ANTARCTIC

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New Zealand's most remote field party this summer starts unloading equipment from a United States Navy Hercules aircraft on the ice of Browning Pass 400km from Scott Base in Victoria Land. To the south are the Northern Foothills (74deg 44min S/163deg 44min E) on the west side of Terra Nova Bay. The party will do geological mapping of Precambrian and early Paleozoic rocks in the Terra Nova Bay region until mid-January.

Antarctic Division photo

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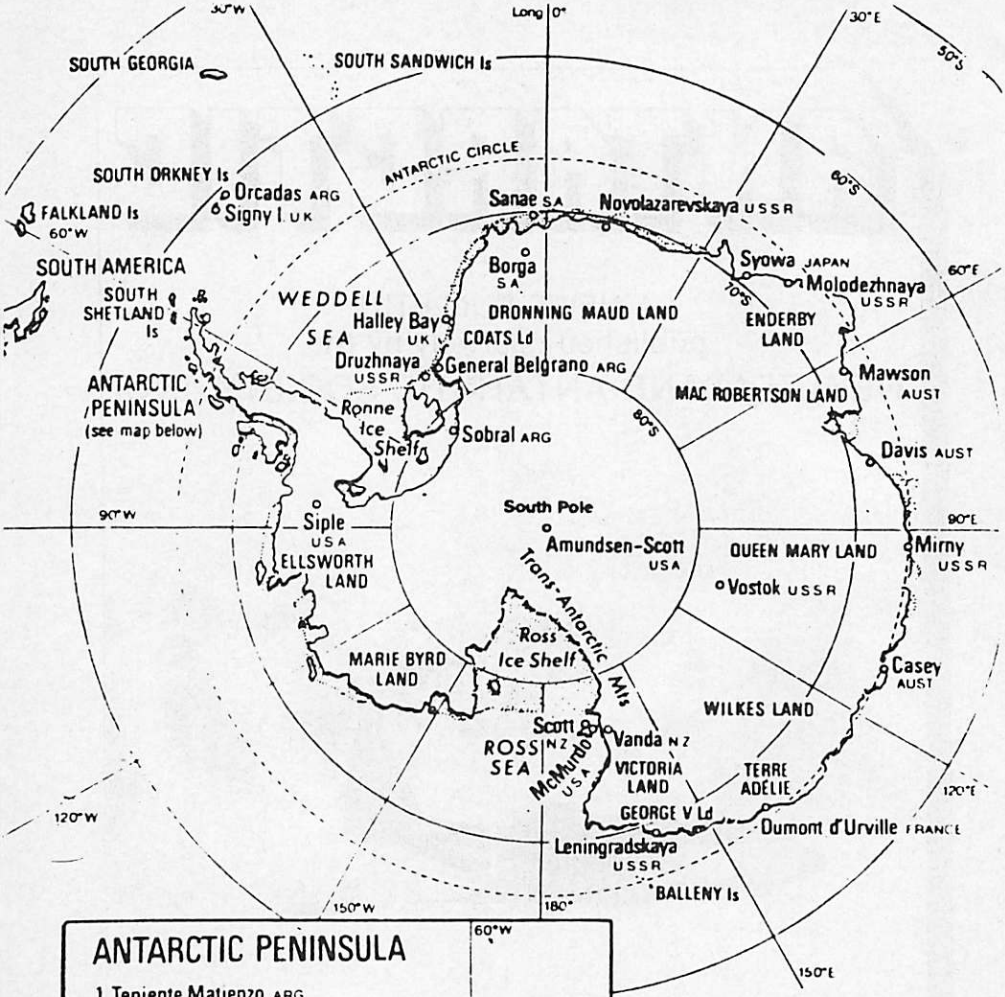

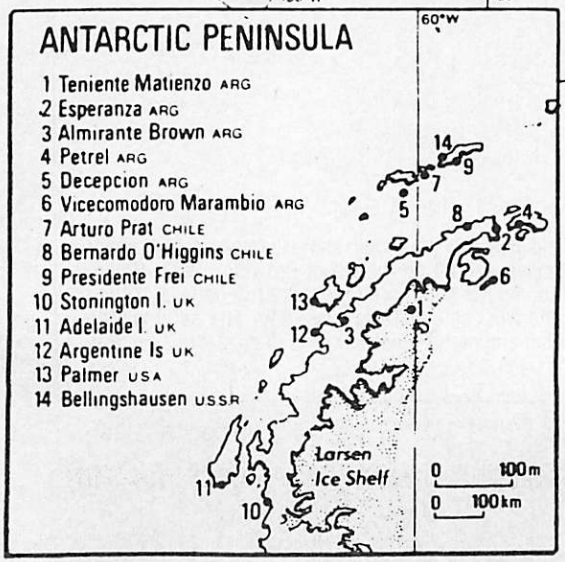

ANTARCTICA

0 500 1000 Miles

0 500 1000 Kilometres

ABBREVIATIONS

ARG ARGENTINA
AUST AUSTRALIA
S.A SOUTH AFRICA
UK UNITED KINGDOM
USA UNITED STATES OF AMERICA
USSR UNION OF SOVIET SOCIALIST REPUBLICS

ANTARCTIC

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NEW ZEALAND FIELD WORK STARTS

Although bad weather, and solar flares which caused a communications blackout towards the end of last month, delayed some flights between Christchurch and McMurdo Station, New Zealand's Antarctic research programme for 1982-83 was not affected unduly. in the first two months of the season, which began officially on October 4, construction teams completed the third stage of the Scott Base rebuilding programme and started the fourth, and scientific parties were placed in the field.

By the end of last month more than 130 scientists and support staff had been flown south. Early this month field parties were at work in the Terra Nova Bay region 400km north of Scott Base, in the dry valleys of Victoria Land, on Mt Erebus, at Cape Bird, and around McMurdo Sound on sea ice or land.

Late this month the Royal New Zealand Air Force completed 12 flights from Christchurch to provide logistic support for the New Zealand and United States programmes. This was the 18th season the RNZAF had carried passengers and cargo between New Zealand and Antarctica.

Strong winds, blowing snow, and reduced visibility at McMurdo Station forced the first flight on November 13 to return to Christchurch. The flight was made the next day. Flights later in the month were delayed for five days by bad weather and a communications blackout, but the programme was completed on the date fixed, November 29, by sending three aircraft south on the same day.

New Zealand's summer programme began when 16 New Zealanders on the first flights of the season by United States Air Force Starlifters reached Scott Base. The party was headed by Mr R. B. Thomson, superintendent, Antarctic Division, making his 62nd flight south, and included Mr John Thurston, officer-in-charge for the summer, his deputy, Mr Grant Woodhead, and Professor A. J. Taylor, who flew south to conduct psychological tests of the 1982 winter party.

On the afternoon of October 6 the 10 men who spent last winter at Scott Base completed their Antarctic service. The leader, Mr Leo Slattery, who was also the postmaster, hauled down his New Zealand flag, which had flown at the base since February 18 and handed over to John Thurston.

In the evening the winter team said goodbye to their leader. They presented him with a painting of Scott Base by Maurice Conly which showed the new buildings and Mt Erebus in the background.

HUSKY TRANSFER

Eight members of the team returned to New Zealand later in the month. The others, Gary Bowcock (dog handler) and Peter Nelson (mechanic) remained until early last month to assist a Japanese camera crew in filming a New Zealand dog team's journey across the sea ice of McMurdo Sound. Earlier in the new season Gary Bowcock had handed over his 15 canine charges to the new dog handler, Wallace Eaton.

Before the summer season began the husky population of Scott base was reduced by two. In June six-year-old Betty had to be put down because of an injury to one of her front paws, and late

All yours now. Leo Slattery, officer-in-charge and postmaster at Scott Base last winter, hands over to John Thurston, summer officer-in-charge, on October 6 to mark the opening of the 1982-83 season. On the left is Bob Thomson, superintendent, Antarctic Division, D.S.I.R.

Antarctic Division photo.

in September a six-year-old lead dog Hanson died. In August he and his companions had been making short trips every three days from Scott Base to Turtle Rock and back to prepare for their spring activities.

In the third week of September the dog teams played their part in the monitoring of the growth and movement of the sea ice in McMurdo Sound. This project was carried out by Gary Bowcock and Scott Base staff to prepare for summer research work.

Two ice reconnaissance journeys were made between September 22 and 30. On September 22 Gary Bowcock, Rick Walshe, and Ross Mason, left Scott Base at 7 a.m. for Butter Point and Marble Point. They camped at Cape Bernacchi and returned by way of Butter Point and the Strand Moraines, reaching the base at 7 p.m. on September 25. A one-day journey was made on September 30 by Bowcock, Mason, Nelson, and Chris Johnson. They went from Scott Base to Hut Point and back by way of the "Dirty Ice."

By the middle of October the summer support staff had settled in and was busily engaged in base duties and preparation for the dispatch of field parties. First events of the new season were the transport of fuel and cargo to Marble Point, and the transfer of the 15 huskies at Scott Base to their new dog handler.

In the early hours of October 13 Garth Varcoe, the Antarctic Division's buildings and services officer, began his journey across the sea ice from Scott Base. He drove the base D4 bulldozer and towed 20 tonnes of cargo on four sledges. The load included building materials for Vanda Station, a hut for Cape Chocolate, materials for a dry valley drilling project, and fuel for another scientific party.

This journey across 95km of sea ice took nearly 35 hours. For most of the trip visibility was poor, and at one stage was reduced to 50m because of a heavy ice fog. Compasses could not be used (the South Magnetic Pole is too close)and navigation was by the sun showing hazily through the fog. Air temperatures were minus 30 to 40 degrees Celsius.

On hard ice the cargo train reached a top speed of 6km an hour. But much of Garth Varcoe's route lay through deep snow or jagged broken ice which forced his speed down to 2km an hour. In the last stages on his journey on October 14 he ran into a blizzard approaching Marble Point.

TIME SAVED

Building materials for Vanda which is 50km inland from Marble Point, were flown there later by United States Navy helicopters — a 20-hour operation. The cargo train saved 80 hours of helicopter time.

For safety a support group accompanied the cargo train in a tracked vehicle. The three members of the Vanda summer team, Ron Garrick (leader), David Melville (field and maintenance officer) and Neil Robinson (meteorological officer) provided the support.

Next in the programme was the transfer of the 15 huskies. Two dog handlers, Gary Bowcock and Wallace Eaton, and Colin Monteath, Antarctic Division field operations officer, left Scott Base early on the morning of October 13 for Butter Point, with Gary Bowcock leading the dog team. They camped in the Butter Point refuge hut next to the old depot established 25 years ago by Sir Edmund Hillary.

A blizzard held up the party on October 14, but the next day Wallace Eaton took the dogs in hand for the next stage of the journey to Cape Bernacchi. Two sets of holes were drilled to test the sea ice thickness and the men camped on the sea ice for the night.

The next morning the party headed towards Cape Evans, and reached Scott Base at 9 p.m., having covered 172km over the sea ice in three days' travel. Temperatures averaged minus 30deg C, bitingly cold for the three men but enjoyable for the huskies.

Vanda Station in the Wright Valley 130km west of Scott Base, was opened for the season on October 21 when the summer party was flown there by U.S. Navy helicopter. The station will serve as a logistic centre for some 30 scientists this season, including guest scientists from Australia, Japan, and the United States. During the summer its living quarters will be upgraded in preparation for occupation by a winter team in 1984.

One of the first field parties to take advantage of the support provided from Vanda was the Ministry of Works and Development team, Trevor Chinn and Ralph Dickson, and an Antarctic Division field assistant, Trevor Butler. It began the hydrology and glaciology programme in the dry valeys on October 23.

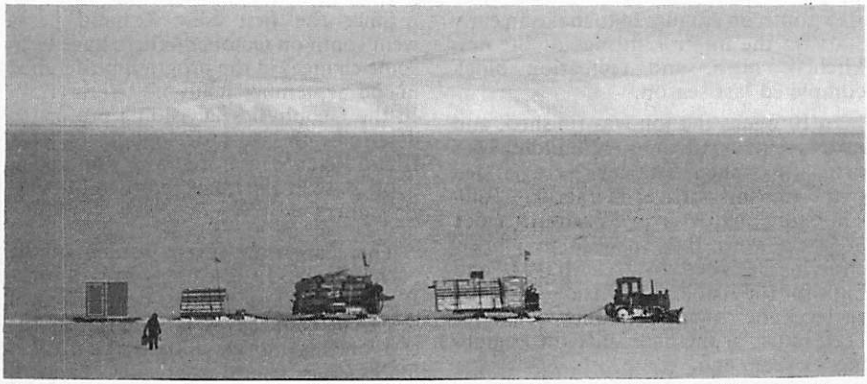
Later in the season Vanda will paly host once again to a Japanese scientific team which will carry out geological and geochemical studies in the dry valleys — a project now in its 16th season. The team is led by Dr Tetsuya Torii, and the others are Drs Shyu Nakaya and Noriyasu Masuda, and Dr Torii's son, Nobuya (field assistant).

A programme of seismic studies to help decide the drill sites on the western edge of McMurdo Sound for a major drilling programme, the 1983-87 Cenozoic Investigations in the Ross Sea (CIROS), and a seafloor sediment sampling survey began on October 31. Three members of the Victoria University of Wellington Antarctic research unit, and an Antarctic Division field leader left Scott Base to spend six weeks on the sea ice in McMurdo Sound.

