ANTARKTIESE BULLETIN

MARCH, 1965 — No. 8 — MAART 1965

Published by the South African Antarctic Association
16, Anderson Street, Brooklyn, PRETORIA.

Uitgegee deur die Suid-Afrikaanse Antarktiese Vereniging
Andersonstraat 16, Brooklyn, PRETORIA

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THE OPERATION OF AIRCRAFT IN ANTARCTICA

By W. J. B. Chapman

The continent of Antarctica is not only a difficult region to approach, but it is also a difficult region in which to travel, whether on foot or by dog sledge, tracked vehicle or aircraft. To the average person an aircraft, especially a helicopter, is apt to suggest itself as the best means of transport there. Generalisations, however, are dangerous. Such factors as the purpose and length of the journey, nature of the terrain, surface conditions, food and fuel requirements, etc., will dictate which mode, or combination of modes, is the most suitable. Although helicopters and aeroplanes are playing an important role today in the unlocking of the secrets of Antarctica, so too are the forms of surface travel.

Although aircraft and their equipment are designed to operate in widely varying climatic conditions, the operation of helicopters and aeroplanes in high latitudes presents many problems which require special preparations and precautions to overcome them.

Because of the very low ambient air temperatures which are experienced, a standard aircraft needs special preparation for operation in Antarctica, or for that matter, in the Arctic. Normal greases are unsuitable; thus all parts which require greasing must be treated with special low-temperature grease. Aircraft will also be grounded when men are still capable of performing tasks because, due to condensation in pneumatic systems, droplets are formed which freeze and clog the airlines; consequently special air drying devices must be incorporated in such systems. The aircraft cabin, moreover, requires a greater degree of draught-proofing, and a cabin heating system, which is effective at low temperatures, is essential. Furthermore, because of the incredible penetrating quality of snow, the entire airframe should be made as "snow proof" as possible, and tight fitting covers must be provided for engine cowlings, pilot heads, static vents, etc., in order to obviate hours spent later on clearing the interior of cabins, engine bays, mainplanes (wings), etc., of snow.

Antarctica is largely an unmapped, featureless white desert, having the worst flying weather in the world. There are virtually no alternate airfields for emergency landings. Moreover, due to the immense logistic problems, the continent is poorly served with long-range radio navigation aids. Such aids, however, if available, are subject to heavy interference from auroral activity which reduces their effectiveness. The navigational techniques employed are thus basically those used in other featureless, ill-mapped areas of the world, having inadequate navigational aids. Owing to the proximity of the South Magnetic Pole and the imperfect knowledge of magnetic variation in those latitudes, however, a magnetic compass is an unsuitable instrument to steer by. An astro-compass, whereby the aircraft's true heading can be obtained from the sun, is thus essential. Owing to the convergence of the meridians in very high latitudes, rhumb line (constant aircraft heading) tracks are impracticable, because of the excessively curved route followed over the earth's surface; nor are great circle tracks (giving the shortest distance between two points on the earth's surface) convenient, because of the need to change the aircraft's heading constantly. Except over short distances, the grid navigation technique is thus employed. This demands a very high quality directional gyro being fitted in the aircraft to serve as the master directional indicator. Furthermore, because the greater part of the continent is featureless and the map contours inaccurate, a good drift sight and radio altimeter are essential to give drift and ground speed. In large aircraft this information should be provided by a doppler navigation system. Whilst long-range navigation aids may be lacking, the aircraft's base is bound to have a radio transmitter, if not a radio beacon; a radio compass is thus also a must. And, finally, every aircraft should be fitted with some form of locater beacon and search receiver, and should have a bright red or orange colour scheme.

Provided a runway of compacted snow, or hard ice covered with a thin layer of snow, is available, aeroplanes with wheeled undercarriages may be used, but ski undercarriages on aeroplanes and float undercarriages on helicopters are generally to be preferred. In fact, except where the nature of the sastrugi renders it impossible, the shelf ice and polar plateau of Antarctica present one vast airfield to aircraft fitted with skis, while helicopters on floats can land on any level surface of undisturbed water, ice, firn, snow or rock which is free of obstructions to the rotor blades.

