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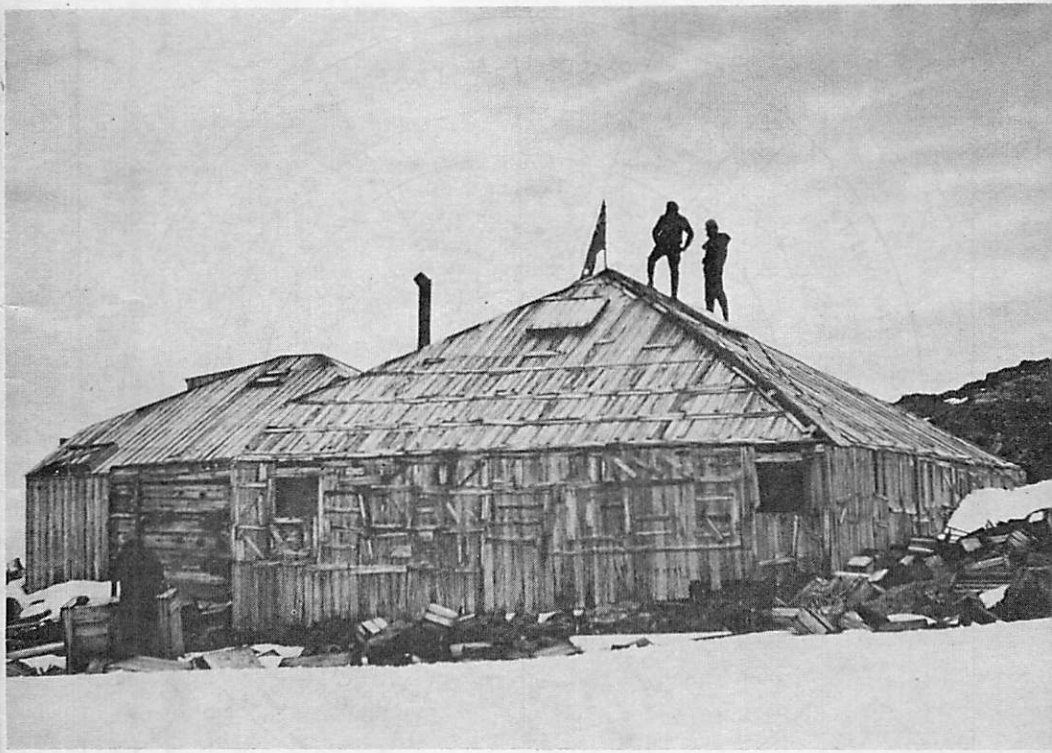

AN AUSTRALIAN FLAG FLIES AGAIN OVER THE MAIN HUT BUILT AT CAPE DENISON IN 1911 BY SIR DOUGLAS MAWSON'S AUSTRALASIAN ANTARCTIC EXPEDITION, 1911-14. WHEN MEMBERS OF THE AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITION VISITED THE HUT THEY FOUND IT FILLED WITH ICE AND SNOW BUT IN A FAIR STATE OF REPAIR AFTER MORE THAN 60 YEARS OF ANTARCTIC BLIZZARDS WITHOUT MAINTENANCE.

Australian Antarctic Division Photo: D. J. Lugg

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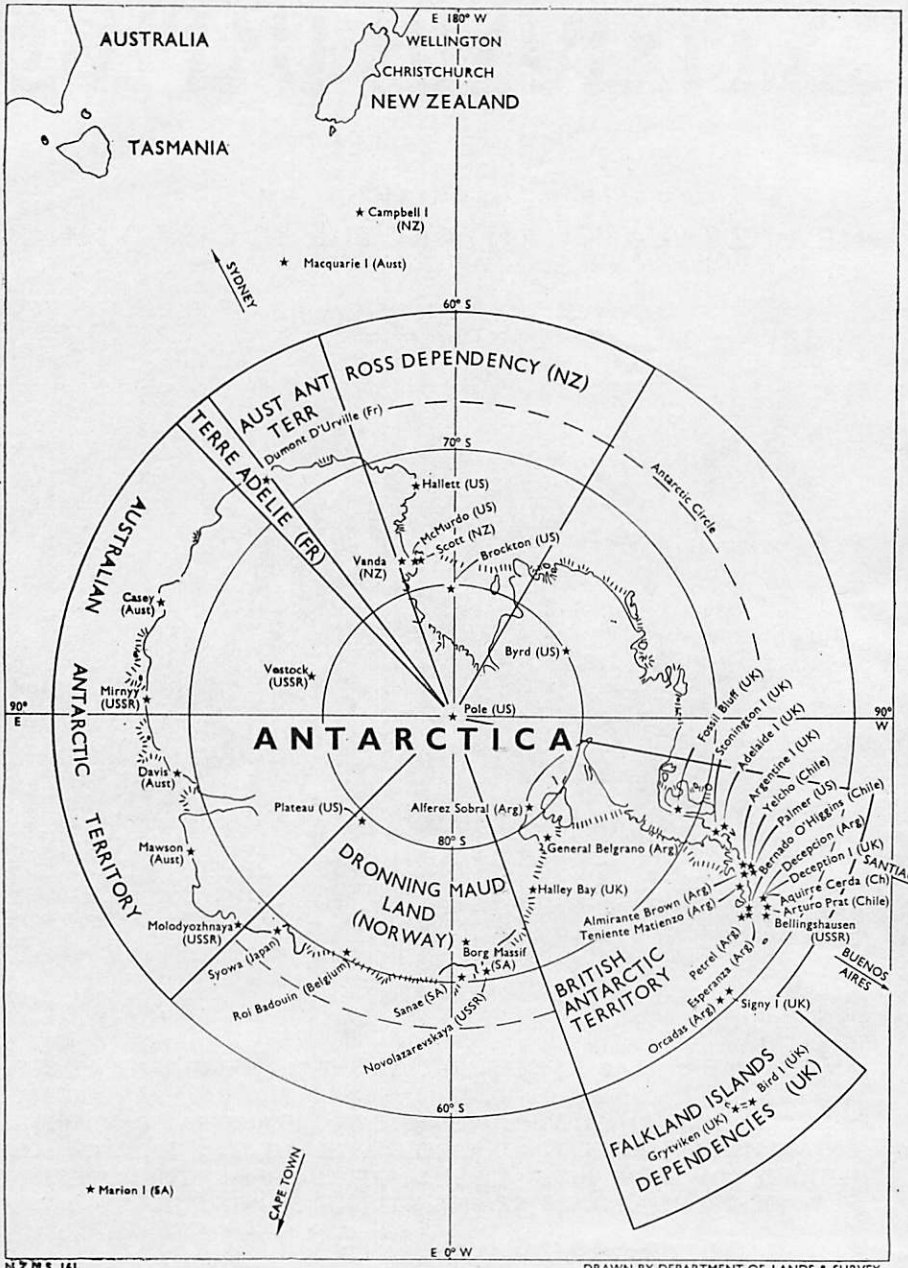

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"Midwinter's Day! For once, the weather rose to the occasion and calmed during the few hours of the twilight day. It was a jovial occasion, and we celebrated it with the uproarious delight of a community of young men unfettered by small conventions. The sun was returning, and we were glad of it. Already we were dreaming of spring and sledging, of the ship and home." Sir Douglas Mawson's words in "The Home of the Blizzard" were written 62 years ago. They are a reminder that several hundred men —and two women—of 10 nations will celebrate the same occasion this month, and, like Mawson and his men, look forward to the return of the sun.

WINTER DARKNESS FOR NEW ZEALAND TEAMS

Winter darkness fell over the Antarctic on April 24. Most of the 12 New Zealanders at Scott Base and the four men at Vanda Station in the Wright Valley watched the sun sink below the horizon at 12.45 p.m., knowing that they would not see it again until August 29.

Since the last aircraft left New Zealand on February 25 the men at Scott Base and Vanda Station have made all preparations for four months of darkness. Food has been stacked for the dogs at Scott Base, and huge piles of ice have been placed at the front and back of the base to provide a reserve water supply. The men at Vanda Station have prepared emergency lighting, heating, and cooking equipment in the refuge hut.

Winter parties in the Antarctic always have problems. This year there are two which concern the Antarctic Division, Department of Scientific and Industrial Research, in Christchurch. Long periods of calm weather in the Wright Valley have meant that there is only enough diesel fuel at Vanda Station to run the generating plants for two-thirds of the winter.

Mysterious husky deaths are the problem at Scott Base. Seven dogs—pups and grown dogs—had died in the three months to the middle of April. Only 16 dogs are left—enough for one sledge team and a half. The Antarctic Division's superintendent, Mr R. B. Thomson, says this is the worst period of dog ill-health to have been experienced at the base, and the reason is not known.

Because there has been no wind for 30 consecutive days at times the wind generators at Vanda Station have not been working, and the diesel generating plants have been running all the time. To conserve fuel it is likely that the generators will have to be cut off occasionally. Mr Thomson says this will not affect the scientific work, but it will affect the creature comforts. There is a reserve of propane gas at the station which might have to be used to heat the buildings.

This is the third winter that research has been carried out at Vanda Station to establish, among other things, the normal climate of the Wright Valley. During the first winter there was little wind and temperatures were reasonable. Last winter there was considerable wind, and temperatures were low. Mr Thomson says this winter seems to be following the climatic pattern of the first.

HUSKY DEATHS

In December last year one of the huskies, Vaska, gave birth to six pups, and five survived. She rejected one, which died soon after birth. The previous year Vaska rejected her entire litter and ate her pups. Of the latest litter three bitches survive, and now weigh more than 40lb each.

An older bitch, Uglan, gave birth to nine puppies towards the end of February. Three were born dead, and of the remaining six only two survive. They live in a box in the sledge room at the base, and are fed milk and minced meat several times daily. But in March Uglan began to fail, and died within a few days. Mr Thomson says that when the pups started to die it was thought that some inbreeding might be the cause, but the older dogs which died should not have been affected by this problem. Now the Antarctic Division hopes to buy four huskies from the United States next summer, although they are not easy to obtain, and their price, $1200, and transport will be expensive. Artificial insemination will

also be considered. It works well with cattle and sheep, and Mr Thomson sees no reason why it should not work with dogs.

Before total darkness fell the men at Scott Base were able to do survival training, climbing, and crevasse work, exercise the dog teams, and field test some modified snow toboggans. These were bought from the American engineer, Mr W. Pederson, who once planned to drive them overland from McMurdo Station to the South Pole. They have been modified because they travel too fast, and do not work in extreme cold.

In the first winter newsletter the leader, Mr H. W. E. Jones, reported that most of March had been spent preparing for winter. The dog lines had been moved closer to the base, seal carcases cut up with chain saws for dog food and stacked nearby, and a multitude of leaks in the buildings caulked and plugged.

Although the weather in March was overcast with poor visibility, there were a few fine periods. During these the men were able to observe the usual Antarctic phenomena—mirages manifesting themselves as towering ice cliffs, parahelia or sun dogs in the air full of ice crystals, and auroras in reds, greens, and blues spanning the sky.

JULIE AT WORK

On March 28 two members of the team, Messrs A. Atkinson and S. Clarke, put Julie out in the snow. But she did not mind. Julie is a photometer which will run at intervals through the winter to find out much man-made light there is near the base and at Arrival Heights three miles away.

Julie was built in the physics and engineering laboratory of the auroral station at Lauder, Central Otago. Readings from it during the winter will help scientists to decide whether highly sensitive optical equipment for measuring auroral and airglow emissions can be installed in the Ross Island area.

The photometer measures the intensity of light as it scans the horizon. If it finds that the man-made light is not too great, future equipment which may record images and directions as well as intensity, will yield data which, when combined with other information about the earth and its magnetic field, could increase understanding of the interaction with the earth of high speed particles given off by the sun.

Scientists need this information to help them predict short-wave radio conditions, and to forecast magnetic storms for space vehicles. An understanding of the interaction could also assist progress towards power generation by nuclear fusion.

Caretakers for huts

Two members of the New Zealand Antarctic Society will have the opportunity to go south next season to act as caretakers of the historic huts at Cape Royds, Cape Evans, and Hut Point. Applications are now being called for two men to spend three weeks in the Antarctic, starting early in December. There have been caretakers working from Cape Royds for the last five summers.

The Antarctic Division of the Department of Scientific and Industrial Research, which will provide special clothing, transport, food, and accommodation, has suggested certain qualifications of value to anyone applying.