A veteran of five previous VUW expeditions, Alex Pyne, who is also field leader for the Antartic Division, led the expedition. With him were Ian Paintin and Tony McPherson (VUW) and Malcolm McLeod, an Antarctic Division maintenance officer and field leader.

A D4 bulldozer towing two sledges and a wannigan was driven out by Malcolm McLeod. The rest of the team travelled in a tracked vehicle. Both vehicles left Scott Base at 9.30 p.m.

First leg of the journey was a 12-hour trip over the sea ice to Butter Point 65km north-west of Scott Base. There a road was bulldozed last month on the ice for later seismic work. Later the team travelled 80km north to Granite Harbour to continue research for six weeks



Twenty tonnes of cargo for Vanda Station and science projects on the way from Scott Base to Marble Point across the sea ice of McMurdo Sound. The four sledges are towed behind a D4 bulldozer. Antarctic Division photo

or until the sea ice became too thin for safety.

For the summer support staff at Scott Base November was a particularly busy month. But most of the field parties for the first half of the season were fully engaged in their research early this month.

New Zealand's most remote expedition this summer was put in on November 13. Dr David Skinner and his party, Colin Brodie (geologist), Shaun Norman (field leader) and Chris Morris (toboggan mechanic/meteorologist) were flown 400km from Scott Base to Browning Pass in the Terra Nova Bay area where they will work until late January.

A United States Navy ski-equipped Hercules landed the part with its five tonnes of equipment on the ice of Browning Pass (74deg 36min S/163deg 59min E) which is 16km long and lies between the main mass of the Deep Freeze Range and the Northern Foothills (74deg 44 min S/163deg 55min E) on the west side of Terra Nova Bay.

Before the end of January Dr Skinner's party hopes to complete detailed geological mapping of Precambrian and Early Paleozoic (metasedimentary and granitoid) rocks in the Terra Nova Bay region. Dr Skinner began this work in 1962 and completed half of it in 1969-70.

Not long after its arrival the party climbed the steep and narrow O'Kane Glacier which has not been visited before. The glacier at 74deg 26min S/163 deg 06min E) is 24km long and drains the east wall of the majestic flat-topped Eisenhower Range which is 72km long and rises to 3070m.

As part of the New Zealand contribution to the final secons of the three-year International Survey of Antarctic Seabirds (ISAS) Drs Peter Wilson and Richard Sadleir, of the Ecology Division, D.S.I.R., made an aerial survey of Adelie and Emperor penguin colonies in the Ross Dependency between Ross Island and Cape Adare. The first survey was made last season by Rowley Taylor and Dr Wilson during a routine flight by a Hercules aircraft from McMurdo Sound to Christchurch.

This time the photographic survey at 365m was made on November 29 from one of the three flights back to Christchurch by RNZAF Hercules aircraft. The weather on the route was good except over Cape Adare where cloud was encountered.

While scientists were busy in the field a combined New Zealand Army and Ministry of Works and Development construction team was completing another stage of the Scott Base rebuilding programme. An advance party

flew south on August 24 to make an early start on the interior fittings of the new kitchen, mess, and recreation block completed last season.

In 10 weeks the job was finished, and on November 16 the new building was officially opened. The keys were handed over to the officer-in-charge, John Thurston, by Murray Easton, senior architect with the MOWD in Christchurch. Designed by the MOWD and built for the Antarctic Division the block replaces the original building which has been in use at the base since the beginning 25 years ago.

Work began later on the fourth stage of the rebuilding programme — a new command centre building. This is scheduled for completion in 1984. It is 24m by 10m and will house the Post Office, general administration offices, and telecommunications system.

Since the first New Zealand party went south on October 4 there have been some changes in the programme detailed in the September issue of "Antarctic". In the Geophysics Division's project to determine the isostatic loading of Ross Island Peter Whiteford, who wintered at Scott Base in 1967, has replaced Michael Broadbent.

There are now seven women in the New Zealand research programme. When the Cape Hallett ornithological research team leaves Wellington at the end of this month aboard the United States Coast Guard icebreaker Glacier it will have two women instead of one as originally planned. Linda Logan, a University of Canterbury zoology graduate, has replaced Paul Ensor, who has joined an International Whaling Commission survey of minke whales. The other woman is Jeni Bassett.

Prince Edward's Antarctic holiday

Prince Edward, the Queen's youngest son, who spent part of the New Zealand summer as a house tutor at Wanganui Collegiate School, had a short holiday in Antarctica this month as the guest of Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research. He spent several days at Scott Base, the main New Zealand station in Antarctica, flew to the Amundsen-Scott South Pole Station, and visited the historic huts used by Scott and Shackleton on Ross Island.

Prince Edward's father, the Duke of Edinburgh, was the first member of the Royal Family to visit Antarctica; he was at British bases in Graham Land in the 1956—57 season. But Prince Edward is the first to visit the Ross Dependency and fly there from New Zealand.

When Prince Edward flew south from Christchurch on December 9 ina Royal New Zealand Air Force Hercules he was accompanied by Mr Thomson, Air Commodore D. M. Crooks, Deputy Chief of Air Staff, and Mr C. C. Monteath, the Antarctic Division's field operations officer.

Soon after his arrival at Scott Base Prince Edward climbed Observation Hill in company with Mr Monteath. On the summit of the 230m hill is the Australian jarrah cross erected in 1913 in memory of Scott and his four companions who died on the way back from the Pole.

On his flight to the Pole in a United States Navy ski-equipped Hercules Princes Edward passed within sight of the Queen Elizabeth Range where New Zealand explorers gave his name to a glacier at 82deg 46min S/159deg 32min E. In the same range are glaciers named after the Prince of Wales and Princess Anne, and a plateau named for Prince Andrew. The Prince Philip Glacier runs into the Nimrod Glacier between the Cobham and Holyoake Ranges.

Before Prince Edward returned to Christchurch on December 15 he was flown to Vanda, the New Zealand station in the Wright Valley, one of the dry valleys of the McMurdo Oasis. He also inspected New Zealand science projects and visited McMurdo Station.

Observers from China and Italy

Scientific observers from the People's Republic of China and Italy, which have indicated their intention to engage in more extensive Antarctic research visited New Zealand and United States bases between November and December this season to gain an insight into operations on the continent, and the extent of New Zealand's science and support role. In addition, representatives of the Japanese Ministry of Education, Science, and Culture, and the National Institute of Polar Research also visited Antarctica, and like the Chinese and Italians, had discussions with individuals and organisations concerned with the New Zealand programme.

China has been interested in Antarctic affairs since 1977, and its future plans include a permanent scientific station on the continent. Observers have attended the 1980 and 1982 meetings of the Scientific Committee on Antarctic Research, and since the 1979-80 season Chinese scientists have taken part in the Australian research programme.

In the 1979-80 season a geomorphologist and an oceanographer, who spent three weeks at the Australian station, Casey, also visited Scott Base and McMurdo Station. Last season a geochemist, Dr Sheng-Yuang Wang, and a microbiologist, Mr Dezan Yee, were the first guest scientists from their country to work with the New Zealand programme. This season Mr Wu Heng, director of the National Antarctic Research Committee, and the deputy director, Mr Guo Kun, went south for several days. They visited Scott Base, McMurdo Station, Vanda Station in the Wright Valley, and field parties at Lake Fryxell in the Taylor Valley.

Two representatives of the Italian National Research Council, Dr Carlo Stocchino, of the Institute of Atmospheric Physics, Genoa, and Dr Marcello Manzoni, of the Marine Geology Laboratory, Bologna, came to New Zealand to conduct feasibility studies for an Italian Antarctic research programme. Their visit was part of a general investigation of polar institutions and Antarctic operations by the Italian Government.

Drs Stocchino and Manzoni did not need to be introduced to the surroundings of Scott Base, Vanda Station, and McMurdo Station. Both worked with the New Zealand research programme in the 1973-74 and 1974-75 seasons.

For the last 15 seasons Japanese scientific teams have worked with the New Zealand programme, mainly in the dry valleys, but also at Cape Bird and at Scott Base. This season's visit by the representatives of the Ministry of Education, Science, and Culture, and the National Institute of Polar Research, was to discuss further joint programmes in the Ross Dependency.

Japan's polar research is under the jurisdiction of the Ministry of Education, Science, and Culture, and the National Institute of Polar Research is responsible for the Antarctic expeditions. The three representatives who visited Antarctica were Mr Nobuyuki Tsuzukihashi, director of the ministry's international science division, Mr Sumio Fudagawa, head of the institute's office of administration, and Mr Hiroshige Shibano, chief of the research cooperation unit.

U.S. budget for science programme

United States expenditure on research in Antarctica and its support this season has been increased slightly to $82.4 million. The National Science Foundation's total budget last season for scientific projects and logistic support was $66 million.

Included in the cost of the programme for the fiscal year which runs from October this year to October next year is $13.4 million for icebreaker support previously in the budget of the Department of transportation. From the total budget up to $55 million will be allocated for maintenance of the four American inland and coastal stations, contract services, and logistic support by aircraft, icebreakers, and cargo ships.

This summer about 285 scientists, including representatives of 12 other countries, are engaged in research on the Antarctic Continent in the Southern Ocean. One joint project by scientist from the University of Kansas and the West German Federal Bureau of Geosciences and Natural Resources is an airborne survey to assess the potential resources of uranium and other radioactive elements in the exposed rocks of Antarctica.

Since the survey by an airborne gamma-ray spectrometer began in the 1975—76 season surveys have been made in North Victoria Land, Marie Byrd Land, and the dry valleys of South Victoria Land. This season the survey has been extended to Szabo Bluff (86deg 29min S/14deg 48min W) in the Queen Maud Mountains less than 320km from the South Pole.

Szabo Bluff is on the divide between the Van Reeth and Robison Glaciers and flows north-west along the north side of the La Gorce Mountains to enter the Scott Glacier. In the 1980—81 season a geological party led by Dr Edward Stump of Arizona State University, was landed on the Robison Glacier to start geological investigations in the La Gorce Mountains and the central area of the Scott Glacier.

On their last day in the field Dr Stump and his four companions worked at Szabo Bluff which is north-east of the landing site. There they discovered a pegmatite containing yellow concentrations of calcium/uranium-bearing hydrated silicates.

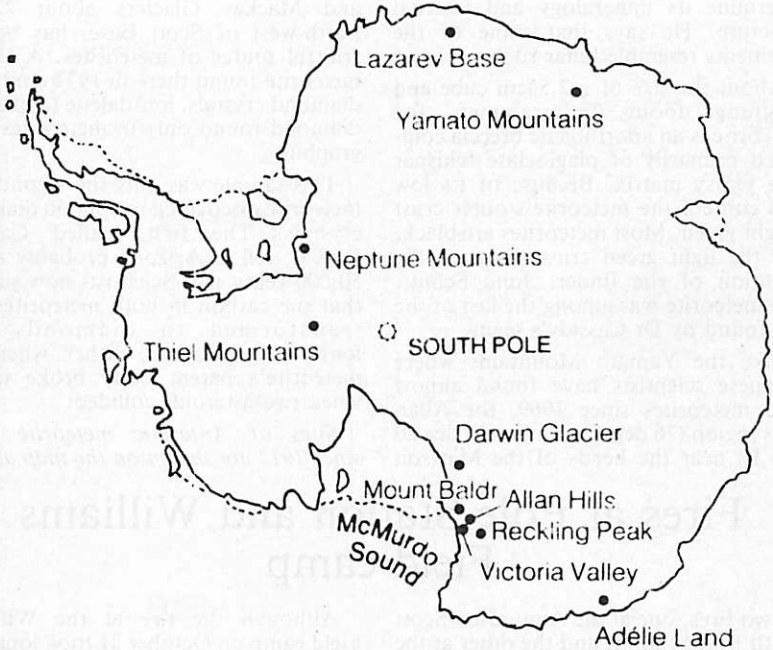
In the 1981—82 season the resource and radioactivity team worked in North Victoria Land. On a return flight from the Amundsen-Scott South Pole Station a radioactivity survey was made near Szabo Bluff, and an indication of a radioactive outcrop was obtained, using a gamma-ray spectrometer.

Late last month six scientists were flown to the Szabo Bluff area from McMurdo Station by a United States Navy Hercules aircraft of VXC-E6 Squadron. A remote field camp was set up at Szabo Bluff to sample a nearby radioactive outcrop. This month Dr Edward J. Zeller's team extended its radiometric survey to other outcrops.

To complement the American/West German investigations a geologist, Donald Burt, from Arizona State University, who was the seventh passenger on the flight, has collected and identified radioactive materials present in pegmatite at the Szabo Bluff site.

Was the poor seal a female? That is the question likely to be asked by anyone who reads the 15-word abstract of a paper on mobbing response in Adelie penguins published in the Australia ornithological journal "The Emu" (81(3): 169) by R. J. Barker and R. M. Hand.

Why ask the question? There is a good reason. The abstract says only that "harassment of a Ross seal by a group of about 100 Adelie penguins is described!!"



RARE METEORITES MIGHT BE MOON ROCK

A meteorite found on bare ice in the Allan Hills region of southern Victoria Land may be a piece of moon rock. The meteorite was one of 378 found last season by a research team led by Dr Willian A. Cassidy, of the University of Pittsburgh. Since the 1976-77 season United States, Japanese, and New Zealand scientists have found about 1183 meteorites in the Ross Dependency.