Although the servicing of aircraft in Antarctica follows the same principles as in more temperate climates, certain additional precautions must be observed. Great care must be taken not to overtighten nuts, bolts, and control cables or rods, as they may sheer due to contraction. All filters must be checked for the presense of ice which may clog fuel and pneumatic lines. Oil and hydraulic fluid leaks, which due to freezing may hamper the functioning of moving parts, must be eliminated. And rubber pipes must constantly be checked for cracks brought about by the cold. Whilst Antarctica is the coldest continent, it is also the windiest region on earth, which introduces another factor, namely "wind chill" — that is, the speeding up, because of the wind, of the natural loss of heat by the human body by greater evaporation and a more rapid conduction of heat from the body. Most work on aircraft in the open is thus not possible unless adequate protective clothing is worn and shelters or windbreaks and heaters are provided. Heated hangers are a boon, but the movement of aircraft in and out of heated hangars introduces snags because of the rapid changes in temperature which take place. Differential expansion and contraction may cause windscreens, windows and canopies to crack, or fuel, oil and hydraulic leaks to occur. Pressures in hydraulic accumulators, oleo legs and tyres will be affected. To prevent the formation of ice, any moisture due to the sweating of an aircraft in a heated hangar will have to be removed before the aircraft is moved into the open again.

Prior to flight, great care must be taken that all aircraft surfaces, control hinges, oleo legs, hydraulic jacks, undercarriage locks and micro-switches, pilot heads and static vents are free of snow, ice and frost. As low temperature causes a loss of capacity and a decrease in the ability to accept re-charging, batteries need special care. Aircraft starting loads are very high; thus an external power supply must be used to avoid overloading the aircraft's batteries. In fact, if the aircraft is large enough, it should be equipped with an auxiliary power unit. Few precautions, except for fuel filter icing, need be taken before starting gas-turbine engines at low temperatures. Special care, however, must be taken during the

starting of piston engines. Oil dilution and high volatility priming, or engine pre-heating, are essential, and the warm-up procedures must be adhered to.

During flight, navigation is the most difficult problem. To obtain the aircraft's true heading, the sun must be visible; and, unless the aircraft is equipped with a doppler navigation system, surface features must be visible in order to obtain the track and ground-speed made good. The weather in Antarctica, however, can deteriorate unexpectedly rapidly. If the sky, moreover, should become overcast, the daylight might become so diffused by multiple reflection between the snow and the cloud layer overhead, a condition known as "white out", that the pilot will be unable to distinguish the horizon or any snow surface feature. This can be extremely hazardous. There are also few bases to serve as alternate landing fields. Very thorough flight planning is thus essential. Furthermore, adequate provision must be made on board the aircraft for adequate clothing, food and equipment for survival at low temperature in case of a forced landing.

Although the helicopter is an extremely versatile aircraft, it has to pay a price for its versatility. In order to enable it to ascend vertically, its engine(s) must develop sufficient power to enable its main rotor to impart lift exceeding its fully laden weight. This does not apply to an aeroplane which relies upon the effect of its forward speed to produce the requisite lift. Weight for weight the helicopter thus requires a more powerful engine, which in turn implies a greater fuel consumption. A helicopter, consequently, is able to carry a smaller load over a shorter distance than an aeroplane having the same fully laden weight. Because each rotor blade is acting as a "wing", while the whole rotor assembly is rotating like a great flywheel, each rotor blade must be perfectly balanced aerodynamically (to ensure the production of the same lift by each) as well as dynamically (to obviate excessive vibration) in relation to the others. The rotor head, moreover, must incorporate devices which will permit the helicopter not only to ascend, but also to move forwards, sideways and backwards. This raises production costs considerably. The purchase price and operating costs of a helicopter thus far exceed those of an aeroplane of the same all up weight. For this reason helicopters should not be employed indiscriminately on tasks which aeroplanes can perform more efficiently and cheaply, but should be used solely for those tasks which the other modes of transport cannot perform

The operation of aircraft in Antarctica, or any polar region, thus presents a difficult task; but, provided the problems involved are thoroughly appreciated, and the requisite preparations made and the necessary precautions taken, air operations can be conducted safely.

