ANTARCTIC

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BRITISH ANTARCTIC SURVEY TWIN OTTER AIRCRAFT SUPPLYING A FIELD PARTY IN GEORGE VI SOUND, WHICH SKIRTS THE EASTERN AND SOUTHERN SHORES OF ALEXANDER I ISLAND, AND SEPARATES IT FROM PALMER LAND AND THE ROBERT ENGLISH COAST. THE TWIN OTTERS ARE FLOWN TO THE ANTARCTIC PENINSULA AT THE BEGINNING OF EACH SUMMER TO PROVIDE SUPPORT FOR THE FIELD PARTIES.

B.A.S. PHOTO.

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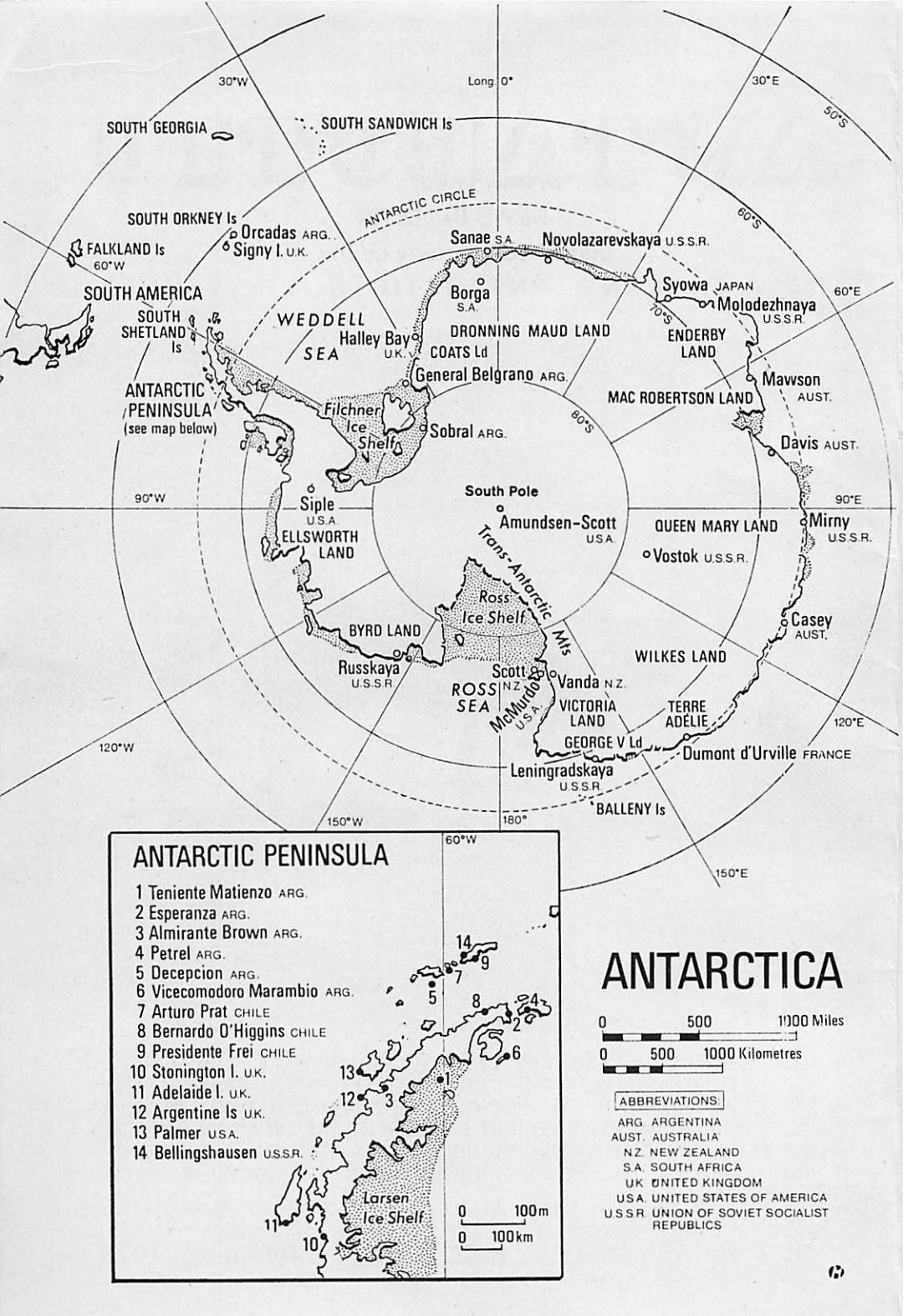

ANTARCTICA

0 500 1000 Miles

0 500 1000 Kilometres

ABBREVIATIONS:

ARG. ARGENTINA
AUST. AUSTRALIA
N.Z. NEW ZEALAND
S.A. SOUTH AFRICA
U.K. UNITED KINGDOM
U.S.A. UNITED STATES OF AMERICA
U.S.S.R. UNION OF SOVIET SOCIALIST REPUBLICS

"ANTARCTIC"

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CONTENTS

Perhaps Adrian de Gerlache was the first explorer to have the vision of Antarctica as a continent for men of all nations. With the Belgians when the Belgica sailed south in 1897 were Norwegians, Poles, a Rumanian, and an American.

Seventy-nine years after the Belgica was locked in the ice men of many nations will celebrate their Antarctic Christmas in traditional fashion, and in happier circumstances than de Gerlache's men. They are not cut from the world completely. As it has done for the last 20 years, "Antarctic" wishes them all a Merry Christmas.

NEW ZEALAND FIELD WORK BEGINS

New Zealand's Antarctic research programme for 1976-77 began officially on October 7 when the first contingent arrived to relieve the winter team of 11 men at Scott Base, and to initiate a wide range of scientific projects. By the middle of this month the first part of the programme was in full swing with field parties in the dry valleys, on White Island, and out in Victoria Land.

This year there are New Zealanders at three United States stations, and a United States field camp on the Ross Ice Shelf nearly 780km from Scott Base. For the second time there are three men at the Amundsen-Scott Pole Station, two of whom will run the meteorological programme next winter. At Siple Station in Ellsworth Land, about 2500km from Scott Base, two men are helping to instal VLF radio receiving equipment for the joint U.S.-N.Z. Leda upper atmosphere project. Other New Zealand men and women are working in the kitchens at McMurdo Station for a Christchurch catering contractor, helping to feed several hundred Americans during the summer season.

Early this month the Royal New Zealand Air Force completed its seven flights, using two Hercules aircraft, to provide logistic support for the New Zealand and United States programme. This is the 12th season that the R.N.Z.A.F. has carried passengers and cargo between New Zealand and the Antarctic. By November 26 when the first Hercules flew to Williams Field near McMurdo Station, the U.S.-N.Z. airlift had transported more than 500 tons of cargo.

SLEDGE JOURNEY

Before the first wave of the summer invasion began four members of the winter team took advantage of the good weather and ever-increasing hours of daylight to spend three days in the field north of Scott Base. They checked the condition of the historic huts at Cape Royds and Cape Evans, and explored the sea ice for the new season's activities.

With 11 dogs to each team, two sledge parties left Scott Base on October 2, and covered the 20 miles to Cape Evans in just over four hours. The team comprised Mike Wing (dog handler), Grant Eames (mechanic and second dog handler), Barry Scannell (Scott Base postmaster), and Clinton Davis (science technician).

They found stable ice as far as Cape Bird, 70km north of Scott Base. At the same time last year, because of an early breakout of the sea ice, there was open water within 15km of the base. The party also encountered the first of the new season's Weddell population, which by early next month is expected to grow to nearly 2000 along this particular stretch of the Ross Island coast.

Despite rough ice and a broken sledge runner, the party made good time on the return journey. It reached Scott Base on the afternoon of October 4.

SUMMER ARRIVALS

Captain Kevin Tasker and two members of the staff of the Antarctic Division, Department of Scientific and Industrial Research, were the first of the summer party to reach Scott Base. On October 8 Flight Lieutenant Hamish Raynham, who was in charge last winter, hauled down his leader's flag, and Captain Tasker took over for the summer season. Flight Lieutenant Raynham was the first of the winter team to return — on October 11 — to what he called the luxuries he had missed during his year in the Antarctic — rain, grass, fresh milk and unlimited hot water for showers.

Summer work began on October 12 with the first operational helicopter flight from Scott Base in temperatures around minus 35deg Celsius. Two New Zealanders aboard the United States Navy helicopter located seal colonies in McMurdo Sound for scientific work, and also chcked the condition of the historic huts at Cape Royds and Cape Evans, and the D.S.I.R. station at Cape Bird.

Travelling by dog sledge, the first field party of the season left Scott Base for White Island on the afternoon of October 18. The purpose of the 29km journey was to make a reconnaissance of the island's isolated Weddell seal colony in preparation for the arrival of the University of Canterbury's research unit which planned to spend three months studying the colony and the ecology of the area. With the leader, Tas Carryer, on the journey were two dog handlers, Mike Wing and Richard Wills, and Colin Monteath, the Antarctic Division's field operations officer. After five days Mr Carryer returned to Scott Base with the news that the cupboard was bare. He searched the island from end to end, both on foot and by dog team, and on the return journey saw only two signs of the seals' presence.

SEALS ABSENT

In February this year the seals were seen. Their absence was a mystery. They are separated from the nearest seasonal sea ice by 29km of solid ice shelf — too far for the seals to swim under. And it was unlikely that they had gone over the top because of the extremely low temperatures during the year.

Hopeful that the seals would appear when the weather improved, Mr Carryer and another member of the university party, Paul Ensor, who replaced Zane Williams, decided to start work without them. Travelling into a strong southerly storm, the party, assisted by Scott Base staff, had a difficult journey to White Island, taking nine hours to cover 29km.

Equipped with a small laboratory, fishing gear, and three months' supply of food, Messrs Carryer and Ensor began their study of the complete food chain in the area — a project of which the seals are an important part. They were joined a few days later by Miss Elspeth Wingham and Bob Zurr.

Weeks of anxiety ended on November 12 when the presence of seals under the ice was confirmed by Americans using special radio equipment. The seals were detected only hours after two other seals arrived on the island — both made of lead, and to be used for postmarking mail.

