

The Polish Expedition to the A. B. Dobrowolski Station on the Antarctic continent in 1978/1979

Communique

Following the Act of the Council of Ministers from 29 January, 1979, on the development of polar research, the Institute of Geophysics, Polish Academy of Sciences, in Warsaw, organized a scientific expedition to the Antarctic continent, to the Antoni Bolesław Dobrowolski Station, which lasted from 19 November 1978, to 15 May, 1979. This station, called "Oasis" previously, was set up at Bunger Oasis in 1956 by a Soviet expedition and was taken over by Poland on 23 January, 1959. In this ceremony of granting the station to Poland, a 7-member expedition of Polish polar researchers took part, headed by Prof. Wojciech Krzemiński. It went to the Antarctic continent on board a Soviet passenger ship, together with a successive Soviet Antarctic expedition. Over the dozen-odd days at the station, which on the take over was given the name of Antoni Bolesław Dobrowolski, Polish scientists carried out preliminary studies at Bunger Oasis, and also conservation work at the station. They did not expect then that it would not be until 20 years later that it would be used again, since it had been closed for such a long time.

After a few months of preparation, on 19 November, 1978, a 15-member Polish expedition set out from Gdynia for the Antarctic continent on board the Polish ship "Zawichost", including:

Prof. Wojciech Krzemiński — geodesist — head of the expedition — Institute of Geophysics, Polish Academy of Sciences, in Warsaw;

Prof. Gabriel Wójcik — climatologist, glaciologist, assistant head of the expedition for research — Institute of Geography, Nicholas Copernicus University, Toruń;

- Prof. Edward Wiśniewski — geomorphologist — Institute of Geography and Spatial Organization Polish Academy of Sciences, Toruń;
- Dr. Eng. Jan Cisak — geodesist — Institute of Geodesy and Cartography in Warsaw;
- M. Eng. Seweryn Mroczek — geodesist — Institute of Geodesy and Cartography in Warsaw;
- M. Eng. Zbigniew Battke — aerophotogrammetrist — Topographic Administration of the Polish Army General Staff in Warsaw;
- M. Eng. Andrzej Pachuta — geodesist — Institute of Higher Geodesy and Geodetic Astronomy of Warsaw Technical University;
- Dr. Bronisław Świetlicki — M. D. — Military Institute of Aviation Medicine in Warsaw;
- M. Eng. Zbigniew Kowalewski — assistant head of the expedition for technical affairs — Organizational and Legal Office, Polish Academy of Sciences, Warsaw;
- Czesław Opoka — pilot — Poznań;
- Stefan Krupski — pilot — Wrocław;
- Eng. Maciej Tałaś — flight engineer — Darłowo;
- Janusz Mazur — flight engineer — Pruszcz Gdański;
- Zdzisław Stochniał — flight engineer — Wrocław;
- Janusz Gumiński — radio operator — Dęblin.

The ship "Zawichost", which was the first ship to reach and moor at the sea ice coast of the Antarctic continent, to unload the expedition, is the so-called "laker", with the displacement of more than 7 thousand tonnes, prepared, with its reinforced sides, to sail in the ice pack. Its purpose was to reach the boundary of detrital ice, from where it was to be led to the solid sea ice barrier by the Soviet ice-breaker "Somov". The matter of the Soviet assistance to the Polish expedition had been agreed upon earlier in the negotiations carried out by the head of the expedition, Prof. W. Krzemiński, with the Institute of Scientific Arctic and Antarctic Research in Leningrad. "Zawichost" carried about 100 t of the expedition equipment, including two Mi-2 helicopters, with the total weight of 20 t, and 40 t of fuel. The other 40 t included other technical equipment (e.g. generators), measurement devices, furniture, food. On its way to the Antarctic continent, the ship stopped at Las Palmas and Cape Town.

On 26 December, 1978, the ship reached the area of the dense mass of already crushed coastal ice. In view of a large delay in reaching the "Mirnyj" Station by the Soviet ice-breaker, the captain of "Zawichost", Wojciech Kozłowski, made an independent attempt to reach this station, where assistance was expected in unloading the equipment. In December, 1978, the sea ice at the coast, over which the unloaded equipment was to be transported to the ice-sheet crushed extremely fast. Such an ice situation in the area of "Mirnyj" permitted "Zawichost", after crossing

the very dangerous wide zone of the crushed sea ice and numerous icebergs, to come close to the Antarctic ice - sheet cliff.