SOUTH AFRICA AND BIOLOGICAL RESEARCH IN THE ANTARCTIC

By J. A. J. Nel

The history of scientific endeavour in the Antarctic is a long one, extending back for at least a century or two. As perhaps befitting a continent with so little to offer in the way of material and financial gains, the interest shown in Antarctica in the past has proved to be rather desultory, although at times (notably at the turn of the century and after the last world war) there was a sudden upsurge in interest which led to discoveries of a major nature. Unhappily the attention was very little accorded to biological research up to very recently, with one notable exception—the voyages of the research vessels "Discovery I" and "Discovery II" in the Southern Ocean.

I would like to give you in this short article some idea of the biological, and especially the zoological, research undertaken in the immediate past and at present in the Antarctic region, with special reference to the possible future role of South Africa in this respect.

It is only during the last ten to fifteen years (apart from the work done on the voyages of the Discovery I and II) that biological research in the Antarctic has become one of the major fields of study being undertaken, primarily, by scientists of Great Britain, the United States and Australia, with scientists of other nations contributing to a lesser degree. A number of valuable studies on seals were undertaken by members of the Falkland Islands Dependencies Survey (now the British Antarctic Survey) and by them and others on the ornithology and botany of South Georgia and the islands off the coast of the Antarctic Peninsula (Graham Land). Similar work has been undertaken by the Australians on Heard and Macquarie Islands. During the past few years the Americans have initiated a comprehensive programme, mostly in the vicinity of McMurdo Sound, including a number of diverse projects such as entomological research; systematics, distribution and origin of the deep-sea Isopoda; growth and metabolic rate of fishes; a study of the bacteria, fungi and other biota in air, soil and melt pools, and a study of the parasites of Antarctic vertebrates, to name but a few.

South Africa's contribution in the field of biological research should be seen against the background of the organisation of all research in the Antarctic region. South Africa's interest in the Antarctic region used to be (and I suspect still is) mainly in the field of meteorological observations. With this in mind, various weather stations were established, starting with the one on Marion Island in 1948, Gough Island in 1956, and on Queen Maud Land, Antarctica, in 1960, when the old Norwegian station (used during the I.G.Y.) was taken over. Control of the weather stations, *and Antarctic research*, was vested in the Department of Transport. This is still the case although later on, especially at the Antarctic base SANAE, a start was made with research on physical projects. At no time, however, was any sustained biological research programme initiated. There is at the moment of writing, a Committee for Scientific Research in the Antarctic, with a Biological Panel, but this body acts in a purely advisory capacity. In this respect South Africa is rather out of step with most of the other nations participating in Antarctic research in that there is no statutory body or council which directs the overall scientific programme. What is more serious is that little effort seems to be made to publish the results obtained.

Up to the present the only research undertaken by South Africa in the biological sphere has been by Rand on the Marion Island Fur seal, La Grange on the Elephant seal on Marion Island, Rand on some of the birds of the Southern Ocean and La Grange on the breeding cycles of some of the birds of Marion, as well as their behaviour. In addition, La Grange also made observations on the bird and mammal life encountered on the way to SANAE. Van Zinderen Bakker has done some work on the flora of Marion, and Plumstead a great deal on the *Glossopteris* flora of the Antarctic continent. This year, under the leadership of Prof. van Zinderen Bakker, a team of scientists, including biologists, left for Marion Island to study, *inter alia*, aspects of the botany as well as the zoology. It is the intention to publish the results as a monograph on the biology of this island.