Mr Carryer predicted that the seals, due to pup shortly, would surface as soon as the weather became warmer. He was right, and although the party had a longer wait than expected, its patience was rewarded. The first cow seal appeared towards the end of last month, and gave birth to a pup which weighed 25 kilograms.

NOT ISOLATED

Now the work of tagging, measuring, and weighing the seals as part of the integrated study of the food chain is under way. But, having established that pupping time at White Island is later than in the McMurdo Sound area, the university team still has a problem.

Originally the White Island colony was believed to be isolated. However, one of the seals from it was tagged in October last year by an American scientist at Hutton Cliffs, Ross Island, which is 30km away.

Mr Carryer reported that the tagged seal was an over-sized male showing signs of starvation. It was about the same age as seals which have driven themselves on to other islands and into the dry valleys, and subsequently starved to death. Their motivation is still unexplained.

Consistently high winds and low temperatures made work outside Scott Base difficult for the new summer staff. Temperatures were consistently low, with a mean temperature for the first half of the month of minus 40deg Celsius. And the month ended as the coldest since 1967. A minimum temperature of minus 52deg Celsius was recorded. In October, 1967, minus 46deg was recorded.

Winds of more than 100km an hour struck a Victoria University field party camped in polar tents on the Taylor Glacier early in November. The first big storm of the summer left the party with a badly torn tent, a missing sledge, and overturned motor toboggans.

With the party was a surveyor, Bill Wicks, whose work was completed before he flew out in the first helicopter able to reach the party after the storm. Before he returned to Scott Base to give the first account of the storm, the United States Navy helicopters had battled high winds for three days before they could fly into the area with another sledge and tent for the party.

When the storm began the party believed it would be "just another blow". But one member went outside the tent and saw a motor toboggan weighing 1100kg, sledges and equipment overturn and scatter across the glacier. Recovery was difficult because of the icy wind, and visibility was reduced by snow gusting down from the sides of the glacier. Extra ice screws were put in, and everything was tied down.

There were five men in the party, Messrs Paul Robinson and Harry Keys, Victoria University geologists, John Nankervis, a field assistant, and two surveyors, Bill Wicks, and John Palmer. They had an early meal in one tent, and then discovered that the wind had torn a large hole in the other tent, which filling with fine snow.

NOISE OF WIND

All the men then stayed in the undamaged tent. They went to bed fully clothed, and tied their boots to the sleeping bags in case the wind, gusting up to 150km an hour, tore the tent, and blew equipment away. The men could not talk above the noise of the wind so they read and slept until it subsided. Then they had to collect the gear scattered across the glacier. One sledge was written off, and the torn tent was useless.

Radio contact with Scott Base was lost in the evening when the party's field

A surveyor, Mr W. F. Wicks, one of five men caught in a violent storm on the Taylor Glacier early last month, with the tent and sledge damaged by high winds. Mr Wicks returned to Scott Base in a United States Navy helicopter which flew in new equipment for the party.

Antarctic Division, D.S.I.R. Photo

aerial was blown out of alignment. The high winds prevented the men from working on it. Eventually they raised another party working at Vanda Station 40km away, and from there a report was made to Scott Base.

Two other members of the Victoria University expedition, Andy Frost (botanist) and Tim Stern (geologist) joined the Taylor Glacier party, which has been studying glacial salts and sediments, and checking the rate of movement of the Taylor Glacier. Messrs Frost and Stern flew to the area in the first helicopter after the storm.

WORK AT POLE

New Zealand wines, cheeses, and oysters were a pleasant surprise for two New Zealanders, Messrs Bernie Maguire and Barry Potter, after more than eight months' isolation at the Amundsen-Scott South Pole Station. The United States Navy Hercules which made the first flight of the season to the station, also brought the New Zealanders letters and newspapers.

Messrs Maguire and Potter returned to Scott Base in the middle of November. They spent nearly 13 months at the South Pole, and ran the station's meteorological programme, conducting routine upper air and surface observations. Their replacements are Simon Norman, a meteorological observer, and Lloyd Anderson, a technician in the Ministry of Work radio section. Another man from the Meteorological Serivce, Tony Quayle, is working at the Pole Station for the summer only.

Life at the South Pole for the two New Zealanders — the first to winter there — was comfortable under the geodesic dome. They had a bar, gymnasium, and sauna bath, and shared quarters designed for 30 men with 16 Americans. But the creature comforts were necessary because the two men had to work had inside and outside the station.

Hours were long — up to 16 hours on an average day, and as much as 30 hours at a stretch. In emergencies, such as the disappearance of three British climbers on the Antarctic Peninsula, weather reports were provided for up to 57 hours at a stretch to assist searchers and aircraft.

Launching weather balloons in temperatures frequently as low as minus 70deg Celsius was miserable work. There was a constant danger of metal burns and frostbite. Once a month Messrs Maguire and Potter had to take measurements from stakes in an area two kilometres from the station, and check the levels of snow drifts. This involved spending an hour or more outside the comforts of the geodesic dome.

ALTITUDE PROBLEM

In the middle of winter the job was quite tough, according to Barry Potter. The strongest wind was only 39 knots, but altitude was a constant problem, and plagued all the men at times. Without any heat from the sun in winter, there were extraordinarily low pressures, which effectively increased the actual altitude of the Pole Station from 2850m to nearly 5000m. As a result, headaches, vomiting, spots before the eyes, and nose bleeds were common.

Bernie Maguire, whose experience of remote outposts includes a summer at Vanda Station, and two year at weather stations on Campbell Island in the sub-Antarctic, and Raoul Island in the Kermadecs, has no desire to winter at the South Pole again. But Barry Potter, whose birthday on September 22 coincided with sunrise at the Pole after six months of darkness, would go back again, although not for two years at least.

Early this month another team from the University of Canterbury research unit was in the field, engaged in the study of penguins, skuas, and the collembola or springtail insects — the largest of the Antarctic land animals. Collembola are between 0.3 and 1.7mm long, and are found under stones and patches of moss. They feed on moss cells, fungi, and algae.

Two zoologists, Kelly Duncan, a senior lecturer, and Bruce Warburton, an honours student, are working at Cape

Bird, 80km north of Scott Base. They will count penguins and skuas in the nearby breeding colonies as part of the units continuing study of population dynamics. Mr Duncan replaced Mr N.M. Henderson, who was killed in an accident several weeks before the team was due to fly south.

EREBUS PROJECT

One international project in the New Zealand programme has been amended. French vulcanologists were to have worked with New Zealanders on Mt Erebus again this season. But Dr Haroun Tazieff, who worked on Erebus in the 1974-75 season, is unable to return to the Antarctic. However, the New Zealanders will continue the monitoring of volcanic activity, and complete a map of the volcano's crater.

Dr Tazieff has been working for some time with other scientists on the French island of Guadaloupe in the Caribbean where the volcano La Soufriere has been shaken by strong tremors and minor eruptions for several months. La Soufriere began spewing acrid fumes ans ash in July, and at the end of August 12 scientists were trapped near the rim of the crater by a vapour explosion.

Two members of the scientific team were caught in mud-slides near the summit and were rescued by helicopter. One of them was Dr Tazieff. He and another scientist were injured, and spent some time in hospital.

While one of the world's foremost vulcanologists is not in Antarctica this season, one of the world's great mountaineers is. Walter Bonatti, once a famous Mt Blanc guide, is a field assistant with the Italian scientific party which has joined New Zealanders in a study of the micro-climates in the dry valleys and the Royal Society Range.

Walter Bonatti, who is now a journalist with the Italian magazine "Epoca", plans to write about his visit to Antarctica. He has climbed in the Andes and the Himalayas, and in 1954 was in the Italian expedition which conquered K2 (8610m) the world's second highest peak.

Christmas gifts for men at Pole

Three New Zealanders at the Amundsen-Scott South Pole Station will have home-made biscuits and fruit cake this Christmas. Members of the Canterbury branch of the New Zealand Antarctic Society, who have sent biscuits and Christmas cakes to New Zealanders in the Antarctic for the last 13 years, have included a special parcel for the men at the Pole in the consignment of 75 dozen biscuits and 11 fruit cakes — four iced — which was flown from Christchurch this month.

Two of the New Zealanders, Lloyd Anderson and Simon Norman, will not return to New Zealand until November next year. They will winter at the Pole and conduct the meterological programme. In the special parcel the two men, and Tony Quayle, who will work with them for the summer, will each receive a cake and a large packet of biscuits. Lloyd Anderson will have the pleasure of eating a Christmas cake sent by his mother.

Men and women working at Scott base will also share the Christmas gifts. As in former years, arrangements will be made, weather permitting, to fly cake and biscuits to the field parties working far from the base. If the gifts do not arrive on Christmas Day, they will be there on New Year's Day.

Recovery of Last Aircraft From Dome C

By the end of this month the United States naval support force expects to complete the last stage of one of the most remarkable aircraft recovery operations ever attempted in the Antarctic. In 1975 three ski-equipped Hercules aircraft were stranded at Dome C, an ice dome in Wilkes Land 1150km from McMurdo Station, after takeoff accidents. Two were recovered last season, and last month a salvage team began work on the third, No. 319, which was the most severely damaged of the three.

After acclimatisation at the Amundsen-Scott South Pole Station in preparation for work at Dome C. which is 3500m above sea level on the East Antarctic ice-cap, last season's recovery team built a skiway and a camp of seven buildings in preparation for the salvage operations. The camp is now occupied by a team of more than 40 men, which began the recovery of No. 319 on November 11 after several days at the Pole Station.

To complete the salvage operation in 74 days as planned, the men at Dome C have been working long hours in sub-zero temperatures averaging minus 30 to 35deg Celsius. On November 25 when most Americans around the world sat down to enjoy their traditional Thanks-

No. 319, one of three Hercules aircraft damaged in takeoff accidents on the East Antarctic ice-cap last year, lies partly buried in the snow after nearly two years' exposure near Dome C, an ice dome 1150km from McMurdo Station. Salvage of No. 319, which has been on the ice since January 15, 1975, began last month. The two other aircraft were recovered last season.