After agreeing with the management of the "Mirnyj" Station on the unloading technique, on 30 December, the ship moored at the wall of the snowdrift formed by the slope winds, on the sea ice, in the shade of the glacier cliff, which made it easier to reach the ice - sheet (Fig. 1). Before this, measurements had been taken of the sea depth at this place. After unloading two helicopters, spare parts and reserve fuel, the ship was forced to sail away quickly from the snowdrift, because the keel continuously struck a submarine rock and the floating ice was pressing on. On 6 January, 1979, the ship moored at this place once again, and then the remaining luggage of the expedition was quickly unloaded. On 8 January, "Zawichost" sailed away to Australia with an ill pilot, Stefan Krupski, a member of the expedition. Because one helicopter had been damaged during the unloading of the ship, all the members of the expedition were obliged to wait at "Mirnyj" for the ice-breaker "Somov", which was sailing to this station with two heavy helicopters Mi-8 on board.

The management of "Mirnyj" Station provided the Polish expedition with adequate accomodation until the time of their transport to the A. B. Dobrowolski Station. This happened on 18 January, after the previous setting up of a fuel station halfway between the "Mirnyj" Station and Bunger Oasis by Soviet helicopters. The distance between these two places is 350 km. All equipment, fuel and most members of the expedition were transported to the A. B. Dobrowolski Station by Soviet helicopters. Owing to this assistance, almost exactly on the 20th anniversary of granting this station to Poland, the Polish flag fluttered for the second time over Bunger Oasis.

On the first days of the stay at the station, when the weather was favourable, indispensable tidying-up work was done. The station had not been used for twenty years and it was in good condition. The station is situated at the centre of Oasis on a lake bank and consists of two wooden barracks standing close to each other and one smaller house some score m away, used for gravimetric investigations (Fig. 2).

Bunger Oasis is about 500 km² large and is the biggest one on the Antarctic continent (Fig. 3). This is a rocky hill area, to which the front of the ice - sheet is adjacent in the east, surrounded by Apfel and Edisto Glaciers in the south and west, and by the shelf glacier and long-term sea ice in the north. The marginal zone of the ice - sheet was the main area of activity of the expeditions. The same place was investigated in 1957/1958 by a Soviet expedition. The aim of this undertaking was to compare and define the dynamics of the front of the ice - sheet.

In order to elaborate a detailed topographic map of the marginal zone of the ice - sheet 22 photopoints were determined previously. All the

members of the scientific expedition took part in this work. Subsequently, air-photographs and measurements of a polygon-triangulation network were taken. This work was carried out in an area 10 km long and 1.2 km wide. The second region of the geodetic work was in the vicinity of the station.

Apart from the group work, the members of the scientific team also carried out their own investigation programmes.

Prof. G. Wójcik carried out systematic standard meteorological and actinometric investigations. All the meteorological data were transmitted every day to the Soviet "Mirnyj" Station by radio.

Prof. E. Wiśniewski carried out geomorphological investigations on the marginal zone of the ice-sheet and in particular on ice-cored moraines. Samples for sedimentological analyses were taken from deposits building these forms.

Dr. Eng. J. Cisak's task was to determine the astronomical coordinates of a point near the station. For this purpose, he performed observations of 27 pairs of stars.