These qualifications include interest in one or more of the Antarctic research projects, particularly biology or meteorology, and knowledge of and interest in the historic huts at Cape Royds and Cape Evans, and the conservation of fauna and flora. Other suggestions are that applicants should have practical experience in some trade profession, and mountaineering and/or tramping experience.

The two caretakers, who will be required to attend the training camp at Tekapo for the Antarctic research team, will be selected from a panel of representatives from the society, the superintendent of the Antarctic Division, and the leader at Scott Base for the 1974-75 season. Applications can be sent by South Island members to the secretary of the Canterbury branch, P.O. Box 404, Christchurch. North Island members can apply to the Wellington branch secretary, P.O. Box 2110.

ROSS ISLAND ENVIRONMENT

Every effort is made by United States and New Zealand authorities in the Antarctic to protect property at historic sites from defacement or damage. Each summer Americans and New Zealanders working at McMurdo Station and Scott Base, and in other areas, are warned against disfiguring historic sites. Any New Zealander found to have defaced or damaged property faces expulsion from the continent by the first available transport, and the American authorities also deal severely with any of their men who commit similar offences.

These points were made recently by Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research, when he discussed complaints about the condition of the cross on Observation Hill erected as a memorial to Scott and his party, and the surroundings of the Discovery Hut on Hut Point, which were made by a correspondent to a Christchurch newspaper.

The correspondent said that the cross on Observation Hill was a sad picture with bolts removed, names carved on it, and pieces cut off for souvenirs. Deep hammer marks had given the cross a lean. Bulldozers had cut into the hill to give it a "civilised" look.

Shackleton Song

A song for a German television film about the Antarctic was recorded in Shackleton's hut at Cape Royds during the visit of the tourist expedition ship Lindblad Explorer in January this year. The song, "South", about Antarctic exploration, was composed by Mr Keith Shackleton, a British marine artist, who is a relative of Shackleton, and was a member of the scientific staff aboard the Lindblad Explorer.

Originally the song was to have been sung with New Zealanders at Scott Base. When the ship was unable to berth in Winter Quarters Bay, Mr Franz Lazi, maker of the film, recorded the song in Shackleton's hut. The singers were Mr Shackleton and Miss Sarah Urlwin, a hostess on the Lindblad Explorer, who also provided a guitar accompaniment.

The historic site of the Discovery hut was cut with roads, and covered with fuel storage tanks and buildings, which showed lack of any foresight in planning.

Mr Thomson, who is a member of the McMurdo Land Management and Conservation Board, said that the cross on Observation Hill did bear the names or initials of people who had visited it, but where any had been traced those concerned had been dealt with by the respective authority. To dissuade people from carving their names, a visitors' book had been placed in a box half-way up the hill in 1969. Since then several hundred visitors had signed the book.

The cross has been on the lean for some years, mainly because of some movement at the base, and batterings by the wind. But Mr Thomson said that next summer it was planned to reset the cross in a concrete base on its present site. Bulldozers have cut into the hill, but this was done in 1962 to make an access road to the site of the nuclear power plant on the lower slopes.

Landscaping is not possible in Antarctica, according to Mr Thomson. Once a cutting has been made into the surface of the ground it remains there for all time. It cannot be disguised by the use of trees, shrubs, or other artificial means which can be applied anywhere else.

Mr Thomson said that in recent years a lot of the old buildings used by the United States support force had been pulled down and replaced by new buildings as part of a development plan for the whole of McMurdo Station. However, because of the need for access to the ice wharf in Winter Quarters Bay, roads to it had, of necessity, been established.

RELICS STILL IN STABLE AREAS OF TWO HUTS

When New Zealand restoration parties worked in the three historic huts on Ross Island in 1960-61 and 1964, they recovered many articles of historic interest, particularly at Cape Royds and Cape Evans, after they had excavated compacted snow and ice which had accumulated in the buildings over the years. Since then the huts have been maintained by the Antarctic Division, Department of Scientific and Industrial Research, with the assistance of caretakers from the New Zealand Antarctic Society.

Each summer since 1969 the caretakers have made fresh discoveries both inside and outside the huts. When warmer weather has melted the ice more material has been exposed, and from what appears to be debris at first sight historic items have been recovered. The caretakers have added archaeology to their duties, searching carefully as they excavate the ice for items which will help to tell the whole story of how men lived in the Antarctic 60 to 70 years ago.

Last summer the caretakers were Mr L. E. Kerr, of the Canterbury branch of the Antarctic Society, and Mr G. E. Madgwick, of the Wellington branch. When they went to Shackleton's hut at Cape Royds they uncovered some interesting items in the permafrost of the floor of the stable in which the expedition housed its ponies. In their report to the Antarctic Division they say that it seems apparent that a wealth of undiscovered relics can still be found in the stable areas of the huts both at Cape Royds and Cape Evans.

When the caretakers excavated in the ice below the north-west window of the hut at Cape Royds they discovered the original shutter. It was well constructed of 4in by 1in timber, and was in an excellent state of preservation. Excavations in the stable side of the hut revealed in the permafrost of the floor pieces of pony harness and a large felt boot with a cleated sole of a type not exhibited in the hut. The harness was hung on the outside wall, and the boot added to the hut collection.

Unfortunately, the rate of thaw—about an inch a day—was too slow to permit Messrs Kerr and Madgwick to make a comprehensive search of the remaining foot or so of the debris on the floor. Many articles of pony harness and clothing are protruding from the ice, and can be removed only slowly and carefully if serious damage is to be avoided. A halter, partly revealed, was covered with an old piece of tarpaulin to give future caretakers a chance to complete its removal before it is covered with ice again.

A puzzling pile of iron hoops and castings lying outside the hut was resolved, after considerable experiment and speculation, into the shape of an elaborate heating stove of the Emperor No. 8 type. The cylindrical barrel of the stove was missing, but pieces of wood served as formers to permit a fair assembly of the ornate iron castings. Apparently, this stove was never used during Shackleton's time.

A small ice anchor, weighing some 60lb, and apparently from Shackleton's Nimrod, was brought to the hut entrance from its location among the rocks between the hut and Backdoor Bay. In this location it will be seen and appreciated by more visitors to the area.

Parts of what seemed to be a wheeled unit for conveying stores were discerned in the scoria, and a wheel hub, a piece of bicycle tyre and tube with valve attached, were salvaged and placed in the hut, suitably labelled. The rusting remains of the vehicle were outlined on the ground, and measured some 3ft 6in by 9ft, and seemed to be made of tubular bicycle framing. The device appeared to be a two-wheeled "barrow" of some sort, and the caretakers

suggest that research through Antarctic literature could, perhaps, prove enlightening.

Pony Lake was a disappointment last season because the water level was too high, and the lake was covered with ice for most of the time the caretakers were at Cape Royds. But a rake included in their equipment was useful to remove broken glass littering the area, and unsightly fragments of wood and wire. It was used also to uncover the odd pieces of interesting material from the scoria surface nearby.

In the hut area, which was tidied generally, the rubbish consisted mainly of splinters and small scraps of wood, and food tins which had rusted right through. A great deal of the stores, now free of ice and snow for some weeks of the year, were found to have deteriorated as had the maize and hay used to feed the ponies.

Because of the considerable snowfall in October last year, the caretakers found that deep drifts had been left over the area round the hut at Cape Evans. This made it difficult to locate objects around the hut. But several items were found, including an iron ice probe 7ft long with part of a sewn canvas cover still attached, and the missing 2lb weight from the scales in the hut. The probe was placed along the outside western wall of the hut near the entrance, and the weight was returned to the net in the kitchen corner of the hut.

Various items of clothing were located. Some were only scraps, but a black woollen helmet of the era was found to be in very good condition. This, and a grey jersey found outside by Mr J. Lowery, of the New Zealand Geological Survey, on a visit from Scott Base earlier in the season, were placed inside the hut on the bunks.

Also recovered were several "electrical" instruments and pieces of scientific apparatus from adjacent areas. These, too, were placed in the hut. The outline of the top of a box containing rock specimens was noticed emerging from the permafrost near the entrance, but time did not allow for its excavation.

While the caretakers were at Cape Evans they made short excursions on fine, calm evenings to places of potential interest indicated on the early maps of the area. One such trip was made to the site of the Bertram meteorological station of Scott's time, half a mile to the east of the hut past the Dreadnought Mound on the lower slopes of Mount Erebus, and through the "Lost City" area of volcanic formations. But because of the drifted snow no sign could be found of this or other cairn sites on the south shore of the cape.

There will be less disturbance of nesting birds in the Adelie penguin rookery at Cape Royds in future. During their stay the caretakers re-located the landing area for helicopters from McMurdo Station. The landing pad is now 200yds further away from the rookery.

A careful count of the birds showed that there were 2,168 Adelies in the rookery. Probably 40 to 50 more would have been in transit to and from the sea at the time. During their stay at Cape Royds Messrs Kerr and Madgwick recorded numerous skuas, two terns, five killer whales, and one leopard seal. On their flight to Cape Evans 1400 Weddell seals were counted from the air. On one occasion a solitary Adelie penguin was seen stolidly trudging southwards 10 miles from the ice edge.

Reconnaissances for future expeditions were made by the Waikato University expedition last summer during the time its members worked in the Taylor Valley, one of the dry valleys west of McMurdo Sound. One trek was made across the Koettlitz region from Buddha Lake to Trough Lake by Professor A. T. Wilson, director of the university's research unit, and Dr T. Healy.

The second trek was from Lake Joyce in the Taylor Valley to Lake Vanda across the Asgard Range. This was made by Professor Wilson, and Messrs J. Gumbley and C. Reynolds.

MAN AND DOG SLEDGE HARNESS

"Trudging along hour after hour, and day after day, with a canvas harness over the shoulders and round the waist is a rather fantastic experience. I was tied to one side of the sledge with an 8ft rope, and Haywood similarly tied to the other. Joyce was in the lead at the end of a rope about 25ft long, behind him Mackintosh, Spencer-Smith and Wild were attached to this rope by harness, and then behind them again the four dogs whose harness was likewise tied to the central rope."

So wrote R. W. (Dick) Richards in his account of the experiences of Shackleton's Ross Sea shore party of 1914-17. Fifty-six years later, the man and dog harness used by the heroic depot-laying party was located at Cape Evans by two New Zealand Antarctic Society caretakers, Messrs R. G. McElrea and H. Burson. They placed this rare relic of a gallant and little-known chapter in Antarctic history in Scott's hut at Cape Evans.

Later Mr McElrea wrote to Dick Richards, one of the last two survivors of the Ross Sea shore party, and sent him a photograph of the harness. He positively identified the harness shown in the photograph above as " . . . undoubtedly ours. All of our sledging was manhauling assisted by four dogs." (These dogs were Con, Gunner, Oscar, and Towser). And he explained the unusual arrangement of straps and toggles in the harness. The leading man was followed by two dogs, followed by two men, two dogs, and two men immediately in front of the sledge.

Now 80 years old, Dick Richards lives at Point Lonsdale, a pleasant bush resort 70 miles from Melbourne. He, and another Australian, A. O. Gaze, are the sole survivors of the shore party. Recently he was visited by Dr R. S. Duff, director of the Canterbury Museum, who asked him to identify two albums of faded photographs presented to the museum by Dr John Middleton, of Lily-dale, Melbourne, whose father, Dr F. G. Middleton, then just graduated in medicine, was surgeon

aboard the Aurora, which rescued the seven survivors of the shore party on January 10, 1917.

Dick Richards is still hale and hearty, and he was able to identify all the photographs of his party immediately—even dim shadows—and the dogs. He was interested to know that the party's motor sledge would be housed in the museum, and pointed out in a photograph its packing crate converted to a kennel with Bitchie peering out. Bitchie was one of two bitches, the other was Nell.

Mr Richards not only identified the two albums of photographs for Dr Duff; he has agreed to provide copies of his diaries for the museum's Antarctic centre. Copies of the diaries Dr F. G. Middleton kept on the Aurora's relief voyage will also be made available by Dr John Middleton.

Observation Hill climb

Clambering to the top of 730ft Observation Hill at McMurdo Station was a popular fitness pastime for sailors, scientists, and visitors to the station last season. From the site of the nuclear power plant, half-way up the hill, the incline averages 63deg. The average climber takes 16 minutes to reach the cross at the top, and about seven minutes to get down.