U.S. Navy Photo

giving Day dinner of turkey, cranberry sauce, and pumpkin pie, 46 men put in another long, cold day at work. They had completed 20 of the 66 planned projects in the operation the day before.

No. 319 had not moved since the takeoff accident on January 15, 1975. Before it could be moved to the repair site near the salvage camp, the men had to remove snow that had accumulated in the last 22 months, and dig a long trench so the aircraft could be pulled from its position up a slight incline.

After the fuel had been removed the two outboard engines were removed, and the aircraft, which had collapsed on one side, was righted by removing a portion of the wing. Then it was towed by two tracked vehicles over the ice for two miles to the salvage camp.

Work on the repairs began early this month. Scaffolding was erected over the wings and extended over the centre section of the aircraft. Then the centre section was loosened, taken out, and replaced by a new section. By the end of this month the salvage team will have replaced the right wing, remounted the engines, and repaired skin damage to the fuselage.

Considerable time will be needed to rewire the electrical systems before No. 319 is ready for the flight back to McMurdo Station. Commander D. Deske, who commands the United States Navy's VXE-6 Squadron, will be the pilot when No. 319 leaves Dome C nearly two years after the accident. He was the pilot of No. 319 on January 15, 1975.

Aircraft recovery in the Antarctic is an expensive business. The price of bringing No. 319 back from Dome C will be less than $2 million. But a new Hercules would cost $9 million.

Antarctic Conservation Trophy

A zoologist who has worked in Antarctica for the last five summers has been awarded the New Zealand Antarctic Society's conservation trophy for 1976. Mr Paul Sagar, who is a research assistant in the zoology department of the University of Canterbury, has studied flora and fauna at Cape Bird as a member of the university's Antarctic research unit.

The award was announced by Mr J.M. Caffin, chairman of the Canterbury branch of the society. There have been four previous awards of the trophy — a 17in carving of an Emperor penguin in African walnut — which was presented by a branch member, Mr Peter Voyce. The trophy is awarded to any person or organisation contributing to the conservation of historic buildings or flora and fauna in Antarctica or the sub-Antarctic islands.

Mr R.B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research, advised the branch that in the last five years Mr Sagar has developed a deep concern for the protection of Antarctic fauna and flora. His dedication to Antarctic conservation generally and the very good work he has done to that end, well merit the award of the trophy.

Mr Sagar will receive the trophy when he returns early next year from a sub-Antarctic scientific expedition to the Snares Islands. He left before the trophy arrived in Christchurch from last year's recipient who lives in the North Island.

Previous awards are: 1972, M. Foster; 1973, L.B. Quartermain (posthumous); 1974, B.N. Norris; 1975, E.R. Gibbs.

TWO FIRES IN SOUTH POLE CONSTRUCTION CAMP

Fire, one of the hazards most feared in the Antarctic, twice struck an old construction camp 400 metres from the new geodesic dome complex at the Amundsen-Scott South Pole Station at the end of October. The first fire on the night of October 30 caused minor damage to a Jamesway hut; the second on October 31 destroyed another Jamesway hut and its contents, and a third hut in the complex was left damaged by smoke and heat.

No-one was injured in either fire, although some personal belongings were destroyed in the main fire. Both fires started after failures in old oil heaters which had functioned without trouble before.

Jamesways are wooden frame and canvas buildings used for Antarctic field camps. The complex where the fires occurred was part of a construction camp built several years ago by United States Navy Seabees for use while the geodesic dome complex was under construction. Since then the camp has been used to store supplies, serve as an emergency camp in case of fire at the Pole Station, and to provide accommodation for scientists and others who work at the Pole during the summer season.

Another Fire

Another small fire, the third in less than a month, occurred at McMurdo Station on December 5. It broke out in the centre where field parties are equipped. No-one was hurt, and the centre was in use again 18 hours later.

In the early hours of Sunday morning smoke was noticed coming from the building. The station's fire department was called, arrived in minutes, and had the fire out in less than an hour.

From the downstairs furnace room the fire spread to the second floor where ski sticks, ice axes, and crampons are stored. Losses were minor because most of the equipment was in use in the field.

When the fire on October 30 started, nine men were were working in the Jamesway complex. One man was inside the galley when the fire started. He heard a crackling sound, and found the fire. It spread rapidly despite his attempt to extinguish it. Then he ran through the building to make sure that no-one was trapped.

No-one saw the fire on October 30 because it started at night when all the men were asleep. It broke out in a different Jamesway hut, but damage was limited to the area around the oil heater.

After the fires all the men involved were housed in the main station under the geodesic dome. But new arrangements had to be made for housing about 30 scientists and summer support staff, and also the team which had to spend several days acclimatising before to Dome C on the Polar Plateau to begin the salvage of the last of the three Hercules aircraft damaged in the 1974-75 season.

Another Jamesway complex was flown to the Pole by United States Navy Hercules aircraft early last month, and was ready for the summer workers and the Dome C team. There was no setback to the scientific programme; living conditions were more austere. And after the fires several other undamaged Jamesway huts at the construction camp were prepared for use, which meant clearing away the snow that had drifted over them during the winter.

Airlift of 135 Penguins to United States

Forty Emperor penguins taken from the colony at Cape Crozier, and 95 Adelie penguins collected in the McMurdo Sound area, were flown from the Antarctic to San Diego, California, aboard a United States Military Airlift Command Starlifter towards the end of last month. The birds all arrived safely, and have been placed in a temperature-controlled facility at Sea World for research, education, and possible public display later.

Originally 140 birds were to have been flown to California, but several were left behind at McMurdo Station. This was the second large consignment to be flown from the Antarctic. In November last year 80 Adelie and 20 Emperor penguins were safely transported, but all died from smoke inhalation in a fire which destroyed the quarantine building.

Dr Frank S. Todd, curator of birds at Sea World, and two assistants, collected the penguins last month. They were kept inside a wire enclosure at McMurdo Station for several days before being loaded aboard the Starlifter. A day or two before the flight there was a "great penguin escape", and Dr Todd and his assistants had to call on men and women at the station to help retrieve the escaping birds.

All the birds were placed in wooden crates for the long flight north, and the Starlifter was kept at a temperature of minus 5deg Celsius. Fifteen scientists and one serviceman also had a very cold flight back to the United States, and were issued with polar clothing to keep them warm on the journey. When the Starlifter arrived at Christchurch, the penguins were transferred to refrigerated vehicles, and moved into an airport hangar where the low temperature was maintained until departure the next day.

FROZEN EGGS

On the flight to San Diego some of the Adelies courted, bred, and even laid eggs. But because of the low temperature the eggs froze and cracked. As the Adelies were at the end of their breeding cycle when captured, no more eggs were laid after their arrival at the Sea World.

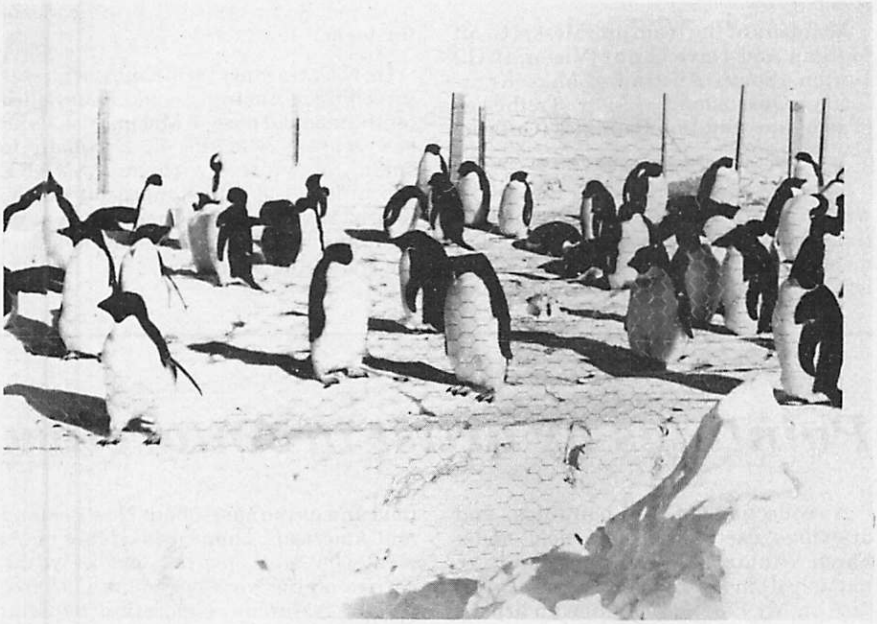
Dr Todd says that the colony has been established at Sea World to enable research and observation all the year round. At present research is limited by the short Antarctic summer. The presence of the colony would be a definite aid to research studies, according to Dr Todd, but he believes there would probably be some modifications to the penguins' behaviour because of the controlled climate environment.

Sea World does not plan to put the birds on public view now but could do so in future if they breed successfully, and the organisation goes ahead with its plans to build a permanent polar complex. At present the birds are living in a huge tank with a controlled climate. Machines automatically make snow, and the birds are able to swim as well as stay cool.

DISEASE CHECKS

As a preventive measure before the birds were collected and transported to California, a team from the department of veterinary science at the University of Wisconsin took tracheal and cloacal swabs and blood samples from a representative collection of penguins and skuas at Cape Crozier. These samples were used to determine whether Newcastle disease and avian influenza viruses are present in Antarctic birds.

Newcastle disease is of economic importance to the United States poultry industry; in 1971 more than $50 million was spent to eradicate virulent Newcastle disease that had entered southern California through international traffic in non-Antarctic wild birds. The information obtained may also provide information on whether Newcastle disease is transmitted between resident and migratory bird populations in the Antarctic.



Some of the 95 Adelie penguins collected in the McMurdo Sound area last month confined in a wire enclosure at McMurdo Station before they and 40 Emperor penguins from Cape Crozier were flown to San Diego, California.
U.S. Navy Photo

START OF ANARE PROGRAMME

Nine members of the Australian National Antarctic Research Expeditions' winter team at Mawson began preparations for the summer programme in Enderby Land when they left early in October to prepare the base camp at Mount King. The team, led by the officer-in-charge at Mawson, Lieutenant-Colonel I. Teague, of Canberra, is expected to return midway through the summer.