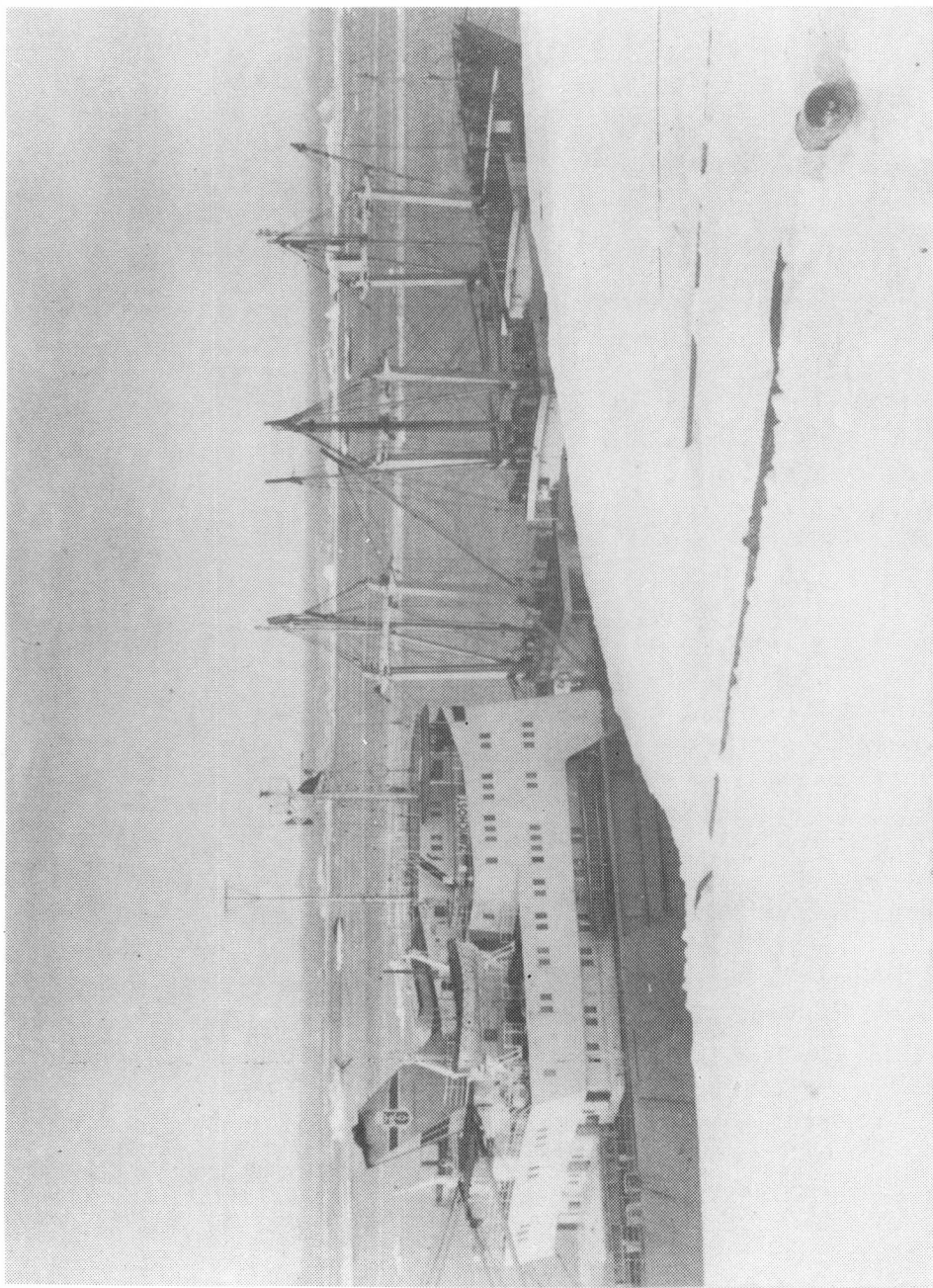
M. Eng. S. Mroczek performed magnetic measurements, electromagnetic measurements and trigonometric and geometric levelings.

M. Eng. A. Pachuta carried out gravimetric investigations in the area of Oasis and performed measurements of the gravimetric tie between the "Mirnyj" Station and the A. B. Dobrowolski Station.