There is a record for the climb to the summit and down again—8½ minutes—set by Lieutenant E. R. Wilgress, the United States Navy's VXE6 Squadron doctor, in December, 1972. Since then there have been many attempts to beat the record.

Lieutenant Wilgress believes that the climb to the top of Observation Hill, plus the walk to the beginning of the climb—about half a mile from any point round McMurdo Station—can be used to good advantage in meeting the general health and fitness requirements of the Navy's training.

Scott Base leader

The leader of New Zealand's Antarctic research team for 1974-75 will be a former Royal New Zealand Navy electrical engineering specialist. He is Mr J. A. Newman, a company secretary, of Auckland.

Mr Newman, who is 41, was born in Hamilton, and was educated at Morrinsville College. He served in the Royal New Zealand Navy from 1949 to 1957, and was specialised in electrical engineering and electronics. During his naval career he was on active service in Korean waters on two occasions during hostilities. As a member of the crew of H.M.N.Z.S. Black Prince he attended the Queen's coronation in 1953.

After his retirement from the Navy Mr Newman joined the engineering staff of the Egmont Electric Power Board. He remained there until 1966 when he went into business on his own account. In 1968 he entered local body politics and was elected a member of the Franklin Electric Power Board.

Mr Newman is an experienced mountaineer. He is a member of the Mt Egmont Alpine Club, and has had four years' search and rescue experience in the Taranaki area.

This month Mr Newman took up his appointment with the Antarctic Division, Department of Scientific and Industrial Research. He will leave Christchurch early in October to relieve Mr H. W. E. Jones, the present leader at Scott Base.

TREATY BREACH

A New Zealand mouse committed a breach of the Antarctic Treaty last summer—it introduced itself to the continent in a cargo consignment flown south from Christchurch. The penalty was death by starvation at McMurdo Station.

CANTERBURY UNIVERSITY

Mummified seals recorded in Taylor Valley survey

Population studies of Weddell seal colonies in McMurdo Sound, and a survey of mummified seals in the Taylor Valley, one of the dry valleys on the west side of the sound, were included in the field programme of the University of Canterbury Antarctic unit during the 1973-74 summer. In his report the director, Professor G. A. Knox, says that this was the unit's 12th expedition to the McMurdo Sound region. The two programmes carried out were seal research, working from Scott Base, and research on marine biology and ornithology at Cape Bird.

Members of the expedition were in the Antarctic from November 23 to February 3. The Cape Bird party was led by a marine zoologist, Mr P. M. Sagar, who had with him another marine zoologist, Mr J. Early, a limnologist, Miss Joy L. Woods, and an ornithologist, Mr C. D. Paulin. The leader of the seal research team was a zoologist, Mr I. T. Clement, who had with him two field assistants, Messrs G. Brehant and R. Newland, from the Antarctic Division of the Department of Scientific and Industrial Research.

In his general report on field activities at Cape Bird station Mr Sagar says that when the party arrived at Scott Base it discovered that its cargo of essential scientific equipment had not arrived. He, Miss Woods, Mr Paulin, and Mr W. Johnson, the Scott Base engineer, flew by helicopter to Cape Bird on November 25 to open the station.

On December 22 the cargo of scientific equipment finally arrived at Scott Base, and was flown to Cape Bird the next day. The month's delay in arrival of this equipment severely restricted the programmes of Messrs Sagar, and Early, and Miss Woods. But after it arrived all study programmes went ahead with no major interruptions. Biological activity having continued in the absence of the equipment, however, lost ground could not be made up.

Two helicopter flights were required to close the station on February 2. The second flight stopped at Cape Royds for an hour to allow Mr Paulin time to obtain gut samples of Adelie penguins breeding there. On February 4 the expedition returned to Christchurch.

Mr Sagar's project was an ecological study of Paramoera walkeri, a very abundant sub-tidal amphipod crustacean. This developed out of a preliminary investigation completed in the 1971-72 summer, and was divided into two parts. In the first part samples were taken at weekly intervals from December 5 to January 30. This was done by hand-hauling an epibenthic sledge across a bay formed in the push-ice. An attempt was made to haul the sledge across a similar stretch of bethos each week but this was not always possible because of variable sea-ice conditions.

After hand sorting the specimens were preserved and later brought back to New Zealand for detail study. This will include length and weight measurements, sexing, morphological studies of the various stages, growth studies, gut analyses, and epizean studies.

SAMPLES TAKEN

The second part of the programme involved the study of live animals in the wet laboratory. This was restricted by the late arrival of the scientific equipment.

When the equipment finally arrived little difficulty was experienced in maintaining the Paramoera, except for a short period of extremely high air temperatures which heated the aquarium water to 6deg C. Sixty animals were isolated individually, and length and weight measurements were made each week. Notes on swimming feeding behaviour were also taken. Besides the collection of Paramoera, samples of other amphipods were taken and preserved, and also samples of the periphyton, the food source of Paramoera.

Mr Early investigated both the phytoplankton and zooplankton in shallow water at Cape Bird. Samples, taken at intervals of four days from early December to late January, were collected in plastic buckets from the fast ice in water up to one metre deep. The phytoplankton was studied from the aspects of standing crop and productivity.

Zooplankton standing crop was estimated by direct counts of species and dry weights of the macro zooplankton. In January a near complete set of samples was taken at four-hourly intervals for 24 hours in water eight metres deep. These samples were analysed to investigate the possibility of diurnal changes in the zooplankton composition.

Three lakes were selected for freshwater studies by Miss Woods at Cape Bird last season. However, as this work was to include seasonal ecological studies similar to the study on Bird Lake by Mrs Barbara Spurr in the 1970-71 season, the programme was several times curtailed by the delay in the arrival of the essential equipment. Work was not begun until December 26, and by this time the lakes were unfrozen and the animal and plant populations well-developed.

Penguin Pond is a small, shallow temporary pond in the northern penguin rookery where the Antarctic rotifer Philodina gregaria was very abundant during the summer. This pond was sampled twice weekly, and measurements taken.

Green Lake is a permanent lake in the moraines behind the hut, about 450ft above sea level, and looks very similar to Bird Lake. Sampling was carried out weekly at three depths, and a diurnal study was undertaken on January 20 and 21. Sampling was also carried out weekly at two stations on Harrison Lake. It is a large, shallow temporary lake south of the hut, and inland from Harrison's Bluff.

A water sample from each of these lakes, and from some other lakes around Cape Bird, were frozen and sent back to Christchurch for detailed chemical analysis.

In the laboratory plankton and algae samples were examined live, and the material identified as far as possible. The samples were then preserved and brought back to New Zealand for further analysis. Many thousands of Philodina gregaria were collected and kept alive in the laboratory, and then brought back alive for experimental purposes.

PENGUIN STUDIES

Weight and bill measurements of 300 Adelie penguins leaving the colony and returning from fishing were taken by Mr Paulin. He measured ten birds every two days. His studies indicated that the Adelies were taking an average of 100 to 800 grams of food on each feeding trip.

Stomach samples were collected from 17 birds. Eight of these were complete, collected from birds which had been injured by leopard seal attacks, and had escaped to die on the beach. The remaining nine samples were collected by use of a stomach pump.

Hourly counts were made of birds leaving and returning to the rookery between December 15 and January 5, and January 12 and 14. A distinct cycle was recorded with peaks of activity at 2 a.m. Only birds leaving the rookery showed this rhythm.

Skeletons of dead birds found on the beach were collected and cleaned. Four Emperor penguins, five Adelie penguins, and eight skuas were obtained complete. In addition a large number of isolated bones was collected, including those of snow and Antarctic petrels.

All skua chicks, with the exception of six that were too small, between the north ice-cap and Priapulus Point, were banded—90 in all. Shortage of time prevented a small number of chicks south of Priapulus Point being banded. Three tapes were made of penguin and skua calls. Wind noise prevented taping from being carried out on most days.

From December 17 to February 6 Mr Clement carried out a Weddell seal programme from Scott Base. He continued population studies, assessed the feasibility of a behavioural study of the Turk's Head colony, surveyed and mapped the mummified seals of the Taylor Valley, and supervised the killing of seals and the collection of data from them.

Resighting and counting the seal populations took almost three weeks, three census flights being made by helicopter. In December most of the seals in colonies between the Erebus glacier tongue and Cape Royds were visited, seals counted and tag combinations recorded.

With two assistants Mr Clement spent three days at White Island from December 31, and made an extensive survey to locate all the seals of the isolated population there. Another survey was made in early February by a party from Scott Base. In early January Mr Clement made an unscheduled trip to Cape Royds, and on the return journey to Scott Base was able to visit most of the colonies along the west coast of Ross Island again.

Remains of more than 60 seals were recorded and mapped by Mr Clement and an assistant during the five days they spent in the Taylor Valley in mid-January. Samples were taken from several for Carbon 14 dating. The time was long enough to cover most of the valley floor but a large area of the slopes remains unsurveyed. It is hoped to complete the mapping with the help of the United States Antarctic Research Programme at Lake Bonney in the coming season.

Mr Clement spent three days at Turk's Head from January 20 to 22. But a wide moat of open water between the land and sea ice prevented the party from moving off the promentory. The seals had nearly all dispersed from the area, moving back into more stable cracks at the base of the Erebus glacier tongue.

The remaining week of January was spent at Cape Bird. Several censuses were made along the length of the beach, and untagged seals were marked for identification.

During the time at Scott Base between field trips six seals were killed. The carcases were used for dog food, and data from the seals was collected by Mr Clement and Dr W. Featherston, of the University of Otago. In February three more days were spent on the main seal kill. The measurements and lower jaws of all seals were collected, and also the females' reproductive tracts.

New Edition of Antarctic Pilot

For more than 40 years the "Antarctic Pilot" has been accepted generally as the best guide to the Antarctic from the seaman's point of view. A fourth edition has been prepared by Captain G. A. French, R.N. (retd.) and will appear this year.

The first edition, published in 1931, was taken partly from South Atlantic directories, and partly from the "Indian Ocean Pilots." They dated back to the middle of the 19th century. Some of the information, like the descriptions of the South Shetlands by the Dundee sealer, Captain Robert Fildes, and Captain James Cook's reports were (and are still) included as the most accurate accounts available.

This early material was supplemented by much information gathered during the scientific voyages of the 1920's. Some of it was the work of Lieutenant-Commander R. T. Gould, who was a very thorough and meticulous Antarctic historian.

The second edition, issued in 1948, included the valuable list of Antarctic voyages started by Gould, and very much enlarged by Dr Brian Roberts, of the Scott Polar Research Institute. This was omitted from the third edition, published in 1961, and now can be found only in the "Polar Record" for 1958.

Dr Roberts, who served with John Rymill's 1934-37 expedition to Graham Land, is preparing an up-to-date and even fuller list of voyages which should appear in the "Polar Record".

B.A.S. ACTIVITIES

Director of survey flies to old Shackleton base

A reconnaissance of possible sites for future field work in the Shackleton Range was made by Dr R. M. Laws, director of the British Antarctic Survey, during his three months in the Antarctic last season. He flew there in one of the survey's de Havilland Twin-Otter aircraft, and also visited Shackleton, the old Commonwealth Trans-Antarctic Expedition base, established at Vahsel Bay on the Filchner Ice Shelf in 1956. The hut was found to be in very good condition with the radio masts and the apex of the roof still visible. It could be useful as an advance base if work is resumed in the Shackleton Range.

Dr Laws, who returned to Britain at the beginning of April, visited the seven occupied B.A.S. bases, and also a number of field parties and some unoccupied bases. and also a number of field parties and some unoccupied bases. He left behind for the winter 88 men. Four of them are at Fossil Bluff in George VI Sound, and the rest are at the six main bases, one of which is the new complex of buildings at Halley Bay.

At the end of January Dr Laws arrived at Halley Bay in the Royal Research Ship Barnsfield. In the next two weeks he supervised the final stages of the transfer to the new complex. He also made the reconnaissance flights inland to the Shackleton Range in the Twin-Otter, which arrived from Adelaide Island on February 6 to take the director across to the Antarctic Peninsula to join the P.R.S. John Biscoe.

On February 10 the Twin-Otter took off for Adelaide Island. The weather was generally good throughout the 7½-hour flight, but because of poor visibility over Marguerite Bay, the aircraft was diverted to Fossil Bluff. The two nights spent there enabled visits to be made to glaciologists and biologists working at sites 20 and 40 miles to the north. A geophysical party working in the mountains east of the sound was also visited on the flight to Adelaide Island.

