7/62/747/91(08). RESTRICTED

Duplicate

REPORT OF THE 1962 VOYAGE OF "THALA DAN" TO WILKES AND OATES LAND

By the Director, Antarctic Division,
Department of External Affairs

The objectives of this voyage were to relieve the Wilkes Station, to repair and set in operation the automatic weather stations at Chick Island and Lewis Island, to explore Oates Land and to call at Macquarie Island and land fuel which was not landed at the earlier relief. The expedition was farewelled from Melbourne, at No. 3 North Wharf, by Mr. Peter Howson, M.L.A., at 1700 hours on Friday 22 December, 1961.

The ship sailed at 1745 hours. The weather remained calm for the first two days but it became rough on Monday 25 December and I had to ask the Captain to "heave to" so that we could have our Christmas dinner in comfort. The weather continued rough on 26th and 27th, and the storm reached its peak on 27th when the ship was "hove to" between the hours of 0225 and 1200. During the storm the helicopter platform sagged due to the splaying of the steel legs which had not been adequately braced. It was repaired by the Chief Engineer.

We settled down to hard work on Thursday 28. Harwood took men to the hold to re-stack cases which had moved during the storm, while I held conference with various groups of men concerning the work ahead. Misson began training specialists on procedures for the overhaul of the automatic weather stations and everyone enjoyed being busy after the boring inactivity of the previous few days.

We did not see the first iceberg until 64°04' S, 135°48' E. This was much further south than usual.

On Friday 29 December at 0020 hours we first met pack ice in position 64°05' S, 135°18' E. We proceeded along the ice edge and entered the pack at 0340 hours at position 64°20' S, 133°55' E. Soundings were started at 0305 hours and the edge of the Continental Shelf was passed at 0645 hours in position 64°45' S, 133°55' E. The depths rose from 700 fathoms at 0600 hours to 170 fathoms at 0700 hours. There was not much pack ice and we were in clear water again at 0530 hours.

The ship sailed south through open water with the icebergs of the Dibble Iceberg Tongue on the port side. At 1315 hours Misson and I flew ahead of the ship by helicopter to land at Lewis Island and examine the automatic weather station, which had not been visited for two years. We found one aerial mast blown down, both aerial wires down and the wind generator still going and in good order, with the batteries fully charged. However, the clock had stopped, the small pawl which engages the pendulum balance having stuck in the "up" position. Most of the other equipment in the hut seemed to be working.

The ship came in close to the island at 1400 hours. We immediately put over the Beaver aircraft which took off at 1435 hours on a photographic flight to Rocher X in Adelie Land. It then flew a photographic flight of the Dibble Iceberg Tongue and finished with a "heighting" run inland for 50 miles over the plateau. The plane landed again at 1850. In the meantime, the helicopters ferried cargo and men back and forth between the ship and Lewis Island. It was a perfect afternoon with clear sunshine and a blue sky. We worked in the evening until 2200 hours. It was a good afternoon's work: all the cargo was ashore before dinner and, by evening, the old generator tower had been dismantled and both aerial masts pulled down; the new batteries had been installed and

some work had been done on the electronic and electrical equipment in the hut.

We rose at 0530 hours on Saturday 30 December. Dr. Soucek commenced a census of the birds of the island, assisted by Field. At 1000 hours the Beaver aircraft flew on a photographic mission as far west as Cape Mose. It returned at 1315 hours and we had some difficulty in hoisting it on board in a strong wind. Ashworth reported that the coast for 50-70 miles to the west was clear of ice. This was unusual as I had never before found it clear for more than 10 or 15 miles. In the afternoon Gale and Kirkby set out in the ship's boat to chart depths around to the north of our anchorage. A wind of about 20 knots made it too rough to attempt another Beaver flight. After dinner two aerial masts were erected by helicopter. At 2130 hours Misson found that the clock was giving trouble. This was rather worrying, as the clock is the heart of the weather station. If it stops everything stops. We all returned to the ship at 2200 hours.

We awoke on Sunday 31 December to find a 50-knot gale howling around the ship. We managed to send a skeleton working party ashore in the ship's boat but the storm had increased by lunchtime and we were unable to take them off again. The ship dragged her anchor and had to move in very close to the ice cliffs of Lewis Island to obtain firm holding ground. At 1800 hours the wind had dropped to 35 knots and the ship's boat managed to take off the men who were ashore. We had a party on board ship to usher in the New Year at Midnight.

Next morning, Monday 1 January, we sent the ship's boat off about 0930 hours, with a wind of about 30 knots. During landing it was washed broadside onto the rocks by the surge and suffered some damage. The main work ashore consisted of erecting the aerial wires and attaching meteorological instruments to the tops of the masts. This involved men climbing the masts and working in the bitter wind at the top, but they faced it without grumbling. Work continued throughout the day and the evening. After dinner the Beaver made another flight, this time to carry out two heighting runs over the plateau between the hours of 2000 and 2350. The men completed their work ashore and were brought off at midnight just as the Beaver was hoisted on board the ship. It had been a long but successful day. Misson was satisfied with the condition of the station and all was ready for our departure.

We had intended sailing at 0300 hours on Tuesday 2 January, but the brake on the anchor windlass had frozen up overnight and it was 0500 before we departed. We sailed westwards along the coast towards Cape Carr, carrying out a running survey of the coast by means of radar as we went and obtaining a good line of soundings. We passed a giant iceberg ten miles long lying in the bay to the west of Cape Keltie and from the north-west corner of this bay we found a string of icebergs running out 10 - 15 miles into the sea. However, there was no pack ice or fast ice and we were able to pass through. About 15 - 20 miles east of Cape Carr we met an edge of pack and small broken-up icebergs and the ship tied up here at 1120 hours.

The Beaver took off at 1255 hours for a photo flight to Porpoise Bay. It photographed the coast as far west as Cape Goodenough, then photographed the iceberg tongue off Cape Carr and made one height run over the plateau, returning to the ship at 2130 hours.

At 1304 hours Kirkby (the surveyor) and I, set off in two helicopters on a reconnaissance flight to Cape Mose. On the way we landed beside a capsized iceberg whose bottom was studded with moraine rubble. We collected specimens and took photos. The rock was mainly grey granite. Further west we found that Cape Carr was definitely the most northerly point of this coast. Cape Mose, a little further on, had a rough group of closely packed bergs spilled off from its point and these apparently have led cartographers to plot Cape Mose more to the north than it should be, and also to show a glacier on the plateau edge where none exists. Beyond Cape Mose we looked down into Porpoise Bay which was filled with fast ice except for a long polynya stretching northward from the centre of the two arms of the bay. We then returned to land at Cape Carr itself which we examined as a suitable site for an astrofix determination by Kirkby. We returned to the ship at 1530 hours. Kirkby and geologist Gregory returned immediately by helicopter to Cape Carr to carry out the astrofix.