Last season the summer programme was carried out from Mount King instead of Knuckey Peaks, which are about 450km inland from Mawson. The camp was relocated another 100km to the north largely because observations were affected by the weather at Knuckey Peaks.

Three traverse trains of heavy sledges or living caravans drawn by tracked

prime movers were used for the trek to Mount King. They carried 65 tonnes of fuel, food, and stores for the base camp. The fuel will be used for air operations by the Pilatus Porter aircraft, and the Hughes helicopters which provide logistic support.

Members of the team are: Messrs Geoff Morgan and Dave Grant (Victoria), Gil Barton (South Australia), Mike Knox-Little (Queensland), John Trethewey (Tasmania) and Don Retallack (Ontario, Canada).

Two women will spend the whole winter on Macquarie Island for the first time next year. With the 17 other members of the relief expedition which left Melbourne last month were Dr Jean Ledingham, who will be the medical officer, and Miss Sarah Stevens, who will be the radio island.

This will also be the first time a married couple has served with an ANARE expedition. Dr Ledingham's husband, Rod, a geologist, is the leader of the team.

Dr N.C. Gardner, of Britain, who was travelling in Australia, when she applied for the medical post on Macquarie Island last season, was the first woman to spend a winter with an ANARE expedition. But she stopped off on the return voyage from Casey early this year, and will return to Australia before the end of the year.

Paintings by artist in Antarctica

A collection of 52 paintings and drawings executed in the field under harsh Antarctic conditions will be published in Christchurch next year. "Ice on My Palette" contains an artist's impressions of Antarctica. The artist is Maurice Conly, who has worked for two summers in the Antarctic, using oils, watercolours, acrylics, and charcoal, to record life and work on the continent.

Maurice Conly went to Antarctica first as official artist for the Royal New Zealand Air Force, which has provided logistic support for New Zealand and United States scientific activities for 12 seasons. His second visit was to make a pictorial record for the Antarctic Division, Department of Scientific and Industrial Research. He visited Scott Base, Vanda Station, and the Amundsen-Scott South Pole Station, and also painted in the dry valleys of Victoria Land, and visited the historic huts used by Scott and Shackleton.

"Ice on My Palette" covers almost every aspect of Antarctic life and work — seals, penguins, skuas, killer whales, sledge dogs, and research both in the field and at the bases, both New Zealand and American. There are sketches of the men who have, for the last 20 years, carried on the work begun in the Heroic Age of Antarctic exploration by Scott and Shackleton.

A New Zealand writer, Neville Peat, who spent the 1975-76 season in Antarctica as information officer and photographer at Scott Base for the Antarctic Division, has provided a background in words to Maurice Conly's paintings. His text tells of the permanent stations, field work, the historic huts on Ross Island, McMurdo Sound, and the mysterious dry valleys.

Publication of "Ice on My Palette" is planned to coincide with the official opening of the centennial wing of the Canterbury Museum, which contains the national Antarctic centre, by the Duke of Edinburgh on March 4. The book will cost $14.95 in New Zealand currency, and can be ordered from the publishers, Whitcoulls, Private Bag, Christchurch, New Zealand. Overseas purchasers are asked to ensure that their remittances are converted to New Zealand currency.

B.A.S. NEWS

New Base and Air Facility on Adelaide Island

Construction of the second stage of Rothera, the new British Antarctic Survey base and air facility on Adelaide Island, is one of the major projects in this summer's programme. Air operations will include support of geologists and glaciologists working on Alexander I Island, in Palmer Land, and in the relief of the five B.A.S. bases where 80 men will work next winter.

This year the Royal Research Ships John Biscoe and Bransfield will be joined by the Royal Navy's ice patrol ship, H.M.S. Endurance. The Endurance wil assist the Joint Services Expedition to Elephant Island in its scientific work for the B.A.S. and the British Museum.

Before the ships sailed for the Antarctic field work from the four Antarctic Peninsula bases in September and October was limited by gales and bad visibility over the west coast.
Halley Bay also experienced persistent bad weather, continuous gales over one two-week period reaching 80 knots. A party reconnoitring a route from Halley Bay to the inland ice, in preparation for a VLF experiment, travelled only 10 miles in one lull before being forced to lie up for 6 days. The whole journey took about twice as long as usual.

Further north, the weather was mostly very good and the great problem on Signy island in October was sunburn! Field work on Signy Island and on South Georgia was in full swing by the beginnning of October, and on South George was limited to areas around Cumberland Bay until the arrival of the ships provided transport to more distant localities.

The John Biscoe sailed from Southhampton on September 22 and arrived in the Falkland Islands a month later. The first southern voyage was to South Georgia, where summer field parties and supplies were landed at a number of localities, including Bird Island, and the base at King Edward Point was relieved.

The the ship returned to the Falklands to collect more men and supplies before proceeding down the west coast of the Antarctic Peninsula to re-open the summer air facility at Damoy Point on Wiencke Island. Damoy was reached on November 9, and men and equiment were landed to await onward transport to the southern bases by air. The John Biscoe then continued assisting field parties on South Georgia.

AIR SUPPORT

Meanwhile, the two B.A.S. Twin-Otter aircraft flew south from Toronto at the end of October, and arrived at Adelaide Island on November 7. Two weeks later, one was flown to McMurdo Station by way of Siple Station and the South Pole. It has been chartered to the United States National Science Foundation for 10 weeks to assist in the continuation of the Ross Ice Shelf Project.

The Bransfield sailed from Southampton on October 28. Her first call was to the U.S. Navy base at Mayport, Florida, to load supplies for Palmer Station, Anvers Island, before proceeding to Montevideo to pick up men who had flown from the United Kingdom, and then on to the Falkland Islands. The first southern voyage will be to South Georgia, to resupply the base and exchange staff.

From there she will go on to attempt to relieve Halley Bay a month earlier than usual, in the hope that fast ice and snow ramps, which disappear later in the summer, will give access to the ice shelf within a few miles of the base. Inlets and ramps where unloading had taken place for many years broke away in the early 1970s, leaving ice cliffs 25 to 35m high, and for the last two seasons the nearest point of access has been 50 miles from the base. Three extra vehicles and drivers were taken south in case unloading had to take place again at a distance.

The rate of movement of the ice shelf where the base is situated appears to be accelerating, and at present it is more than 400m a year. Fortunately, this is westwards, parallel to the nearest part of the ice front which is only 13km from the base.

On the return traverse across the Weddell Sea, the Bransfield will tow a magnetometer, extending the geophysical surveys carried out further north and west. The ship will then re-supply the Signy Island (South Orkneys) biological station, and assist field parties at South Georgia before returning to the Falklands.

RELIEF OF BASES

A mid-season visit will be made to Punta Arenas where the Bransfield's co-master will take over command. She will then proceed to the west coast of the Antarctic Peninsula, to deliver the supplies picked up at Mayport to Palmer Station, and relieve the B.A.S. Argentine Islands base.

A brief visit will be made to the Argentine station, Almirante Brown, which, together with Palmer Station is co-operating with B.A.S. on an HF Doppler ionospherics experiment. Monitoring equipment will also be operated for a few weeks from the unoccupied British base at Prospect Point on the coast of Graham Land. This experiment, which is a joint effort by Leicester University and B.A.S., is part of the United Kingdom contribution to the International Magnetosphere Study.

Another major task for the Bransfield will be to re-supply and assist in building the second stage of Rothera, the new base and air facility on Adelaide Island. This replaces the old one 40 miles to the south-west, which will then be closed as its airstrip has become unusable.

The new airstrip, three miles inland from Rothera at a height of 280m was stocked with fuel earlier in the year in preparation for the summer air operations. This task was completed in October in spite of thick snowfall which hampered all outside activities.

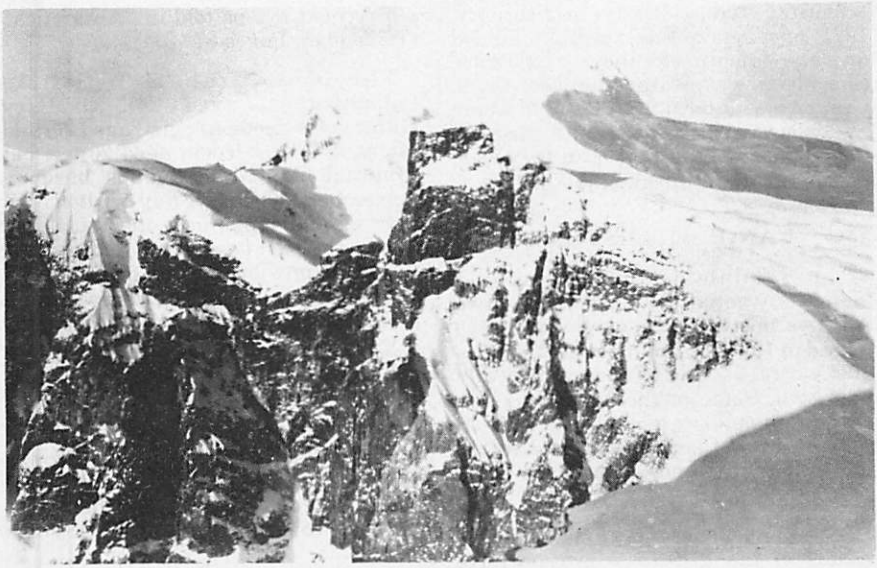
Forty-six new recruits went south in the John Biscoe and the Bransfield, and a number of other men, including senior scientists based in Cambridge, will also work in the summer research programme. The Bransfield also took two members of a Cambridge University expedition to Tierra del Fuego.

H.M.S. Endurance sailed from Portsmouth for the Antarctic in mid-October. The ship will spend about one month assisting B.A.S. with work on South Georgia, in the South Shetland Islands and at Marguerite Bay, and two to three weeks assisting the Joint Services Expedition to Elephant Island.

AIR OPERATIONS

Air operations will include the support of geologists and glaciologists working on Alexander Island and in Palmer Land, and continuation of magnotometer flights over Graham land and Palmer Land. Accuracy of navigation has been greatly increased by the installation of Doppler radar, and last year's 100-hr airborne magnetometer traverses were consequently very successful.