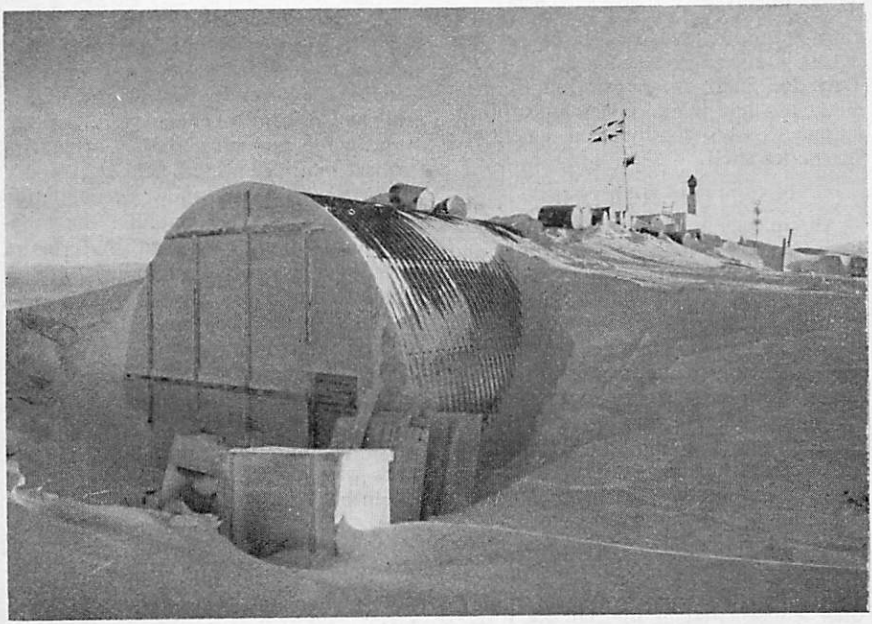
Dr Laws then spent two weeks in the Marguerite Bay area, during which the Biscoe relieved the Adelaide and Stonington Island bases (in stages, when weather and seas permitted), and spent some time sealing for dog food. This gave Dr Laws the opportunity to do some biological work.

Future field programmes were discussed with the base members, ship's officers and pilots. The Biscoe then proceeded north to the Argentine Islands base and the United States Palmer Station on Anvers Island. The new emergency snow landing-strip on nearby Doumer Island was inspected and found to be very satisfactory; it should be a great improvement on the old airstrips on Anvers Island.

The ship then returned to the Falklands, and Dr Laws and other members of the London office staff flew home by way of Buenos Aires, visiting the Instituto Antartico Argentino en route. The Biscoe arrived back at Southampton on April 25.

SUMMER VISITORS

Meanwhile, the R.R.S. Bransfield left Halley Bay on February 11, and returned to South Georgia and Signy Island before proceeding to Mar del Plata, Argentina, to pick up more summer visitors and staff for the bases. The summer visitors included two distinguished guests: Dr O. G. Edholm, director of the human physiology unit of the Medical Research



One of the steel tunnels of the new British Antarctic Survey base at Halley Bay before it was finally buried by snow. All the buildings of the base have been built inside the tunnels like those at the Australian base, Casey.

B.A.S. Photo

Council, and Professor G. E. Fogg, professor of marine sciences at the University College of North Wales. Both have been associated with the survey in an advisory capacity for many years; Professor Fogg is chairman of the survey's advisory committee.

The Bransfield then re-visited the west coast of the Antarctic Peninsula and completed the relief of the Marguerite Bay bases, in spite of continuing gales and rough seas which made cargo handling very difficult and at times dangerous. She turned north again at the end of March and paid a final visit to the Argentine Islands before calling at Deception Island to see if any further eruptions had occurred. (The island was evacuated at the beginning of 1969, after a second series of eruptions; the first occurred at the end of 1967.)

The Bransfield then returned to the Falklands by way of Signy Island and South Georgia and set course for home. She reached Southampton early this month.

Summer melt was more extensive than usual at the Antarctic Peninsula bases. The Argentine Islands reported a record high temperature of plus 9.4deg C (48.9 deg F) in February—the highest since observations began there 27 years ago. As a result, various oddments which had frozen into the ice many years ago have been reappearing.

Rain fell at Stonington Island again in February and the island was bare of snow for much of the summer. In the absence of snow, a land rover which was taken there this year by the Bransfield proved invaluable for moving stores. By the end of the summer it had covered a distance of 230 miles in journeys around the base.

Further south, field parties in George VI Sound again suffered from melt-water problems, but surfaces improved in April and the four men wintering at Fossil Bluff were then able to resume work in the

area. Later, at the end of the month, they transported two tons of supplies across southern Alexander Island to the Bach Ice Shelf, in preparation for next summer's field work. Glaciological measurements were continued at a field site on the ice shelf.

WINTER ROUTINE

All equipment at Halley Bay has now been transferred to the new buildings, and the base has settled down to its winter routine.

A recent alarming experience at Halley Bay was a salutary reminder that life in the Antarctic is still hazardous. The base commander, an experienced Antarctic traveller, was returning from the radar installation in a high wind and thick drift, using the hand-line, when he saw what he thought was another man walking in the opposite direction. As his calls could not be heard above the noise of the wind he left the hand-line to warn the man and, having failed to find anyone, then realised that he himself was lost.

This occurred on Friday morning, and as soon as it was noticed that the commander was missing search parties combed the area, including all the outbuildings and the old base huts. The search was continued all Friday and Saturday but there was no trace of the commander. Although no-one would admit it, it was then unlikely that he would be found alive.

But on Sunday morning, to everyone's immense relief the commander walked into base unharmed and free of frostbite. Realising that he was lost he had orientated himself by the wind direction and attempted unsuccessfully to quarter the area.

As the blizzard continued, and it was getting dark, he dug himself a snow hole with a frozen mitt and went to ground. When he woke he tried to find his way back to base again but failed. With the wind still blowing and darkness approaching again he went to ground and slept.

It was not until the next morning that a lull in the wind made it possible for the commander to recognise some stakes. Then he was able to make his way back unharmed.

A summer building team on Signy Island constructed a new generator shed and boat shed and greatly improved the landing facilities by completing a slipway and clearing a channel to it. In addition to the biological studies, which involved maintenance of field huts and a diving programme, snow accumulation studies were carried out and the topographical survey continued. A series of seismographs was also installed for Professor Griffiths' geophysical project.

Field work continued on South Georgia at various localities, but after the departure of the ships was confined to areas accessible overland or by launch from King Edward Point. Glaciological work on the Hodges Glacier catchment area was completed and the equipment taken back to base.

AIR OPERATIONS

The two B.A.S. Twin-Otter aircraft had a very successful season but were held up by prolonged bad weather in the first half of February. However, an unexpected fine spell allowed them to fly a glaciological party across the Antarctic Peninsula to the Larsen Ice Shelf for a few days, to complete their programme. Three men were then taken to Fossil Bluff for the winter and a new field hut was delivered for the Spartan Glacier project.

The aircraft returned to Adelaide Island and finally left for Punta Arenas on February 28. As usual, they were flown to Canada for servicing during the Antarctic winter. One of the pilots, David Rowley, has just retired from the survey after five seasons' outstanding work. He has joined an airline operating in Devon and Cornwall.

H.M.S. Endurance was in Marguerite Bay at the same time as the Biscoe to carry out a hydrographic survey programme. While there she measured tellurometer lines for the Stonington Island surveyors with the aid of her helicopters. She had already given valuable assistance to the survey on South Georgia earlier in the season.

B.A.S. bases had several visits from other ships during the season. On January 16 an Italian yacht, the San Guiseppe II visited the Argentine Islands. She stayed at the base until January 25, and during her visit provided what can only be described as "banquets" by Antarctic standards—pizzas, and huge mounds of spaghetti and macaroni—and also gave the base cook a number of useful culinary hints.

In February the Italians visited Signy Island. They then spent some time at South Georgia in March, making various repairs before sailing for St Helena.

Professor D. H. Griffiths and his geophysical party aboard the R.R.S. Shackleton called at South Georgia in March. They had completed another season's work on the Scotia Arc project.

NEW BUILDING

Plans for the new B.A.S. headquarters in Cambridge are near completion. As planning permission has now been obtained it is hoped that work will start on the foundations early this month. If there are no set-backs the building should be completed by August, 1975. It will house all the present scientific divisions of the survey together with the administration in one U-shaped two-storey block. The complex will include a packing store, vehicle workshop and an electronics laboratory.

OBITUARY

Dr Mackintosh was authority on whales in southern seas

An authority on the ecology and populations of whales in Antarctic seas, and a distinguished biological oceanographer, Dr Neil Alison Mackintosh, died in England on April 9. He was 73. Between 1933 and 1935 Dr Mackintosh in Discovery II made oceanographic surveys between South Georgia and the latitude of Cape Horn, and between South Georgia and Enderby Land. He also did other work in the Scotia Sea, and made a survey of the South Shetlands.

Professor Sir Alister Hardy wrote in "The Times" that Dr Mackintosh played a leading part in the long series of Discovery investigations in Antarctic seas from their inauguration in 1924 when he led the advance party to establish and take charge of the marine laboratory for the study of whales on South Georgia. Later he took part in three major voyages of the Discovery II, being leader of two of them.

In 1936 Dr Mackintosh succeeded Dr Stanley Kemp as director of research until the fusion of the investigations in 1949 with the new National Institute of Oceanography of which he became deputy director. Since 1936 he had edited the long series of Discovery Reports to which he made many outstanding contributions, including one to the 36th volume published at the beginning of this year. In 1961 he established and became director of the institute's whale research unit at the British Museum (Natural History).

Dr Mackintosh's pioneer research into the biology of southern whales laid the foundations of most of the current knowledge of the economically important species. His book, "The Stocks of Whales", published in 1965, is an important contribution to a study of their populations and conservation prospects. He played a prominent part in the International Whaling Commission, being chairman of the scientific committee.

In addition to his work on whales Dr Mackintosh published several important papers on the macroplankton of the Antarctic, and was the discoverer of the remarkable seasonal virtical migration of many species. He received the Polar Medal in 1942, and in 1954 the Royal Geographical Society honoured him by the award of its Patron's Medal.

SOVIET NEWS

Southern Ocean's level was higher 1,000,000 years ago

Scientists of the 19th Soviet Antarctic Expedition found lichen and moss 7,260ft above sea level in the Prince Charles Mountains of Mac-Robertson Land last season. Other scientists working in Eastern Antarctica far from the coast discovered shells, fossil marine organisms, mummified seals and seal skeletons. From a study of these they have decided that during the Quaternary Period 1,000,000 years ago the level of the Southern Ocean was 1,220ft higher.

Last season 750 seamen, pilots, tacked vehicle drivers, builders, and scientists, took part in the expedition. Among them were geodesists from East Germany, biologists from Poland, and a United States geophysicist. This winter there are 233 men at the six Soviet stations. Molodezhnaya in Enderby Land—the main Soviet research centre—has one of the largest staffs—94 specialists in various fields — meteorologists, geophysicists, radio engineers, builders, welders, mechanics, drivers, diesel engineers, doctors, and cooks.

In Eastern Antarctica members of the last expedition continued the comprehensive exploration of the coast of Mac-Robertson Land. They made a geological survey of the mountains framing the central part of the Lambert Glacier, and a reconnaissance for future geological exploration of the Larsemann Hills on the Ingrid Christensen Coast, and the Bolingen Islands lying about five miles west-south-west of the hills. The characterists of minerals discovered by previous expeditions were also studied.

"Izvestia", the Soviet newspaper, which has a circulation of 8,500,000 daily, sent a special correspondent to the Antarctic with the 19th expedition. A copy of his article, "The Sixth Continent Reveals its Secrets", has been supplied to "Antarctic" by the Novosti Press Agency. In it the correspondent, Eduard Tserkover, describes the flora and fauna of Antarctica, and the discoveries of Soviet scientists.

Once the Antarctic was a blooming, warm land with thick woods of beech trees, araucarias, ferns, laurel trees, and even palms, writes Tserkover. Soviet geologists, headed by D. Solovyov, have discovered near Beaver Lake traces of tropical soils and coal-bearing formations similar to the Paleozoic beds in Europe, with traces of fossil flora.