The Beaver returned from Porpoise Bay at 1705 hours. After dinner, at 1810 hours, Ashworth flew out again for another flight, mainly a heighting run plus photos of the iceberg tongue for 60 miles out from the coast. He returned at 2130 hours, the helicopters with the survey team returned at 2050 hours, and at 2200 hours the ship departed from this area. Kirkby's astrofix gave the position of Cape Carr as being 66°08' 25'' S, 130°42' 20'' E.

We sailed first north-east then north past the tip of the iceberg tongue off Cape Carr whose last icebergs passed abeam of us at 2045 hours. I had a vague hope that we might pass around the pack ice and fast ice to the north and be able to head west again.

On Wednesday 3 January we met pack ice at 0130 hours and although it appeared to thicken up we appeared to be making good progress at 0200 hours when I retired. However, the ice proved thicker and more extensive than we had expected and all of Wednesday we continued to push through difficult ice. We passed the edge of the Continental Shelf at 1047 hours in position 65°06' S, 130°35' E and passed out of the ice at 1848 in position 64°30' S, 130°23' E. We turned west in open water to proceed to the longitude of Cape Goodenough.

Wednesday night the wind blew strongly at 40 knots from the west and we butted and rolled in the heavy seas. Early on Thursday morning we turned south-west, and later south, along the meridian of 126°E. We entered the pack ice again at 1035 hours in position 64°51' S, 126°09' E. At 1135 hours I made a reconnaissance by helicopter, finding that a strip of heavy pack separated us from reasonably open water beside an extensive group of large icebergs which stretched to the south as far as I could see. The ship proceeded at 1215 in open water northwards around a tongue of pack ice and then on course 240°, until at 1320 hours we entered open pack.

At 1500 hours I flew another reconnaissance as snow squalls moved in and obscured the ship and the view. Stanwix and I flew twelve miles from the ship and found the main mass of icebergs which was our objective. It was not pleasant flying in such poor visibility but we found our way back using the radio compass. At 1640 hours the ship reached the icebergs and continued to push down south in fairly open water in amongst these monstrous mountains of ice. At 1645 we flew again and to my delight found open water stretching away southwards towards the coast as far as we could see. From 1700 hours until 1900 we sailed amongst large grounded domed icebergs in fairly open water covered only with ice cakes and brash. The depth was about 240 fathoms.

Our run ended at 2136 hours when we met an edge of fast ice barring further progress to the south in position 65°50' S, 125°15' E. We cruised around for an hour or so only to find that we were apparently in the bottom of a deep bay with the iceberg tongue to the east and with fast ice to the south and west. The ship tied up to an iceberg at 2240 hours amidst snow showers and bad visibility.

Friday 5 January was a bad day, with continuous snow and conditions in which the visibility prevented our sailing. We remained moored to the icebergs and I spent the day planning the changeover programme for Wilkes Station.

The weather was better on Saturday 6 January and I took off at 0534 on another reconnaissance. This flight showed open water to the north and north-west and indicated that we were lying at the southern end of the main accumulations of domed icebergs. This flight, too, was made in bad conditions with grey-black clouds lowering around us and snow storms sweeping below them to envelop us in obscuring mist. Only by flying over the open water were we able to proceed at all in these white-out conditions.

It was obvious that with the weather the way it was there was nothing we could do, so the ship proceeded north and north-west at 0900 hours. We decided on our way northwards to plot accurately the icebergs on the western edge of the bank. It proved a valuable morning's sailing with Kirkby and the Third Mate plotting the icebergs along our track. Between the hours of 1340 and 1420 I flew another reconnaissance, with poor visibility, fog and snow showers producing marginal conditions. We reached a point 25 miles from the ship, where a long line of icebergs ran east-west. When we returned to the ship we sailed north again until we reached this extension of icebergs, and from there we sailed westwards, still plotting their positions. At 2100 hours the Captain wished to go north where he thought there might be open water. I preferred to go west in the hope of meeting the Dalton Iceberg Tongue, so I flew again at 2120 hours to have a look to the north. It was snowing hard and visibility was about as bad as it could be. We flew 25 miles north and beyond there could see at least 10 or 15 more miles of pack ice. We returned and flew ten miles to the west, finding very open pack. As a result I advised the Captain to continue to the west.

On Sunday 7 January the Captain called me at 0430 hours for an ice reconnaissance. He had proceeded west all night and in the early morning had run into thick ice. I flew from 0550 until 0630 and as a result directed the Captain 8 miles north to a large iceberg, and then WNW and W. By lunch-time we had run into heavy ice again with large icebergs in sight which probably constituted part of the northern tip of the Dalton Tongue. I decided to have another look from the air. As a result of this reconnaissance I decided that we had little hope of pushing further west or of reaching Chick Island before going to Wilkes. I therefore directed the Captain towards open water in the north which we reached at 2000 hours.

We proceeded on course 315° towards Wilkes along the fringe of the ice in a 40-knot NNW gale. The ice edge at 2300 hours was in position 64°34' S, 122°10' E. We sailed all day Monday, 8 January, being diverted as far north as 63°32' S by tongues of pack ice. This is the furthest north that I have ever seen pack ice in these regions.

On Tuesday 9 January we turned south and met an ice edge at 1700 hours. The ice edge was composed of some extremely heavy floes, growlers and bergy bits. An unusual sight was that of an elephant seal basking on a floe in the pack ice. At 2035 hours I had a look again from the air and found open water only a few miles to the west. I returned quickly and redirected the ship.

When we landed the mechanic found that the housing for the belt drive of the cooling system of the helicopter had snapped off. We could have stayed aloft for only about a few more minutes. It was fortunate that this had not happened two days earlier when we were 25 miles away from the ship in bad visibility. Late that evening we reached open water near the bottom of Vincennes Bay and sailed around past the Vanderford Glacier and the Windmill Islands to approach Wilkes from the south.

We arrived at Wilkes at 0235 hours on Wednesday 10 January. The American biologists came out to meet us in their launch and over the station in welcome were suspended coloured balloons moored on long strings. I sent the mail ashore and retired to bed.

At 0630 I went ashore with Harwood, Buskirk, Thomson and Reu. We were met at the beach by Smethurst and Dr. Orton and escorted to the Mess where the 1961 party was assembled. I spoke briefly, so also did Smethurst and Thomson. The ship meanwhile unloaded the DUKWs, the Beaver aircraft, the pontoons and the Mac.Robertson launch. Smethurst took me on a tour of the station and Harwood returned by helicopter to the ship to supervise unloading. The station was in immaculate order and a number of improvements had been made, particularly in roofing and electric wiring. We had just finished our inspection when the first DUKW load of cargo arrived.

