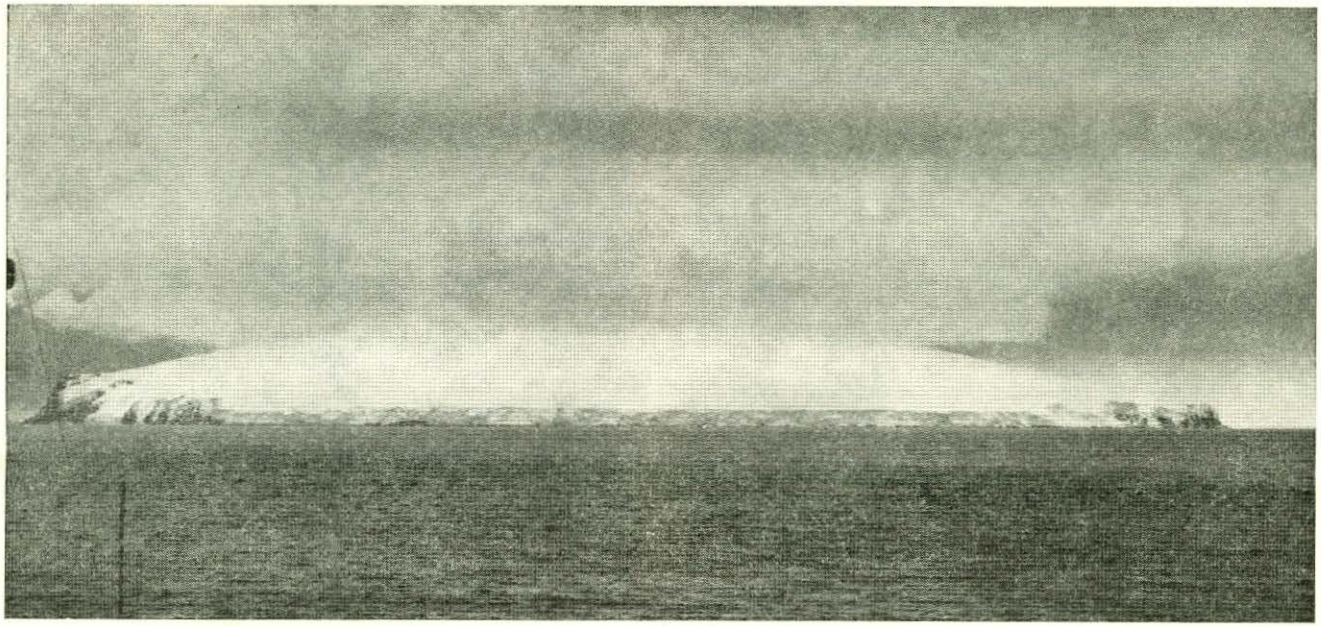

Bouvetoya as seen from 3 *miles east of the Island by the United States cutter* West Wind *on* 1*st January*, 1958.

RECONNAISSANCE EXPEDITION TO BOUVETØYA

(54° 25′S, 3° 24′E)*

by J. J. Taljaard

Just over 9 years ago, in January, 1955, the frigate H.M.S.A.S. *Transvaal* sailed to Bouvetøya during the first effort by South Africa to investigate this island with a view to the establishment of a meteorological station. In spite of fair weather, which is obviously a luxury at those latitudes, only two landings of short duration could be made and the *Transvaal* returned with the recommendation that another expedition be sent during the following winter to have a second look at the island under different conditions. This expedition did not materialise.

On New Year's Day 1958 the United States cutter *West Wind* was able to take a few excellent photos of parts of the island using a helicopter. A most surprising extensive "beach" area was found on the west coast. This feature had never been seen previously, not even by the *Transvaal* three years before. About a year later the 1958-59 Norwegian relief expedition to Norway Station surveyed this new area by radar and sextant and produced an approximate map which showed that the "beach" was about 500 yards wide in one place and about 1,000 yards long. Considerable speculation ensued as to the origin of this landmark and its suitability for a manned or automatic weather station. It was seen time and again from a distance by subsequent South African relief expeditions to Norway Station and SANAE.