Dr Cassidy, who has organised and led all the meteorite searches financed by the United States National Science Foundation, says that the discovery in January this year could be among the most significant finds in the field of the planetary sciences. It could be the first concrete evidence that fragments are being knocked off the moon by meteor impact.

Two rare achondrite meteorites called shergottites found in southern Victoria Land at Elephant Moraine (an ice core moraine west of Reckling Peak, 76 deg 16 min S/ 159 deg 15 min E) in 1979 and in the Allan Hills in 1977 are believed by many scientists to be pieces of one of the inner planets, probably Mars. If the latest sample is shown to come from the lunar surface scientists will have to begin thinking of the Antarctic ice cap as a place that collects and preserves not only fragments of asteroids but also fragments of other bodies in the solar system.

A New Zealand-born geologist, Dr Brian Mason, now curator of the department of mineral sciences at the Smithsonian Institution, one of the organisations which has co-operated in the collection, classification, storage, and distribution of Antarctic meteorites for study by scientists, has examined a thin slice of the Allan Hills meteorite to

determine its mineralogy and internal structure. He says that some of the fragments resemble lunar rock.

About the size of a 2.54cm cube and weighing about 28 grammes, the meteorite is an anorthositic breccia composed primarily of plagioclase feldspar in a glassy matrix. Because of its low iron content the meteorite's outer crust is light green. Most meteorites are black, and the light green crust attracted the attention of the finder, John Schutt. The meteorite was among the last of the 378 found by Dr Cassidy's team.

Like the Yamato Mountains where Japanese scientists have found almost 4000 meteorites since 1969, the Allan Hills region (76 deg 42 min S/ 159 deg 20 min E) near the heads of the Mawson and Mackay Glaciers about 225km north-west of Scott Base, has been a fruitful source of meteorites. A 10.5kg meteorite found there in 1977 contained diamond crystals, lonsdaleite (a phase of diamond found only in meteorites) and graphite.

This sample was only the second iron meteorite discovered to contain diamond crystals. The first, called Canyon Diablo, fell in Arizona probably about 50,000 years ago. Scientists now suggest that the carbon in both meteorites was transformed to diamonds and lonsdaleite in space, either when the meteorite's parent body broke up or when two asteroids collided.

Sites of Antarctic meteorite finds since 1912 are shown on the map above.

Fires at Pole Station and Williams Field camp

Two fires, one at the Amundsen-Scott South Pole Station, and the other at the Williams Field camp on the sea ice in McMurdo Sound, marked the first month of the United States summer research programme. The South Pole fire caused the loss of about 9898 gallons of Antarctic diesel fuel and a 25,000-gallon fuel storage bladder; damage in the Williams Field fire was limited to the inside of one of the generator modules and the generator itself.

On October 9 fire broke out in the Pole Station fuel arch where 100,085 gallons of fuel are stored in bladders to serve the station. The cause of the fire was mechanical damage to an electrical lead in the heater blanket connection which resulted in a short circuit.

A potentially disastrous fire was put out in five minutes with dry chemicals. Patrick Kraker, station manager for ITT Antarctic Services, which provides support services for the National Science Foundation, led several men wearing breathing apparatus to the fire which was in the middle of the nine storage bladders. The fuel was lost when it leaked out on to the snow.

Although the fire at the Williams Field camp on October 21 took longer to control, and four of the fire-fighters had hospital treatment at McMurdo Station for the effects of smoke inhalation, it did not interrupt operations. The fire broke out about 6.07 p.m. and was extinguished about 7 p.m. An emergency generator was installed and was quickly linked with the power supply for a camp which houses more than 120 men.

Design for polar living

Two investigators from the Institute of Planning and Development in the Faculty of Architecture in the Catholic University of Chile, Professors Marcia Poupin and Antonio Dahen, have carried out a study on the possibility of constructing a settlement in Chilean Antarctic territory with a capacity of 300 inhabitants. This settlement would be sited on King George Island in the South Shetlands where the Air Force base Teniente Rodolfo Marsh is situated.

Australia to spend more on research

Australia plans to spend more on research in Antarctica and the provision of ships and operational facilities for aircraft to support science programmes. This year the Government provided $390,000 for an Antarctic transport study to indicate practicable alternatives to the present system of chartering foreign ships for research and supply voyages.

This long-term study is based on the premise of an enhanced level of activity in Antarctica. The Minister for Science and Technology (Mr David Thomson) has said that additional projects in 1983—84 will include a survey of the remote eastern sector of Australian territory, annual marine biology and marine geoscience voyages, a major summer field programme which will include a 1000km traverse, and the restoration of Mawson's hut at Cape Denison in Commonwealth Bay.

Details of the new transport system and the level of the Australia Antarctic programme will be considered in next year's Budget. This year the Antarctic Division received an extra $5 million in its 1982—83 budget, bringing the total allocation to $23 million. In addition some $11 million was allocated to the Department of Transport and Construction for the 10-year $58 million rebuilding programme in progress at the three Antarctic bases, Casey, Mawson, and David. This began in 1981.

As a result of the transport study Australia is likely to buy its own Antarctic supply and research ship, and build as many as three runways on the continent, one designed to take Royal Australian Air Force Hercules aircraft. The study will determine the relative feasibility of operating Hercules and Boeing 747 aircraft between Australia and Antarctica.

Runways near Casey and Mawson would be built of compacted snow, using Soviet techniques employed in the construction of a runway for heavy wheeled aircraft at Molodezhnya in Enderby Land. Surveys have been made in past seasons of an area in the Vestfold Hills near Davis, one of the few where a rock runway could be built for wheeled aircraft.

Restoration of Mawson's hut is expected to be deferred until the base rebuilding programme is past its peak and excess shipping capacity becomes available. It would take about 12 men two summer seasons to restore the hut at an annual cost of $300,00. If the work was started next season support for the project would require the charter of an additional ice-strengthened ship from the Northern Hemisphere, and would cost about $3 million for the two seasons.

Australia's intention to strengthen its position in Antarctica followed the release of the second report of the Antarctic Research Policy Advisory Committee (ARPAC), a body of expert scientists, science administrators, and industrialists set up to advise the Government. The chairman is Professor David Caro, Vice-Chancellor of the University of Melbourne.

In its first report three years ago ARPAC made 18 recommendations. The Government responded by initiating the $58 million rebuilding programme, and supporting the establishment of marine research as a priority.

There are seven recommendations in the latest report. They emphasise the need for increased resources for the Antarctic research programme and the development without further delay of a new transport system.

ARPAC reported that more than 25 approved research projects had been dropped since 1979 because of lack of funds. Concern was expressed at the large number of projects deferred each year because of present constraints in the transport system which relies on the charter of foreign vessels. ARPAC recommended that a new system should include an intercontinental air service for passengers and a surface system for cargo transportation and marine research.

Marine research in the Prydz Bay area between David and Mawson stations by scientists aboard the Nella Dan will be part of the main programme of Australian National Antarctic Research Expeditions (ANARE) for the 1982—83 summer. The main objective of the project, which began early this month, is to conduct additional research in support of the international BIOMASS programme.

This is the third Australian marine research voyage since the Nella Dan was modified in 1980 at a cost of some $2 million. Early in 1981 the first voyage was made as part of the FIBEX programme, the first phase of the BIOMASS project which had as its particular aim the study of krill. A geoscience cruise was made to the Prydz Bay region earlier this year.

During the present cruise Antarctic Division scientists will follow up and extend the findings made in Prydz Bay during FIBEX. These krill studies will be closely linked with physical and chemical oceanography. The distribution of krill over the study area will also be investigated by echo sounding.

AGE OF KRILL

One of the most important aspects of the krill research will be a study of the age of krill and how long they live. Detailed studies will also be made of phytoplankton, the food of krill, and its distribution from the surface to a depth of 200m.

Other BIOMASS related studies will include observations of the distribution of seabirds, fish, and squid, all of which feed on krill. Helicopters from the Nella Dan will make a pilot study of the distribution and abundance of Crabeater seals as there is no information on their numbers in the Prydz Bay area.

Other programmes will also be carried out on the voyage. Magnetic surveys of the Southern Ocean which began late in 1979 will be continued by the Bureau of Mineral Resources, Geology, and Geophysics. Studies will also be made of sea ice in relation to data provided by satellites.

EIGHT VOYAGES

Relief and resupply of Australia's three Antarctic base, Mawson, Casey, and Davis, and the sub-Antarctic base on Macquarie Island, this season will be carried out again by three chartered ships, two Danish and one Canadian. They will make eight voyages, the largest number ever arranged by the Antarctic Division to support ANARE programmes.

Shipping plans were revised this winter when the Thala Dan was sold to Brazil. She has been replaced by the Canadian ice-strengthened cargo ship Lady Franklin. The Antarctic Division has sub-chartered the vessel from Expeditions Polaires Francaises for one voyage.

Eight voyages will be needed this season because of the huge increase in cargo to be delivered to Antarctica for the maintenance of summer scientific stations and the continuation of the rebuilding programme. Some 12,000 cubic metres of cargo (8500cm in 1981—82) will be shipped south and 1,700,000 litres of diesel fuel.

First to go south was the Nella Dan, now in her 22nd consecutive season of support for Australian programmes. She sailed from Hobart towards the end of October and carried out the resupply and changeover of the station on Macquarie Island. After three days in port she departed again on November 8 for the Mawson and Davis ice edges where staff and a small amount of cargo were to be flown to the two stations by helicopter.

When she completes her marine research in the Prydz Bay area at the end of December the Nella Dan will go south again early in January to carry out the changeover and resupply of Casey. Her final voyage to Davis and Mawson will be made from Hobart in the second week of February.

Nanok S which will be in her fourth ANARE season will carry the bulk of the rebuilding materials south on her three voyages. Her first was to the ice edge at Casey last month. There she was to deliver a summer party, cargo, and station staff by helicopter, and discharge other cargo if able to reach the station itself.

This month Nanok S returned to Melbourne. Her second voyage was to Mawson, Davis, and Casey by way of Hobart. She will proceed direct to Mawson and Davis on the final voyage from Melbourne in early February and return to Hobart about March 18.

Lady Franklin will be used for one voyage to Casey and Davis in the New Year. She is expected to leave Melbourne on January 21 and is due back on February 23. Her cargo carrying capacity of 3000 cubic metres means that all cargo needed for the next phase of the rebuilding programme will be shipped this season.

Ship to winter in ice at Prydz Bay

An international group of four men and two women which will spend 15 months in East Antarctica aboard the 21m auxiliary schooner Dick Smith Explorer left Sydney last month for Prydz Bay, a deep embayment between the Lars Christensen and Ingrid Christensen Coasts where it will carry out a programme of marine, geological, biological, and anthropological research. The group will work for two summers in Prydz Bay, and next winter the ship will be frozen in from April to November near the Rauer Islands in the south-east part of the bay. It will return to Sydney in March, 1984.

This expedition, which sailed from Sydney on November 14, is the third Antarctic research expedition organised by the Oceanic Research Foundation. The leader is Dr Davis Lewis, the New Zealand-born navigator and ocean voyager. He led the 1977-78 expedition to the Balleny Islands and the Cape Adare region in the 17.3m yawl Solo, and the 1981-82 expedition which did research from the Dick Smith Explorer around Commonwealth Bay and off the French station, Dumont d'Urville.

Prydz Bay (69deg S/75deg E) is one of the geologically least-known areas in the world, and the Lambert Glacier-Prydz Bay region is considered to be a prime hydrocarbon exploration area. The Prydz Bay region is also rich in marine life, and Australian scientists conducted marine research there early in 1981. A geoscience cruise was made last summer, and a second marine research programme is planned this season.

An extensive scientific programme will be carried out by the Oceanic Research Foundation expedition. Acoustic data on Weddell seals, whales, and Emperor penguins will be recorded for scientists at the Scripps Institution of Oceanography. Under the guidance of scientists from the Australian Antarctic Division members of the expedition will carry out programmes of seal tagging, penguin and seabird counts, sea ice sampling, and the collection of fish and geological samples. Weather recordings will be made regularly at sea and on land for the Australian Meteorological Bureau.

A study of the interactions of the members of the expedition in an isolated and hostile environment will be made by Mimi George, a 31-year-old anthropologist from the University of Virginia as a project for her doctorate. She is second-in command of the expedition, and will be the chief photographer.

Special projects of the expedition include the development of polar adaptive technologies for small private Antarctic expeditions. Examples are the use of sail power in the Southern Ocean and in pack ice, the freezing in of a small steel ship, and the use of modern materials and aids to polar exploration such as an inflatable sledge boat, synthetic clothing, and satellite navigation.

Members of the expedition are:

Jannik Schon. He is a 28-year-old Danish naturalist and wildlife photographer who has worked in Scotland as a gamekeeper, and also worked for one year at an outdoor training centre in the Cairngorms ski-ing, canoeing, and ice climbing. Jannik will assist in bird and seal studies.

Jamie Miller. A 25-year-old biologist from Melbourne, he will co-ordinate the science programme. In addition to a degree in biology he has completed three years' study in geology. He is an able cross-country skier.

Jill Cracknell. She is a 24-year-old English geographer.

Nitish Iyengar. Aged 18, he is the youngest member of the crew, and on the expedition will be ship's engineer and radio operator. He was born in India, and is now a New Zealand citizen. His deep-sea sailing experience includes a voyage from Auckland to Buenos Aires through the Straits of Magellan, and he has studied marine biology.