Unloading proceeded throughout the day and in the afternoon the RAAF fixed a mooring for their aircraft in the bay to the north of the station. From 1930 until 2100 the Beaver flew two glaciologists over the surrounding country to show the new man the surrounding terrain. I investigated an alternative landing ramp near the vehicle park, but decided against its use. I also examined the area around the vehicle park to assess its suitability as a site for a new station and decided here, too, that it was not suitable. After dinner the American biologists came on board to see the Captain and me about loading their launch. We found that the only place suitable for the launch was No. 2 hatch, but there we were carrying the Beaver aircraft. The Captain advised that No. 1 and No. 3 booms and winches were not strong enough to lift the launch, which weighed between 6 and 7 tons. We found it was too long to go down No. 2 hatch into the hold and too long to lie alongside No. 2 hatch where one of the DUKWs was carried. After consideration, the Captain and I decided that the launch should go home on the "Nella Dan". One factor in our decision was that the "Thala" was already cluttered up with a great weight of deck cargo and the Captain was reluctant to add to the weight of top hamper on his empty ship. "Nella", on the other hand, was carrying only two DUKWs and could take the launch without difficulty. Work ashore finished at 2100 hours. The pattern of work in general was as follows:-
Rise 5.30. Meals 6 a.m., midday and 6 p.m., with supper at 9 p.m.
Work ashore from 6.30 a.m. until 8.45 p.m.

Thursday 11 January was calm and cloudy with an occasional snow storm. As unloading proceeded, other men worked preparing sites for the cosmic ray hut, the store hut, the balloon filling hut and the platform for the rubber bulk fuel tank. During the morning I flew by helicopter to examine a coastal rock outcrop just south of Wilkes Station on the other side of a large bay. After examining all the other rock outcrops for twenty miles around the Station I decided that this was the only one which offered any opportunity for a site for a new station in the Wilkes area. After this I photographed Nelly Island and the Donovan Islands. After lunch the First Mate and I tried out various diving suits with aqua-lungs beside the ship. During the afternoon the U.S. biologist, Saunders, approached the Captain with other proposals concerning ways of carrying his launch on "Thala Dan" and after dinner he and Wilson again talked to me. I agreed to speak further to the Captain. They were very reluctant to wait at

Wilkes for the "Nella". During the afternoon Ashworth flew Budd and geologist Gregory around the local area to look at the geological structure of the region. A proposed heighting run over the plateau was abandoned because of cloud.

Friday 12 January was again dull with snow showers and flying was not possible. Unloading proceeded well. Some building was held up until certain items such as bolts and bearers were discovered amongst the cargo.

Saturday 13 January was again overcast, dull and grey, with snow showers. I again went over to the rock outcrop I had chosen as an alternative station site and examined it thoroughly. It offers possibilities for a new site: although there is no run-out for DUKWs, there is a place at which I think a jetty could be built for unloading from pontoons; there is plenty of room for huts; a snow ridge behind the site provides an ample reservoir of ice for provision of water; and there is ample space for aerials. By evening the general unloading had been completed, the cosmic ray hut had been erected, and drum unloading had started. The weather fined up on Sunday 14 January. One of the first jobs was to unload the caravan and sledge by means of a pontoon. This passed off satisfactorily. Unloading of fuel drums then proceeded. There were more than one thousand 44-gallon drums to be handled. In the afternoon I carried out further swimming tests on a naval diving suit.

On Monday 15 January, Gregory used a helicopter to visit a number of islands for geological examination. Helicopters also took Soucek and Orton to Ardery Island for ornithological work. In the evening we planned the 1962 seismic traverse and then the two OICs and myself had discussions about stores.

On Tuesday 16 January Battye, Ashworth, Harwood and I flew to the ice airfield 8 miles inland and examined the terrain. We also had a look at the wrecked burnt-out Neptune aircraft. It is amazing that four out of the nine passengers escaped almost unhurt out of this wreckage which is strewn over two hundred yards of snow. During the morning the frozen victuals were put ashore. All the buildings were now finished except the balloon hut provided by the United States Weather Bureau. This was an extremely heavy and clumsy prefabricated hut, very difficult to erect. At 1700 hours the unloading of drums was completed and the back-loading of empty drums started. While I was ashore at 2100 hours Ashworth directed my attention to ice sweeping into the small bay where the Beaver was moored. I returned to the ship which I found surrounded by pack ice but was able to board the launch, "Macpherson Robertson", and sail it through the ice around to the entrance to the bay. As there was considerable danger of the ice damaging the Beaver I took with me the Beaver mechanic Ron Frecker and we gradually pushed floes aside with the launch and carved a passage for ourselves into the open water near the Beaver. The nearest floes at that stage were about forty yards away from the aircraft so we started pushing the nearest ones back, using the bows of the launch. It proved a reasonably effective method. From then until 1.30 a.m. next morning we worked continuously pushing floes. At that stage conditions seemed static and we decided that the tide might have turned and there would be no further danger. We therefore tried to return to the ship, but could not bring the launch within 100 yards of it. We found that the pontoons which were moored alongside the ship were being pinched by large floes, so we shouted to the Second Mate to hoist them above the water to allow the floes to move past the ship without damaging them. We then sailed back in the launch to the small bay and, as conditions were still static, we moored alongside the aircraft and I snatched a couple of hours sleep while Frecker stood watch.

He woke me up at 4 a.m. on Wednesday, saying the ice was coming dangerously close. We started up the engine and attacked the nearest floe, which was only about 30 feet away from the aircraft. The next nearest, with a large "bergy bit" tangled in it, had fortunately run aground to one side and formed an effective block to any floes approaching from that direction. While we were working a third floe, still another drifted in imperceptibly, so we raced back and barely managed to push it aside before it touched the aircraft. The launch was excellent. It was exciting and interesting work, but very slow. When we had pushed most of the approaching floes back to more than 40 yards from the plane we looked around and found that a small cake about 8 yards long had drifted unobtrusively in and had wedged itself between the front ends of the aircraft floats. We were able delicately to extricate this and push it away. The last floe that threatened the plane was about 50 yards long and very heavy. It could have swept the plane and her moorings to one side and crushed the floats like paper. However, by 4.30 a.m. we were able to relax, and at 6.30 the ice was definitely drifting out of the bay again with the tide. We therefore went back to the ship for a welcome breakfast.

That morning our 1962 Wilkes party went ashore for the last time. Gregory and Walker were flown by helicopter to the Balaena Islands for geology and gravity surveys. The Captain moved the ship in close to the point near the engine shed at 9 a.m. to enable us more easily to put the fuel line ashore. Before lunch the pipe line was rigged and after lunch fuel was pumped into the bulk tanks. At 1400 hours we held a short changeover ceremony in the Recreation Room. I addressed the men and then Smethurst handed the station officially over to Thomson. We toasted the Queen and the President of the United States of America and after a short drink the party broke up.