A joint programme with the U.S. Geological Survey was also carried out last year using Doppler satellite receiving (geoceiver) apparatus. This fixed the positions of 26 stations over the whole Antarctic Peninsula to an accuracy of a few metres, and provided a satisfactory net for 30 years' trilateration and ground control for satellite mapping. A B.A.S. geophysicist was able to carry out simultaneous gravity



The Tower and Mount Peary beyond where three members of the British Antarctic Survey team at the Argentine Islands base died early in September. The men set out on September 3 to climb Mount Peary on the west coast of the Antarctic Peninsula. They reached the summit on September 6, but were not seen again.

B.A.S. Photo

survey, which was probably some of the best ever done as the geoceiver was determining all three co-ordinates, including height above the ellipsoid.

SECOND EXPEDITION

A second British expedition to Elephant Island and other islands in the South Shetlands will undertake scientific work on behalf of the British Antarctic Survey and the British Museum this summer. Commander Chris Furse, deputy leader of the Joint Services Expedition led by Commander Malcolm Burley in 1970-71 will return this month with another Joint Services team of 16 men.

Commander Furse's team, which has qualifications in geology, physics, geography, and zoology, will follow up the discoveries of the 1970-71 expedition, which was the first to penetrate inland on Elephant Island. These initial surveys will be extended to cover Clarence, Gibbs, Aspland, Eadie, and O'Brien Island, and possibly Cornwallis and Seal Islands.

The expedition will be in the field for four months until March next year. Clarence and other satellite islands will be climbed, and the peaks on Elephant Island where avalanches prevented successful climbs in 1970-71. These ascents wil complement the main scientific aims of the expedition.

Elephant Island and the other islands lie some 500 miles south-east of Cape Horn at the eastern end of the South Shetlands. Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition made the first recorded landing on Elephant Island on April 15, 1916, after the Endurance had been trapped and crushed in the ice of the Weddell Sea.

Command Burley's expedition spent nearly four months on Elephant Island and the other eight islands of the group. It made topographical surveys and

scientific studies. Early in February, 1971, members of the expedition landed on Cape Valentine for the first time since Shackleton's expedition had been there. Groups also landed at Point Wild where Shackleton's men were marooned for four months and a half until they were rescued by the Chilean ship Yelcho.

CANOE TRANSPORT

The satellite islands have been mapped by aerial photography and two Americans spent some weeks on Gibbs Island in 1974/75, but they are otherwise unexplored, unclimbed and scientifically unknown. Some of the 900m peaks on Elephant Island were climbed in 1970-71, but those on Clarence Island (1940m) and Aspland Island (740m) have never been attempted.

Seven papers describing the scientific results of the 1970-71 expedition have been published in the British Antarctic Survey Bulletin. Further papers are in preparation.

On arrival, H.M.S. Endurance will establish two depots of food and equipment on Elephant Island and two on Clarence Island. Each depot will be used for about a month as a base for the field parties.

The men will live in tents, and to avoid traversing coasts that are precipitous or threatened by avalanches will be equipped with sea-worthy Tasman double canoes and single kayaks. Put together in pairs as catamarans, the Tasmans will be used with an outboard engine for fishing, and as sledges for portages across glaciers. This will be the first Antarctic expedition to use canoe as a major means of transport.

FATAL ACCIDENT

The beginning of the new season was overshadowed by the tragic loss in September of three young B.A.S. men in a climbing expedition to the 1800m Mount Peary on the west coast of the Antarctic Peninsula. This was the first fatal accident in the Survey for 10 years.

Because of poor communications in the area, and conflicting reports, the full story could not be told in "Antarctica" (September, Pages 370-371).

The men, Graham Whitfield (geophysicist, aged 24), Geoffrey Hargreaves (meteorologist, aged 21) and Michael Walker (cook, aged 20) set out from the Argentine Islands base on September 3. Their five-day trip had been very carefully planned, the route was known (at least two parties had climbed the peak previously and many others had visited the area), and they were well provided with equipment and food.

They crossed the sea ice from the islands to a depot on the mainland, a distance of about 11km, and then proceeded through Mill Col on to the Bussey Glacier, climbing the Tower before going on to Mt Peary. They achieved their goal on September 6 and radioed from the summit with some elation.

LAST CONTACT

This was their last contact with base, but as radio communication in this mountainous area is usually difficult and they were due to arrive back two days later there was, at that stage, no cause for alarm. However, when they failed to return on time, the base commander alerted B.A.S. headquarters and then, with two other base members, set off in deteriorating weather to search for them.

At the same time, the High Commissioner for the British Antarctic Territory approached the Argentine Air Force for help. The response was immediate and generous, but very bad weather prevented any ground or air search for three days. At last, in a lull on September 11, an Argentine Otter aircraft was able to fly low over the area and discovered two pairs of skis and what appeared to be a ground-sheet some 300m below the summit, but there was no sign of activity. There had been heavy snowfall and considerable avalanching on to the glaciers below.

As the ground party was unable to reach the area, the Argentinians agreed to fly south to pick up three expert mountaineers from Adelaide Island, and

then attempt to land them near the top of the mountain. The men were picked up as planned, but bad weather again closed in and made further search impossible.

The aircraft was therefore diverted to Marambio. Unfortunately, the bad weather continued and by September 14 it was reluctantly decided that conditions had exceeded human endurance, and the missing men must therefore have perished.

Meanwhile, the Otter which had been assisting the Survey was called out to search for an Argentine Neptune aircraft overdue on a flight over the northern part of the Antarctic Peninsula. Later the Survey was grieved to hear that the Neptune had crashed on King George Island with the loss of 10 lives.

SUB-ANTARCTIC

WILDLIFE ON SNARES ISLANDS

Five scientists from the University of Canterbury, including one woman, left Lyttelton aboard H.M.N.Z.S. Taranaki on November 8 to spend four months on the sub-Antarctic Snares Islands, which lie 104km south-west of Stewart Island. The expedition will study various aspects of the wildlife on the islands, and will be based on Main Island, the largest island of the group, which has an area of about 280 hectares.

Dr D.S. Horning, who was formerly a senior lecturer in the university zoology department, returned from the United States to lead the expedition. He will co-ordinate the research of four post-graduate students, and help them in their projects. This will be his fourth visit to the Snares Islands. Four years ago he and his wife spent 13 months there, most of the time by themselves.

Several members of the expedition have worked previously with the university's Antarctic research unit at Cape Bird on Ross Island, Dr Horning led the research unit expedition last season. Mr P. Sagar, who is a member of the Snares Island team, was in the Antarctic for his fifth summer last season.

Miss Joy Woods, who worked on Ross Island in the 1974-75 season, will study the fresh water streams of the Snares Islands, which have received little attention from scientists. She will concentrate on the stream chemistry, and microscopic animals that may live there.

Mr J. Early's chief field of interest will be life history studies of parasitic wasps, which are unique to the islands. As yet they are without a scientific name. Mr Early was in the Antarctic during the 1973-74 summer.

A marine biologist, Mr G. Fenwick, also worked at Cape Bird in the 1972-73 season. He will study the different marine algae and animals below the water line. His research will involve scuba diving in which he will be assisted by Dr Horning.

Mr Sagar will study Buller's mollyhawk and the Snares crested penguin. There are colonies of these birds on Main Island. He will also study the interaction between a number of birds which nest on the island, and which have similar breeding and feeding habits.

Dr Horning and Mr Sagar will search the island for any survivors of the mollyhawks which he and his wife banded as chicks in 1972. He will also continue his own research on the life history of some insects on the Snares.

Soviet Expedition to be Largest Since 1956

Headed by the new flagship of the Antarctic fleet, Mikhail Somov, seven ships will be used this season to transport the Soviet Union's largest expedition since 1956. When the Mikhail Somov sailed from Leningrad last month she had on board more than 250 scientists and other experts, including a number from other countries. The other ships of the fleet will relieve the six coastal stations, and transport 500 people who will spend all summer in the Antarctic or a short season.

A geographer, Leonid Dubrovin, who has taken part in two previous expeditions — the fifth and 11th — is leader of the 22nd Soviet Antarctic Expedition. This season scientific research in the Weddell Sea area will be increased. Soviet geologists, working from the new station — Druzhnaya — on the Filchner Ice Shelf, established last year, will continue their research in the Shackleton Range, the Theron Mountains, and the Pensacola Mountains. With them in the Shackleton Range will be a United States exchange scientist, Dr Edward S. Grew, of the department of geology, University of California.

Oceanographic work will be extended as part of the international global atmospheric research programme, Polex-South. The Soviet research ship, Professor Zubov, will begin observations in the Indian Ocean sector, and the United States research ship Thomas G. Thompson, will explore Drake Passage between South America and the Antarctic Peninsula. Each ship will carry a scientific team from the other country.

After a hard winter members of the 21st expedition have completed their scientific programme, and are awaiting the arrival of the relief ships which will take them home. The leader, Gennady Bardin, reported last month that several times last winter the air temperature round Vostok Station on the Polar Plateau fell to minus 80deg Celsius, and Leningradskaya Station on the coast of Oates Land reported winds up to 170 miles an hour.

During the year members of the expedition made the traditional close radio contacts with other stations, and visits were made to British, Australian, and other stations on the continent. An American geophysicist, Ralph Johnson worked at Vostok, and a Soviet meteorologist, Eduard Lysakov, spent the winter at McMurdo Station.
Lysakov, spent the winter at McMurdo Station.

After her maiden voyage to the Antarctic last season, the Mikhail Somov sailed from Leningrad to the coast of Greenland in the northern summer to take part in the Soviet North '76 expedition. Her captain, Mikhail Mikhailov, described the ship as rugged and ideal for Antarctic navigation.

On her maiden voyage the Mikhail Somov, named after the polar explorer who died in 1973, covered 39,000 nautical miles in seven months, more than 20,000 of them through the ice. She called at Bellingshausen, Leningradskaya, Molodezhnaya, and Mirny, and delivered some 1500 tonnes of supplies.