Most of the scientific projects of the Oceanic Research Foundation expedition will be carried out in the Larsemann Hills area. This is a series of low rounded coastal hills along the south-east shore to Prydz Bay. Other research will be done on the Rauer Islands which are about 30km from the Australian station, Davis, and on the Svenner Islands 22km south-west of the six dome-shaped and ice-polished islets of the Rauer group.

Antarctic Talkback

"Talkback Antarctic" became a reality early in February this year when members of an Australian Rotary club and their wives listened to a guest speaker at Scott Base more than 4000km away. The speaker in a radio hookup through New Zealand was Robert Frost, deputy-officer-in-charge last summer. His brother, Neil, is secretary of the club in Rosebud near Melbourne.

Rosebud's postmaster, Alan Watson, who is vice-president of the club, was chairman of the talkback. Appropriately, Leo Slattery, postmaster and officer-in-charge last winter, and David Atwell, Post Office clerk, also shared in the talkback from which the Australians learned a lot about Scott Base and its activities.

Winter with no sun

How do you occupy your spare time during an Antarctic winter at the South Pole when the sun departs for good on March 21 and does not rise again until September 21? Three of the 17 Americans who worked for a year at the Amundsen-Scott South Pole Station provided different answers to the question.

A United States Geological Survey scientist, Kathy Covert, one of two women in the winter team — the other was the station cook, Merriann Bell — devoted some of her spare time to making a modern version of a dulcimer, an ancient musical instrument. Her scientific duties were to record the doppler effect of passing satellites, and operate a seismometer.

Patrick Kraker, the base station manager, found time to write a 50,000 word travelogue about the Colorado River. Another member of the team wrote a novel.

JARE 24

Traverse in eastern Queen Maud Land

A traverse from Mizuho Station, 300km south-east of Syowa Station, to the Sor Rondane Mountains along the 2000m contour, ice core drillings at Mizuho and on the ice sheet, and another search for meteorites on bare ice areas near the Yamato Mountains are among the projects of the 24th Japanese Antarctic Research Expedition (JARE24) in the 1983-84 season. The major glaciological research programme in eastern Queen Maud Land, which was started this year, will be continued for several years, and the winter marine biology project at Syowa will be carried on for three more years.

This year the veteran icebreaker Fuji under the command of Captain Syuichi Takeuchi will make her last cruise to Antarctica. She has been in service since the 1965-66 season. Next season her place will be taken by the new icebreaking research and supply ship Shirase, which will be commanded by Captain Tomatsu Sato. The 11,647-tonne Shirase, launched in December last year, is now fully equipped, and was officially transferred to the Japanese Maritime Self-Defence Force early last month.

For this summer JARE24 will have the Fuji's three helicopters — two Sikorsky S-61As and one Bell 47GA — available in the Syowa area. They will be used in support operations in January and February next year. Two aircraft, a Cessna 185 and a Pilatus Porter PC-6/B2-H2 owned by the National Institute of Polar Research will be operated at Syowa by civilian pilots this summer and next summer. Still under trial at Syowa is the Mitsui experimental hovercraft designed for ship to shore use and inland transport over the ice.

This season's programme began officially on November 25 when 45 members of the JARE24 winter and summer parties left Tokyo on board the Fuji. The leader of the expedition and of the winter party of 35 is a National Institute of Polar Research glaciologist, Dr Shinji Mae, who was deputy-leader of last summer's party. A NIPR biologist, Dr Yoshikuni Ohyama, is deputy-leader of the summer party.

There are five summer visitors aboard the Fuji. Three United States guest scientists from the University of Alaska, Dr Thomas Gosink (marine chemist), and Messrs George Landreth and Terence Green (technicians), will study carbon dioxide exchanges between the air and ocean. The other summer visitors are Mr Isao Inoue (Maritime Safety Agency) and Mr Toshiki Makino (Kyodo News Enterprise).

From Tokyo the Fuji sailed to Fremantle. She is expected to reach the pack ice late this month. The transport of JARE24 to Syowa by helicopters is expected to begin early next month, and the official relief of the JARE23 winter party will take place in February.

ICE STUDIES

One of the projects in the eastern Queen Maud Land glaciological programme from Mizuho Station, which will be the centre for glaciological field studies for the next four years, was started by JARE23 in October. Eight members of the winter team led by Dr Fumihiko Nishio (glaciologist) left Mizuho on October 12. Markers were set

in the upstream of the Shirase Glacier following the stream line along the line of 40deg E from 71deg S to 73deg S.

Shallow ice-core drilling to about 130m was done at 71deg 02min S/39deg 52min E. After the installation of markers for about 250km to the southern end of the Yamato Mountains the party planned to set a 100kmn triangulation chain. This will help to clarify the mechanism of Yamato meteorite concentration in the vicinity.

A coastal marine biology study of life under the sea ice has been the main project of the winter party at Syowa. The JARE23 leader is Dr Takao Hoshiai, marine biologist in NIPR. Under his direction three marine biologists have made ecological studies of phytoplankton, zooplankton, and benthos, including dimersal fish. This biology programme, carried out in conjunction with the BIOMASS investigations will be continued for another three years.

Environmental science projects will be continued at Syowa by JARE24. They will include continuous measurement of atmospheric carbon dioxide compounds, sampling of soil algae and soil bacteria, limnological studies of fresh and saline lakes, and a study of the life cycle of bryophytes.

PENGUIN CENSUS

Reception of geophysical data from the scientific satellites ISIS I and II, and NOAA VII and VIII, will be part of the continuing upper atmosphere programme at Syowa. Balloons fitted with detectors will be launched to measure minor constituents (nitrogen dioxide, ozone) in the stratosphere. Other projects are aurora and ionosphere studies, meteorological and seismological observations, tide observations, and a geodetic control survey of ice-free areas.

Marine biological research will include a population census of Adelie penguines and Weddell seals, and routine oceanographic observations in Ongul Strait. Ecological studies of marine life will be continued.

Glaciological projects will be concentrated in the programme planned from February, 1983 to January, 1984 at Mizuho Station and on the Mizuho Plateau. During the traverse along the 2000m contour to the Sor Rondane Mountains radio-echo soundings of the ice sheet will be made by ice radar, and laser-radar equipment will be used to make a surface micro-relief of Mizuho Plateau. Firn snow cores will be sampled to a depth of 10m along the traverse routes.

Ice-core drilling to a depth of 100mm will be carried out at three locations. One is at Mizuho, a second at 71deg S/40deg E, and the third near the Yamato Mountains. Medium-depth drilling will be done at Mizuho.

METEORITE SEARCH

Since 1969 an area of bare ice near the Yamato Mountains has yielded more than 3500 meteorites to Japanese searchers. The search will continue this summer.

Scientists at Mizuho will make a surface synoptic observations and glaciological study in the station area. Film records of blowing snow, using an 8mm camera (12 frames an hour) and a gauge, will be made again at Mizuho, 73deg 10min S/53 deg 30min E, and at 69deg 50min S/47deg 40 min E.

Micro-meteorological observations will be made at Mizuho with a micro-meteorological sensor on a 30mm tower erected in January, 1979. This will enable the meteorologists to observe air temperature and wind profiles, vapour pressure, and drifting snow.

Programmes aboard the Fuji from November to April next year will cover marine meteorology, temperature, salinity, and current measurements, chemical analyses of sea water, upper atmosphere physics, and a geodetic control survey of ice-free areas of the Soya Coast.

Marine biologists aboard the Fuji will measure the chlorophyll content in surface sea water and make ecological studies of phytoplankton. They will also collect organic particulates.

Members of JARE-24 and their duties (surnames first) are:—

Summar staff aboard FUJI (1982-1983) —
OHYAMA, Yoshikuni, Dr (deputy-leader/biologist), HANZAWA, Takashi (physical oceanographer), IWAMOTO, Kouji (chemical oceanographer), SASAKI, Hiroshi, Dr (biological oceanographer), TOYODA, Tomoo (surveyor), MATSUBARA, Satoshi, MOTOYOSHI, Yoichi (geologists), SANO, Masashi, MASUDA, Mitsuo (construction engineers), IMAMURA, Yuji (general assistant).

Other summer visitors board FUJI:—
GOSINK, Thomas, Dr (marine chemist), LANDRETH, George, GREEN, Terence (technicians), University of Alaska, INOUE, Isao (Maritime Safety Agency), MAKINO, Toshiki (Kyodo News Enterprise).

Winter staff (1982-1983) at Syowa Station and Mizuho Station:—
MAE, Shinji, Dr (leader/glaciologist), TSUKAMURA, Kouji, YANO, Takao, KONDO, Kouji, IWASHITA, Gouki (meteorologists), SAKURAI, Haruo (geophysicist), YAMAZAKI, Ichiro, IWASAKA, Yasunobu, Dr, TANAKA, Takashi, Dr, SHIBAZAKI, Kazuo, Dr (upper atmosphere physicists), MAKINO, Yukio (meteorologists), NARITA, Hideki, NAKAYAMA, Yoshiki, NAKAO, Masayoshi, Dr (glaciologists), ISOBE, Tamio (surveyor), TAKAHASHI, Eiji, Dr, WATANABE, Kentaro (marine biologists), KANDA, Hiroshi, Dr (botanist), SATO, Hiroo, Dr (marine chemist), SHIGA, Shigeo, ANDOH, Keiichi, YAMASHITA, Takaaki, BABA, Hiroaki, SAKAMOTO, Fujio (mechanics), TANAHASHI, Toshio (radio engineer), MURASE, Masaru, YAGI, Shigeyuki (radio operators), NAKATSUGAWA, Toshiaki, TOMITA, Mizuho (cooks), OOKUBO, Eiji, OGASAWARA, Isao (medical officers), JIMBO, Masahi, MORI, Makoto (pilots), KAWABATA, Kazuto (aircraft mechanic), ISHIZAWA, Kenji (general assistant).

Japanese oil survey off Wilkes Land

Marine geophysical and geological surveys off Wilkes Land in the Wilkes Basin area and the Ross Sea, ice conditions permitting, for geological indications of oil will be made this season by the Japanese Metal Mining Agency's geological survey ship Hakurei Maru. These will be the final surveys of a three-year programme begun in the 1980-81 season by the Japan National Oil Corporation for the Agency for Natural Resources and Energy.

Scientists from the National Oil Corporation and research institutions have conducted surveys in the Weddell and Bellinghausen Seas. Earlier reports ("Antarctic", September, 1982) suggested that the first stage of the final surveys would be in the Scott Basin off the coast of Adelie Land, and the second in the Ross Sea. The planned research area this season is between Latitude 60deg-74deg S and Longitude 135deg E-150deg W.

Under the command of Captain Hideaki Okumura with a crew of 35 and 18 scientists the Hakurei Maru sailed from Funabashi near Tokyo on November 29. She is expected to arrive in Sydney on December 13 and sail again on December 17 for the survey area, arriving on December 25. On January 3 she will sail to Lyttelton, arriving on January 11 and sailing back to Antarctica on January 15.

From January 20 to February 12 the Hakurei Maru will be in Antarctica again. She is due in Sydney on February 21, and on February 25 will depart for Funabashi where she is expected on March 11.

Leader of the research staff aboard the ship is Dr Shunji Sato, a geochemist who is the chief scientist. Principal member of the staff are the two co-chief scientists, Dr Eiji Inoue (geologist) and Mr Takemi Ishihara (geophysicist), and Dr Masfumi Arita (geologist), Mr Takao Saki, Mr Nobutaka Oikawa (geophysicists). Dr Sato, of the National Oil Corporation's technology research centre, took part in the Weddell and Bellinghausen Seas surveys, and Mr Saki went to the Weddell Sea.

This season the research team will conduct seismic reflection and sonoradio buoy refraction surveys. They will also do depth sounding and sub-bottom profiling, take core samples from the seabed, measure terrestrial heat flows, and carry out magnetometer and gravimeter surveys.

BAS NEWS

Bigger budget for future research

More money will be spent in future years on British research in Antarctica. The British Antarctic Survey's annual budget of about six millon sterling will be increased by four million in 1983-84, and thereafter by five million a year, which will more than compensate for the cash cuts which began in the mid-1970s.

A bigger budget will enable BAS to make a major increase in research programmes, particularly in the earth sciences and marine life sciences. There will be additional research opportunities for British university groups and more international co-operation.

Facilities at Rothera on Adelaide Island and Signy in the South Orkneys, and the Cambridge headquarters will be improved. Halley on the Brunt Ice Shelf off Coats Land is already being rebuilt this summer at a cost of about 1½ million. Two new Twin Otter aircraft were bought to replace those wrecked in a storm at Rothera last summer. Now it is likely that two more aircraft will be bought. There are hopes also that the Royal Research Ship John Biscoe, now 25 years old, will be replaced in 1987-88 although this would require a special allocation of funds.

Scientific work has been resumed on South Georgia. The small biological station on Bird Island at the northwestern extremity of the island was reopened by two BAS ornithologists at the end of September. It had been closed in April after the conflict between Britain and Argentina. Three more BAS scientists and two Americans from the University of Minnesota will also work there during the summer, and four of the BAS men will remain for the winter.

Only 4.8km long and .8km wide, the island has rocky coves, shingle beaches, and luxuriant tussock grass which provide breeding grounds for vast numbers of fur seals and birds. It is designated a "Site of Special Scientific Interest". Present BAS work there on fur seals and sea-birds (particularly albatrosses) is closely linked to the long-term Offshore Biological Programme.