Since 1955 South Africa has been repeatedly linked with the establishment of a scientific station on the island. Therefore, when it came to light at the SCAR meeting in Cape Town last September that H.M.S. *Protector* would visit the island for a few days in April this year and put a scientific party ashore, the opportunity was snatched to take a South African party to the island at the same time. H.M.S. *Protector* carries two helicopters and therefore if the R.S.A. could take one helicopter there would be a safeguard in case of emergency. The 1955 expedition had already come to the conclusion that operations on Bouvetøya would have to be carried out by helicopter and that for rescue operations a second helicopter would be essential.

The R.S.A. sailed from Cape Town on Sunday 22nd March with two meteorologists (myself and A. B. Crawford), geologist D. C. Neethling (Geological Survey), glaciologist T. Lunde from the Norwegian Polar Institute, airworthiness inspector D. E. C. Mallinson (Civil Aviation) and Mr. Frank McCall from the Public Works Department, on board to cover the main aspects of investigation for establishing a station (and possibly an aircraft runway) on Bouvetøya. On board were also the relief team for the weather station on Gough Island, a P.W.D. team for sundry items of work at Gough and more than 100 tons of cargo for Tristan da Cunha. Last but not least, a Hiller 12E helicopter stood safely secured on the helideck. The helicopter had been hired from United Helicopters (Pty) Ltd. and when it landed "with the greatest of ease" under

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choppy sea conditions in Table Bay outside the harbour on Sunday afternoon, we set forth with high hopes that at long last the icy slopes of Bouvetøya would be conquered. With an experienced pilot, Tony English, and an able mechanician, Charles House, to handle and care for this high-powered though small whirlybird, we were convinced that all the gloomy prognostications of the doom prophets in South Africa, that our helicopter would not even be able to take off once from the R.S.A. at Bouvetøya, would be disproved.

Calm and stormy days alternated during the voyage to Bouvetøya and some of us were smitten by the usual maladies which afflict landlubbers who take to sea. Six and a half days after departure from Table Bay, Bouvetøya hove into sight at sunrise on the 29th, while a 35 knot gale whipped up numerous white horses even to the lee (eastern) side of the island. From this time on, for the next four and a half days, the R.S.A. executed a maddening march upwind and downwind east of the island, interrupted only for an occasional few hours when the ship sailed round or partly round the island. It was too rough to anchor and so the ship had to keep sailing slowly.

H.M.S. *Protector* arrived late next day. We had meanwhile conferred and drawn up plans for the attack on the island should the weather improve. The sea remained too rough also on the 30th to get the helicopter operational and we were extremely surprised when H.M.S. *Protector* immediately on arrival and with the wind blowing 25-30 knots, sent over one of her Sikorski helicopters to fetch the mail which the R.S.A. had carried from Cape Town. *Protector*'s helicopters are of course housed in a hangar and are always ready for operations apart from the warming up of the engines. As a matter of fact the first machine had to give up the effort after a short attempt, but the second managed to hover safely above the bouncing heliceck until all the main bags had been towed up by cable. The leader of the British scientific party, Dr. Martin Holdgate, had invited me to come over to the *Protector* for discussions on our programs of work on the island, but on second thoughts it was considered not advisable to be towed up like a mailbag into the British helicopter.

The British interests were centred mainly on geoglogical and biological investigations on the west coast and our primary purpose was to inspect the eastern ice slope. It thus seemed that the work of the two parties would be complementary.

Advantage was taken of a lull in the wind on the morning of the 31st to get our helicopter ready for flying. All the equipment was assembled on the helideck and everybody stood by, ready for flying to the ice shelf. However, it took about 3 hours before the first dummy flight could be made and then Allan Crawford was transferred to the *Protector*, with which he was to return to Cape Town. Unfortunately it started raining continuously and the cloud base lowered almost to sea level so that no further flying could be undertaken for the rest of the day. Early in the morning when the visibility had been fair the British party was flown to the West Wind plateau, but with increasing rain and wind they had to be evacuated before noon without being able to complete their task.

When I plotted the coded analysis and whaling ship reports received from Pretoria on the 31st, I issued a very confident forecast for improved weather next day, but just the opposite happened. The 1st of April was a vile day as regards the wind, although the sun actually peeped through the clouds occasionally and there was only slight precipitation.