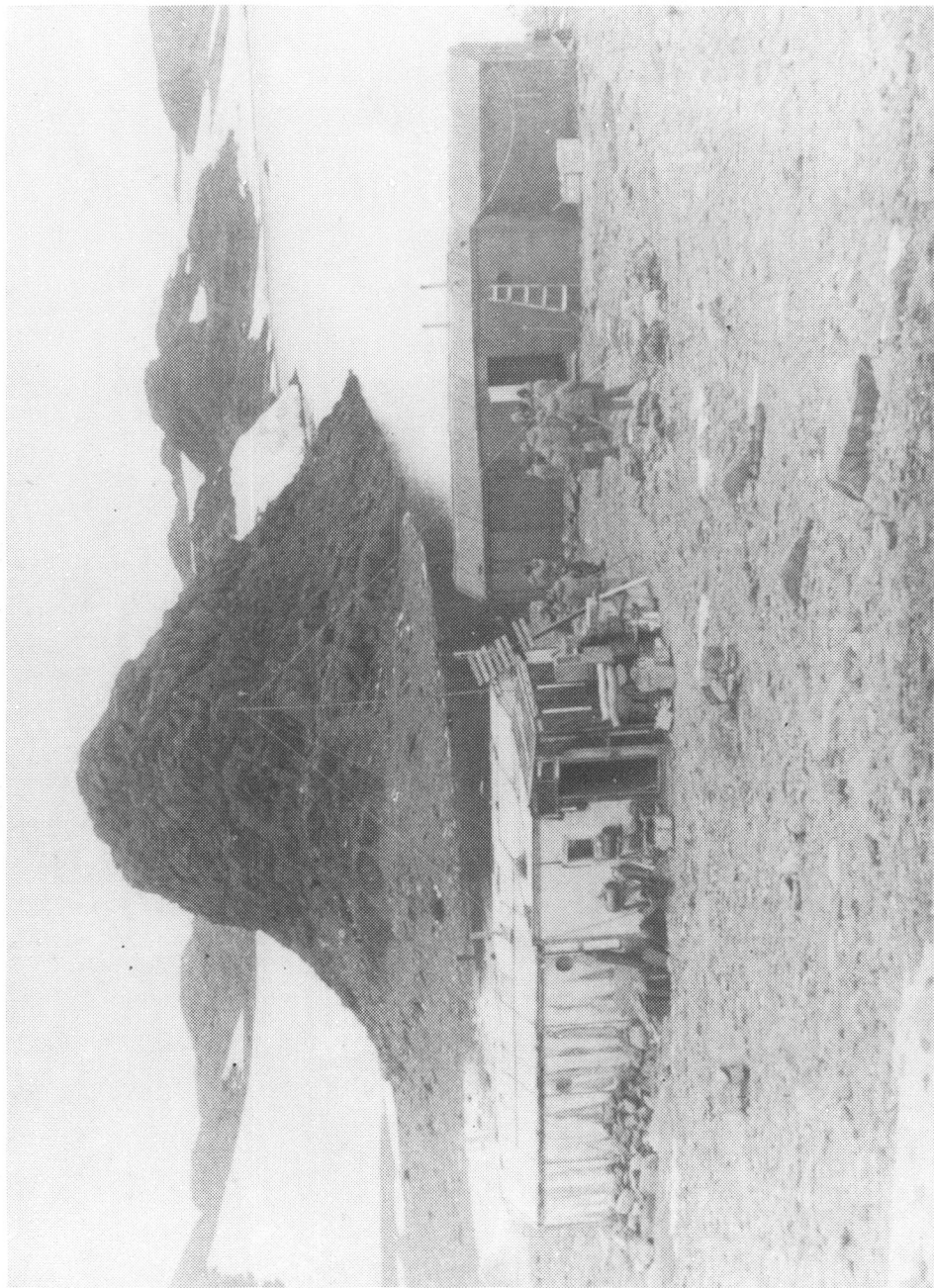
M. Eng. Z. Battke performed a stabilization of the photopoints and air-photograph work.

In view of the fact that the A. B. Dobrowolski Station occupies a central point of Bunger Oasis, the transport of men and equipment in the investigation area was executed by a helicopter, which was always ready to take off, owing to the diligent work of three mechanics and a pilot. Imperfect radio communication with Poland was a certain deficiency. It worked well by means of cables which were sent by the "Mirnyj" Station to Poland, however, it failed in the return direction. The connection between the Dobrowolski and "Mirnyj" Stations was made every day.