Three other BAS men spent the last two weeks of September at Grytviken and were able to salvage a considerable quantity of scientific records. The station is at present manned by servicemen who have resumed the meteorological observations. BAS hopes that it will be possible to restart its other scientific programmes in 1983-84.

Satellite communications are now being used to supplement the teleprinter link between BAS stations and the Cambridge headquarters by way of Stanley, which was severed during the hostilities. This development was envisaged as long ago as 1980-81 as a means of handling the vast amounts of data which would be produced by the advanced ionospheric sounder at Halley Station.

Sledge-mounted compact terminals are now on their way to Signy and Halley. Each will provide voice communication as well as fast and dependable telex and facsimile transmission, and the Halley terminal will also be used to transmit data between the computers at Halley and the Cambridge headquarters. This will enable continuous monitoring of programmes and allow experiments to be conducted direct from Cambridge. It is expected that the equipment will be operational early in the New Year.

Relief of BAS stations began officially on September 21 when the RRS John Biscoe sailed from Southhampton, and the RRS Bransfield followed her on

November 5. The John Biscoe will spend the season resupplying all the stations except Halley and transporting staff. She will not undertake Offshore Biological Programme work this summer as it is proposed that there should be a winter OBP voyage in 1983. Meanwhile, the Bransfield's maind task is to carry the materials and equipment for the new Halley ("Antarctic", September, 1982). She will stand by at the station between mid-December and the end of February while the main construction work is in progress.

In mid-October the John Biscoe called at Rio de Janeiro to embark more BAS men, but a week later she developed engine trouble and had to put in to Rio Grande, Brazil. She was delayed for two weeks while repairs were carried out.

After a call at Stanley, she proceeded to the northern end of the Antarctic Peninsula, and landed a party of geologists on James Ross Island where they will continue work begun last summer. The next task was to take field parties to Damoy, Wiencke Island, from where they were flown south to Rothera and southern field work sites. Bird Island, Signy and Faraday stations will be relieved after a brief visit to Montevideo to pick up more men and, sea ice permitting, the ship will also go to Rothera. The Bransfield will visit Signy and the Antarctic Peninsula stations at the end of the season.

On October the 20 two new Twin Otter aircraft, arrived at Rothera from Canada. While awaiting the arrival of the summer field workers at Damoy, the aircraft replenished Fossil Bluff advance station, George VI Sound, and several depots on the Palmer Land plateau.

Routine work has continued at all stations and some journeys have been undertaken. A party from Faraday was able to travel to the Yalour Islands and Peterman Island in October, but found no trace of the men who were tragically lost when the sea ice broke up suddenly in mid-July ("Antarctic", September, 1982). An exhaustive search carried out by the Chilean Air Force when the men were first reported missing had also revealed no trace of them.

In the South Orkneys, the sea ice also came and went intermittently during the winter. One party from Signy was able to visit Coronation Island in August.

Very heavy snowfalls and strong winds at Rothera restricted travel in August, but several parties managed to visit north-eastern Marguerite Bay, including the old Horseshoe Island station (a round trip of about 160km), and the old Adelaide station (64km to the southwest). Further journeys were undertaken in September and October: at least one party went to Horseshoe Island and two south-eastwards to the old Stonington Island station and Northeast Glacier.

Maintenance work on the large fleet of vehicles, in preparation for the summer, occupied much of the time at base. The airstrip was also prepared for the arrival of the aircraft.

A number of journeys was undertaken in snowmobiles from Halley in October. A route was reconnoitred through the "hinge-zone" from the ice shelf to the inland ice, and part of the coast resurveyed. Possible landing sites were reconnoitred and sea ice condition monitored in preparation for the Bransfield's arrival.

Six landings on Peter I Island

Peter I Island, discovered by Bellingshausen on the afternoon of January 22, 1821, is not a very busy place — it is at 68deg 47min S/90deg 35min W about 240 nautical miles off the Eights Coast — but through the years it has had more visitors than suggested in a West German report printed in the March issue of "Antarctica". The landing made on January 29 this year by members of the crew of the cruise ship World Discoverer was not the second in 53 years but the sixth.

Bellingshausen was unable to approach

the island because of heavy pack ice, and since then other ships have been unable to send landing parties ashore for the same reason. The first landing was made from the Norwegian research ship Norvegia on February 2, 1929. In February, 1931, the captain, Nils Larsen, attempted another landing but was prevented by pack ice.

In mid-February, 1948, the Norwegian Brategg expedition with Nils Larsen again the captain landed the second party on the island. It was there for three days and was evacuated on February 13 because of encroaching pack ice.

Two days later the United States icebreakers Burton Island and Edisto arrived and put a small party ashore for an hour. The Chilean naval vessel Baquedano also landed a party in January, 1956; no reports of its observations have been found.

On the afternoon of February 29, 1960, the Burton Island landed parties on the island by boat and helicopter. Dr Campbell Craddock, of the University of Wisconsin, who supplied the information about earlier landings to "Antarctic", was a member of a party which landed by boat and remained for about two hours and a half. Another party of two was landed by helicopter near the north-east corner of the island.

Dr Robin retires from Scott Polar Research Institute

One of Britain's most distinguished polar scientists, Dr Gordon de Quetteville Robin, who has been director of the Scott Polar Research Institute in Cambridge since 1958, retired at the end of September. He began his association with polar research in the 1947—48 season when he was officer-in-charge and meteorologist at Signy, the Falkland Islands Dependencies Survey station in the South Orkneys.

Dr Robin, who is 61, was born in Melbourne, and gained his M.Sc. degree at the University of Melbourne. He served in the Second World War first with the Royal Australian Naval Volunteer Reserve on anti-submarine duties, and then in submarines with the Royal Navy.

After his service with FIDS, now British Antarctic Survey, Dr Robin was a lecturer in physics at the University of Birmingham. Then in 1949 he was appointed as physicist and senior British member of the 1949—52 Norwegian-British-Swedish expedition to Queen Maud Land.

This was the first international expedition to Antarctica. It established a base, Maudheim, on the ice shelf near Cape Norvegia where it spent two years. Its primary task was to determine what sort of terrain lay beneath the ice sheet of Queen Maud Land.

In later years Dr Robin initiated the Scott Polar Research Institute's airborne radio-sensing programme to measure the ice thickness of East and West Antarctica. This was a co-operative effort by the institute, the United States National Science Foundation, the Technical University of Denmark, and the United States Navy which flew a specially-equipped Hercules aircraft for the scientists.

Dr Robin has had a long association with the Scientific Committee on Antarctic Research. He was the first secretary when the committee was established in 1958, has served as president, and is one of only six honorary life members. For many years he has been the United Kingdom's permanent representative on the committee.

For his notable contribution to Antarctic and Arctic research Dr Robin has been honoured by universities and institutions in Britain, Sweden, and Norway. In 1974 he received the Royal Geographical Society's highest award — its Patron's Medal.

West Germany sends two expeditions

West Germany will have two scientific expeditions in Antarctica this season. One will work from the new permanent station Georg von Neumayer, in the mountains of New Schwabenland, and in the Weddell and Scotia Seas. The other will be the third to North Victoria Land. Ganovex III, planned by the Federal Institute for Geosciences and Natural Resources (BGR) will continue and finish the work of Ganovex which had only started when the Gotland II sank in December last year.

Three ships, two chartered, will be used by the two expeditions. The new icebreaking research and supply ship Polarstern (3900 tonnes), built for the Federal Ministry of Research and Technology, will make her maiden voyage to Antarctica for the Alfred Wegener Institute for Polar Research late in January next year. For the first stage of the expedition the institute has chartered the Norwegian Arctic research vessel Polarbjorn (590 tonnes).

Ganovex III sailed from Wellington at the beginning of this month aboard the chartered Arctic research Polar Queen (1050 tonnes). She, like the Polarbjorn and Polarsirkel, is classed as an icebreaker and is fitted with a helicopter deck.

Last season the Polar Queen was used to carry additional construction materials and supplies for Neumayer Station (70 deg 37 min S/08 deg 22 min W) in Atka Bay on the Ekstrom Ice Shelf, and the Filchner summer station (77 deg 09 min S/50 deg 38 min W). She also supported scientific research at both stations.

This season the Polarbjorn will leave West Germany on December 28 for the Weddell Sea and Neumayer Station. She will remain in Antarctica until March 8.

On January 25 the Polarstern will leave Bremerhaven for the Weddell Sea. She will supply Neumayer Station and support scientific work in the Weddell and Scotia Seas until March 8. Both ships will provide helicopter support for scientific projects on the ice and at sea.

When the summer season ended in early March this year seven men remained at Neumayer Station for the winter. The officer-in-charge was the medical officer, Dr H. Dietz. The winter team included two meteorologists and a geo physicist from the University of Munich and a support group of four provided by a West German firm — medical officer, mechanical engineer, radio operator, and cook.

A major geological field camp will be established in the mountains of New Schwabenland this season by the expedition to the Weddell Sea. New Schwabenland is the mountainous upland area of Queen Maud Land more than 500 miles in extent which lies between 12 deg W and 16 deg E and runs south to 72 deg 30 min S. It was first explored from the air and mapped photogrammetrically by the German Antarctic Expedition (1938-39) led by Captain Alfred Ritscher in the 8000-tonne catapult ship Schwabenland.

Before the Polar Queen sailed from Wellington members of Ganovex III took part in a snowcraft and survival course in the Mt Cook area from November 22 to 26. There are 27 scientists, technicians, helicopter pilots, and engineers in the expedition which is led again by Dr Franz Tessensohn, who was the leader of the Ganovex I and II expeditions.

Aboard the Polar Queen, which carries a crew of 13, are five Hughes 500 helicopters chartered from a Canadian firm, Liftair, of Calgary.

Those chartered were damaged on the voyage to New Zealand. Two had to be replaced. Four will be used for fuel transport and support of field parties; the fifth will be held in reserve.

Most of the West German scientists have worked in North Victoria Land with Ganovex II, and some are veterans of both Ganovex I and II. In addition there are four guest scientists, two from Australia, one from New Zealand, and one from the United States. Dr Tom Wright, of Allegheny College, who was with Ganovex I, will not work with Ganovex III until later in the season because of commitments to the United States programme.

A New Zealand Antarctic Division geologist, Greg Mortimer, worked on a geological mapping project in the Miers Valley during the 1980-81 season. One of the two Australian guest scientists, Dr R. H. Findlay, who is a reseach fellow in the geology department of the University of Tasmania, spent four seasons in Antarctica with the New Zealand Antarctic Division, and last season led one of the New Zealand teams in the international expedition to North Victoria Land. The other geologist is George Gibson, of the University of Melbourne.

East German winter research team

Nine scientists and technicians from the German Democratic Republic continued research programmes in Antarctica during the 1981—82 season within the framework of the 27th Soviet Antarctic Expedition. Seven wintered at the partly self-sufficient GDR base close to the Soviet station Novolazarevskaya. They continued their research this summer.

One biologist spent last summer at Bellingshausen, the Soviet station on King George Island in the South Shetlands. Dr Ulrich Lundberg continued the ecological and population studies and parasitological investigations of Antarctic seabirds and seals on King George and Nelson Islands. This programme was started in the 1979—80 season and continued in 1981 within the framework of the 25th and 26th Soviety Antarctic Expeditions.

A research student of geology, Klaus-Peter Stanek, worked at Druzhnaya I, the Soviet summer research station on the Filchner Ice Shelf last season. He took part in the geological field programme of the 27th Soviet Antarctic Expedition which was carried out from Druzhnaya I.

East Germany's winter base was opened in 1976. Last winter's party was led by Dr Wieland Burger, and included two other physicists, Jorg Voigtlander and Frank Habendorf. Others in the party were Conrad Kopsch (electronics engineer), Bernd Moller (cook), Reiner Hofling and Alfons Schindler (engineers).

Peruvian Antarctic interests

Peru, which acceded to the Antarctic Treaty last year, will have an oceanographer and hydrologist in the Antarctic this season. Mr Hector Soldi will join an Australian National Antarctic Research Expeditions team to observe expedition methods, and to do marine biological research at Casey Station and the sub-Antarctic station on Macquarie Island.

Earlier this year the Peruvian Ambassador in Canberra, Mr Jose Torres Muga, visited Hobart where he discussed marine research in the Antarctic.

SAE-27

Expedition makes more use of aircraft

Six transport ships were used by the 27th Soviet Antarctic Expedition (SAE-27) to support its 1981-82 research programme. In addition SAE-27 made greater use of air support, and early in the season 160 scientists and technicians were flown south to the main Soviet station, Molodezhnaya.

Air operations began on November 2 when an Ilyushin 18-D left Leningrad for Molodezhnaya by way of Odessa, Cairo, Aden, and Maputo (Mozambique) with 40 members of the expedition. In the course of the month the aircraft made three shuttle flights between Maputo and the permanent airstrip near Molodezhnaya, delivering 120 members of SAE-27.

On November 28 the Ilyushin 18-D returned to Leningrad with winter parties from SAE-26. Another airlift between Leningrad and Molodezhnaya was carried out in February.