After dinner the U.S. biologist, Wilson, came to see me bringing with him Major Buskirk, the U.S. Observer. He again tried to raise the issue about the boat, but I refused to discuss it further, telling him that the Captain and I had made our decision on the matter. During the afternoon Harwood had organized the back-loading of vehicles which were to be returned to Australia. Two Dodge motor trucks and one Sno-Cat were successfully transferred to the ship by pontoons. The fuel pumping was completed at 1900 hours. At 1930 the Captain took the ship back to its old anchorage where we hoisted the plane on board and moored the pontoon and motor boat behind the ship. That evening, starting at 2030 hours, we held a "Changeover party" ashore, which ran until just after midnight. During the afternoon the 1961 Wilkes party had come on board with all their belongings; the changeover was therefore complete.

Thursday 18 January was our ninth and last day at Wilkes. At last the day was fine and the Beaver aircraft took off at 0825 hours for a photographic flight eastwards to the Totten Glacier. Ashore, the return of cargo to the ship was finished about 0930 hours, and the men were working hard on the balloon hut. At 1730 hours a wind arose and rapidly reached 20/30 knots. I could see the men ashore struggling to get the roof of the unweildy meteorological hut into position. The Beaver came alongside at 1745 hours and we had trouble hoisting it in the wind. At a critical moment a large ice floe drifted up on the plane but the motorboat crew managed to pole it aside until the plane was hoisted. The DUKWs had been loaded on board - one at 1100 hours and the other at 1330. By 1900 hours the men had fitted the roof on the balloon hut and it was tied down safely. This was a relief to us all. At 1940 I said goodbye to the men on shore and returned by helicopter to the ship. We departed from Wilkes at 2045 hours.

We pushed through very light pack the other side of Nellie Island and at 2225 hours reached open water in position 66°12' S, 109°57' E. On Friday 19 in an easterly wind of 40 knots we maintained an easterly course, deviating northwards occasionally to avoid tons of pack.

On Saturday the weather was calmer and we made good progress. We met the ice edge about 2200 hours. From the helicopter I flew 10 miles south of the ship and found the tip of the Dalton Iceberg Tongue with open water lying along the western side of it. Upon my return at 2300 hours the ship began to move south immediately and we made slow progress through very heavy floes and cakes.

We reached open water at 0715 hours on Sunday 21 January and cruised south at full speed with the iceberg tongue lying a mile or two away on our port side. The depth was 180 fathoms and the sounder showed the flat bottom typical of these banks. Our progress was uninterrupted by pack and we tied up at the edge of the fast ice about 6½ miles from Chick Island in almost the identical position that we occupied the previous year. It was then 1222 hours.

After lunch Missen and I went in by helicopter to inspect the station. We found that the wind generator had seized up, but the clock was still going and only about 6 minutes slow after a year of operation. All masts and aerials were standing, but one lead wire had become disconnected from the outlet bar passing through the wall of the hut. The anemometer head had blown away off one of the masts, otherwise this station seemed to be in fairly good order. Ferrying of men and equipment by helicopters started at 1340 hours and by 1600 everything was ashore. After dinner we had to stop operations because white-out conditions prevented the helicopters from flying over the fast ice.

Next day, Monday 22, I looked at the weather at 0330 hours only to find white-out conditions existing. As flying was not possible I decided to take the ship westwards to make a running survey of the coast as far as possible. Accordingly, the ship departed at 0400 hours. Commander Gale and I plotted the coast by radar and ran a series of soundings. Open water stretched to the west further than I had seen it in previous years and we had a good run until in the vicinity of Cape Mikhaylov, where an iceberg tongue ran out from the coast for about 10 miles surrounded by accumulated pack ice. The ship was finally forced to turn around about 1230 hours, having gone as far as it could in a gradually narrowing east-west lead. We had come nearly 90 miles and made an excellent plot of the coast with good soundings. We arrived back at our Chick Island anchorage at 2730 hours.

I rose at 0315 on Tuesday 23 and found the weather reasonable, so called the men and sent them off to Chick Island at 0500. They returned for breakfast. At 0900 the Beaver carried out a heighting run inland over the plateau followed by a photographic run over the Dalton Iceberg Tongue. In the afternoon the Beaver made another flight - a photographic flight to the west, then inland over the plateau to determine heights.

There were two Ross seals on the ice near the ship. After photographing them from various angles I arranged for Dr. Orton to kill one and bring it on board to return to Melbourne Museum. At the weather station which I visited after lunch I found all the outside work completed but Missen was having trouble with the equipment inside, finding fault after fault. Missen and Stansfield returned after dinner to carry out further work at the station. They returned at 2245 to report good progress.

On Wednesday I rose at 0315 to find a perfect day. The helicopters took Missen, Stansfield and Church to the weather station at 0430 and they returned at 0845, reporting that the AWS was running satisfactorily. At 0921 the Beaver aircraft set off on a photographic run to the west as far as the Totten Glacier. The ship then sailed at 0925 hours for Cape Mikhaylov and, as we were proceeding, the helicopters flew off to take Kirkby to carry out an astrofix near the Cape. We reached the icebergs off the cape at 1330 hours and tied up against a floe just as the Beaver returned to the ship. During the afternoon I tested out further diving equipment in water at 29.6°F. I found that the demand valve of the breathing equipment froze up after about 10 minutes in the water. However, the wet suit was sufficiently warm. As I was about to emerge a killer whale surfaced only 15 yards away. The helicopters returned at 18.55 hours and Kirkby reported obtaining a satisfactory astrofix. Harwood and I flew by helicopter at 1953 for an examination of the Mikhaylov Iceberg Tongue and coastal features. When we landed at 2020 I asked the Captain to proceed and the ship sailed at 2050 hours. Overnight the ship cruised through open water and at 0525 hours on Thursday 25 January we met the first pack ice. However, the ice was of short duration and at 0900 the ship was sailing in an open lead which led to the ocean.

The Captain had been lucky to find this lead for if he had pushed ten miles further west he would have encountered thick pack ice to the horizon. At 0930 Harwood and I flew by helicopter to the south-east to examine the northern extremity of the Dalton Iceberg Tongue. We returned at 1030 after successfully sketching the outline of the Tongue. We also obtained valuable photographs. The ship proceeded towards Lewis Island and in the evening a storm arose with snow showers and a wind from the south-east at 45 knots.

Friday 26 was a rough day but the weather was moderating. We found the ship rode more easily now that she was empty than when heavily loaded on the way down.

On Saturday 27 January we met ice at 0600 hours but we had only two hours of easy pack before heading through open water for Lewis Island. We anchored close off the Island at 1115 hours. As the wind was still blowing at more than 20 knots and conditions were marginal for the helicopter we delayed our landing until after lunch. A party went ashore at 1305 hours and Missen inspected the station. Missen reported that everything at the station was satisfactory except for the clock, which had stopped. At 1715 hours Harwood and I flew by helicopter to look at the so-called Dibble Glacier, whose existence I had for some time doubted. Light conditions were perfect and we obtained interesting information and photographs about the terrain at the base of the Dibble Iceberg Tongue, proving definitely that Dibble Glacier did not exist. After dinner Missen returned to the island with three helpers to fix the wind direction head which was faulty.