Mikhail Somov led the first Soviet Antarctic expedition in 1956, and also commanded North Pole II, the second Soviet Arctic station on the drifting ice. His name is also remembered in Antarctic where a section of the coast between the Ross and D'Urville Seas has been named the Somov Sea.

JARE REPORTS

Upper Atmosphere work at Syowa Station

A major scientific programme of upper atmosphere research will be continued by the 18th Japanese Antarctic Research Expedition (JARE-18) at Syowa Station and Mizuho Camp, about 300km to the south-east on the inland ice, in 1976-78. Six sounding rockets will be launched from Syowa Station next year in continuation of Japan's observations for the International Magnetosphere Study (IMS, 1977-79). Four men will winter at Mizuho Camp to carry out upper atmosphere studies and glacial-meteorological research.

Field activities from Syowa Station were resumed by JARE-17 scientists when the Antarctic spring returned. The JARE-18 programme for 1976-78 was initiated on November 25 when the ice-breaker Fuji sailed from Tokyo. After a call at Fremantle this month she is expected off the station on December 24.

There are 40 men in the JARE-18 winter and summer parties, and the Fuji will also take four summer visitors south. The leader is Dr Kou Kusunoki, who is a glaciologist, and head of the division of research in the National Institute of Polar Research. He will winter at Syowa Station next year. He replaces Associate Professor Sadao Kawaguchi, a meteorologist in the division, who was nominated as leader but had to withdraw because of illness.

ROCKET FIRING

Japan's three-year programme for the IMS will continue in February when the first of six sounding rockets will be launched from the launching facility south-west of the centre of Syowa Station. The rocket will be one of the newly-developed S-310JA type, which weighs 670kg, is 6.8m long, and has a diameter of 310m. Its payload is 40kg, and its peak altitude is 220km.

In March and April S-210JA rockets, which have a smaller payload, will be launched. The second S-310JA will be launched between May and June, and the last two S-210JAs between July and September. The smaller rockets have a peak altitude of 130km.

Signals sent from scientific satellites will be received by the auto-tracking reception system installed at Syowa Station in January this year. Other relevant research programmes of upper atmosphere physics will be carried out in addition to the reception of geophysical data from four satellites — ISIS I and II, and NOAA III and IV. These will include studies of the auroa and ionosphere, natural VLF waves, and geomagnetic variations.

Scientific programmes at Syowa Station will also cover various disciplines such as meteorology, seismology, geomorphology, glaciology, oceanography, geochemistry, sea ice studies, and medical science. A geodetic control survey will be made of ice-free areas, and the seismological programme will include the recording of natural earthquakes.

ICE-FREE AREAS

Scientists will study the submarine

geomorphology and geology in Lutz-Holm Bay where Syowa Station is located on East Ongul Island. Studies will also be made of the glacial geomorphology of ice-free areas in marginal parts of the bay, using an echo sounder and an ordinary survey instrument.

Activities planned at Mizuho Camp from February, 1977 to January, 1978, include studies of the aurora and ionosphere, VLF emission, and geomagnetic variations. The four men who will spend next winter there will continue the glacial-meteorological programme. They will make stratigraphic studies of the surface snow layer, micro-particle studies of ice cores, and surface meteorological observations.

During the same period geophysical observations will be made at an unmanned station which will be located at 69deg 35min S/42deg E. Equipment will be used to record geomagnetic variations and ionospheric absorption. An automatic weather recorder will make surface meteorological observations.

The summer party of JARE-18 will carry out marine science programmes aboard the Fuji, and upper atmosphere physics studies. Oceanographers will make temperature and salinity measurements, and current measurements, and chemical analyses of sea water.

MARINE BIOLOGY

This summer the emphasis will be on marine biological work. Benthic animals and sediment cores will be collected in Lutzow-Holm Bay, the clorophyll content of surface sea water will be measured, and ecological studies of phytoplankton and zooplankton will be made.

A documentary film to publicise the work of the Japanese Antarctic Research Expeditions will be made during the summer by Mr Kenzo Kano, of the Mainichi Eigasha Company. He will travel south aboard the Fuji as will two civilian shipbuilding engineers, Mr Mamoru Sato, of the Nippon Kokan Company, and Mr Shoichi Yabuki, of the Mitsui Engineering and Shipbuilding Company.

Dr S. Wartel, a Belgian geologist, of the Royal Institude of Natural Sciences, will also joint the JARE-18 summer party under the Antarctic Treaty programme for the exchange of scientists. The Fuji, which is expected to leave the Antarctic at the end of February, carries a crew of 34 officers and 148 men, including pilots for her three helicopters. She also carries a Cessna-185 aircraft, which will be used for air support at Syowa Station during January and February.

Captain Tsunezo Kuramoto, who commands the Fuji, is making his fourth Antarctic trip. The icebreaker will call at Port Louis, Mauritius, from March 13 to 18, and is expected back at Tokyo on April 20 after a call at Singapore.

Two scientists from the National Institute of Polar Research, Dr Katsutada Kaminuma (geophysicist) and Dr Keizo Yanai (geologist) will work in the McMurdo Sound area this summer. Dr Yosio Suzuki, of the Institute of Low Temperature Science, Hokkaido University, will join the Ross Ice Shelf Project in the same period, and Dr Tetsuya R. Torii will work in the dry valleys with two assistants. Dr Takesi Nagata, director of the Institute of Polar Research, will visit McMurdo Station and the Amundsen-Scott South Pole Station this month.

SUMMER PARTY (1976-77)

Dr Susumu Kokubun, a physicist from the University of Tokyo, is deputy-leader of the JARE-18 summer party. Other members of the expedition are: Takanori IMANISHI (physical oceanographer); Katsuyuki ODA (chemical oceanographer); Dr. Mitsuo FUKUCHI (marine biologist); Fukashi FUKUI (geochemist); Morihisa SUZUKI (geologist); Mikio SHIMAMIYA (civilian pilot); Takashi SUZUKI (aircraft mechanic); Mitsuhiko AKAHIRA (construction engineer); Koji NAKAMURA (general assistant).

WINTER PARTY (1976-78)

Itaru FUJISAWA, Yasuo YAMAKAWA, Toyoo ABE, Shizuo FUKUZAWA, (meteorologists); Noboru NISHIYAMA (ionosphericist); Shigeru OTAKI (surveyor); Masaru AYUKAWA, Susumu MACHIDA, Hitoshi YOSHIDA, Yoshinobu IWASHITA, Naomoto, IWAGAMI, Masao JYODAI, Takeshi TOYA, Jun'ichi SAKAMOTO, (upper atmosphere physicists); Kunimoto IWAI (meteorologist); Yoshiyuki FUJII (glaciologist); Kiichi MORIWAKI (geomorphologist); Dr Yoshihiro OGAWA, Dr Hiroaki FUJISHIMA (medical officers); Yoshiyuki SHIMAZAKI, Naomi ISHIDA, Hidekatsu SASAKI, Seiichi KANEKO (mechanics); Tokio MEGURO Takashi OGA, Masamichi HASEGAWA (radio operators); Shozo FUR-KAWA, Mizuho TOMITA (cooks); Kei TERAI (general assistant).

Taiwan Voyage

Taiwan has joined other nations in fisheries research in Antarctic waters. The research ship Hai Kung left Keelung last month on an experimental voyage which will last 70 days.

After a call at Cape Town the Hai Kung will spend 45 days in southern waters. According to the Taiwan Fisheries Research Institute, the purpose of the research is to develop Taiwan's fisheries.

For several years the Soviet Union and Japan have exploited the stocks of krill in Antarctic waters. Two other nations, Poland and West Germany, sent exploratory expeditions to study krill in the 1975-76 season. Norway and Taiwan have shown interest in harvesting the Southern Ocean's living resources. The Hai Kung is expected to concentrate on krill research.

Winter snow in high drifts at the entrance to the geodesic dome complex at the Amundsen-Scott South Pole Station. When daylight and fine weather returned the 18 men who wintered at the Pole this year had a lot of snow clearing to do.

U.S. Navy Photo

Norwegian Expedition To Visit Bouvet Island

Norway's first independent scientific expedition to Antarctica since 1960 will go south early next month. The expedition of about 24 scientists will use a small Norwegian icebreaker, the Polarsirkel, and will return early in March, visiting Bouvet Island for a few days on the return trip.

Organised and led by the Norwegian Polar Institute, the expedition will work in western Queen Maud Land and the eastern section of the Weddell Sea. The Polarsirkel will make a six-week cruise along the coast of Queen Maud Land and in the Weddell Sea, and participating scientists from various Norwegian universities and research organisations will carry out a detailed research programme.

Studies of energy fluxes, and of small-scale air circulation at the snow-air interface will be done on the Riiser-Larsen Ice Shelf. An automatic station reporting air pressure and air ground temperatures at various levels will be placed at Vestfjella.

Several automatic stations reporting positions, and in one case air pressure and temperature, will be placed in the northern Weddell Sea. All the automatic stations will transmit data by way of the United States Nimbus-6 satellite, and they will have the capacity to run for one year.

SEA ICE STUDIES

Mass balance and ice movement studies will be initiated on the Riiser-Larsen Ice Shelf, and ice cores will be collected at several localities. Ice thicknesses will be surveyed along a wide sector of the ice shelves bordering the eastern Weddell Sea, and sea ice studies will be conducted.

Detailed paleomagnetic and geological studies will be done on the Vastfjella volcanic sequences. Marine geological studies will be done in the eastern Weddell Sea by coring, dredging, and bottom photography.

During the Polarsirkel's cruise seismic, magnetic, bathymetric, side-looking sonar, and possibly gravimetric, surveys will be carried out. It is planned to place instruments recording currents and temperatures for one year at the edge of the continental shelf near 74deg S/38deg W. CTD soundings will be done along the whole cruise. Studies of the biochemistry and biology of krill will be made aboard the icebreaker.

Biologists will collect collembola and mites from Vestfjella. Geophysicists will conduct a gravity survey on the Riiser-Larsen Ice Shelf.

