wide circulation.

Subscription for non-members of the Antarctic Society, NZ$2.50, Overseas NZ$3.00, includes postage. Details of back issues available may be obtained from the Secretary, New Zealand Antarctic Society, P.O. Box 2110, Wellington, New Zealand.

## The New Zealand Antarctic Society

The New Zealand Antarctic Society was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have seen Antarctica for themselves, and all of whom are vitally interested in some phase of Antarctic exploration, development, or research.

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

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

You are invited to become a member, South Island residents should contact the Canterbury secretary, North Islanders should contact the Wellington secretary, and overseas residents the secretary of the New Zealand Society. For addresses see below. The membership fee is NZ$2.00 (or equivalent local currency). Subscription to "Antarctic" is a further $2.00.

### New Zealand Secretary

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

### Branch Secretaries

Canterbury: Miss J. Garraway, P.O. Box 404, Christchurch.

Wellington: Mr P. Wilson, P.O. Box 2110, Wellington.

The Secretary,
New Zealand Antarctic Society,
P.O. Box 2110,
WELLINGTON.

Sir,

I wish to

*become a member of the New Zealand Antarctic Society,

*subscribe to "Antarctic",

and forward herewith subscription for ..... year(s) amounting to $.....

Name (in block letters): .....

Address: .....

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Brief details of participation in Antarctic activities, if any:

Date..... Signature .....

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