On Sunday Missen went ashore at 0750 and returned at 0845 to report that the automatic weather station was fully operational. The ship departed Lewis Island at 0900 hours. We sailed northwards along the edge of the Dibble Iceberg Tongue, delineating some of its minor features. By 1645 hours we were in open water and headed NNW to where last year we had found a sea mount rising 800 fathoms. During the night we searched for it by echo sounder in a number of traverses without success. It is difficult with DR navigation exactly to reproduce a position in the ocean. For example, both here and also when sailing out from the Dalton Iceberg Tongue, we found that strong northerly currents placed us 10 or 15 miles north of our dead reckoning

position. These currents appeared to be tidal in character. We then headed for Commonwealth Bay.

Monday was uneventful. But Tuesday as we were approaching Commonwealth Bay we ran into a 40-knot storm. When within 8 miles of Commonwealth Bay the echo sounder stopped working. This prevented any further approach but the waste of time did not greatly matter as it was too stormy to do much. We spent the rest of the afternoon and evening "hove to" in the storm steaming gently up and down off Cape Hunter. After breakfast I had given the men a long talk on the history of Australians in Antarctica and the history of Sir Douglas Mawson's Australasian Antarctic Expedition and its achievements. I warned them against disturbing anything ashore at the old Mawson Station.

The wind continued to blow on Wednesday 31 and we anchored about 1½ miles off the ice cliffs and to the west of Cape Denniston in Commonwealth Bay at 1145 hours. At 1400 hours the First Mate took Burch and myself ashore. It was still blowing at 30 knots and we had a very wet trip. While Burch proceeded with magnetic work I hoisted the Australian flag, took various photographs and examined the station. I found the main hut filled to the gables with ice. The nearby meteorological shelter was half demolished and filled with drift snow. The absolute magnetic hut had disintergrated and only broken wall timbers still stood like pickets in a fence. However the magnetograph hut was in excellent order, partly because it was heaped around with rocks and partly because it was so thoroughly sealed. Inside a tin in the hut were three notes. The first was a copy of Blake's original note. The second note was signed by Father Mayaud of the 1951 French Expedition. The third was by P.E. Victor, dated 25 January 1959, giving details of French re-occupations of the station.

We returned to the ship at 1700 hours and found that Harwood had completed rigging the pontoon. As the weather was by then excellent I decided to take the men ashore after dinner.

Almost everybody came ashore at 1930 hours. The men assembled around the hut, I raised the Australian flag, we gave three cheers for Mawson and then photographed the assemblage. Some of the wood of the station showed remarkable examples of erosion caused by wind-driven snow. On the memorial cross the oregon timber had been eroded away to a depth of 1½ inches. We left by pontoon at 2030 in a strong katabatic wind and had a moderately rough ride, with plenty of spray, out to the ship.

The approaches in Commonwealth Bay are treacherous. The sea floor goes up and down violently. Reefs run out from the cliffs and from the MacKellar Islands. Going ashore in the motorboat over a distance of 1½ miles we passed soon after leaving the ship a spot with a depth of only 4 fathoms.

This historic site made a deep impression upon all of us. I shall strongly recommend that efforts be made to restore the station to the condition in which it was when occupied by the Mawson Expedition. As such it would be a fitting memorial and a valuable historic site.

Next day was overcast, with strong winds up to 35 knots. We waited until 1600 hours but as the wind began to increase and the barometer to fall the ship sailed at 1630 for Dumont d'Urville. At 1900 hours we passed through the centre of a large iceberg accumulation. There were more than 50 bergs within a 5-mile diameter, grounded on a bank 80 to 100 fathoms deep. A little earlier the depth under the ship had risen suddenly from 130 fathoms to 10 fathoms. This is indeed a most treacherous piece of coast.

We arrived at Dumont d'Urville during the early hours of Friday 2 February at 0130 hours. Paul Emile Victor and Captain Pedersen of the "Magga Dan" came out to our ship at 0645 hours and stayed for breakfast. As the 1961 French party was on board "Magga Dan" our men flew over to visit them at 0800 hours. At 1000 hours we transferred our men from "Magga Dan" to the French Station, where they remained until 1230 hours. The wind was rising and we brought the men back to the ship by helicopter in marginal conditions. The ship departed at 1400 hours after a very pleasant visit. One of the pleasures was the receipt of mail from Australia by "Magga Dan" which had been forced to return to Australia with a sick expedition man only a few days early.

Our next objective was the Mertz Glacier Tongue. We arrived off its north-west extremity about 1000 hours on Saturday 3 February. Visibility was bad so we cruised eastwards along the edge of the tabular ice front. It appeared to be an ice shelf rather than an iceberg tongue of the ordinary type. At 1315 hours, in heavy snow, we ran into an edge of pack ice and stopped to wait for a reconnaissance in better conditions of visibility.

On Sunday 4th I flew a reconnaissance at 0420 by helicopter, and as a result directed the Captain to sail eastwards along the fringe of the ice front towards open water about ten miles ahead. The ship started at 0600 hours. Round about noon we passed the most north-easterly extremity of the tongue and ran into open water at 1430. Soon after a heavy fog drifted over us and at 1540 we changed course to 200 degrees to probe down into the bay between the Mertz and Ninnis Glacier Tongues. We later passed the position Wilkes had reached in 1840 and thereafter went further south than any ship had penetrated in this region. At 1700 hours we ran into heavy pack ice and when fog settled over us we stopped for the night.

Next morning Monday 5th two helicopters with Harwood and I left at 0642 to have a look at the Mertz Glacier Tongue. We flew south for about 15 miles and delineated a point of what appeared to be the iceberg tongue or ice shelf mentioned earlier, took photographs and sketched in as much of it as we could see. Then we ran into fog and white-out and were forced to turn back. We landed at 0800. This feature was obviously ice shelf and not glacier tongue in the ordinary sense. (Later it was to be shown that this was a large detached tabular iceberg.) I decided now to investigate the Ninnis Tongue, so the ship sailed at 0830 on a course due east, heading towards the most southerly of the group of icebergs I had seen. At 1315 we met pack ice and as visibility was very bad we stopped. At 1700 there appeared a chance of the weather clearing and I went on another helicopter flight at 1734 but after flying in two directions we were blocked off by fog in each case and returned to land at 1740.

Next morning I looked at the weather at 0300 hours and again at 0500. Finally the two helicopters with Harwood and myself set off at 0921. We flew south over heavy pack and 15 miles out found a polynya of open water. However fog again blocked us and about 10 miles later we were forced to return to the ship where we landed after first having done an ice reconnaissance to the north where we found our escape to the open water was reasonably clear. This flight had proved disappointing for we did not see any sign of the Ninnis Glacier Tongue. During the afternoon Dr. Orton collected some fine Emperor Penguin specimens for the Sydney Museum.