Since the beginning of the expeditions's landing at Oasis, the weather was good for the scientific activity and conservation work. The air temperature varied between -3°C to -5°C in the day. The vicinity of the station and its interior were ordered. The big snow fall on 20 February and the sudden break in the weather in this part of the Antarctic continent caused the expedition to leave the station already on the next day. The men were transported to the "Mirnyj" Station in two stages: first, over 130 km from the station to the shelf Shackleton Glacier, where the auxiliary fuel store was; the helicopter transported the men and equipment four times. This operation lasted from 9 a.m. to 5 p. m. in very difficult weather conditions. The helicopter took off from Oasis in fog and after



1. "Zawichost" near the wall of the continental glacier of the Antarctic continent by the Soviet "Mirnyj" Station. December 1978. Photo by E. Wisniewski



2. The Polish A. B. Dobrowolski Station at Bunger Oasis on the Antarctic Continent. February 1979. Photo by E. Wiśniewski

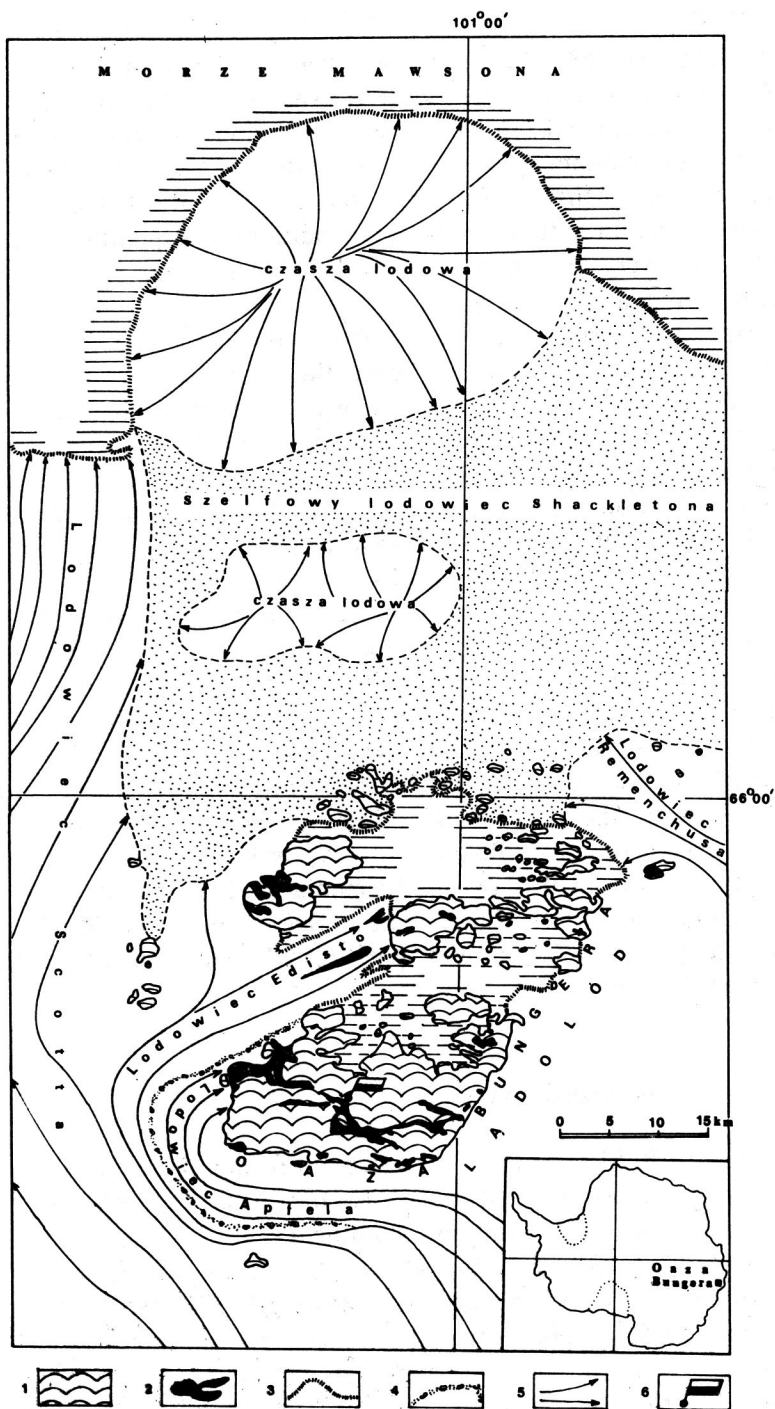


Fig. 3. The geographical situation of Bunger, Oasis

- 1 — free ice areas, 2 — lakes, 3 — ice chiffs, 4 — central moraine, 5 — directions of ice flow, 6 — localization of the A. B. Dobrowolski Station

