

THIRD SOUTH AFRICAN METEOROLOGICAL EXPEDITION TO BOUVET ISLAND

FEBRUARY - MARCH, 1966

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Third time lucky! This was certainly true of the third South African expedition to Bouvet Island during February and March, 1966. The first two expeditions were only partially successful since without air support the landing parties could not reach the highlands and inspect possible sites for a manned station, viz. on Cape Circoncision and on the eastern ice slope. The second expedition during March—April, 1964 (*Ant. Bull. No. 4*) was provided with one helicopter, while the British scientific party on the H.M.S. *Protector*, which visited the island at the same time, had the support of two helicopters, but inclement weather allowed during four days at the island only one brief landing on the recently formed *West Wind* beach.

As a result of the experience gained from the previous two, this recent expedition was a well planned and thoroughly executed effort in which the M.V. *RSA* (the ice-strengthened ship of the Department of Transport) and the S.A.S. *Natal* (the hydrographic survey ship of the South African Navy) took part. The *RSA* carried two Westland WASP helicopters of the South African Air Force. A "telescopic" hangar was specially constructed to harbour the helicopters on the helideck of the *RSA*. The platform between the holds of the boat was modified into a landing stage for the helicopters to pick up heavy loads next to the holds.

The *RSA* sailed from Table Bay at noon on 22nd February. On board were 10 scientists and experts in various fields, as well as 15 Naval and Air Force personnel to manage the logistics and the flying operations at the island. Captain B. V. Hegarty of the South African Navy was in command of the expedition and Mr. S. A. Engelbrecht, Director of the Weather Bureau, was the leader of the scientific section. Observers from the United States of America and Norway accompanied the expedition.

The frigate S.A.S. *Natal* provided comforting support. Two biologists, three physicists for ionospheric, air glow and geomagnetic observations and a meteorologist for radiosonde soundings were accommodated on the *Natal*.

Due to continuous strong south-westerly winds sailing time was 9 days for the *RSA* and 7 days for the *Natal*. When the island hove into sight on the 3rd of

March the weather was fine and the wind light. Operations could be started immediately. During the next six-and-a-half days more than one hundred landings were made at numerous localities on the island. These aerial manoeuvres filled about 40 flying hours.

From the north-western side of the island juts out Cape Circoncision. Its steep, insurmountable slopes culminate in a sharp edge about 250 feet above sea level, an extension of which joins on to the main land. The second South African expedition (1955) considered this promontory as a possible, though far from ideal, site for a manned station. A great deal of blasting would have to be done to level a large enough area for buildings on its summit. Establishment and maintenance would in any case have to be done by air.

In 1955 a party of the expedition landed at the extremity of the main promontory near the entrance of the cave which is clearly visible between two bulwarks of rock on the photo. They could, however, not scale the steep cliffs above that. On the more gentle slopes to the left of the cave there are thousands of penguins which "catapult" out of the sea on to the rocks and then laboriously wind their way to the sanctuary 200 feet above.

During the *Norvegia* expedition of 1928 the Norwegians securely anchored a hut 20 feet above sea level on the outermost rocks of the Cape. A year later the hut had disappeared, evidently demolished by high waves. A comparable event occurred during the past expedition when on the second last day at the island a tide gauge was erected in what seemed to be a protected niche connected to the sea. A moderate gale developed during the last day and when the final flight was made to collect the recording unit of the gauge it could not be located in the spray and turmoil.

A rocky shelf, *West Wind*, projects from the foot of the western lava cliffs, which characteristically form the western border of the main island. Off its coast are numerous rocky stacks and shallows. *West Wind* shelf appeared between January 1955 and January 1958, when the American cutter *West Wind* visited the island and was the first to discover its existence. Its origin is controversial; some consider it to be a volcanic up-doming which was accompanied by a rockslide from the

Part of "West Wind" beach viewed from the north.



A birds-eye view of Cape Circumcision—no doubt considerably more attractive than the dreary view which met Pierre Bouvet's eye on that foggy New Year's day of 1739, when he discovered the island. Part of "West Wind" beach appears in the upper right hand side of the photo.



adjacent tall cliffs. The geologists of the recent expedition examined the feature thoroughly and consider it to have been created by a massive rockslide from the adjacent rock masses. Taking into account that the pile of rock extends 500 yards seawards and is about 1000 yards long, it is evident that the rockslide which might have caused it must have been one of the largest in history and was probably caused by an earthquake.

A small lagoon on the level lower portion of the shelf harbours a small rowing boat and fur seals. The country of origin of this boat remains obscure owing to absence

of identifying marks. This lagoon is probably connected underground with the sea and apparently gets its water from seepage through the porous mass of rubble and pebbles, which forms the northern section of the beach. It is also probable that during storms waves sweep over the 10 foot high divide between the sea and the lagoon. Behind the pool the main mass of jumbled black rocks rise in places to well over 100 feet above sea level. Near the lagoon are numerous conical mounds, consisting of lighter, grey material. These hillocks have evidently been formed through the rapid mechanical



weathering of boulders by means of the shattering effect produced by alternate melting and freezing of the water in their pores.

Macaroni and chinstrap penguins abound on the beach and at a rookery on its western slopes. Several hundred fur seals and one or two score of sea elephant bulls keep them company.

At a height of about 800 feet above sea level an extensive ice plateau slopes towards the east. The ice forms a blanket over most of the island. This blanket is evidently several hundred feet thick and where it reaches the edge of the cliffs it forms an almost vertical wall resting on igneous rock. This edge is markedly crevassed. Blocks of ice tumble down from time to time as the ice layer moves towards the sea.

The ice plateau is considered to be most suitable and safe for the establishment of a manned scientific station. The surface consists of smooth, partly consolidated snow. Surveying showed that the area is a shallow valley about 500 yards wide and probably more than 1,000 yards long in the direction of the slope. Thorough probing showed that this "concave" surface is probably clear of all but the smallest crevasses, although further afield they definitely reach greater dimensions.

A small polar tent and a wooden "hut" (a box measuring about 4 by 6 by 5 feet) with some glaciological equipment were erected. The tent was used as a shelter and a store for emergency rations while glaciological investigations (core drilling, pit digging and probing for crevasses) were in progress. The hut was left behind with emergency food and fuel supplies inside and as a marker on the ice for future expeditions. The tent and important equipment were retrieved at the end of the investigation. A safe area of 32 morgen was demarcated with sturdy poles and mapped. An ice core of more than 20 feet long was recovered and brought to the Republic for chemical and ice budget studies.

About three miles south of the contemplated location of a weather station the undulating rocky slopes of Rustad Hill rise steeply from the ocean. Here the cliffs are more than 1,000 feet tall and, as also typical of the north coast, they gradually become lower towards the east. The rocky platform of Rustad Hill offers an alternative site for a manned station. It measures about 6 morgen and is suitable for the establishment of permanent buildings. The area, though, will probably be exposed to gusty winds and often be shrouded in cloud. Its surface is patched with mosses of various species. About two-thirds of a mile west the massive Christensen Glacier descends between cliffs to sea level.



Above:

Temporary canvas quarters on the plateau, and Mr. D. Neethling (left) and Dr. Van Eeden, Director of Geological Survey, drills down into the ice sheet to determine the density of the ice mass.

Below Left:

An unidentified rowing boat in the lagoon is a playground for fur seals.

Below:

"Rustad Hill"—a rocky platform—in the foreground, and part of the ice plateau which slopes gently eastward.