Ship operations began in October when the Mikhail Somov took American and Soviet participants in the joint U.S.-U.S.S.R. Weddell Polynya Expedition to the Weddell Sea. The purpose of the expedition, carried out in October and November last year, was to investigate a polynya or icefree region observed on satellite imagery within the Weddell Sea in recent years.

As it turned out there was no clear indication of a polynya in 1981 but the expedition collected a set of observations on the ice edge zone up to the deepest point of penetration of the Weddell Sea ice cover some 300 nautical miles from the ice edge. Having entered the northern fringe of the Weddell Sea ice on October 20 near 56deg 5min S/5deg E the Mikhail Somov left the ice on November 14.

In November the research ship Professor Zubov left Leningrad on her 10th Antarctic voyage to relieve Bellingshausen Station and continue oceanographic work in the Scotia Sea area. She reached the Antarctic early in January with the relief team for Bellingshausen, and some seasonal staff and equipment.

In other operations the cargo ships Vasiliy Fedoseyev and Pioner Estonii reached the Weddell Sea area in December to reopen Druzhnaya I on the Filchner Ice Shelf. It has been operated as a summer research station since December, 1975. Three field camps on the Ronne Ice Shelf, Druzhnaya II, Shelf and Geolog, were also opened for the summer. Geologists hoisted flags at the station and the field camps on the night of January 1 to mark the opening of a new scientific season.

One of the six ships used by SAE-27, the Bashkiriya, completed her seventh Antarctic voyage when she returned to her home port of Odessa in February after an absence of almost four months. She brought back part of the 1981 winter staff of SAE-26 as well as Soviet participants in the Weddell Polynya Expedition.

Last of the SAE-27 vessels to go south was the passenger ship Estoniya. She sailed from Riga on January 21 and reached the Antarctic in early March. Her passengers included 1982 winter staff headed by Ryurik M. Galkin, of the Arctic-Antarctic Institute of Leningrad, and Oleg N. Struin, leader of this winter's team at Bellingshausen Station.

Eight Argentine summer and winter bases

Argentina's Antarctic research programme for the 1982-83 season will be carried out at seven permanent stations and one refuge. Three other stations, two temporary and one previously permanent, will be occupied for the summer only. To support the winter and summer stations and the scientific programme the icebreaker and research ship Almirante Irizar and the polar ship Bahia Paraiso will operate between January and early March.

Two of the permanent stations are in the Weddell Sea area. They are Belgrano II (75deg 51min S/34deg 33min W) on the Bertrab Nunatak, and Belgrano III (77deg 55min S/45deg 45min W) on the Filchner Ice Shelf north of Berkner Island. Three are in the Antarctic Peninsula area — Almirante Brown (64deg 53min S/62deg 53min W), Esperanza (63deg 24min S/56deg 59min W), and San Martin (68deg 07min S/67deg 08min W). Vice-commodoro Marambio (64deg 14min S/56deg 38min W) is on Seymour Island at the southern margin of Erebus and Terror Gulf.

This season Jubay (62deg 14minS/ 58deg 38min W), a refuge in Potter Cove on King George Island, South Shetlands, will be permanently manned. The other permanent station is Orcadas (60deg 45min S/44deg 43min W) on Laurie Island in the South Orkneys. The stations in temporary use will be Primavera (64deg 09min S/60deg 57min W) on the Antarctic Peninsula, which was occupied permanently last season, Teniente Matienzo (64deg 58min S/ 60deg 64min W) and Petrel (63deg 28min S/56deg 17min W) on Dundee Island.

Air support will be provided from September, 1982 to March, 1983 by the Argentine Air Force which will make monthly flights to Vice-comodoro Marambio with Hercules aircraft. One Twin Otter aircraft and one helicopter will be at the base during the summer to support research activities on the Antarctic Peninsula and in surrounding areas. The Almirante Irizar carries two Puma SA-330L helicopters, and the Bahia Paraiso one.

Between January 5 and March 12 the Almirante Irizar will work in the South Orkneys, the Weddell Sea, and off the Antarctic Peninsula. She will sail from Buenos Aires to Ushaia, Tierra del Fuego, and then on to the South Orkneys to relieve Orcadas. After the relief of Belgrano II and Belgrano III she will proceed to Seymour Island and relieve Vice-comodoro Marambio. Her last call will be to San Martin in Marguerite Bay by way of Grandidier Channel. Then she will call at Almirante Brown on her way back to Ushaia and Buenos Aires.

After leaving Buenos Aires on January 5 also the Bahia Paraiso will sail direct to the South Shetlands. She will call first at Admiralty Bay, King George Island, then at Jubay, and finally at Nelson Island.

Then the ship will go south along the Danco Coast to Cape Sterneck. On her northward leg she will call at Primavera and Deception, Nelson, and King George Islands. Her last call before she returns to Buenos Aires on February 26 will be to the South Orkneys.

Corbeta Uruguay, the Argentine station established on Southern Thule, South Sandwich Islands, in the 1976-77 season, was closed on June 19 by a detachment from the South Georgia Task Group which arrived in H.M.S. Endurance, the Royal Navy's ice patrol ship, and the Fleet Reserve Auxiliary Olmeda. This was the final land action

of the British campaign against Argentina in the South Atlantic.

A 10-man patrol was landed on June 18 and warned the Argentines of its impending arrival. After a night of observation in howling winds and low temperatures if advanced towards the station. The Argentines surrendered without fighting and were quickly repatriated. There were only 10 of them, another 20 to 30 having been withdrawn early in the campaign.

Like South Georgia the South Sandwich Islands have been part of the Falkland Islands Dependencies since 1908. In 1947 they were included in Argentina's claims.

Chilean base on Charcot Island

A summer base will be established this season by the Chilean Air Force on Charcot Island in the Wilkins Sound area south-west of Alexander Island. An advance party from Teniente Rodolfo Marsh on King George Island, South Shetlands, flew to the island last month to establish a camp and prepare a runway for summer air operations by Twin Otter aircraft.

Located at 70 deg S/76 deg W the base will be Chile's most southerly research station. There are three permanent stations — Capitan Arturo Prat and Rodolfo Marsh in the South Shetlands, and General Bernado O'Higgins on the Trinity Peninsula. Other stations in the Antarctic Peninsula area are unoccupied or used in summer only.

In the 1981-82 season Chilean Air Force aircraft explored a sector between Rodolfo Marsh and Wilkins Sound to 70 deg 30 min S. Three flights were made by Hercules aircraft and four by Twin Otters.

These flights were designed to find suitable areas for the installation of sub-bases this season. These would provide communications and meteorological support for an advance towards the interior of Antarctica. The purpose of this advance would be to locate a suitable area for the construction of a base similar to Rodolfo Marsh.

Earlier this year the Chilean Air Force announced that this season's programme would include the installation of a sub-base in the Wilkins Sound area. There would be more exploratory flights to the south to decide on a suitable area for a new base.

Preparations for the summer sub-base in Wilkins Sound began at the end of October when eight Chileans arrived at the British Antarctic Survey base, Rothera, on Adelaide Island, from Rodolfo Marsh in two Twin Otters. They had installed a caboose at the Rothera airstrip last season. Next month the Chilean supply ship Piloto Pardo will call at Rothera to collect men and equipment for the Charcot Island base.

Whaling nations object

Three whaling nations, Japan, Norway, and Peru, have lodged formal objections to the International Whaling Commission's decision to end commercial whaling by 1985. Under IWC rules whaling nations have 90 days from the date of the commission's decision to object to it, and are not bound by the resolution adopted by 25 votes to seven.

Japan, Norway, and Peru are three of the seven whaling nations which voted against the proposal at the IWC 34th annual meeting in July which called for a negotiated end to coastal and pelagic whaling. The objection period was to have ended on November 4 but the Peruvian and Norwegian objections under the IWC rules extend the period for another 90 days.

Two Brazilian Antarctic expeditions

Brazil will send two expeditions to Antarctica this summer, one to the Princess Martha Coast of Queen Maud Land and the Weddell Sea, and the other to the Antarctic Convergence. Three ships will be used, the Thala Dan, now renamed the Barao de Taffe, the Almirante Camara, and the Professor Bernard.

Present plans are for the two expeditions to leave Brazil in the first half of December and return in the first half of January next year. The Antarctic expedition will use the Thala Dan, which was sold to the Brazilian Ministry of Marine in May by her Danish owners, J. Lauritzen Lines, and delivered in September. ("Antarctic", September, 1982).

Scientists from the University of Sao Paulo Oceanographic Institute will work aboard the Almirante Camera and the Professor Bernard. They will carry out a marine research programme along the Antarctic Convergence.

Originally the Brazilian ships were to have refuelled at Grytviken, South Georgia. Now they will refuel at the Argentine port of Ushuaia, Tierra del Fuego.

A National Commission for Antarctic Affairs (CONANTAR) was established by presidential decree early this year to advise President Joao Figueiredo on the formulation and implementation of a National Policy on Antarctic Affairs (POLANTAR).

In another decree President Figueirado entrusted the drafting of a Brazilian Antarctic Programme (PROANTAR) to the Interministerial Commissionon Sea Resources (CIRM) pending the creation of specific agencies to carry out the national policy on Antarctic affairs.

Nine agencies and organisations are represented on CONANTAR which is headed by the Minister of Foreign Relations. They are the Ministries of the Navy, Army, Foreign Affairs, Agriculture, and Aeronautics, the Planning Office of the Presidency, National Security Council Secretariat, Armed Forces General Staff, and the National Council for Scientific and Technological Development. CONANTAR can call on representatives of other agencies to take part in its meetings as ad hoc members.

Three polar veterans

Three veterans of the Heroic Age of Antarctic exploration, who served with Scott, Shackleton, and Mawson, are still with us. Two are in their nineties, and one is 89.

William Burton, who was 94 on April 7, is the sole survivor of Scott's 1910-13 expedition. He was born in London, joined the Terra Nova from the Royal Navy, and has lived in Christchurch for nearly 60 years.

An Australian, R. W. Richards, known to the Antarctic fraternity as Dick Richards, is the sole survivor of Shackleton's Imperial Trans-Antarctic Expedition of 1914-17. Dick Richards, who was 89 on November 14, lives at Port Lonsdale, south of Melbourne.

A New Zealander is the only survivor of Mawson's Australasian Antarctic Expedition of 1911-14. Eric Webb, the chief magnetician, who now lives in England, was 93 on November 23. He was born in Lyttelton, and became a distinguished civil engineer.

XVII SCAR

Research and relation to environment

Five nations with definite plans for Antarctic research were represented at the 17th meeting of the Scientific Committee on Antarctic Research which was held in Leningrad from June 28 to July 9 this year. Observers from Brazil, India, Italy, the Netherlands, and the People's Republic of China met the SCAR delegates in one session and described the status of Antarctic research plans in their countries.

SCAR's delegates represent 15 countries — Argentina, Australia, Belgium, Britain, Chile, France, East Germany, West Germany, Japan, New Zealand, Norway, Poland, South Africa, the Soviet Union, and the United States — and several international scientific organisations. Some of the five nations permitted to send observers to SCAR meetings are likely to apply for membership in the near future.

Main problems discussed by 150 specialists at XVII SCAR were the biological resources of the Antarctic, the preservation of ecological systems in relation to the possible exploitation of minerals, and problems of the Antarctic climate. About 50 specialists of SCAR's working group on logistics attended a symposium to discuss the organisation and supply of Antarctic expeditions. Nearly 100 papers were presented on such topics as the design of new stations, telecommunications, transportation, tourism, methods of dealing with oil contamination, controls to minimise man's impact on the environment, and the implications of mineral exploitation.

New Zealand presented 19 papers to the symposium. Most of them were written by Mr R. B. Thomson, superintendent of the Antarctic Division, who is chairman of the logistics group, and members of the division staff. All papers will be edited by Mr Thomson and then published in book form by the Soviet Union.

As protection of the environment will be an essential part of an agreed regime to regulate the exploration and exploitation of Antarctic mineral resources the consultative members of the Antarctic Treaty have asked SCAR for advice on environmental matters. SCAR established AEIMEE (Antarctic Environmental Implications of Possible Mineral Exploration and Exploitation). This group of specialists which made a brief report of XVII SCAR, will continued its work and complete a draft report by April next year.

Biological matters occupied much of the SCAR sessions. The main questions discussed were the BIOMASS programme to study the Antarctic marine ecosystem, and relations with the new international Commission for the Conservation of Antarctic Marine Living Resources. SCAR also considered a list of recommendations for an international Antarctic climate research programme drawn up by a specialist group.

New responsibilities such as BIOMASS and the minerals-related environmental questions have placed increasingly strain on SCAR's limited resources. Dues have remained unchanged for three years; this year delegates were obliged to approve increases of 12 per cent for 1983 and 1984. In addition separate requests will be made to governments for other funds to support the BIOMASS programme, and the preparation of an atlas of specially-protected areas in the Antarctic.

New Zealand's permanent delegate to

SCAR, Professor G. A. Knox, of the zoology department, University of Canterbury, who has been president since 1978, completed his term at Leningrad. He has been chairman of the permanent working group on biology for eight years, and was secretary for four years.

Professor Knox was made on honorary member of SCAR. He is only the sixth member to be so honoured in the last 25 years. The others are G. R. Laclavere (France), Rear-Admiral R. N. Panzarini (Argentina), Dr L. M. Gould (United States), Dr G. de Q. Robin (Britain), and Dr T. Gjelsvik (Norway).