American scientists from Dr D. H. Elliot's group in 1969 have made similar discoveries on Mount Sirius in the Trans-antarctic Mountains, 400 miles away from the South Pole. Moreover, upon Mount Sirius the explorers have found the skulls, bones, and even whole skeletons of nearly 400 vertebrates, including reptiles, whose absolute age is about 200 million years—a prehistoric giant lizard, amphibians, and a labyrinthodont. In short, these are the remains of prehistoric animals which before had been found in Southern Asia and in Africa.

SHELLS AND SEALS

Soviet scientists E. Korotkevich and P. Voronov have found in the eastern part of the Antarctic, far from the coast, a great number of shells, petrified sea organisms, mummified seals and seal skeletons. Having studied all these finds, as well as the surrounding locality, the scientists arrived at the conclusion that during the Quaternary Period the level of the Southern Ocean had been 370 metres (1220ft) higher.

Though Antarctica seems lifeless and silent at present, it is alive. Not far from

Mirny, the Soviet Antarctic station, and on Khmara, Kikov, Fulmar and Haswell Islands there are noisy bird colonies where one can find albatrosses, sea-gulls, roseate terns, snow petrels, blue-eyed cormorants, pigeons and penguins. The latter must have settled there 2000 years ago—scientists have determined the age of the sediments in the penguin colonies by applying the radio-carbon method. Dozens of well-fed Weddell seals lie basking in the sun.

The coastline fauna is very diverse and rich. Polish biologists, members of the 19th expedition, have gathered hundreds of starfish, sponges, sea cucumbers and bivalve molluscs.

There are whole thickets of algae by the Antarctic coast. While in the water they look red, green or brown, but they often turn dull or lose their colour altogether in the air. The hanging algae, which are of a bright yellow-orange colour and not found anywhere else, also become colourless when taken out of the water. British underwater naturalists say that they have discovered these algae near Deception Island where they grow in bunches up to 50 centimetres long and only about a centimetre thick.

Walking in the sparkling white snow in the mountains of the Antarctic one can see that though this land has a great deal fewer animals and less vegetation that the other continents, it is not lifeless. All of a sudden the snow drifts turn green or red. This means that they are covered with coloured snow algae.

LICHEN SPECIES

In the environs of Bellingshausen Station one can find two kinds of flowers, the only ones in Antarctica, hair grass and a representative of the clover family. Besides these there are lichens—green, black, brown and grey, 200 species altogether, and about 70 varieties of moss. The latter grows chiefly in oases.

There can also be found on the Antarctic Continent peculiar miniature "forests" where the vegetation grows in two tiers. The lower consists of all kinds of lichens that cover the rocks in a solid film, while on top of it there grow bunches of other lichen. We also found lichen and moss at a height of 2200 metres (7260ft) above sea level in the Prince Charles Mountains, while only 500 kilometres (320 miles) away from the South Pole there can be found spots of a certain dry and hard vegetation. This only proves how persistent life is!

The largest "inhabitant" of Antarctic dry land is the wingless mosquito (Belgica Antarctica), five millimetres long. In the moss can be found hardly perceptible puss moths and mites that survive at a great height up to 86deg S. In the inland water reservoirs, such as Lakes Glubokoye and Kitezh, a great number of cymatoa have been caught, including branchipods, arthropods, rotizera and sloths. Of course the fauna is not very rich, but, on the other hand, Antarctica is the only continent free of such pests as flies, bed-bugs and snakes.

DIPLOMAS AND MEDALS

After nearly 20 years in the Antarctic the Soviet expeditions have established traditional methods of welcoming newcomers to their stations. Each new party receives a specially made symbolic key to the station its members have to man.

On Mid-winter's Day men who are in the Antarctic for the first time receive special diplomas. At some of the smaller stations every man is presented with a hand-made medal.

Every first ship or aircraft bringing a new party is saluted by salvoes from flare pistols, and national flags are displayed. Last season Moldezhnaya, the main Soviet centre in Antarctica, was able to fly the flags of five countries, including the Soviet Union.

In a report from Molodezhnaya the leader, Mr Pavel Senko, said that his staff included representatives of various nationalities from Moscow, Leningrad, the Crimea, Siberia, and the Far East. The station hoisted the flags of the U.S.S.R., the Mongolian People's Republic, the German Democratic Republic, the Polish People's Republic, and the United States.

JARE 15 REPORTS

Scientists find meteorites in Yamato mountains

About a dozen meteorites were found near the Yamate Mountains by scientists of the 14th Japanese Antarctic Research Expedition (JARE 14) who made a traverse from Syowa Station last summer. Ten men led by Mr Renji Naruse, a glaciologist who also wintered at Syowa in 1969, made a geological, glaciological, and terrestriat survey adound the mountains, and resurveyed the strain grid band about 250km long along the parallel of 72deg S. The party was the second to collect meteorites; the first was the JARE 10 traverse party which set up the strain grids in 1970.

Because of good ice conditions near Syowa Station and around the Russian Molodezhnaya Station the summer relief operation of JARE 15 was very successful. The party was led by the Antarctic research veteran, Professor Masayoshi Murayama, formerly director of the Polar Research Centre, and now assistant director of the new National Institute of Polar Research. He was returning to Syowa Station for the seventh time.

Forty members of JARE 15 arrived about January 1 in the icebreaker Fuji, which moored at the fast ice edge about 36 nautical miles from the station. Most of the cargo was transported by helicopters, and heavy vehicles and other materials were taken over the sea ice.

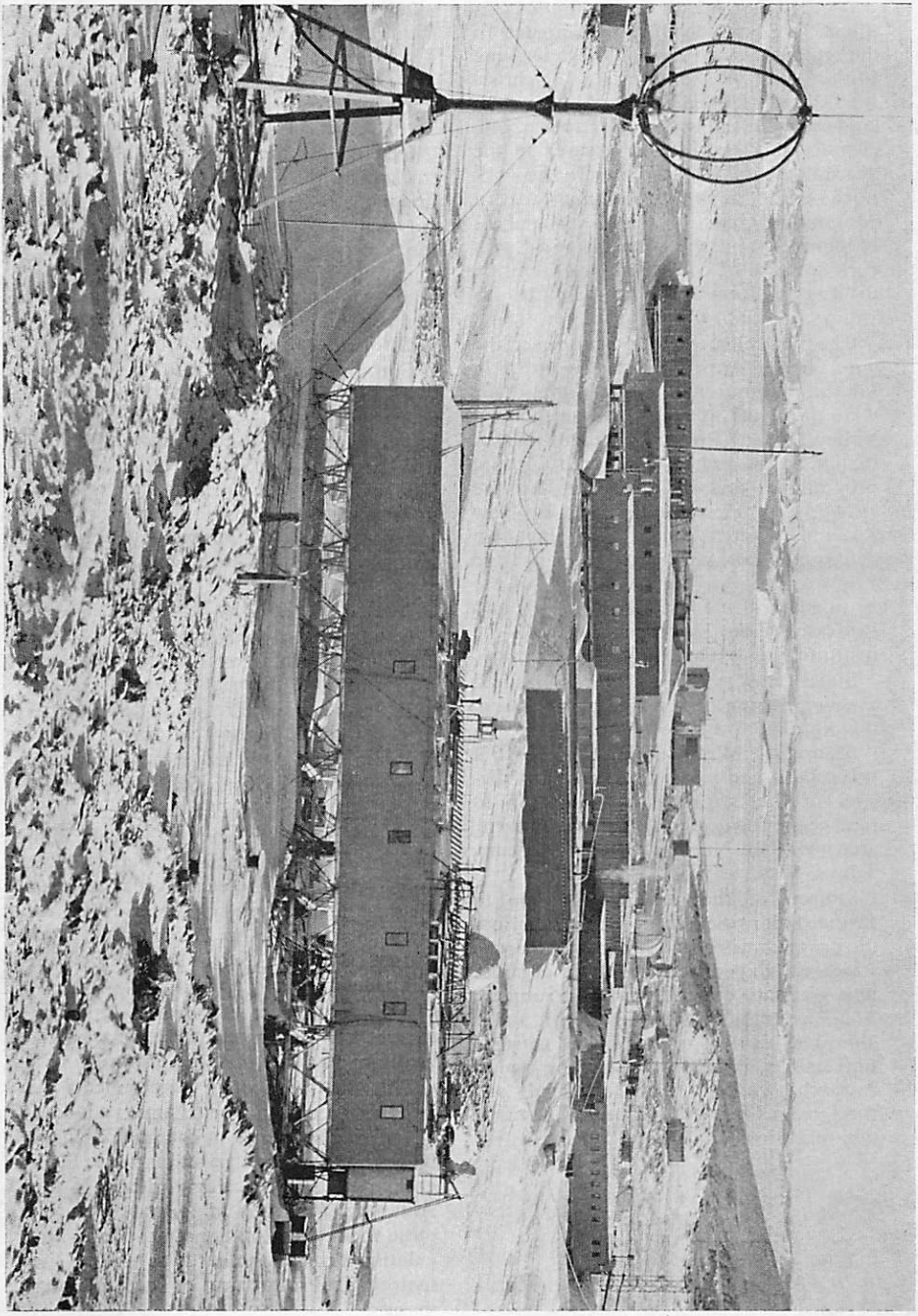
Summer scientific programmes were carried out without major change except for the postponement of an aerial photogrammetric survey. This was caused by the forced landing of an aircraft on the ice-cap. The aircraft was not damaged but minor repairs had to be made to its landing skis. Mr Naruse's party completed its traverse to the Yamate Mountains between November 10 last year and January 29.

During the relief period a new laboratory for environmental research (a wet laboratory) with a floor area of about 100 square metres was erected at the station. Programmes on biology, medical research, and geochemistry, are being carried out by members of JARE 15.

The official change-over was completed on February 1, and the Fuji left Syowa Station on February 6 and visited Molodezhnaya Station on February 12. It made oceanographic observations to the west and back off Syowa Station up to 50deg S. A small party was sent to Shin-nan Rock to make a geodetic survey and conduct earth science research for a few days. Another party made an astronomical survey from the northern promontory of the Riiser-Larsen Peninsula.

On March 6 the Fuji called at Cape Town to disembark the JARE 14 winter party led by Dr Takeo Hirasawa, an upper atmosphere physicist from the University of Tokyo, and two observers, Dr Kiyoo Wadati, former president of the Japanese National Committee on Antarctic Research, and a member of JARE headquarters, and Dr Norberto Luis Bienati, an Argentine marine biologist. The JARE 14 party returned by air to Tokyo on March 30, and the Fuji reached Tokyo on April 20 after calling at Singapore.

Syowa, shown on the opposite page, is the sole permanent station of the Japanese Antarctic Research Expedition. It is located on the north-east corner of East Ongul Island, which is three miles from the continent, off Prince Olav Coast. Syowa was established in 1957, closed temporarily in 1962, and reopened in 1965.



On the other side of the Antarctic Continent Japanese scientists participated in the international Dry Valley Drilling Project last season. Eight scientists worked with United States and New Zealand scientists in the core description, geochemical and geological research in the dry valleys, and also took part in the work in the Thiel Earth Science Laboratory at McMurdo Station on the X-ray analysis of samples, and the preparation of thin rock sections of cores obtained from the drilling on Ross Island and in the dry valleys.

Chemical elements and isotopes of the core samples are now being analysed in Japanese laboratories. Some of the results were presented at a seminar on the Dry Valley Drilling Project in Seattle, Washington, at the end of last month. Future programmes and drilling plans for the 1974-75 summer were discussed by New Zealand, United States, and Japanese delegates. Delegates from Japan were Professor Takesi Nagata, director of the National Institute of Polar Research, and Professor Kou Kusunoki, head of the institute's research division.

Since October last year Japan has had a new government research organisation, the National Institute of Polar Research ("Antarctic", March, 1973, page 325). It was established under the direct jurisdiction of the Ministry of Education to replace the former Polar Research Centre, attached to the National Science Museum, Tokyo.

Objects of the new institute are to further polar research in Japan, carry out the programmes of the Japanese Antarctic Research Expeditions, and to organise post-graduate courses in polar subjects. The institute, which has legal status almost equivalent to that of the national universities, is also available for use by research workers from national and foreign universities, and private research organisations.

French track icebergs

Icebergs in the Antarctic have been tracked by the French E.O.L.E. satellite in polar orbit for two years over distances between 2,000 and 2,500 miles for a long-range survey of the marine current flowing around the continent. The project was planned by the National Space Research Centre which built the satellite and Expeditions Polaires Francaises.