After dinner, as the sky was clearing from the south, we made another attempt to reach the coast. The two helicopters with Harwood and I took off at 1920 hours and flew on course 200 degrees. 25 miles south we met fast ice which appeared to extend as far as the coast. About 60 miles south and an estimated 10 miles from the coast we were forced by white-out conditions to turn for home. At this distance the main features of the coast were clearly delineated. We landed at 2108 hours.

Next morning Kirkby and Gregory set off in the two helicopters at 0830 to carry out an astrofix and a geological collection at Penguin Point. We then moved the ship about 5 miles north to clear water and sent the Beaver aircraft off at 0921 hours. The Beaver flew to the junction of the coast and the Mertz Glacier Tongue, then turned eastwards and flew to Cape Freshfield on a photographic run. Just before lunch the weather closed in all around the ship, with snow showers and bad visibility. We warned the Beaver, which was just turning at Cape Freshfield, to return. We also warned the helicopters, whose pilots decided to attempt to return in spite of the white-out. As the snow showers swirled around the ship, we were concerned about the ability of all our aircraft to approach the vessel; but they all arrived within minutes of each other at about 1400 hours in a heavy snow shower with visibility about 200 yards. As soon as the aircraft were on board we decided to leave King George V Land and proceed to Oates Land, so the ship sailed at 1400 hours. We met pack ice at 2300 hours and stopped for the night until 2330. The pack continued until 0800 next day. Later we found ourselves just north of the Virik Bank so turned south to examine it. Icebergs appeared ahead and the bottom began to rise. We ran into pack ice, so diverted eastwards, having assured ourselves from the presence of the bergs and the rapid rise of the ocean floor that the Virik Bank does exist in the position indicated.

On Saturday 10 February we sailed south past the Balleny Islands, the first time I have seen them since 1948 in the "Wyatt Earp". We had a good ice-free run and at 2210 hours the coast became visible. At 2145 we ran into an ice-berg bank stretching across our path and cluttered up with pack. We diverted eastwards around it.

On Sunday February 11 I was awakened at 0145 by the Captain who told me that we were within about 10 miles of the coast. We came in through cloud and mist in open water to see the rugged coast with Cape North to starboard and Cape Hooker to port. At 0408 we anchored in a small bay close to the western side of two small rocky islands just east of Cape North. After breakfast, at 0900, Harwood and I flew ashore on the larger island and erected the New Zealand flag. The following operations then started: Kirkby began an astrofix, Burch began magnetic measurements and Dr. Orton supervised a survey of the birds of the island. The weather was overcast and foggy with occasional glimpses of the sun. In the afternoon Gregory and I flew by helicopter to Cape North. We landed on sea ice 200 yards from the bluff and frog-hopped over ice floes to reach the shore. It was difficult to reach the main rock slopes for they were approached by steep scree slope bedded on polished ice. We were forced to cut steps and did not climb very high. We found the Cape to be 2,500 feet high, which is more than it looks. Next morning at 0945 Gregory and I flew to the base of the high rock face on the eastern side of the fjord which indents the coast beside Cape North. The sky was still overcast. After collecting geological specimens we flew up the fjord over the glacier and then climbed to measure the altitude of the main snow peak on the eastern side, which proved to be 3,400 feet in height. It was interesting to find

that the rock on the Cape North side of the fjord was slate, whilst that on the eastern side was granite. During the morning I sent the Mac.Robertson launch eastwards to travel along the coast and take soundings as far as Cape Hooker; however at lunch time they had engine trouble and were forced to return to the ship.

Tuesday 13th was calm with mist and snow, and no work was possible. Wednesday brought a blizzard of 60 knots. On Thursday 15th it was calm again but there was mist with heavy snow showers. At 2300 the sky cleared suddenly, so I despatched Burch and Kirkby to the island to complete their observation.

Friday 16th dawned clear and sunny. We arranged for Kirkby and Burch to be picked up at 0400 and called the men concerned with the Beaver for a flight. Kirkby had obtained a good astrofix for the island and Burch had completed his magnetic observations. The ship was forced from its anchorage because of pack ice and at 0715 in the open water we were about to put out the Beaver when the wind freshened to 30 knots. The wind cleared the ice, so we returned at 0830 to our old anchorage and at 0930 in the shelter of some icebergs we managed to launch the Beaver which took off on a long flight to photograph the coast from Williamson Head to Cape North. The helicopters with Kirkby and Gregory set out at 1050 for Rennick Bay. Unfortunately at 1130 it started to cloud over again. The Beaver returned at 1400 and Ashworth said he had photographed from Williamson Head as far as Rennick Bay before running into coastal cloud. This flight linked the boundary of the Australian Sector with the area where we were working during our two previous visits. The helicopters arrived back safely at 1645 after a worrying trip through white-out conditions in which for most of the way they had been guided by the ice cliffs. Kirkby had obtained only two sun shots before being blocked by cloud.

Saturday 17th was again a bad day, cloudy and foggy with snow showers. Altogether this period was most trying for our patience but fortunately we had sufficient time to allow us to wait in the hope of some good weather.

Sunday was again a frustrating day. We rose at 0300 but snow showers shortly after 6 o'clock covered the Beaver with snow and the men were forced to de-snow it again. The Beaver was hoisted out at 0715 hours but after making three attempts to take off the water gave up and returned to the ship. Lack of wind and very smooth water apparently prevented it from taking off with its heavy load of fuel. By 0800 it was snowing heavily again and all operations ceased.

On Monday, our ninth day at Oates Land, the weather began badly but at 1000 hours the sun broke through, so we set the aircraft crew cleaning the snow off the aircraft again; however cloud along the coast prevented any Beaver flight. At 1600 hours the Plateau began to clear so Kirkby and I in one helicopter were flown to land on a prominent bluff due south of the ship and about 7 miles away. At an altitude of 3400 feet the temperature was + 4° F. and we stepped out into deep powdered snow almost up to our waists. We took sets of angles and photographs of the surrounding peaks and returned about 1930 with enough information to enable me to complete a sketch map I had been making of the area.

Tuesday 20th proved to be the day we had been waiting for. We rose at 0300 and sent the helicopters away at 0630 with Kirkby and Burch to carry out an astrofix near Rennick Bay.

The Beaver aircraft was ready to be hoisted out at 0600 hours but the ship's motor boat could not be started and we had to hoist out our launch instead. The plane finally took off at 0725 to complete the photography which was not possible on its last flight, namely, from Cape North to Rennick Bay. The pilot also decided to photograph as far inland as his film would permit along the great glacier that exists south of Cape Rennick. The aircraft returned after a successful flight at 1105. At 1225 it took off again to fly to Rennick Bay, then due south along the glacier to 72° S, then east until 100 miles south of the ship, then due north to return home. The flight was successfully accomplished at 1620 hours. These two flights cleaned up very nicely the huge area of mountain ranges in this region.