20-minute flight landed in a sunny weather on the shelf glacier. On its way back to the station (three times) it was led by radio. At 3 p. m., an IL-14 airplane came from the "Mirnyj" Station to Shackleton Glacier, to take all the equipment and the majority of the members of the expedition to the "Mirnyj" Station, after the arrival of the last group from Oasis. Here, in difficult weather conditions (temperature from -7° to -20°C) and very strong winds, the helicopters were dismantled, conserved and stored in containers.

The expedition was to be taken from the "Mirnyj" Station in the same way it had reached it, i.e. on board the Soviet ice breaker "Somov". The only difference was that this task was assigned to the school-goods ship of the Higher Marine School in Gdynia, m/s "Antoni Garnuszewski". After taking on board the members of the Antarctic expedition, from the H. Arctowski Station, this ship sailed round half the Antarctic continent and on 14 March it reached the area of the "Mirnyj" Station. Here, it came across masses of ice blocks and icebergs, and in a stormy weather with zero visibility. The ship iced; its ribs were pressed in and the hull was broken in two spots under the water line. At that time, "Somov" was at ten days of sailing distance from the "Mirnyj" Station. After three days of a stormy weather, the conditions improved and the captain of the m/s "Garnuszewski", Władysław Rymarz, decided to reach the "Mirnyj" Station. On 17 March, the expedition embarked and after a two-hour stay at the port of the "Mirnyj" Station, the m/s "A. Garnuszewski" sailed out for Poland via Australia, where it stopped at Adelaide, Port Pirie, Bell Bay on Tasmania and Fremantle. Its farther way led to Gdynia via the India Ocean, Suez Canal, the Mediterranean Sea, with stoppings at Ceuta and Kiel Canal. The expedition returned to Poland on 15 May, 1979.

The calendar of the expedition

- 19 November, 1978. M/s "Zawichost" sailed out from Gdynia at 11 a. m. with a 15-member expedition on board to the A. B. Dobrowolski Station at Bunger Oasis on the Antarctic continent.
- 28 November, 1978. One-day stay at Las Palmas in the Canary Islands.
- 4 December, 1978. At 6²⁰ a. m. m/s "Zawichost" crossed the Equator.
- 11 December, 1978. Stopping at Cape Town to replenish fuel and sweet water.
- 12 December, 1978. At 11 p. m. the ship sailed out from Cape Town for the Antarctic continent.
- 24 December, 1978. M/s "Zawichost" crossed the 60° latitude South. Numerous icebergs and blocks of crushed sea ice appeared.

- 27 December, 1978. After crossing the wide zone of the crushed sea ice and icebergs, the ship stopped at the Soviet "Mirnyj" Station in the afternoon.
- 28 December, 1978. The management of the expedition went in a boat to the "Mirnyj" Station to discuss the way of unloading the equipment of the expedition.
- 30 December, 1978. After measuring the sea depth in a convenient place for mooring the ship at the ice-sheet cliff, the ship moored at 2 p. m. The unloading of the expedition was assisted by Soviet equipment and men.
- 1 January, 1979. New Year at "Mirnyj". In the evening the ship moved away from the ice-sheet cliff because the floating ice pressed on.
- 6 January, 1979. The ship moored once again near the front of the ice-sheet to unload the rest of the equipment.
- 8 January, 1979. "Zawichost" sailed out from the port of "Mirnyj" for Australia.
- 12 January, 1979. The Soviet ships "Somov" and "Bashkiria" with another Antarctic expedition on board came to the "Mirnyj" Station.
- 14 January, 1979. The first transport by a Soviet helicopter Mi-8 and a Polish one Mi-2 of barrels of fuel between "Mirnyj" and Bunger Oasis.
- 15 January, 1979. The transport of barrels of fuel by a Soviet helicopter Mi-8 to Shackleton Glacier.
- 16 January, 1979. On that day and the next, a Polish helicopter Mi-2 transported men and equipment of the next Soviet expedition from the ship "Bashkiria" to "Mirnyj" and back.
- 17 January, 1979. At 10³⁰ a. m. by a Soviet helicopter Mi-8, a three-person group flew to the Dobrowolski Station on a reconnaissance, headed by Prof. Krzemiński, taking also part of the equipment.
- 18 January, 1979. At 6 p. m., by a Soviet helicopter, the first group of the expedition (three persons) with equipment flew to Bunger Oasis.
- 21 January, 1979. All the remaining members of the Polish expedition landed at Bunger Oasis. At 11 p. m. a solemn hoisting of the Polish flag.
- 1 February, 1979. Establishment of a tent subbase, with 5 persons, at the front of the ice-sheet on the Far Lake to carry out investigations on the marginal zone of the ice-sheet.
- 21 February, 1979. Ending of investigations at Bunger Oasis and flight out by a Polish helicopter and a Soviet IL-14 airplane to "Mirnyj".
- 13 March, 1979. A festive farewell party with the Soviet crew at the "Mirnyj" Station.
- 17 March, 1979. At 4 p. m. m/s "A. Garnuszewski" reached the port