A thorough and comprehensive study of the biology of the Antarctic region should prove to be of inestimable value in the understanding of the distribution patterns of plants and animals of this region at present and in the past; of the biological history of this region — the origin of its plants and animals; its ecology, and, perhaps the most important of all, the effect of human occupation on the balance of nature in this remote part of the globe.

Let us now take a brief look at the scope for biological research open to South Africa. For purposes of delimitation of research projects, it is logical to subdivide the Antarctic region into four zones, not necessarily biotic zones, although this may eventually prove to be the case.

(*a*) The subantarctic Islands (Marion, Gough and Bouvet);
(*b*) The Southern Ocean (South of the Antarctic Convergence);
(*c*) The pack ice, and
(*d*) The Antarctic continent with, in summer, a variable amount of open water between the continental iceshelf and the inner edge of the pack ice.

Of these four zones, only the subantarctic islands offer any worthwhile scope for botanical research. All four zones, however,

offer ample scope for zoological research of the following nature:

(i) Entomology (zone a) only;
(ii) Ornithology (all zones);
(iii) Marine Biology (all zones);
(iv) Mammalogy (all zones) and
(v) Soil microfauna (zone a and perhaps zone d).

It would be presumptuous for me to try and define the scope for study in each of the fields of zoology mentioned above. It should be noted, however, that in spite of the earlier work done by La Grange and Rand, and the work at present being done on Marion, a great deal remains to be learnt about the habits, reproduction and migration of the bird life, as well as that of the seals. Very little in this respect has been done on Gough either. The marine littoral fauna of both these islands is very incompletely known, and would well merit serious study. The soil microfauna, as far as can be ascertained, has never been investigated, nor the insect life. The difficulty of landing on Bouvet Island, and the near impossibility of staying there for any appreciable length of time, precludes the possibility of undertaking any worthwhile research, although a great deal can be learnt about the avian fauna from observations done from the relief ship "R.S.A."

As regards the Southern Ocean, a great deal of oceanographical work has been done during the voyages of the research vessels "Discovery I" and "Discovery II". This does not mean that a great deal cannot still be learnt about the movements and relative abundance of krill and fish, the latter being of supreme importance to the fishing industry around the coasts of South Africa. In addition, a careful study of the oceanic bird life should prove to be of the greatest value to ornithologists here and elsewhere. Collecting and ringing birds from ships would entail running considerable risks and should not lightly be contemplated.

The pack ice offers a great deal of scope for studies on the distribution, abundancy, population structure and behaviour, as well as the ecology, of the four species of truly Antarctic seals. The bird life is rich, and the relative stability of the pack ice makes collecting and ringing of birds possible. As far as is known, no extensive collecting of the fishes living beneath the pack ice has ever been undertaken. More or less the same conditions apply to the Antarctic continent itself, as well as the narrow strip of water surrounding it during the summer months.

Unquestionably, then, the scope for zoological, and to a lesser though no less important extent, botanical research in the Antarctic regions facing South Africa is great. The value of doing research in this region lies in the fact that apart from the voyages of the "R.S.A." to SANAE very few research ships traverse the Southern Ocean and pack ice lying south of South Africa. This region is zoologically speaking still to some extent an unknown part of the globe, and would well merit serious consideration as an area to be extensively submitted to biological research. The storminess of the Southern Ocean would hamper research, especially during dredging for below-surface sampling, but that this is no insurmountable barrier has been conclusively proved by the research undertaken by biologists on the "Discovery" expeditions. The sub-antarctic islands and the pack ice offer a stable platform from which to conduct research, and here it is only inclement weather that has to be taken into account with, when in the pack ice, the danger that this may break up. In the pack ice and during voyages to the "weather islands" the "R.S.A." could be used as a floating laboratory and platform from which to conduct research.