The helicopters returned at 1533 and both Kirkby and Burch reported a successful day. The helicopters set off again at 1600 hours, one to proceed north-west with the Captain on a reconnaissance of the ice, and the other to take Gregory and Harwood to land on the nearby bluff and any other accessible rocks for geological work.

At 1500 hours it began to cloud over rapidly. The Beaver went off on its third flight at 1745 to take photographs of the region within 20 miles of Cape North. However, low cloud limited the value of the work done and it landed at 1830 hours. The helicopters returned at 1708, and at 1915 the ship departed from this area of Oates Land to sail further west.

Wednesday 21 February dawned sunny and calm. The ship had sailed all night and at 0815 stopped in ice 45 miles off the shore due north of Mt. Gorton. The Beaver took off at 0732 to make a deep penetration of the mainland, with photography south from Davies Bay and north again past Magga Peak. The two helicopters set off at 0910 to take Burch and Kirkby by helicopter for an astrofix and geomagnetic work on the coast just north of Mt. Gorton.

The Beaver returned at 1130 after a successful flight and was launched again at 1430 on a photo flight between Magga Peak and Mawson Peninsula. However, the helicopters were not so fortunate. At 1040 we received a radio message stating that, as the two helicopters were landing on a 4000-foot snow peak sixty miles away, one of them had burst an oil seal and was out of oil. It was arranged for the other to return to the ship for oil. It flew back at 1400 hours and left again at 1600 to return with a supply of oil to the stranded machine. In the meantime the Beaver, which had flown about half-way along the Mawson Peninsula, radioed back that two cameras had stopped working and it therefore was returning to the ship. It arrived back at 1737. Meanwhile, on the Continent, working in temperatures of around 0° F., the mechanics cut off the breather tubes from the oil sumps of both helicopters for it was icing up in those which had caused a build up of oil pressure to burst the seals. At 1800 hours, after refilling with oil, the machines began to limp their way back to the ship, stopping every quarter of an hour for an inspection. We were relieved to learn at the end of the first inspection that the damaged aircraft was holding its oil reasonably well. Both helicopters returned safely at 1905 hours. As soon as they were on board the ship sailed to try to move westwards closer to Mawson Peninsula. However, at 2315 hours, we were stopped by ice at position 68°41 S, 160°11 E.

On Thursday 22nd I rose at 0300 hours and arranged for Frecker to repair the Beaver cameras. It was overcast and calm and new ice had formed over all open water. It was obvious that we could not proceed further towards the west, and I decided to make no further attempt by the Beaver on Mawson Peninsula and Cook Bay. It was apparent that the ship could not provide

cover for such a flight and I did not feel that the helicopters were reliable enough to back it. Further, we had not enough aviation fuel left to enable the helicopters to frog-hop via a number of depots to reach the Beaver should it be forced down. I considered it would be better to concentrate on the Cook Bay area next year with the ship anchored somewhere near the Ninnis Glacier Tongue. Instead, I proposed to return to about 162½°E and strike at the coast within a 50-mile radius for geological work, also to send the Beaver on a last flight should the plateau become clear of cloud. The ship therefore departed at 0855 hours to head east and south. Its position was then 68°44'S, 160°21' E. We reached open water at 1000. Here we saw a most interesting mirage. Mt. Gorton showed on our starboard bow 100 miles away, towering up into the sky, yet no neighbouring peaks were visible nor any of the high land in front. After lunch it was fine and clear and at 1400 hours I spoke to Ashworth about a possible flight. Although we were 120 miles from the coast and a flight would need to be fairly long, we considered that the possibility of deteriorating weather next day would make it worth while our trying while conditions were good. The ship stopped at 1535 hours and the plane was hoisted outboard. However, the sea was choppy and the spray, when the aircraft turned into the wind, iced it up so badly that Ashworth gave up the attempt. The plane was hoisted back on board and we resumed our course, proceeding SE along the ice edge. At 2030 hours we stopped for the night at the edge of the pack. All through the day the helicopter mechanics had been working on the two helicopters. On one they had to replace mast assembly and also change the carburretor which was a long job.

The next day, Friday 23rd, dawned clear and sunny with an air temperature of 13°F. After examining the weather at 0400, I arranged to call the Beaver mechanics at 0500 and to move the ship at 0700 back to open water. The Beaver went off at 0805 hours on a photographic run for 60 miles due south of Cape North, then 60 miles west, then north to the coast again. This was to be its last flight as we had used all the available aviation fuel, After breakfast a south-east wind developed, and overcast and hazy conditions spread over the plateau. However the area of photography to the east still appeared to be clear.

The plane returned at 1140 hours. I was delighted that this last flight had been successful and was relieved that a lot of flying had been accomplished with no accidents. It is a constant source of worry to have a single-engined aircraft flying on floats 100 miles inland over mountainous terrain. Squadron Leader Ashworth deserves the highest praise for his courage and energy. His last flight was lucky because the clouds spread over the plateau as he was completing his run.

As soon as the aircraft was on board the ship moved off in a south-easterly direction to a lead reported by Ashworth to run in towards Island "X". Unfortunately engine trouble developed and at 1450 the ship stopped. It was to remain immobilized until 0800 the next day while repairs were being effected. The wind rose and we drifted westward at 1 - 1½ knots, wallowing a bit in the swell in our broad-side position. Fortunately, however, there were no icebergs and we were far enough off-shore to be free of reefs and other dangers.

The ship moved on again on Saturday at 0800 hours in stormy and overcast weather with winds rising to 35 knots. In the afternoon a faulty injector valve caused a further stop between 1540 and 1704 hours. When the ship resumed its course the Captain could find no sign of the lead running south-west towards Island "X", the wind having closed it up. The Captain stopped for the night at 2300 hours in position 70°37'S, 160°54'E.

To my surprise, Sunday 25th dawned fine, calm and sunny. I decided at 0330 to call the helicopter men and to wait where we were until the helicopters were repaired and able to fly to the coast. At 1100 hours Harwood and I set off on a reconnaissance flight and found that there was no lead to the west towards Island "X". except right alongside the ice cliffs of the Continent and even this lead was jammed in places with pack ice. After lunch the second helicopter was ready, so Gregory, Burch and I, in two helicopters, set off to land and examine rock on a ridge that we could see flanking the eastern side of a glacier which on the map was marked as a crooked fjord. We landed on a north-south ridge at a height of 1500 feet, balancing rather precariously on a small flat of stone between the precipitous cornice on the western side and the steep rock face on the eastern side. Burch set up his magnetic instruments and Gregory collected and examined the rocks. Across the glacier valley and somewhat further south was a very high snow peak with rock on its surface. As it was the outstanding peak of the area I left Burch to carry on with his magnetic work while Stanwix flew Gregory and me across to land on its peak. The summit was only large enough for about two helicopters and was covered with magnificent fern-like snow crystals two or three inches long. Under six inches of this powdery substance was blue ice which was frighteningly slippery, so one avoided walking on any except the flat areas. The northern face of this peak fell away at a slope of about 60 degrees for 3000 feet. The altitude of the peak was 4400 feet. The rock at each of these places was horn- an felsed fine-grained sediment, but that at the high peak was more stratified and slaty than at the first peak. From the south-east around to the west there was a magnificent panorama of high snow-covered peaks and I took a 360-degree panoramic series of photographs. The weather was calm and pleasant, but already it was beginning to grow hazy in the west. We flew back, collected Burch and Arthurson, and at 1610 hours reached the ship again. The main worry of landing on these peaks with two helicopters is that with the intense cold at that altitude the engines might not start. It would be extremely difficult to rescue people and of course impossible to salvage the aircraft themselves should such an event occur.