- of "Mirnyj". Loading of the expedition. At 6 p. m. the ship sailed out for Australia.
- 27 March, 1979. Stopping at Adelaide. A visit by a group of Australian scientists.
- 29 March, 1979. Stay at Port Pirie.
- 1—4 April, 1979. Stay in Bell Bay on Tasmania.
- 6 April, 1979. Stay at Adelaide.
- 11 April, 1979. Stay at Fremantle and a trip to the Suez Canal.
- 28 April, 1979. Replenishing of fuel at Djedda (Saudi Arabia).
- 2 May, 1979. Passage through the Suez Canal.
- 8 May, 1979. Stay at Ceuta (to replenish sweet water).
- 13 May, 1979. Passage through the Kiel Canal. In Kiel, a visit by a group of German scientists from the Institut für Meereskunde.
- 15 May, 1979. Return to Gdynia.

Wojciech KRZEMIŃSKI

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Fig. 3. Air photograph of the area of A. B. Dobrowolski research station at Bungler Oasis, taken by Author

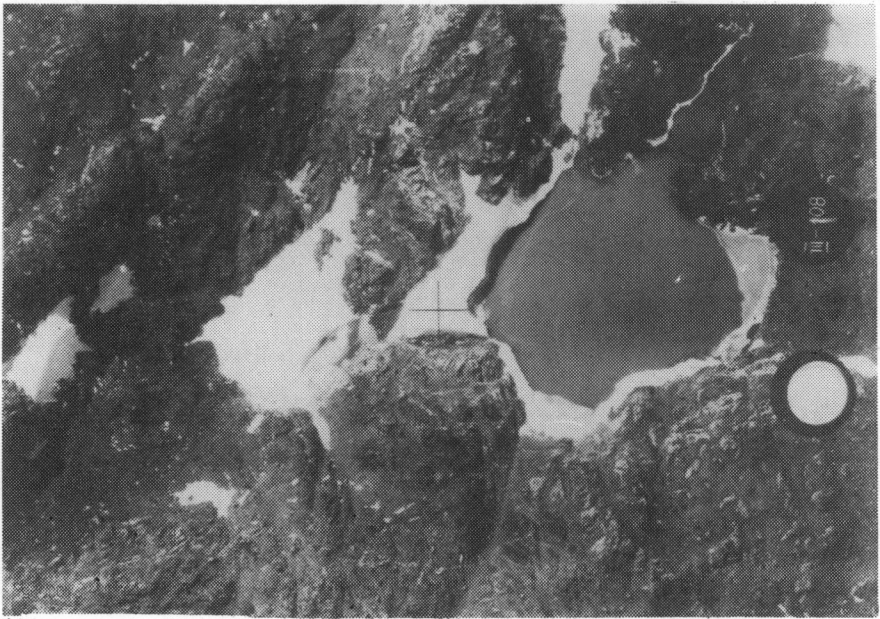


Fig. 4. Air photograph of the area of Bungler Oasis, taken by Author