Dr J. H. Zumberge, the United States permanent delegate, who is the president of the University of Southern California, Los Angeles, is the new president. Dr J. P. de Wit (South Africa) was elected vice-president, and Dr G. A. Avsiuk (Soviet Union) was elected secretary. Mr R. B. Thomson (New Zealand) is chairman of the finance committee.

Chile will be the host nation for the 18th meeting of SCAR. It will be held in Santiago in September, 1984.

Antarctic resources seminar at Chilean base

Scientists, diplomats, and oil technologists, attended in October the first international scientific seminar ever held in Antarctica to discuss its natural resources. More than 60 representatives of all the consultative members of the Antarctic Treaty except the Soviet Union held discussions from October 6 to 9 at the Chilean Air Force base, Teniente Rodolfo Marsh, on King George Island in the South Shetlands.

Japan did not have a representative at the seminar but only because Dr T. Nagata, director-general of the National Institute for Polar Research was unable to attend as arranged. A paper was read on his behalf.

Logistic support was provided by one of the sponsors of the seminar, the Chilean Air Force, which flew those attending from Santiago to Punta Arenas, and then to Rodolfo Marsh by Hercules aircraft. The seminar was organised by the Institute of International Studies, University of Chile, to discuss alternative policies for the natural resources of Antarctica. Other sponsors were the University of Chile, the Ministry of Foreign Affairs, the Chilean Corporation of International Studies, and the United States Tinker Foundation which provides cultural assistance to Iberian and Latin American countries.

Britain's representatives at the seminar included Sir Vivian Fuchs, former director of the British Antarctic Survey, the present deputy director, Dr R. J. Adie, and Dr Martin Holdgate, Deputy Secretary and Chief Scientist, Department of Environment and Research, who gave a paper on environmental factors in Antarctica. Other representatives were Dr J. A. Heap, head of the Polar Regions Section, Foreign and Commonwealth Office, and Mr F. G. Larminie, general manager, Environmental Control Centre, British Petroleum, who was a British alternate representative at the ninth consultative meeting of the Antarctic Treaty nations in London in 1977.

New Zealand's representatives were Mr C. D. Beeby, Assistant Secretary, Ministry of Foreign Affairs, and Professor G. A. Knox, who ended his four-year term as president of the Scientific Committee on Antarctic Research earlier this year. Mr Beeby led the New Zealand delegation to the 11th Antarctic Treaty consultative meeting in Buenos Aires last year, and was chairman of the meeting of representatives of the 14 nations held in Wellington this year to formulate a regime to regulate the exploration and exploitation of mineral

resources. Professor Knox is chairman of the New Zealand National Committee for Antarctic Research.

One of Australia's leading experts on Antarctic affairs, Mr Keith Brennan, who has led delegations to Antarctic Treaty meetings and Law of the Sea conferences, was a speaker at the seminar. He is a former ambassador to Norway and Switzerland. Belgium's representative, Mr Alfred van der Essen, who gave a paper on the relationship of the Law of the Sea to Antarctica, has represented his country at all the Antarctic Treaty meetings for the last 20 years.

Among the oil specialists at the seminar was Mr E. Bergsaker, divisional head of the Norwegian Petroleum Directorate. Other Norwegian representatives were Dr T. Gjelsvik, director of the Norwegian Polar Institute, and Dr Finn Sollie, director of the Fridtjof Nansen Foundation, which is a polar research organisation.

One subject discussed at the seminar was the impact on the Antarctic environment of possible exploitation of mineral resources. Canada, which is concerned with the management of Arctic offshore oil and gas development in the Beaufort Sea-Mackenzie Delta region, was represented at the seminar by a member of Environment Canada.

Symposium on polar resources

Exploration, development, and exploitation of Arctic and Antarctic biological, mineral, and oil resources, past, present, and future will come under scrutiny at the 15th Pacific Science Congress which will be held in Dunedin from February 1 to 11. The theme of the congress is the conservation, development, and utilisation of the resources of the Pacific.

One symposium designed to develop this broad topic will consider high latitude resources, and associated topics such as the environment, conservation, and climate. The symposium, which will run from February 7 to 10 will also consider other questions like tourism and measures taken to minimise man's impact on the Antarctic environment.

A world authority on the Antarctic environment, Dr Martin Holdgate, Deputy Secretary and Chief Scientist of the British Department of the Environment and Research, will lead off the symposium with an address to the congress on world environment trends in the 1970s. Professor George Knox, past president of the Scientific Committee on Antarctic Research, will lead the section on marine resources with a paper on the BIOMASS programme (Biological Investigation of Marine Antarctic Systems and Stocks).

A series of papers on oil resources in high latitudes has been organised by Dr Peter Barrett, director of the Antarctic Research Unit, Victoria University of Wellington. Dr Holdgate will present a paper on the use and abuse of polar environment resources, and British, Canadian, and United States authorities will discuss offshore oil development in polar regions, Canadian and Soviet development in the Arctic, and oil development in the Bering Sea.

New Zealand's contributions will include papers by Dr F. Davey on the sedimentary basings of the Ross Sea, and by Mr R. A. Cook on aspects of continental margin oil potential in the area. Drs M. R. Gregory and R. N. Kirk will consider planning for hydrocarbon spills in the Ross Sea and the possible environmental consequences.

Speakers in the marine resources section will examine krill resources in the Southern Ocean, exploitation of whales, and conservation of Arctic Ocean mammals.. In the discussion of high latitude climates the guest speaker, Dr Neill Streten, of Melbourne, will speak on high latitude climates of the Pacific. The effects of carbon dioxide on polar regions will also be discussed.

For the second week of the congress the few is $100 or $30 a day. Anyone interested in attending should write to the Secretary-General, 15th Pacific Science Congress, P.O. Box 6063, Dunedin, or John Darby (convenor), Otago Museum, Dunedin.

SUB-ANTARCTIC

Private expeditions to Heard Island

Scientists, mountaineers, and amateur radio operators from two private Australian expeditions will work on one of the world's most isolated sub-Antarctic islands this summer. Each expedition will spend several weeks on Heard Island in the Indian Ocean 4000km south-west of Perth.

Unlike other sub-Antarctic islands Heard Island (53deg 01min S/73deg 23min E) which is only 45km by 20km, is almost completely covered by crevassed ice. It is dominated by an active volcano Big Ben, which rises to 2743m and has been climbed only once since 1963. Big Ben's crest is a filled in volcanic crater surrounded by blizzard-shrouded peaks of which Mawson Peak (2744m) is the highest.

Heard Island and the small, rocky outlying McDonald Islands 43km to the west were passed to Australia by Britain. Australian National Antarctic Research Expeditions maintained a permanent scientific station on Heard Island from December, 1947 to March, 1955. Since then nine expeditions have visited the island, the last in 1980.

One private expedition, which is expected to cost $150,000, will be led by a Sydney architect, mountaineer, and photographer, William Blunt, and a medical research scientist, Dr Ross Vining. It will sail to Heard Island from Perth on January 1 next year by way of St Paul and Amsterdam Islands, and the Kerguelen Islands, aboard the chartered 27m ocean-going yacht Anaconda II.

Among the 16 members of the expedition are William Blunt's wife, Meg Thornton, who is also an architect, Dr Richard Priddy and glaciologist Martin Hendy, who have worked at Casey Station, and two American radio operators. A painter, Alasdair McGregor, will be the first professional artist to work on Heard Island.

A scientific programme to co-ordinate the expedition's work with existing scientific records has been compiled by the Australian Antarctic Division. Research projects in geophysics, glaciology, and terrestrial biology, will be carried out, and a seabird count will be made for the International Survey of Antarctic Seabirds (ISAS).

When Anaconda II reaches the island the expedition will establish its base camp in Atlas Cove, site of the 1947—55 ANARE station. Scientists and photographers will visit McDonald Island and the two smaller islands in the group, Flat Island and Shag Island.

A second party will be landed in Spit Bay at the eastern end of the island to establish an advance base camp for the mountaineering team which will attempt to climb Big Ben. The first ascent was made in January, 1965, by five members of the private South Indian Ocean Expedition led by Major Warren Deacock. It included three New Zealanaders, Colin Putt, Philip Temple, and John Crick. Deacock, who led the team, and Graeme Budd, made an unsuccessful attempt on Big Ben in January, 1963.

Another project will be an attempt to make the first circumnavigation of the island in small inflatable surf rescue boats. Amateur radio operators in the expedition will set up a station with the call sign VKOHI, and will try to establish links with enthusiasts as far away as Saudi Arabia and the Soviet Union.

A converted whale chaser will be used by the second private expedition which

will spend two weeks on Heard Island in January. It will sail early in the month from Hobart aboard the Cheynes II, once owned by the Cheynes Beach Whaling company, of Albany, which ran Australia's last coastal whaling station.

For marine research the Cheynes II has been fitted out as a deep-sea trawler. Additonal equipment and accommodation have been provided, and during the voyage the vessel will run several deep trawls to help three marine biologists in their studies of marine life.

During their two weeks' stay on the island the 18 members of the expedition will make scientific tests, and glaciologists will study the movement and formation of glaciers. Six amateur radio operators wil set up a station and hope to make contact with up to 50,000 other "hams" all over the world.

Topograpic surveys of Heard Island and the McDonald Islands, and bathymetric surveys of the offshore areas, were made by the 1980 Australian expedition, which was organised by the Division of National Mapping, Department of National Development and Energy, and included scientists from the Bureau of Mineral Resources and ANARE.

Results of Marion Island eruption

Almost five months after a volcanic eruption on sub-Antarctic Marion Island in November, 1980, temperatures of 235deg Celsius was recorded less than a metre below the surface. Steaming carbon dioxide and sulphur dioxide were still escaping from fissures and crystals of various minerals were being deposited on the rocks. Marion Island, one of the Prince Edward Islands group, is 2300km south of Cape Town. It is well known as a South African weather station and the centre of a comprehensive sub-Antarctic biological research programme.

Phenomena produced by the eruption, the first reported since the island was discovered in 1772, were observed by a team of geologists led by Professor W. J. Verwoerd, of the geology department, University of Stellenbosch, which visited the island in April last year. This was done at the request of the South African Scientific Committee on Antarctic Research after news was received from the island of the eruption. ("Antarctic", June, 1981).

Geologists found that the eruption had affected an area of about 10 hectares on the west coast, and had been far more extensive than at first supposed. Lava had flowed from at least four places along a straight line extending nine kilometres from coast to coast.

Samples of the fumarolic gases were taken, and these are being analysed at the Scripps Institution of Oceanography in California, to discover their isotope composition. This will indicate whether the volcanic activity on the island is related to the formation of new ocean floor basalt along a mid-ocean ridge.

Marion Island's volcanoes differ considerably from the large cone-shaped volcanoes such as Mt St Helens and Vesuvius. There is no central crater but rather many small "chimneys" which have shot out hot fragments or from which lava has flowed from time to time. About 130 of these little chimneys are scattered throughout the 290 square kilometres of the island.

Fissure eruptions of the kind reported from Marion Island have been relatively rare in historical times but have been known in Iceland and Hawaii. There has never been any indication of a destructive eruption taking place on the island.

Marion Island was formed originally over a period of millions of years through submarine eruptions. Later a fine rain of

lava mixed with sea water and sifted down. Finally, on land, there was an unobtrusive welling up of lava or small violent eruptions.

If it is considered important to predict when and where the next eruption will occur South African geologists will have to instal a seismograph network on the island. Several other steps are being made to gain more information about the eruption and its implications for future geological research which will be undertaken.

Source: "Scientiae" in the "South African Digest", October 8, 1982.

University expedition to Snares

A scientific expedition to the sub-Antarctic Snares Islands sponsored by the Lands and Survey Department left Oban, Stewart Island, last month by trawler to spend nearly three months in biological and entomological research. One of the principal tasks of the leader, Mr P. M. Johns, of the zoology department, University of Canterbury, will be to investigate the ecological effects of a recent decision to permit fishing boats to moor in the lee of the islands.

Since 1961 the remote group about 209km south-west of Bluff, has been a totally restricted nature reserve. The islands are in Area F of New Zealand's Exclusive Economic Zone, which is fished mainly by Japanese, joint venture, and South Korean trawlers.

Mr Johns will act as honorary ranger for the Lands and Survey Department, which has made an unsolicited grant of $9060 to the zoology department for the support of the expedition. He and three honours students whose research he will supervice will also act as guardians against the risk of unauthorised landings on the islands.

A research programme on bird biology organised by Dr John Warham, of the zoology department, will be carried out by the three students. Colin Miskelly and Catherine Pettigrew will make a census of penguin breeding colonies and study other bird life. Christine Butts will also study insects.

Mr Johns, who is a senior lecturer in zoology, has worked on the Snares before. He will continue his own research into insect relationships on the islands. His report to the Lands and Survey Department will include the assessment of the effect on island plant and animal life if rats or mice were inadvertently introduced from fishing boats.

This is the eight expedition the zoology department has mounted to the Snares since the first visit in 1961. It is also the first expedition since the 1975-76 summer.

In addition to its research the expedition will keep daily weather records. It will be picked up by the Lindblad Explorer which is expected in Lyttelton about February 20 after an Antarctic and sub-Antarctic tourist cruise.

Scott Base student

Answering questions in an examination paper with the temperature outside at minus 23deg was a new experience for a 23-year-old University of Canterbury commerce student, Stuart Allen, who arrived in Antarctica on October 15 to work as a mess hand at McMurdo Station for a Christchurch catering firm. He sat the first four papers for his Bachelor of Commerce degree on October 19.