Back at the ship we refuelled quickly and set off again at 1633 to fly to Island "X", about 20 miles to the west. The ship in the meantime was endeavouring to return to open water through pack ice which the west wind had now tightened up very considerably. It was late as we approached the island and the light was too bad for good photography. The haze had settled around us and the mountains were exhibiting white-out conditions. It was therefore not possible to land on the summit of the island so with some difficulty we landed on an ice slope beside a small area of out-cropping rock at the northern corner. The whole of the rest of the island constituted an ice dome. While the geologist was examining the terrain I flew around the island to examine the country to the south. The first major feature was a great snow dome at least 2000 feet high which was strikingly unusual. Extending around the dome and further east was an ice shelf fed by an extensive plain of rising ice into which, through mountain valleys, flowed several large glaciers. To the west of the dome the serrated peaks of the Bowers Hills ran south, and to the west of this another vast glacier plain, ending in another ice shelf, stretched as far as we could see. It is from here that the great glacier of Rennick Bay runs south. On the island Burch carried out a measurement for declination and Gregory found the rock to be of massive granite. As no other rocks were within our range, we went back to the ship, arriving at 1900 hours. As we flew back it was obvious that there was little further we could do in this locality, even with fine weather, (which was doubtful) so upon arrival I asked the Captain to proceed directly to Macquarie Island.

This was just as well, because Monday 26th dawned with an easterly wind of 30/40 knots with mist and, strangely enough, rain. We decided to proceed via the Balleny Islands and carry out such work there as might be possible in the weather. We passed the southernmost cape of Sturge Island at 0930 and proceeded to carry out a radar survey of its eastern coast and to run a series of soundings. We worked in heavy mist and fog, and did not see the islands except on the radar screen. This completed our antarctic work. We found some discrepancies in the shape of Sturge Island and its position in relation to the other Balleny Islands.

The next three days were rough and we pitched and rolled our way up to Macquarie Island, arriving at 1255 hours on Friday 2 March. As we came up to our anchorage the sun broke through, the wind dropped and the day developed into an exceptionally fine one. I went ashore by helicopter immediately and the helicopter then towed a fuel line from the ship to the shore. The ship then pumped 10,000 gallons of diesel fuel into the bulk tanks at the station. I had left the whole of the Macquarie operation in the hands of Harwood. He sent a pontoon load of cargo successfully ashore about 3 p.m. This pontoon returned to the ship again with cargo for return to Australia from Macquarie I.

The helicopters then made two trips each down the island, first of all to land building supplies at Lusitania Bay for the repair of the hut and secondly to photograph the lake region of the plateau and deposit stores at various points for the biologists. We were extremely lucky that the plateau was free of cloud to enable us to carry out this part of the work. By 7 p.m. all our Macquarie work was completed. After dinner I watched the American physicists launch one of their 50-foot cosmic ray balloons. Unfortunately, after reaching a height of 50,000 feet, the balloon lost altitude owing to some undiscovered fault in it.

Next morning, Saturday 3 March, I had consultations about building programmes for 1963 with the Officer-in-Charge and the engineer of the station. Most of the men from the ship came ashore and at 1030 hours we had a most enjoyable party with the 1962 group. We broke up the gathering at 1145 and by 1230 all men and the helicopters were back on the ship. We sailed at 1245 hours for Melbourne.

The first three days of the trip were very rough but the sea was calm in Bass Strait and we had a pleasant run home to berth at No. 2 North Wharf at 1945 hours on Thursday 8 March.

This has been the most successful and profitable voyage of exploration in the history of the ANARE. Favoured by unusually good ice conditions and occasional patches of good flying weather we were able to fill in all major remaining gaps in our mapping of the coast of Australian Antarctic Territory. The ship "Thala Dan" travelled 9,000 miles of which 800 were in ice.

The RAAF Antarctic Flight carried out aerial photography along 1,100 miles of poorly mapped coast and 650 miles of unknown inland terrain. Flights totalling 850 miles were made to determine heights of the inland plateau using a radar altimeter.

Astrofixes to tie down the aerial photography were obtained at 7 points by surveyor Sydney Kirkby, geomagnetic observations were made at 8 new places by geophysicist William Burch, and geological examinations of a number of localities were made by Chris Gregory. All such landings were made by helicopter. More than 1,000 miles of ocean soundings and sea ice observations were made and a hydrographic survey of Wilkes harbour and its approaches was carried out by Commander Gale.

The expedition's Beaver aircraft logged 80 hours of flying and took 10,800 aerial photographs.

The two chartered helicopters, flown by Captain John Stanwix and John Arthurson, logged 143 hours flying.

The expedition carried out the first comprehensive survey of Oates Land and the data obtained will enable us to map 300 miles of coast and some 20,000 square miles of unknown territory. New landings were made at eight places. This region is extremely interesting, with hundreds of snow-clad mountain peaks, some exceeding 10,000 feet in height. It is characterized by foul weather conditions and heavy coastal ice. Altogether it is an extremely difficult area to work in, and this is our sixth attempt to do so. It is most gratifying to have achieved success at last.

Passenger List - M.S. "Thala Dan" - 1962

P. G. Law — Leader

T.R. Harwood — Lieutenant to Leader

2nd Lieut. R. M. Kelly)
Sergeant K. L. Pledger) Army DUKW Crew
Sergeant D. J. Evans)

Squadron Leader Norman Ashworth)
Sergeant Alan Richardson) RAAF Antarctic
Sergeant R. Frecker) Flight

Captain John Stanwix)
Captain John Arthurson) Helicopter Crew
Arthur Chapman)

Major Harvey Buskirk, U.S.A.F., Official U.S. Observer

Sydney Kirkby, Surveyor, National Mapping Section

Christopher Gregory, Geologist, Bureau of Mineral Resources

Commander D.A. Thomas Gale — Hydrographer, National Mapping Section.

Raymond Missen, A.W.S. Technician, Meteorological Bureau.

On Outward Journey — 1962 Wilkes Party

On Homeward Journey — 1961 Wilkes Party

From Macquarie Island — Dr. Wallace Campbell, U.S. Physicist