BOUVET ISLAND

Bouvet Island, where the expedition will call on its way home, has been a Norwegian possession since 1927. Situated at 54deg 25min S/3deg 24min E, it is perhaps the most isolated island or piece of land in the world. A circle with a 1600km radius drawn around the island would not include any other island or land mass.

A French expedition under Bouvet de Lozier discovered the island on January 1, 1739. Heavy pack ice and fog prevented Bouvet from determining the nature of his discovery. It was determined to be an island when sighted by two British whaling ships, the Snow Swan and Otter on October 6, 1808. Bad weather prevented a landing.

Captain George Norris with the Enderby whalers Sprightly and Lively

sighted the island again on December 10, 1825, and a landing was made on December 16. It was not until a party from the German deep-sea expedition ship Valdivia made a landing on November 25, 1898, that the nature of the land and its accurate position were made known.

Captain Harald Horntvedt, of the Norwegian research vessel Norvegia, visited Bouvet Island in December, 1927. He raised the Norwegian flag on the island, stayed about a month, made several landings, and left an emergency food depot.

ICE AND SNOW

Bouvet Island is a particularly inhospitable island. It is roughly 10km by 6km, and its highest peak is some 800m above sea level. Ninety-eight per cent of the island's surface is covered by ice and snow, and the remaining two per cent consists of exposed volcanic rock. The island usually has a cloud cover, and rain and snow often blur its outline.

Because of the island's isolated position, meteorologists of various nations have been interested since as far back as 1918 in the establishment of a weather station there. Since 1927 several expeditions have attempted to explore the island, but no station has been established.

In 1939 a South African meteorologist accompanied a British team to investigate the possible establishment of a weather station. The first South African meteorological expedition to Bouvet Island in 1955 did not have air support, and could not reach the highlands of the central plateau to inspect suitable sites for a manned station.

A helicopter reconnaissance of the island was made in 1958 by the United States Coast Guard icebreaker Westwind when it stopped there on January 1 en route from Capetown to Ellsworth Station. British and South African expeditions visited the island again in March-April, 1964. The South Africans had a helicopter, and the British scientific party had two. But bad weather permitted only one brief landing during a four-day period on the so-called Westwind Beach.

MANY LANDINGS

Good weather in February-March, 1966, favoured the third South African expedition which attempted to assess the feasibility of placing and maintaining a manned weather station on Bouvet. The research vessel RSA, which carried two helicopters, was supported by the South African Navy's ship Natal.

During a period of six days and a half of good weather, more than 100 landings were made at various points on the island, and meteorological, glaciological, cartographic, and geological observations were carried out. Two possible sites for a manned weather station were considered, one on the glacier surface, and the other on bare rock.

Undesirable or potentially undesirable features of both sites included the following: inaccessibility except by helicopter; confinement to very small area; possibility of volcanic action requiring rescue operations; and possible radical changes in the thickness of the ice cap from one year to another. Despite these disadvantages, South African scientists still cherish the idea of manning a station on Bouvet in collaboration with the Norwegians.

Dogs Get Wet

Scott Base traditionally has problems with drifting snow, but on December 14 water caused a minor emergency when a large melt pool in the sea-ice drained, flooding the dog lines. Staff found many of the 22 huskies knee-deep in freezing water — which was getting deeper by the minute.

The flood came when water from the melt pool about 100m long found it's way out through a crack in the ice. Surprisingly, the new lake disappeared overnight, probably draining through other cracks and hollows.

Duke of Edinburgh will open Antarctic Centre

Veterans of the Heroic Age of Antarctic exploration, representatives of the Antarctic Treaty nations, and scientists and others involved in exploration and research during the last 45 years, are expected to attend functions arranged to mark the opening in March next year of the Canterbury Museum's new wing of which the national Antarctic centre is an integral part. The wing will be officially opened on the afternoon of March 4 by the Duke of Edinburgh, whose interest in the Antarctic goes back more than 20 years.

Before H.M.N.Z.S. Endeavour sailed from Lyttelton for the Antarctic in December, 1956, Prince Philip dined aboard with Sir Edmund Hillary and members of the New Zealand section of the Commonwealth Trans-Antarctic Expedition. Sir Vivian Fuchs and some of his colleagues had told Prince Philip about the expedition a year earlier.

Prince Philip then decided to visit some of the British Antarctic Survey bases in Graham Land. He sailed there in H.M.Y. Britannia in 1956-57 and took as his guide and mentor the late Sir Raymond Priestley, who was acting director of the B.A.S. in the absence of Sir Vivian Fuchs. To visit the bases he transferred to the Royal Research Ship John Biscoe.

After his return to Britain, Prince Philip maintained his interest in the Antarctic. He contributed a foreword to an edition of Edward Wilson's diary of the Discovery expedition, prepared from the original manuscript in the Scott Polar Research Institute, and in May this year he officially opened the new headquarters of the British Antarctic Survey in Cambridge.

MUSEUM FUNCTION

Because of the limited accommodation, it will not be possible for all those with Antarctic interests to attend the formal opening ceremony. But on the evening of March 5 the Canterbury Museum Trust Board and the New Zealand Antarctic Society will be joint hosts at a function from 6 p.m. to 9 p.m. in the museum's Pacific hall. A general invitation is extended to members of the society and their wives to attend, and visitors with Antarctic interests.

Two veterans of Shackleton's Imperial Trans-Antarctic Expedition of 1914-1917 will be the guests of the Antarctic Society at the opening of the centennial wing. They are Messrs. R.W. Richards and I.O. Gaze, who, as young Australians, were members of the Ross Sea Shore Party whose task it was to lay depots for Shackleton's proposed crossing of Antarctica.

There are two veterans of Scott's Terra Nova expedition in Christchurch, Messrs W. Burton and W. McDonald, who were members of the ship's crew. They will be among the guests of honour. It is hoped to have members of other expeditions at the Antarctic function on March 5. Members of the Antarctic Society who may know of veterans of other expeditions in the period before 1956 are asked to advise their branch secretaries.

On the evening of March 4 the Canterbury branch of the society will hold a function to entertain members from outside Christchurch. It will also welcome Messrs. Richards and Gaze.

APPEAL FOR RELICS

Although the Canterbury Museum already has a comprehensive collection of Antarctic literature and relics of the Heroic Age of exploration, it still needs

material of historic interest. The Antarctic Society asks its members, and anyone in Antarctic exploration and research, to advise Mr David Harrowfield, who is the assistant curator in the national Antarctic centre, whether they have material which they would be willing to present or lend to the museum.

Of particular interest to Mr Harrowfield are tinned and bottled provisions with good labels which would be placed on shelves in the reconstruction of the interior of an historic hut. Personal diaries and reports of field work would also be welcomed; such records assume an historical value within a few years, and would form an important section of the Antarctic library.

There is a selection of material from various expeditions — in particular those associated with the Heroic Age — in the extensive collection of relics (many presented by members of the Antarctic Society). But the museum would still like to obtain clothing or equipment from the expeditions of Rear-Admiral Richard E. Byrd and Sir Douglas Mawson, and from the early years of Operation Deep Freeze.

French Deep-Drilling Project

A deep-drilling project on the Antarctic ice-cap in Adelie Land about 50km from the coast is included in the 1976-77 scientific programme of Expeditions Polaires Francaises. Glaciologists plan to drill to a depth of 1000 metres, and will take temperature profiles, measure the amount of gas and the structure of the ice crystals in the core samples, and later make geochemical studies of the cores.

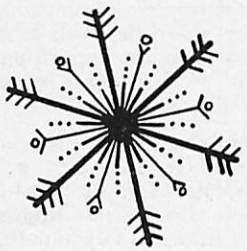
Relief of Sanae

Members of the 17th South African National Antarctic Expedition (SANAE) will be relieved early next month when the supply ship RSA arrives off Sanae in Queen Maud Land with SANAE 18 and supplies from Capetown. The RSA began the Antarctic and sub-Antarctic research season in October when she relieved the weather station on Gough Island, and called at Tristan da Cunha.

When the RSA left Capetown with 300 tons of freight, she carried a rather mixed crowd of passengers. Among the 31 on board were a team of meteorologists and an Australian biologist for Gough Island, two stud rams travelling to Tristan da Cunha, the island's one and only policeman, Mrs Albert Glass, and a new teacher.

Early in October the chartered Danish ice ship Thala Dan sailed from Le Havre with supplies for the 27th expedition. Members of the new summer and winter teams flew to Hobart at the end of last month to join the Thala Dan, which leaves for Dument D'Urville this month. It will relieve the 33 men who have wintered at the base.

A full programme of scientific work will be carried out during the season. It will include seismological observations, meteorology, and upper atmosphere physics. Biologists will continue their studies of the penguin population. In the 1977-78 summer a gravimetric programme is planned. Absolute measurements will be made on the edge of the crest from Dumont d'Urville, using a portable installaion for conversion of the figures under the control of the International Bureau of Weights and Measures.



British Expedition Plans Journey to Both Poles

Next year a British expedition will begin the first polar circumnavigation of the world. This 28,000-mile journey, using the Greenwich meridian as a basic route, is expected to end in the northern summer of 1980.

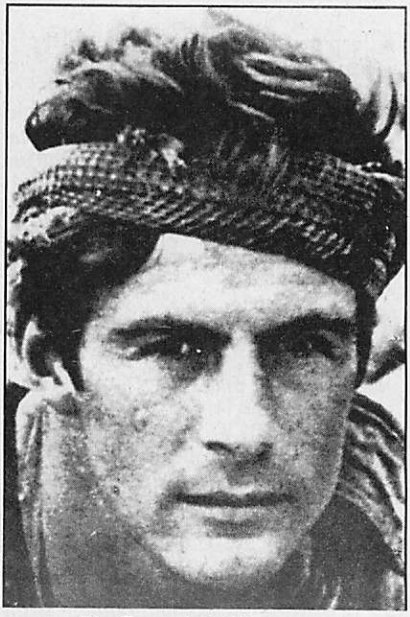
In the 1978-79 southern summer the Transglobe Expedition plans a crossing of Antarctic from the small South African base in the Borga Massif of Queen Maud Land to Scott Base by way of the South Pole. The journey will end with an Arctic crossing from Greenland to Spitzbergen over the North Pole, and back to Greenwich by sea.