For the survey E.O.L.E. was put to work between March 1, 1972, and February 10, 1973, tracking the drift of four icebergs on which responding beacons had been planted. The beacons were interrogated by E.O.L.E., and replied, indicating their positions. They also transmitted information by the satellite to ground receiving stations, particularly to those of the National Space Research Committee in Brittany.

Although the exact path of the peri-Antarctic current was not established with complete accuracy, various facts were discovered by Professor Paul Tchernia, of the French Natural History Museum, who gathered and studied the data relayed back by E.O.L.E.

The east to west drift is continuous and fairly study along the 65th and 70th parallels, over distances of about 1,250 miles. However, the current makes complete eddies between some meridians. In addition, one of the icebergs observed drifted from west to east, in the opposite direction from the other three.

The next studies of the peri-Antarctic current will be concentrated more specifically in the area of these eddies.

This first series of experiments is designed to obtain a better understanding of the exact influence of energy exchanges between the sea and the atmosphere. Such exchanges are particularly intense in the Antarctic, and it is important to determine their effect on the atmospheric circulation around the earth as well as the hydrological structure of ocean water masses.

AUSTRALIAN NEWS

Huts built at Cape Denison withstand ceaseless winds

Some of the huts built at Cape Denison, the main base of Sir Douglas Mawson's Australasian Antarctic Expedition, 1911-14, have survived more than 60 years of Antarctic snow drifts and blizzards without any maintenance. They were visited in January this year by members of the Australian Antarctic Research Expeditions (A.N.A.R.E.) on the way to the French base Dumont D'Urville in Adelie Land and the Australian station at Casey.

Sir Douglas Mawson visited the Commonwealth Bay area again as leader of the British, Australian, and New Zealand Antarctic Expedition (B.A.N.Z.A.R.E.) in 1929-31. Since then the only visitors to the base have been an Australian expedition in 1962 led by Dr Philip Law, then director of the Antarctic Division of the Department of External Affairs, several French expeditions under Paul-Emile Victor, director of Expeditions Polaires Francaises, and two groups of New Zealand and United States scientists who carried out scientific studies.

On her way to relieve Casey the Thala Dan called at Dumont D'Urville and landed six French expedition members. The expedition, led by Mr A. E. Humphreys, senior engineer, and Dr D. J. Lugg, senior medical officer, of the Antarctic Division, Department of Science, reached ice-free Commonwealth Bay in the early evening of January 14. Members of the expedition were ferried ashore by helicopters in fine weather.

When Sir Douglas Mawson himself revisited Cape Denison in 1931, he was surprised to find that his old hut had withstood 20 years of ceaseless, violent winds. By 1974 visitors found the main hut—built of wood, and measuring 42ft by 24ft—filled with ice and snow, but in a fair state of repair after more than 60 years of Antarctic weather.

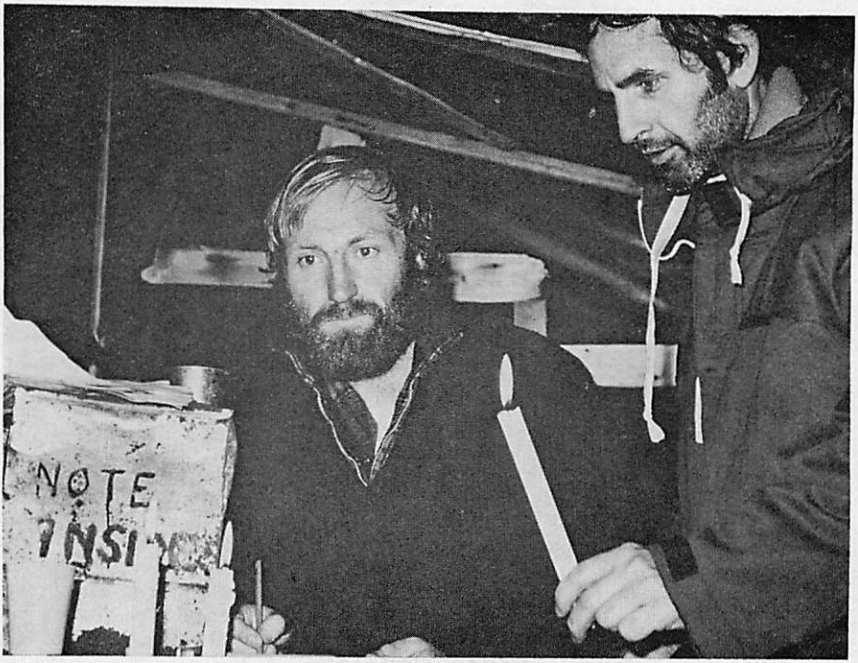
Two other huts were in poor condition. But a smaller hut used for magnetometer readings—built of tongued and grooved boards over a wooden frame with tarred paper lining—was found to be in excellent condition and free of snow.

The expedition repaired the cross set up in memory of Lieutenant B. E. S. Ninnis and Dr Xavier Mertz, who died during a field trip from the base. Ninnis disappeared in a crevasse in December, 1912, and Mertz died of hypervitaminosis A from eating husky liver in January, 1913. Mawson was the sole survivor of the party, and his return over 100 miles of the Polar Plateau to the base remains an epic in polar literature, and a classic feat of human endurance.

During Mawson's second Antarctic expedition in 1929-31 the Australian flag was hoisted at Cape Denison at noon on January 5, 1931, and a proclamation deposited in a casket at the foot of the flagpole, claiming possession for Australia of King George V Land—that section of the coastline between 142deg E and 160deg E, stretching southwards to the Pole.

The party this year found the original proclamation still in place. They raised the Australian flag again, and held a short ceremony to commemorate the work of Mawson and his men, whose efforts laid the foundation for contemporary Australian Antarctic expeditions.

The memorial cross and plaque, and the huts at Cape Denison have been designated as historic monuments for permanent preservation under the terms of the Antarctic Treaty. It is hoped that restoration will take place before these relics are damaged beyond repair.



Dr D. J. Lugg (right), leader of the ANARE party, and the deputy leader, Mr A. E. Humphreys, investigating Mawson's magnetic hut at Cape Denison when the Thala Dan called there in January this year. The sealed box contained messages from parties who had visited the area in the past decade, and the candles had been left by a previous party.

Australian Antarctic Division Photo: J. Stalker

Mawson told in his book, "The Home of the Blizzard", how he managed to survive one of the worst ideals in the history of scientific discovery. He, Ninnis, and Mertz, were a sledging party which was exploring inland from Commonwealth Bay. They were 300 miles from home when Ninnis and one of the two dog sledges disappeared down a huge crevasse, at least 150ft deep.

In bad weather, Mawson and Mertz pressed on with the remaining sledge and few supplies. They were forced to kill their dogs for food. After 200 miles Mertz died. His death was attributed to poor food and exhausting conditions but in 1968 two Australian doctors established that the cause was acute vitamin A poisoning from the husky liver.

Mawson, himself weakened, cut the remaining sledge down to half size to reduce the load and pulled it himself. When his boots gave way, he walked on the ice and snow with his bare feet wrapped in rags.

It took him one month—with no break in the appalling weather—to cover the last 100 miles and reach the base at Cape Denison, where some members of the expedition were still waiting. Their relief ship, the Aurora, however, had sailed for Australia the day before. Mawson and his companions having been given up for dead. Mawson had to remain another year in the Antarctic before the base party was relieved.

Men and women at U.S. bases begin winter isolation

Record high temperatures were recorded at United States stations in the Antarctic last summer. Since the sun set for the last time until the end of August, and 161 men and two women began four months of winter darkness little snow has fallen, but temperatures have dropped sharply. Early in May the Amundeson-Scott South Pole Station recorded a minimum temperature of minus 72.8deg Fahrenheit, and a maximum of minus 56deg.

Thirteen men at the Pole Station last saw the sun on March 20. On April 24 the men and two women scientists at McMurdo Station watched the sun sink below the horizon at 12.45 p.m. Nearly a month earlier there was a ship launching ceremony near the station, and one of the women scientists, Dr Mary A. McWhinnie, of de Paul University, Minnesota, cracked a bottle of wine in traditional fashion to christen the Riff Raft, a new research vessel which will be used for a biological sampling project in McMurdo Sound.

Despite the cold weather representatives of the National Science Foundation, the United States Navy, and Scott Base, attended the launching of the Riff Raft. It is a12ft square raft with a plywood deck and a steel frame with eight 55-gallon drums welded together for flotation. In the centre of the deck is a 42in hole.

The main propulsion for the raft is by means of a steel cable attached to a power winch on a truck ashore. Three Navy men wearing wet suits will act as crew for Dr McWhinnie and Dr S. Rakusa-Suszcewski, a Polish exchange scientist. They will study krill, the shrimp-like crustacean endemic to Antarctic waters.

Because mechanical equipment has almost replaced dogs Antarctica can have traffic accidents like other parts of the world. On May 16 McMurdo Station had a road death. The manager of the biology laboratory, 26-year-old Gregory William Nickell, of Boulder City, Nevada, was killed in a truck accident.

Mr Nickell, who was employed by a sub-contractor for the National Science Foundation, was driving a truck over the hill between McMurdo Station and Scott Base when it left the road and went 600ft down an embankment. Mr Nickell was thrown clear, and was found 50ft below the truck on the snowy slopes leading to the sea ice.

POLE STREAKERS

Towards the end of the mad March days at the Amundsen-Scott South Pole Station two hardy petty officers contributed to the streaking craze. They raced nude in a 10ft radius round the South Pole. The temperature was more than 70 degrees below zero.

Antarctic veterans were not impressed by the performance, which was a long way from being a famous first. There have been men running bare in freezing temperatures for many years, but they never boasted of their hardiness; the term "streaking" had not been heard of.

During the International Geophysical Year a distinguished American scientist at Little America was reported to have walked from a steam bath 200yds in sub-zero temperatures, clad only in his boots. And later men at the old Amundsen-Scott South Pole Station built their own version of a steam bath. It was no novelty to see several steaming bodies streak out for a brisk rub down with snow.

U.S. NAVY PLANS TO RETURN TO CUTTING ICE WITH SAW

Seventy years ago 30 men from the Discovery spent a fortnight vainly trying to saw through the 6ft thick ice sheet which held their ship in Winter Quarters Bay. Since United States operations began in the Antarctic nearly 20 years ago icebreakers have been used each season to cut a channel through the ice in McMurdo Sound for the supply ships to reach the wharf in Winter Quarters Bay below McMurdo Station.

Now the United State Navy has plans for the use of a giant saw capable of cutting through ice 30ft thick to ease the movements of the supply ships next season, and to face the seaward edge of the 28ft thick ice wharf which was used successfully last season. It is hoped to use the giant saw to cut the last few hundreds yards of the half-mile channel from the turning area to the berthing area, and also to trim the irregular facing of the ice wharf so the ships can berth more easily.

Commander T. Kirkpatrick, who conceived the idea of an ice wharf in Winter Quarters Bay, says the intention at this stage is to have the ice saw mounted on a power-driven sledge, and have it winched along the lines of a proposed cut in the ice. Plastic would be inserted in the cuts to keep them open—in Scott's day the saw cuts quickly froze over. An icebreaker would then tow the chunks of ice out. A saw will make cleaner cuts in the ice than an icebreaker.

Unloading of cargo at the ice wharf last season proved that it was an efficient base from which to work. Cargo placed in the veteran supply ship John R. Towle during 12 days at Lyttelton was unloaded on the ice wharf in 44 hours.

Unfortunately the heavy ice-breaking needed to cut out the turning area in Winter Quarters Bay produced cracks in the ice wharf which ran through the entire width at one end. Additional bollards had to be placed in the wharf which stretches 650ft along the shore, and is 460ft across on the seaward side where the ships dock. A network of steel cables was used to brace the smaller broken portions to the main part, and hold the whole wharf together.

Saws have been used successfully to release ships from ice since Scott's day. During her 1923-24 expedition to the Ross Sea the 13,000-ton whaling factory ship Sir James Clark Ross was caught in ice 5ft to 6ft thick. With five whale catchers towing astern and the ship's screw turning she would not budge. Using huge, single-handed saws, and working for more than five hours, the crew sawed the ship free.