Stuart Allen did his paper in the new Scott Base library. His supervisor was the officer-in-charge, Mr John Thurston. He will sit the other three papers under the same supervision before he leaves Antarctica in February.

TOURISM

New Zealand guides on cruise ships

Tourists aboard the Lindblad Explorer and World Discoverer this season will learn about New Zealand's Antarctic research programme, and its nature reserves on sub-Antarctic islands when the two ships make cruises to the Ross Dependency and New Zealand. Mr Colin Monteath, field operations officer, Antarctic Division, Department of Scientific and Industrial Research, will be aboard the Lindblad Explorer, and Mr David Bamford, a ranger from the Lands and Survey Department, Wellington, will be on the World Discoverer.

Both ships will sail from Punta Arenas, the Chilean port of Tierra del Fuego, in the third week of January. Originally the Lindblad Explorer was to have sailed from Ushaia, the Argentine port on the same island. The two ships will end their Antarctic and sub-Antarctic cruise programme at Lyttelton in February. Neither will call at Macquarie Island as previously arranged.

Mr Monteath will join the Lindblad Explorer at Punta Arenas, and Mr Bamford will fly from Christchurch before the World Discoverer arrives in McMurdo Sound. Mr Bamford is also familiar with the New Zealand Antarctic research programme and Scott Base; he was an Antarctic Division field assistant in the 1971-72 season.

French yacht and family head south

Damien II is heading for Antarctica again. The French yachtsman, Jerome Poncet, and his wife, Sally, sailed from New Zealand early this month for the Antarctic Peninsula. Also aboard were their two children, Dion and Liev, a New Zealander, Tina Troup, and a Breton troup sailor, Patrick Cudennic.

In 1978 the Poncets sailed their 15m schooner-rigged steel yacht to the Antarctic Peninsula. They wintered on Avian Island in Marguerite Bay 80km from Rothera, the British Antarctic Survey base on Adelaide Island. When Sally became pregnant they sailed to South Georgia where Dion was born early in 1979 at Leith Harbour. Later they went to the Falkland Islands where Dion was baptised in the church at Stanley.

Dion, whose mother is Australian, was the first child born on South Georgia. His birth certificate is SG1, and was issued by the BAS base commander at Grytviken. He was named after the Dion Island in Marguerite Bay south-west of Adelaide Island.

Liev, who will probably celebrate his second birthday in Antarctica, was born in Tasmania where the Poncets have spent the last two years preparing the Damien II for her present voyage. They crossed the Tasman in July this year, spent two months at Stewart Island, and then sailed to the port of Lyttelton early in September.

This time the Damien II will be sailed direct to the Antarctic Peninsula. The voyage is expected to take four weeks. In March the Poncets will go to South Georgia, and then, possibly, on to Stanley. They will return to Antarctica next summer.

One purpose of the present voyage is to map all the penguin rookeries north of Adelaide Island up to the Argentine Islands where there is a BAS base, Faraday. Sally Poncet, who has a science degree in zoology and botany, will continue her research, and Tina Troup will take part in the rookery mapping. She was a New Zealand Antarctic Division field assistant in the 1980-81 summer and worked in the dry valleys with a Ministry of Works and Development glaciology and hydrology team.

ANTARCTIC BOOKSHELF

ANTARCTIC GEOSCIENCE

Edited by
Campbell Craddock

International Union of Geological Sciences Series B. No. 4: 1982. University of Wisconsin Press. 1172 pp. $US35.00

This massive book is too unwieldy for the casual reader, but for the serious scientist it will serve as an important source of geological and geophysical data and opinion about Antarctica for a very long time. "Antarctic Geoscience" contains all the scientific papers presented at the Third Symposium on Antarctic Geology and Geophysics, University of Wisconsin, August 22-26, 1977. The symposium was sponsored by the Scientific Committee on Antarctic Research (SCAR), the International Union of Geological Sciences (IUGS) and the Inter-Union Commission on Geodynamics (IGG). More than 200 scientists attended from 15 countries and 151 papers were presented. Thirty-seven New Zealand authors were involved in the preparation and presentation of 21 of the papers.

This book demonstrates conclusively, as did its predecessor (SCAR, Oslo, 1970), that the age of regional exploration of Antarctica has long since been overtaken by the age of purposeful scientific investigation. No longer are the investigations predominantly reconnaissance and descriptive. The full range of earth science techniques and methodologies is applied, often in combinations of one kind or another.

Detailed geological and geophysical mapping are leading to a level of understanding of Antarctica's geological history that is beginning to match that of some of the other major continents. The same work is providing a platform from which the application of specialist skills in structural analysis, petrogenesis, biostratigraphic analysis, paleocurrent analysis, and many others, is beginning to provide the detail necessary for geological tests of Gondwanaland reconstruction.

"Antarctic Geoscience" clearly shows that by 1977 plate tectonic theory had become widely accepted. More and more workers are looking seriously at the applicability of their data to tests of Gondwanaland correlations and reconstructions. One section is devoted exclusively to that topic, and of the 11 papers four are by New Zealanders.

Work by New Zealand scientists figures prominently throughout. Apart from Gondwanaland studies most fall in the categories of Upper Precambrian and Paleozoic rocks, structural geology and tectonics and Cenozoic history, with a scattering in several other categories. Most stem from work undertaken in the Ross Dependency, New Zealand's traditional area of interest, and some represent follow-up work conducted in laboratories in New Zealand and the United States. For its scientific population and budget, New Zealand is a prominent contributor to Antarctic earth science investigations.

But comparisions of SCAR Geoscience 1, 2 and now 3, suggest that negligible growth in effort has occurred during the last 15 years. The number of scientists involved in the preparation of papers grew significantly during the seventies, but the suspicion is that this is largely because of an increase in the range of specialists involved in the analysis of the field observations and specimens collected. The list of New Zealand authors also is notable for being dominated by experienced and mature scientists. Except for a few on university-sponsored projects, young scientists are not being attracted to Antarctic research. This is of increasing concern to the co-ordinators of New Zealand's programme.

All parts of Antarctica and its surrounding seafloor are dealt with in some respect in at least one paper. Two areas figure most frequently — Transantarctic Mountains and Antarctic Peninsula (including Falklands Plateau) — for reasons of abundant rock outcrop or of competing territorial claims. For both reasons the geology of the Antarctic Peninsula and its surroundings is better understood than any other part of Antarctica. Though of little direct interest to New Zealanders, the many papers make absorbing reading.

Excellent paper, printing and binding are features of "Antarctic Geoscience". Its use as a source book is aided by the provision of an outline map of Antarctica on the front end-paper showing the area covered by each paper, and by the inclusion of an author, subject and locality index. The inclusion in a back pocket of a copy of the Americal Geographical Society's 1972 1:5 million geological map of Antarctica will be appreciated by many readers.

There is only one serious complaint — five years elapsed between the time of the conference and the date of publication (May 19, 1982). Publication and distribution were achieved only just before SCAR Geoscience IV opened in Adelaide, in August, 1982. The short Antarctic field season ensures that the rate of gain in knowledge is modest compared with other parts of the globe.

Nevertheless, the five-year delay in publication meant that some papers had been substantially superseded by the time "Antarctic Geoscience" was printed. This aside, Professor Craddock and his editorial team must be highly commended for bringing their mammoth task to a most satisfactory conclusion.

R. B. ANDREWS, Ph.D.
N.Z. GEOLOGICAL SURVEY
LOWER HUTT

Antarctic Wildlife

Photographs by Eric Hosking. Text by Bryan Sage.

Published in New Zealand by Whitcoulls. First published in United Kingdom by Croom Helm Ltd, 1982. 154pp, appendices and index. N.Z. price $29.95

Eric Hosking is one of Britain's most noted natural history photographers; the illustrator of more than 1000 books on the subject, and the author of four books himself. Now he has used his artistry to give us an authoritative pictorial record of the fauna of Antarctica and the sub-Antarctic islands.

Two recent Antarctic tours aboard the Lindblad Explorer created the opportunity and stimulus for this book. One was to the Antarctic Peninsula area, the other from South America round to Ross Island and New Zealand, which is wrongly described in tourist publicity as a "circumnavigation" of the continent.

Hosking has combined his creative talent with the words of Bryan Sage, a writer and wildlife consultant, who has worked as an ecologist in Alaska, and written of its wildlife. Sage's Arctic experience, and his sensitive understanding of the fragility of polar environments emerges strongly in the descriptive passages on each species, and how these species blend together in harmony in the Antarctic ecosystem.

After a precis of early Antarctic exploration and a balanced chapter on general Antarctic ecology the rest of the book deals with the major animal groups, penguins, albatrosses, "other birds", and seals. Species within these groups are discussed in terms of three distinct environments — the Antarctic Continent, the maritime Antarctic and the sub-Antarctic.

The descriptive ecology of the sub-Antarctic island is particularly impressive. The Lindblad Explorer assuredly passed by the Campbell, Auckland and Snares Islands but they do not even rate a mention nor do they appear on the solitary and completely inadequate map of Antarctica. A mountain is misplaced on the map and only three station are

mentioned. One has been closed as a science station for many years. For a book which otherwise does an excellent job of teaching ecology in plain language accurate maps would have been a minimum requirement.

But the text is lively, well-researched and informative throughout as well as concise in its dossier of facts on each species and in the creation of an awareness of the potential hazards they face. Errors such as Amundsen basing his expedition on Ross Island and the date for Shackleton's expedition based at Cape Royds given as 1914 are disappointing. However, they do not detract seriously from the main theme and impact of the book.

All of the photographs are good, some superb, and are well-reproduced. Penguins are a feature of every Antarctic book, but Hosking has captured them from refreshing angles. His actions shots of cormorants, albatrosses and petrels are brilliant. Only his shots of Weddell, Crabeater, and Leopard seals seem a trifle unimaginative in their bland lighting; perhaps this is a product of rushed encounters.

"Antarctic Wildlife", ends with a welcome chapter on wildlife photography in the Antarctic. Hosking's expertise on film speed, filtration and lens selection will aid anyone who has to contemplate images of spirited sea birds from a heaving deck.

COLIN MONTEATH

French expedition to Pole planned for 1985

A French expedition plans to winter on the Ross Ice Shelf in 1985 and the make a summer journey by dog sledge to the South Pole from the Bay of Whales. The expedition of 15 sailors, mountaineers, divers and skiers, will use 60 dogs and sail three 16m boats south from New Zealand in December, 1984.

French reports describe the members of the Basile expedition as professional adventurers with Antarctic experience. They have taken their name from their first boat, Basile I, which was used for a sea and mountain expedition to South Georgia in the 1979-80 season.

Since September last year the 15 men have been running their dog teams and becoming used to handling polar sledges. Three boats have been built this year at a shipyard near Lyon. The first, Basile II, was launched in March, and then taken on a trial cruise to Greenland; the second, Balthazar was launched in September, and the third, Barnaby, last month.

Each boat will carry five men and 20 dogs, and seven tons of food, fuel, and equipment. Twenty-one tons are expected to make the expedition self-sufficient for two years. The three boats will sail from St Malo in December next year. After calls at Rio de Janeiro in February, 1984, and Cape Town in May, the expedition plans to reach New Zealand in August.

In December the expedition will leave New Zealand for Antarctica. When the boats reach the Bay of Whales they will be raised on to the ice, and the 15 men will build an igloo camp on the ice shelf for the 1985 winter. Before the summer ends a party will establish supply depots along the proposed route to the Pole.

Fourteen months of the two-year Basile expedition will be spent on the ice. After reaching the Pole and returning to the Bay of Whales the 15 men expect to begin the journey back to France in February, 1985.

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 worldwide circulation.

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Overseas subscribers are asked to ensure that their remittances are converted to New Zealand currency.

NEW ZEALAND ANTARCTIC SOCIETY (INC.)

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.

You are invited to become a member, South Island residents should write to the Canterbury secretary, North Islanders should write to the Wellington secretary, and overseas residents to the secretary of the New Zealand Society. For addresses, see below. The yearly membership fee is NZ$6.00 (or equivalent local currency). Membership fee, overseas and local, including "Antarctic", NZ$12.50.

New Zealand Secretary: P.O. Box 1223, Christchurch

Branch Secretaries: Canterbury: P.O. Box 404, Christchurch.
Wellington: P.O. Box 2110, Wellington.

ANTARCTIC POSTCARDS

Four attractive postcards depicting aspects of Antarctica are now available from the New Zealand Antarctic Society. They show Scott Base, Emperor penguins on the sea ice of McMurdo Sound, a New Zealand dog team outside Scott's hut at Cape Evans, and Don Juan Pond in the Wright Valley.

These cards sell at four for $1 plus postage. Surface mail postage rates are 30 cents (New Zealand) and 50 cents (overseas).

Orders accompanied by cheque or money order should be addressed to Cards, P.O. Box 1223, Christchurch, New Zealand. Overseas payments should be converted to the equivalent New Zealand currency.

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Advertising rates for "Antarctica", which is published four times a year in March, June, September, and December are:—

Whole page:	180 x 115mm	NZ$100
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Quarter page:	90 x 57.5mm	NZ$25

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All advertising inquiries should be addressed to the Treasurer, New Zealand Antarctic Society, P.O. Box 1223, Christchurch 5, New Zealand.

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