Protector was scheduled to sail to Simonstown at 1200 GMT on the 2nd and so there remained only a few hours on the morning of the 2nd to do something. The wind had backed to WSW and moderated to 20-25 knots and the eastern ice slope was alternatively blurred by snow flurries and brilliantly illuminated by the sun. The experts on the *Protector*, with long experience of helicopter flying in Graham Land, advised us not to fly to the ice cap because of expected turbulence and so our last hope, to accomplish something of our main purpose, vanished. Instead, it was suggested that our helicopter should accompany theirs to the West Wind volcanic beach where they wanted to do some more last minute work. This was done and Dirk Neethling and Tore Lunde were chosen to go on this our only flight to the island. They found the West Wind plateau to be a large raised area covered with very rough lava rubble and blocks of older lava jutting through the loose material. Although the area is new, there are already numerous penguins and seals on the beach. A dinghy of some unknown origin lay wrecked in a little lagoon near the northern side of the beach. Allan Crawford also had the opportunity to land with the British party for an hour on the area.

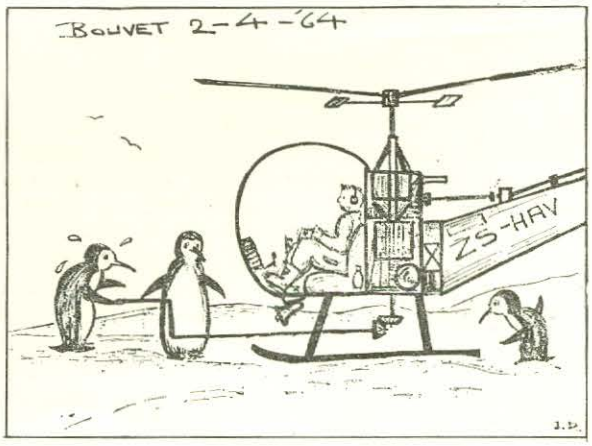
After about one-and-a-half hour's scrambling around over the rough terrain our party wanted to return but the helicopter engine refused to start and finally wore down the battery. A new battery had to be flown in from *Protector*. This event illustrates very clearly the dangers of operating on Bouvetøya with only one helicopter.

During the flight of our helicopter from the R.S.A. to West Wind plateau Neethling and Lunde had the opportunity to see the south-eastern fringe of the slope at close range. It was riddled with crevasses near the edge of the ice and many other crevasses could also be seen further inland. Parts of the slope are covered with snow but there are many areas where the surface consists of hard ice and these are much darker than the snow-covered areas. Many streams issued at the interface between the ice and rock cliffs which form the northern and southern coasts of the island. This, together with the fact that the mean air temperature at Bouvetoya is well above zero in summer, is evidence that a considerable amount of melting takes place in the warm season, a fact which will create many snags for erecting buildings on the ice.

I only had the opportunity of seeing Bouvetøya through binoculars and the picture of the eastern ice slope is disconcerting. It would seem to be a relatively thin ice shield resting on an uneven rock foundation and the ice surface is very much crevassed. My enthusiasm for the erection of a station on the island was very much damped, because, looked at from all angles, Bouvetøya will be a tough nut to crack. There are no sheltered areas for a ship to approach and anchor close to the island. It is surrounded by almost sheer cliffs of rocks or crumbling ice walls which cannot be scaled. The West Wind plateau is unsafe for a manned station since it is of volcanic origin. Cape Circonision is a knife-edge promontory (as seen by Lunde and Neethling who flew over it on their return from West Wind plateau). The eastern ice slope is certainly also far from ideal for a station, although I do not doubt that a station could be erected at a distance of half a mile to one mile from the coast. The danger of moving about will make life very inconvenient for men stationed on the island. Apart from this the erection and maintenance of a station on the ice slope will have to be carried out by helicopter and this would mean high expenses.

In spite of this rather dismal picture, I still feel that we should not give up the idea of a station on Bouvetøya completely. Perhaps international assistance will bring a solution for the logistics problems. Another expedition should be mounted to make sure what the actual conditions are on the ice slope and to see if there are no sizeable areas free of crevasses on the ice cap.

After departing from Bouvetøya on 2nd April the remainder of the voyage to Gough and Tristan took 31 days before it ended in Table Bay early on Sunday 3rd May. We had many interesting experiences on these legs of the extended voyage, but space does not permit recounting them. Perhaps the main highlight was to witness the extreme suitability of a helicopter for transferring cargo from ship to shore at these islands where landing facilities by boat are dangerous if not crude. At Tristan some of us had the opportunity to spend several hours on the recent volcano, from the crater of which plenty of steam and sulphur fumes are still issuing.



The hazards of single helicopter operations on Bouvetoya (by J. Duizers, first engineer of the R.S.A.).