Base commander leaves

One of the most popular United States Navy officers associated with Antarctic operations left Christchurch last month to take up a staff appointment with the North Atlantic Treaty Organisation in Naples. Commander R. G. Davis has been in command of the Antarctic support force base at Christchurch for the last three years. He has been replaced by Commander R. Moss, who has been responsible for training naval aviators at Pensacola, Florida.

Commander Davis served with the Navy's VX6 Squadron in the Antarctic during the 1957-58 International Geophysical Year, and flew Neptune aircraft for two seasons. When he returned to Christchurch he spent his summers and winters in the city.

Bacteria frozen for 10,000 years grow in Antarctic laboratory

Bacteria frozen in a state of suspended animation in Antarctica for at least 10,000 years revived when exposed to air, and have grown in active colonies in the Eklund Biological Centre at McMurdo Station, according to two United States scientists, Dr Roy E. Cameron, and Mr Frank A. Morelli. The first of the living bacteria were found in a core sample from a depth of about 420ft during the Dry Valley Drilling Project conducted on Ross Island by United States, New Zealand, and Japanese scientists. Later samples were found there, and also in the Taylor Valley, about 60 miles north-west, where a New Zealand drilling team worked at New Harbour last season.

In a report to the National Science Foundation Dr Cameron and Mr Morelli, of the Darwin Research Institute, said that the bacteria were found in permanently frozen ground and sediment cores. Using aseptic techniques and a sterilised hand drill, chips were removed from the centre of the cores. The samples put in nutrient broth—to see what, if anything, would grow—were taken from sediment in cores removed from depths between about 250ft and 1,400ft.

Dr Cameron reported that the minimum age of the cores in which the bacteria were found was estimated by geologists at the drilling site to be 10,000 years. The deeper sections of the cores, in which bacteria were also found, could be as much as 1,000,000 years old.

An Antarctic veteran, Dr Cameron has headed eight research projects on the continent, seven under the auspices of the California Institute of Technology Jet Propulsion Laboratory, and one for the Darwin Research Institute. He and Mr Morelli, who were assisted last season by four students from the Virginia Polytechnic Institute and State University, have both conducted research in Antarctica under the National Aeronautics and Space Administration's programme for extra-terrestrial life detection on Mars.

Dr Cameron believes that the results of the discovery could have tremendous relevance for understanding the ability of micro-organisms to remain frozen in a state of suspended animation for hundreds of thousands of years. Scientists involved in the project to send an unmanned Viking spacecraft to Mars in 1976 to attempt to detect life in the Martian soil will obviously be interested in findings in the Antarctic cores.

In recent years, many scientists have speculated that Mars may once have had a surface environment much more hospitable than the dry and frigid desert believed to exist there now. If so, scientists have reasoned, life may have developed on the Martian surface and might still survive, frozen under the present surface. Dr Cameron says that the scientists involved in the Viking Lander project may well speculate that if no life forms are found on the surface of Mars, the sub-surface permafrost of the planet may hold the key to ancient and living biota deep within it.

NOT IDENTIFIED

None of the bacteria has yet been identified, although all were motile (equipped with fine hair-like appendages that propel the individuals) and were rodshaped. One type, found in a section of marine sedimentary rock from a depth of about 280ft formed unusual doughtnut-shaped colonies that grew or flowed in towards the centre as the colony expanded.

Last season scientists from the Darwin Research Institute and the Virginia Polytechnic and State University were responsible for environmental impact monitoring of the drill sites on Ross Island and in the dry valleys to the north-west on the other side of McMurdo Sound.

CORE SAMPLES

During their monitoring work Mr Morelli and his team found bacteria in a core section from about 420ft beneath the surface at the drilling site near the earth science laboratory at McMurdo Sound. Later the team found living bacteria and associated fossil diatoms in samples from the centre of the core at depths of about 750ft, 1070ft, and 1,400ft respectively.

These bacteria appeared different at each depth. In every cae they were unlike those occurring in the surrounding environment, including the laboratory and the freezer where the cores were stored. Mr Morelli says that samples were taken from the same core five times during the season with the same results in each case.

Dr Cameron and his team made their find later in the season. The last drilling done for the season by the New Zealand drillers was at New Harbour, about five miles from Lake Fryxell at the mouth of the Taylor Valley. Core samples containing the bacteria came from drilling into beach and delta deposits to a depth of about 520ft.

DR LEWIS FAILS TO FINISH TRIP AROUND ANTARCTICA

Dr David Lewis, the 56-year-old New Zealand-born adventurer, was forced to abandon his attempt to circumnavigate the Antarctic Continent single-handed in his 32ft steep sloop Ice Bird on February 24 when he was 800 miles south-west of Cape Town. His sloop was capsized in a Force 12 hurricane, and the mast and self-steering gear were smashed. Then he sailed the Ice Bird under jury rig, steering by hand day and night, for 25 days, and entered harbour at Cape Town on March 20.

In October, 1972, Dr Lewis left Sydney on the first leg of his 17,000-mile voyage. He reached Palmer Station, the United States base on Anvers Island, off the Antarctic Peninsula on January 28 last year, 86 days after leaving from Halfmoon Bay, Stewart Island. The Ice Bird had been capsized in two storms and dismasted, and Dr Lewis postponed the next stage of the voyage because the Ice Bird needed repairs, and his hands and feet were frostbitten.

Men at Palmer Station repaired the Ice Bird last winter, and Dr Lewis began the second leg of his voyage on December 12. Less than two days after leaving Palmer Station he was trapped in pack ice for three days. He was sighted for a few days north of the British Antarctic Survey's Argentine Islands base in pack ice. Fires were lit at the base and flares let off but there was no indication that he had seen the signals.

On January 5 the Ice Bird reached Berge Bay on Signy Island, in the South Orkney Islands, where there is a B.A.S. base.

After two days at Signy Island making minor repairs and waiting for favourable weather, Dr Lewis sailed on January 8, expecting to complete the third leg of his voyage in May. Disaster struck late on the afternoon of Sunday, February 24.

At two o'clock in the afternoon the Ice Bird was slammed over on its side twice by the force of the gale. Then at 4.15 p.m. the sloop was capsized to port and the mast was broken. By 5 p.m. the hurricane had dropped to Force 10 and the barometer was rising so Dr Lewis decided to attempt to sail to Cape Town under jury rig when the weather improved.

TOURISM

ORGANISED PARTIES NO THREAT IN ANTARCTIC

By BADEN NORRIS

It is no secret that the advent of tourism to Antarctica has been accepted grudgingly, and with many misgivings. I, like many others, felt uneasy for the future well-being of polar wildlife, feared for the sanctity of the historic places, and hoped that every effort would be made to keep visits by tourists to a minimum.

Therefore I welcomed the opportunity early this year to go south in the Lindblad Explorer to the sub-Antarctic islands, McMurdo Sound, and the Antarctic Peninsula, and to see for myself just what happens when tourists visit Antarctic. There were 93 passengers on the cruise, but I must emphasise that they were all very conservation minded, and to a degree selected for their interest in the Antarctic. Therefore this particular expedition might be representative of Antarctic tourism in general.

Once again the expedition was led by Lars Eric Lindblad. He was assisted by Dr Roger Tory Peterson, a noted United States ornithologist, who led the 1969 expedition. Dr Peterson took part in the United States Antarctic Research Programme in 1965, and is widely known as an author, artist, scientist, photographer, and lecturer. His field guides have become standard guides for the identification of birds by students and experts alike in the United States and Europe, and his bird paintings and prints are widely known.

Other members of the scientific staff were Mr Keith Shackleton, a leading British painter of wildlife and marine subjects, and Mr John Green, who served with the British Antarctic Survey for several years. Mr Shackleton, who is a relative of Sir Ernest Shackleton, was a member of the staff on the Lindblad Explorer's cruise in 1970, illustrated "Birds of the Atlantic Ocean", and has represented Britain on many occasions as a small-boat sailor.

The Lindblad Explorer's first landfall was the Auckland Islands. We landed by zodiac rubber boats (the secret behind the success of this ship) at Erebus Cove, Port Ross, and began the first of a series of interesting landings in the sub-Antarctic and the Antarctic. Before we sailed for Campbell Island we inspected the castaway depot and the old cemetery of the settlement of Hardwicke. The station staff at Campbell Island welcome us warmly, guided us to the nesting royal albatrosses, and shared our Christmas dinner aboard the ship.

We had another friendly welcome from the A.N.A.R.E. station staff when we called at Macquarie Island. Some of the time was spent walking two miles south along the beach to the Nuggets to inspect the huge colony of royal penguins. On the way we passed elephant seals, and gentoo, king, and rock happy penguins.

On January 2 after pushing through thick ice we reached Robertson Bay, and at one o'clock in the morning the Lindblad Explorer anchored off Cape Adare, the tall basaltic headland, which looked grim and uninviting in the early light. We landed immediately and proceeded along Ridley Beach to the hut erected by Borchgrevink's South Cross Expedition in 1899. This hut was cleared of snow, tidied up, and strengthened, in February last year by Mr S. Norman, deputy-leader at Scott Base, and Mr L. K. Cairns.

After the visitors had inspected the interior of the hut, which was treated with reverence, the door was sealed, and outside four bronze plaques were erected. These, provided by the Antarctic Division, Department of Scientific and Industrial Research, outline the history of the building in English, French, Spanish, and Russian.

Keith Shackleton and I then climbed up Cape Adare, and after some time located the grave of Nicolai Hanson, the expedition's zoologist, who was the first man to be buried on the continent. The white cross picked out in quartz pebbles, which was placed on the grave by Petty Officer Frank Browning, of Lieutenant V. L. A. Campbell's northern party of Scott's last expedition in 1911, is still in place. But we found that the brass plate wired to the iron cross on top of the boulder which marks the site, had been blown off.

From Robertson Bay the Lindblad Explorer steamed through heavy ice to Cape Hallett, and then to Cape Bird before mooring to deadmen at Cape Royds for three days. The tourists visited the historic huts at Cape Royds and Cape Evans, and at no time were the buildings, contents or the surrounding area treated with anything but respect. I was impressed by the way all the visitors kept their voices to a whisper when they were in the huts, almost as though they were at a shrine.

Several nations were represented among the Lindblad Explorer's passengers. I was the only New Zealander, but the party had the opportunity to meet other New Zealanders from Scott Base who arrived by dog sledge and tracked vehicle. On the walk from the ship to Cape Evans and back there were several women in the party. I am certain this would be the first time women have made this journey.

From McMurdo Sound the Lindblad Explorer sailed round the continent to the Antarctic Peninsula. During the 10-day voyage an elderly passenger from California, Mr Earl Youngmeyer, died. He was buried on January 17 in the iceberg strewn Pendleton Strait.

The expedition's first call was at Galindez Island, one of the Argentine Islands, where the staff of the British Antarctic Survey base welcomed the chance to meet the tourists. This island was discovered by the French explorer, Jean Charcot, on his 1903-1905 expedition.

Then the ship sailed north through Penola Strait and the beautiful Lemaire Channel to Anvers Island where the tourists visited the United States Palmer Station. The old whaling station at Port Lockroy proved a good place to photograph nesting gentoo penguins before visiting Paradise Bay and the hospitable Argentine station, Almirante Brown. On the steaming beaches of Deception Island the tourists were able to see a unique sight—penguins swimming in thermal water.

King George Island came next with visits to Potter Cove (known to sealers as early as 1821) to see the wildlife, and then on to the Russian base, Bellingshausen, and the Chilean base, Presidente, Edouarde Frei, which stand cheek by jowl. When we arrived the men at both bases were recovering from a visit the previous day by a Spanish cruise ship. According to the Chileans, it landed 900 passengers, who disturbed both the penguins and the station staff. This is the type of tourism Antarctica can well do without—too many tourists and lack of control.

The last stop was Hope Bay, which indents the tip of Palmer Peninsula and opens on Antarctic Sound. It was discovered in 1902 by the Swedish explorer, Nordenskjold, who named it in commemoration of the winter spent there by three members of his expedition.

Here the tourists received the friendliest welcome of the whole cruise from the men at the Argentine Army base of Esperanza. The buildings were thrown open to all, and vehicles were provided to take parties up Mount Flora to collect plant fossils.

By the time we reached Ushuaia, the most southern city in the world, on the island of Tierra del Fuege, I was convinced that tourist expeditions as well organised and led as the one of which I was a member offer very little threat to the Antarctic.