Leader and organiser of the British Transglobe is a 32-year-old explorer, writer, and lecturer, Sir Ranulph Twistleton-Wykeham Fiennes. He joined the Royal Scots Greys in 1966, and spent five years in Europe training soldiers in cross-country skiing, mountaineering, and canoeing. For two years he was seconded to the Sultan of Muscat's forces in Dhofar.

Sir Ranulph Fiennes, who has retired from the Army, has led three major expeditions since 1969. His minor expeditions include crossing Norway by canor, and the Pyrenees by mule. The first major expedition was the British White Nile Hovercraft Expedition (1969) when Sir Ranulph Fiennes took six men and two mini-hovercraft up the 4000-mile course of the Nile from mouth to source.

In 1970 the British Jostedalsbre Glacier Expedition mapped the largest glacier in Europe for the Norwegian hydrological authorities. The expedition also made the first descent of the Briksdalsbre Glacier. To complete its survey and other scientific work in the short summer season the expedition and its equipment were dropped by parachute from 10,000ft.

Sir Ranulph Fiennes was asked by the Royal Scots Greys in 1971 to lead the Headless Valley Expedition which made a 2800-mile river journey across British Columbia from the Yukon to the United States. With a team of 10 the journey was completed in five months.



Sir Ranulph Fiennes

TO NORTH POLE

Planning for the Transglobe Expedition began in 1972, and this year the expedition team, selected from 42 volunteers, has been training on the

Greenland ice-cap to prepare for the Antarctic crossing. In January-May next year a return journey will be made from Ward Hunt Island to the North Pole.

Only three men will take part in the polar sectors of the expedition. They will use two snow vehicles which will tow 8ft stainless steel sledges. Air support will be provided by a de Havilland Twin Otter aircraft which will be used to parachute supplies and replace any members of the team "should any deaths occur."

On the first stage of its journey the expedition will leave Greenwich in August, 1977, and expects to reach Cape Town in November. Then it will use a small fishing trawler with sails and engine, and "icebreaking capacity" to reach the South African base, Sanae, in January, 1978. It expects to reach the Borga Massif 350km south of Sanae in March.

WINTER AT BORGA

After wintering in prefabricated huts at Borga Base, the ice group of three men will begin the crossing of Antarctica in October, 1978. The group expects to reach the South Pole late in January, 1979, and leave early in February for Scott Base where it expects to arrive in mid-March.

Advance publicity for the expedition says that the group will follow Amundsen's route to the South Pole in reverse, including a journey down the Axel Heiberg Glacier. From Scott Base the expedition will continue to Christchurch, Sydney, Fiji and the Aleutian Islands.

A 2000-mile detour through the North-West Passage will be made to Ward Hunt Island on the edge of the Arctic Ocean, and the Arctic crossing will begin in late January, 1980. Reaching the North Pole in mid-March, the ice group will cross to Spitzbergen.

All six members of the Transglobe Expedition have had training in signals, mechanics, medicine, and astro-navigation. The ice group consists of Sir Ranulph Fiennes, Charles Burton, and Oliver Shepard. Lady Virginia Fiennes, who accompanied her husband on the Headless Valley expedition, Geoffrey Newman, and Mary Gibbs, make up the support group.

SCIENTIFIC WORK

On its journey across the North and South Poles the expedition will take temperature and humidity readings, and measure the concentration of ice nucelei in the atmosphere for the British Meteorological Office. It will also take water and snow pollution samples daily along the Greenwich meridian route.

One object of the expedition will be to promote the exports of 400 sponsoring companies, 94 per cent of them British, who have provided equipment or services. Sixteen trade exhibitions and demonstrations will be held on or near the expedition's route. Two are planned in New Zealand in Christchurch and Wellington in 1979.

JAPANESE PLAN

A solitary journey across Antarctica is contemplated by a 35-year-old Japanese adventurer, Naomi Uemura, who completed a 12,000km journey alone across the Arctic by dog sledge in May this year. His trek took 18 months.

Uemura, who is also an alpinist, climbed the highest peaks of five continents, including Mt Everest, before his Arctic adventure. He left Kekertuk, Greenland, at the end of December, 1975, and arrived at Kotzebue, Alaska, on May 9.

Uemura is now preparing a book on his journey. He told a press conference in Tokyo that after this work he may contemplate a similar trek across Antarctica.

TOURISM

Flight To South Magnetic Pole

Sixty-eight years ago three members of Shackleton's 1908-09 expedition, Douglas Mawson, Thomas Edgeworth David, and Alistair Forbes Mackay, man-hauled their sledges 1260 miles to establish the position of the South Magnetic Pole on the Victoria Land plateau at 72deg 25min S/ 155deg 16min E. On Sunday, February 13, next year Mawson's grandson, Dareth Mawson-Thomas, and 289 other passengers will make a 12-hour flight from Sydney to the Magnetic Pole, now at sea off the George V Coast, and back.

An Australian international airline, Qantas, will operate a special charter flight to the Magnetic Pole for a Sydney electronics engineer, Mr Dick Smith, who decided to provide the opportunity for "anyone in the world who has always wanted to go to the Antarctic for the day", and is prepared to pay $230 (economy class) and $295 (first-class) in Australian currency for the privilege. The response was so great that Qantas had to replace the original Boeing 707 aircraft with a Boeing jumbo jet.

Normally the Boeing 747B carries 398 passengers, but for the flight south it will carry 290 so that everyone at some stage during the flight along the Antarctic coastline will have a good view. Weather permitting, it is hoped that the aircraft will fly along the coastline at an altitude of 10,000ft to allow passengers to take photographs.

For the 8500km non-stop flight the Boeing 747B will carry abou 150 tons of fuel. It will leave Sydney at 10 a.m. and return about 10 p.m. that night. From Sydney it will head south to Macquarie Island, and when it reaches the George V Coast will fly over the mighty Mertz and Ninnis Glaciers, and then Commonwealth Bay, the windiest area in the world, where winds of up to 200 miles an hour have been recorded.

These names have an historic association with early Australian Antarctic exploration, and with Australia's most distinguished polar explore, Sir Douglas Mawson. After Mawson, his fellow-Australian, Edgeworth David, and Forbes Mackay, made their journey to the Magnetic Pole, Mawson returned to the Antarctic as leader of the Australasian Antarctic Expedition of 1911-1914. His main base was established at Cape Denison on the south side of Commonwealth Bay.

This expedition discovered the Mertz and Ninnis Glaciers, which bear the names of two men associated with Mawson in one of the most remarkable chapters in Antarctic exploration. The Mertz Glacier (67deg 30min S/ 144deg 45min E) which is 20 miles wide and more than 40 miles long, was named after Dr Xavier Mertz, a Swiss mountaineer, who was in charge of the expedition's Greenland dogs.

To the east of the Mertz Glacier is the Ninnis Glacier (68deg 25min S/ 147deg 05min E) which is also 20 miles wide, and even longer than the Mertz. It was named after Lieutenant B.E.S. Ninnis, of the Royal Fusiliers, who also looked after the expedition's dogs.

Both men died in a sledging journey east over inland ice from the main base, which was led by Mawson. Ninnis disappeared with his sledge and dogs in a crevasse on December 14, 1912. Mawson and Mertz struggled on — they had to kill all their dogs for food — until January 7, 1913, when the Swiss collapsed and died. With a half-sled, the barest minimum of food, and simple navigational instruments, Mawson was left to make a solitary journey of 160 miles over treacherous and wind-lashed ice to Cape Denison. he began his homeward march on January 11, and arrived on February 8.

ANTARCTIC BOOKSHELF

ANTARCTICA: THE HEROIC AGE
by
George Finkel

Williams Collins Publishers Pty., Ltd, Sydney. 160pp, 16 illustrations, four maps. N.Z. price $6.95

This is yet another book with "Antarctica" as its principal title. Most of the photographs in it have appeared many times before, and the relatively short text deals with an extensive subject which has been written about separately and collectively in the past on many occasions. Also the author appears to have had no access to any new material.

All these elements could contribute to a recipe for an unsuccessful publication. But George Finkel, who completed his book just his death early last year, studied his subject for 10 years, and has produced a book which is the product of extensive research and deep reflection. His text is flowing and yet condensed, and he makes his points clearly. The conclusions he reaches are provocative, and some are new.

Finkel was born in England, and was an Australian by adoption. For more than 10 years he wrote books for children, historical fiction, adventure stories, and historical studies of the Australian States. During the Second World War he served in the Royal Navy. No doubt that is why almost half of his book is about Captain Scott.

Finkel's approach is summed up in his statement: "....for many years it was near heresy to question Scott or his methods. Any mistakes he made were glossed over by the tragedy of the death of his party". He concludes that the Discovery expedition was a far more successful operation than Scott's last expedition which is seen as a succession of misjudgments on his part.

He lists 10 mistakes made by Scott. One was that Scott commanded the expedition as if it were a battleship, and was only approachable through his four senior officers. One of the most telling sentences in the whole book is: "Professor Griffith Taylor has said that he never once spoke to Scott after his first interview".

Although Finkel acknowledges Shackleton's first expedition "achieved more than any other before or since," he is critical that Shackleton gambled with his own life and that of his men. Surely this was an almost inevitable hallmark of the Heroic Age.

Amundsen's lifetime achievements are neatly summarised in 19 pages. Finkel sees him as 'a professional explorer with greater experience than Scott. His two gambles paid off — making his base at the Bay of Whales, where it might have become part of a drifting iceberg, and finding a new route to the Polar Plateau.

Much of the material of the Heroic Age is only dealt with in passing. Scott's Northern Party (1912-13) which "at a time and place where fortitude is commonplace, had perhaps shown the greatest fortitude of all" (Finkel's words) deserves more space. Likewise, Shackleton's second expedition and Mawson's expedition (1911-14) surely fall within the ambit of this book.

Despite the lack of an index or a bibliography, the author has covered well-worn ground in a concise and interesting manner. Not everyone will agree with all his conclusions. But if the balance of the material dealing with the Heroic Age had been dealt with in the same manner, then this book would have been even more worthwhile.

R.G.M.