SUB-ANTARCTIC

Calls at Campbell Island by ships and aircraft

After nearly eight months members of the expedition on Campbell Island have had their first experience of sub-Antarctic winter weather. They began their service on the island early in October last year after a stormy passage in the Holmburn from Wellington; last month a period of reasonably fine weather—Campbell Island style—was broken, and May demonstrated what early winter is like beyond 50deg South.

Campbell Island is an isolated station, but so far the expedition has had an unusual number of visitors by sea and air. Four ships called in December, and another in April. In addition a Royal New Zealand Air Force Orion dropped a container of newspapers on December 27. Urgently needed replacement parts, and the usual mail were dropped by parachute from an R.N.Z.A.F. Bristol Freighter which flew south on April 4.

In a report from the island last month the leader, Rex Firman, says that the Roaring Forties really roared for the party on the voyage south. The Holmburn rolled and pitched, and the men were glad to step ashore at Beeman Cove on October 7. A major breakdown of the ship's boat, and bad weather during the unloading of cargo, prolonged the annual servicing of the station longer than usual.

More snow fell in the last weeks of last year than for most of 1972. But the party completed its most urgent task—the installation of seven new 500-gallon copper water tanks in the supply system. This now gives the station a main supply of 5,000 gallons in rust-proof tanks, and a reserve of 1,000 gallons from two tanks coupled on to the food store.

December was visitors' month, and at one stage a ship a day called for three days in a row. There was a surprise visit on December 13 by the New Zealand Oceanographic Institute's research ship Tangaroa, which put in for the night to make some repairs.

Ten days later the United States Coast Guard icebreaker Glacier called with stores and welcome mail—the first for nearly three months. The next day (December 24) a Japanese vessel, the Satsu Maru 17, which was fishing in the area, put in for the evening.

Christmas Day was a long, enjoyable, and exciting day for everyone. A third ship dropped anchor. It was the Lindblad Explorer, and Campbell Island produced its third fine day in a row to welcome the tourists.

Since all the visits another road has been built to the meteorological store, and the other one has been extended towards the balloon shed.

First victim of May's bad weather was the research vessel Acheron. It arrived from Dunedin with a replacement technician on May 1. It brought welcome mail, newspapers, and fresh food, and Department of Scientific and Industrial Research technicians to service equipment at the station. But because of very heavy seas it had to turn back on its return voyage and shelter in the harbour for nearly a week.

Because of bad weather the R.N.Z.A.F. Bristol Freighter had to make two attempts to drop the urgently needed replacement parts early in April. The weather clouded over just as the aircraft arrived over the island on April 3, and it had to turn back. The next day, however, there were no clouds or wind, and a perfect drop was made on Homestead Plateau.

THE READER WRITES

Sidelights of Antarctic Research

Letters, preferably not longer than 500 to 600 words, are invited from readers who have observed some little-known facet of Antarctic life or have reached conclusions of interest on some Antarctic problem.—Editor.

ANTARCTIC RELICS

Sir,—Soon New Zealand will have an Antarctic centre of international interest in the new wing of the Canterbury Museum. A feature of the centre will be the collection of relics of Antarctic exploration from several parts of the world. Most of the relics relate to the Heroic Age of exploration. Now, I suggest, it is time to add to that collection items of historic interest from the new age of scientific research which began nearly 20 years ago with the International Geophysical Year.

In 1956-57 men began living at the South Pole for the first time, and relics of the establishment of the Amundsen-Scott South Pole Station would add to the interest of the Antarctic centre collection. Perhaps an approach could be made to Lieutenant John Tuck, United States Navy leader at the Pole Station in the first winter (now Professor Tuck), and the relatives of the scientific leader, the late Dr Paul Siple.

I mention Dr Siple in particular because when he left New Zealand for the United States after his year at the Pole he took with him what he called a sentimental souvenir. It was a 16-inch mirrored glass ball which was fixed to the top of the "South Pole", a bamboo pole painted in ascending alternate orange and black stripes like an old-fashioned barber's pole. The ball was dropped by parachute from a Globemaster, and was put on the symbolic "South Pole" in the hope that the sunlight flashing off the ornament would make the station more easily visible from the air.

Dr Siple bought two silvered glass balls from a Christchurch firm which obtained them from Australia, and when he left the Pole Station he exchanged the spare one with the one that had been on top of the striped pole on the garage roof all year. If the ball is still in the possession of the Siple family they might be persuaded to present it to the Antarctic centre.

Since the International Geophysical Year there have been many visitors to the historic huts on Ross Island. Some of them are known to have taken small items from the huts as souvenirs. Could the owners be appealed to for the return of the items as gifts to the museum? I have in mind an author who visited Scott's hut at Cape Evans in 1958-59. In his book he records that "among treasured souvenirs" are "a glass inkwell on which 'R. F. Scott' had been written, also a bottle of Indian ink marked 'Wilson'."

Yours etc.,

JAMES PIGG.

SCOTT BASE HUSKIES

Sir,—The recent interest shown in the future of dog teams at Scott Base raises some interesting points.

The obvious advantages in not keeping dog teams at Scott Base is that Weddell seals will not be killed each year for dog food.

The Antarctic Treaty nations have gone to great lengths to ensure the conservation of all wildlife in Antarctica, yet here are New Zealanders killing seals for no valid reason other than providing food for a group of dogs which, I understand, are used mainly for recreation.

A number of seals is killed each year for dubious scientific purposes, and even if it is correct that there are many hundreds of seals about Scott Base, it has been proved that the killing of even a few each year can upset future populations and breeding areas.

Yours etc.,

LEPTONYCHOTES.

Mawson expedition veterans Antarctic Society patrons

Two veterans of Sir Douglas Mawson's British, Australian, and New Zealand Antarctic Research Expedition of 1929-1931 have accepted office as patrons of the New Zealand Antarctic Society. They are Sir Robert Falla, chairman of the Nature Conservation Council since 1962, and Dr R. G. Simmers, who was director of the New Zealand Meteorological Service from 1963 to 1965.

Both men have had a long association with Antarctic affairs. Sir Robert Falla is a former president of the Antarctic Society, and in 1953 he and the secretary, Mr A. S. Helm, wrote to the Prime Minister urging that a scientific station be set up in the Ross Dependency in time for New Zealand to take part in the work of the International Geophysical Year. Later he was on the executive of the Ross Sea Committee, which was set up to organise the New Zealand section of the Commonwealth Trans-Antarctic Expedition.

Dr Simmers, who, like Sir Robert Falla, was awarded the Polar Medal in bronze for his work as meteorologist with the B.A.N.Z.A.R.E., joined the Meteorological Office in 1929, and after his return from the Antarctic, worked in the aviation section. Before the Second World War he spent two years in the United States at the Massachusetts Institute of Technology studying meteorology, with special reference to aviation. He retired from the Meteorological Service in 1965. Dr Simmers is a former chairman of the Ross Dependency Research Committee, which advises the Minister of Science about New Zealand's scientific programme in the Antarctic, and also served on the national committee for space research.

Sir Robert Falla is best known as an ornithologist and museum director. He was a lecturer in nature study and education at the Auckland Teachers' College when he was selected as assistant zoologist and ornithologist with Sir Douglas Mawson's expedition in the Discovery. On his return he was appointed ornithologist and education officer at the Auckland War Memorial Museum. He was assistant director from 1935 to 1937, director of the Canterbury Museum from 1937 to 1947, and then director of the Dominion Museum until 1966.

Dr Simmers served in the Royal New Zealand Air Force during the Second World War; Sir Robert Falla was leader of one of the coast watching parties of the secret Cape Expedition which established bases in the Auckland Islands and on Campbell Island. This expedition did scientific and meteorological work, and after the war Sir Robert Falla took part in several expeditions to the sub-Antarctic Islands.

CHEERY DIARY

In Professor A. Grenfell Price's book on the B.A.N.Z.A.R.E. voyages, "The Winning of Australian Antarctica", there are several references to the two young New Zealanders. Professor Grenfell Price mentions, and also quotes from what he calls the cheery diary kept by Dr Simmers, and the New Zealander's considerable capacity for setting doggerel to popular tunes for the amusement of the members of the expedition. The names of both men appear on the expedition's maps.

Falla Bluff is a prominent rocky bluff at the head of a bay, about five miles south-east of the Stanton Group of Islands off the coast of Mac-Robertson Land. It was discovered on February 14, 1931. Simmers Peaks are a group of four rocky peaks about 12 miles south-east of

Cape Close in Enderby Land. They were discovered on January 13, 1930.

Sir Robert Falla and Dr Simmers were proposed as patrons at the annual meeting of the Antarctic Society in Wellington on March 16. The meeting also decided to award the honour of life membership to Mr H. F. Griffiths, a former president.

Mr Griffiths has had a close association with the Antarctic and the expeditions that have gone south in the last 45 years. He was the founder of the Dunedin and Canterbury branches of the society, and his association with Antarctic expeditions dates back to Rear-Admiral Richard E. Byrd's first expedition in 1928-30. In Christchurch Mr Griffiths was president of the Canterbury branch. He made two visits to the Antarctic, and last year retired after three years as information officer, Antarctic Division, Department of Scientific and Industrial Research. During this time he also edited the society's news bulletin, "Antarctic".

In recognition of their contributions to Antarctic exploration the society decided at its meeting to send complimentary copies of "Antarctic" to men who lived in the historic huts at Cape Adare, Cape Royds, and Cape Evans. They are Mr Hugh Blackwell Evans, who was with Borchgrevink's Southern Cross Expedition at Cape Adare in 1898-1900, Sir Philip Brocklehurst, who served with Shackleton's 1907-1909 expedition, Sir Charles Wright, the Canadian glaciologist, and Tryggve Gran, the Norwegian ski expert, who were with Scott's last expedition, and A. O. Gaze, the Australian member of the Ross Sea party of Shackleton's 1914-1916 expedition.

Mr J. A. Cross, of Christchurch, was re-appointed president, and Mr G. W. Markham, of Wellington, vice-president. Other officers of the society are: Secretary, Mrs B. Hale; treasurer, Mr R. G. McElrea; editor of "Antarctic", Mr J. M. Caffin; honorary auditor, Miss I. O. Orchard.

BRANCH REPORTS

With a former leader at Scott Base, and several former caretakers of the historic huts on Ross Island, among its officers, the Canterbury branch has been able to maintain its members' interest in Antarctic affairs during the past year. Also Christchurch has a closer link with the Antarctic because of the United States Navy's support force, and the Antarctic Division.

In his annual report the chairman, Mr S. W. M. Smith, referred to a programme which included addresses dealing with visits to Cape Adare and the Snares Islands, life on the Chatham Islands, and the work of the hut caretakers at Cape Royds.

Officers of the branch are: Chairman, Mr S. W. M. Smith; vice-chairmen, Messrs J. M. Caffin and R. G. McElrea; honorary secretary, Mrs E. F. Cross; honorary treasurer, Mr J. A. Cross; committee, Messrs B. Duffell, V. J. Wilson, H. Burson, L. Kerr, J. Barker, K. Smith, D. Spence, R. Venning, Mesdames E. Smith, J. Kerr, and B. Hale.

Wellington also has links with the Antarctic. Its committee members include a former superintendent of the Antarctic Division, the man in charge of the construction of Scott Base in 1956, and a hut caretaker. Branch activities during the year included a visit to the deep-sea drilling ship Glomar Challenger, and entertainment of delegates to the meeting of the Antarctic Treaty nations' consultative committee. Arrangements were made by the branch for the painting of the memorial portrait of Mr L. B. Quartermain, which the society will present to the Canterbury Museum for hanging in the national Antarctic centre.

Officers of the branch are: Chairman, Mr L. S. Donnelley; vice-chairman, Mr G. W. Markham; honorary secretary, Mr R. H. Blezard; honorary treasurer, Mr V. E. Donnelly; committee, Messrs R. M. Heke, J. Cable, P. Wilson, G. Silvester, H. Mallitte, Squadron Leader W. Hopper, and Captain H. J. Pool.

"ANTARCTIC"

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

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

The 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.

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

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

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$3.00 (or equivalent local currency). Membership fee, including "Antarctic", NZ$5.00.

New Zealand Secretary

Mrs B. Hale, P.O. Box 1223, Christchurch.

Branch Secretaries

Canterbury: Mrs E. F. Cross, P.O. Box 404, Christchurch.

Wellington: Mr R. H. Blezard, P.O. Box 2110, Wellington.

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