It would serve little purpose, however, if the biological research should continue to be undertaken in such a haphazard fashion as has previously been the case. It would be a good idea if a programme, covering the zones mentioned above, could be drawn up so that biological research could in future be undertaken on a sustained basis. I would like to suggest that this programme, including all the fields of zoology as well as botany, be worked out by the Biological Panel of the Committee for Scientific Research in the Antarctic and then be circulated to the various Universities and Institutes with biological interests for comment. In this way a good idea could be obtained of the scope in the various fields, as well as the individual projects which the Universities and Institutes feel they would like to undertake.

Biologists stationed for a year or longer on the "weather islands" would be given the opportunity of working on long-term projects, or, as was the case with some of the biologists who recently returned after a stay of only a few months on Marion Island, the collecting of material. Biologists accompanying the "R.S.A.", especially to Antarctica, could undertake some research, as well as the collecting of material, during one voyage, and perhaps follow it up during a later journey. If the transport position could be satisfactorily settled, it might even prove profitable to have a zoologist staying "down south" for a year at a time. The equipment and apparatus used for undertaking the various projects could be supplied by the Universities and Institutes, so no great capital outlay would be involved.

The Antarctic region is vast and the possibilities for research nearly unlimited. The three South African scientific stations in this region offer a vast scope for biological research, and the results that can be obtained would well merit the small additional expense incurred. South Africa could thereby contribute significantly to this so important field of Antarctic research.

NEWS FROM SANAE AND THE ISLANDS

MARION, 1st March, 1965:

During the early hours of 26th February we experienced one of our rare thunderstorms on Marion Island, with a definite temperature increase but strangely enough a steadily falling barograph trace. The brief summer on the Island is past. Snow fell on the 28th, associated with cold weather.

All of us benefitted to some extent from our stay on Marion, not so much in terms of monetary gains, but by the experiences which we shared. We also learnt to know ourselves and each other. All this contributed to make us better human beings. We are now looking forward to be back in the Republic, but no doubt we will often think back a little nostalgically of our pleasant year on Marion Island.

We hope that the members of the 22nd relief team will be as happy on the Island as we were. Somebody once said that the Prince Edward Islands should be avoided at all costs if no specific purpose is to be served by going there. Well, we think we served a good purpose!

GOUGH, 19e Maart:

Die stilte, rus en vrede wat die afgelope jaar ons bestaan hier op Gough gekenmerk het is uiteindelik verbreek deur die gelui van die klok vir die laaste rondte. Dit beëindig nie net ons verblyf hier nie maar onder andere ook daardie eetwedstryd waarvan in 'n vorige program melding gemaak is. Die wedstryd is byna 'n jaar reeds aan die gang en nog kan ons nie daarin slaag om 'n duidelike wenner aan te wys nie. Die volgehoue pas wat deurentyd aan die etenstafel gehandhaaf word is 'n duidelike bewys van die hoë graad van vaardigheid wat almal van ons voor die kospotte bereik het.

Ons was verbaas om te hoor dat groot gedeeltes van die Republiek en Suidwes-Afrika deur droogtes geknel word. Die 11 maande wat verby is was hier nie eintlik sprake van droogte nie. 'n Beeld van hoe klam ons jaar was kan gevorm word as 'n mens in gedagte hou dat hier op 2 millimeters na 2800 mm. gereën het. Dit is amper viermaal soveel as Pretoria en Kaapstad se jaarlikse gemiddelde reënval.

Die oorvloedige reëns kon egter nie ons boerdery dwarsboom nie. Hoewel ons elke Sondag twee hoenders in die kombuis oor die kole gehaal het sal ons nog tenminste 50 hoenders hier agterlaat. In die loop van die jaar het ons geveerde vriende gesorg vir 'n aanwas in hulle bevolking van meer as 100. Nie al die bloedjies kon die pyp teen die skua se aanslae rook nie, maar die wat suksesvol was, is goed op pad om ook hulle name op die spyskaart verewig te sien.

SANAE, 1st March, 1965:

Usually when a new expedition takes over from an old one it is a surge of frantic activity until the ship has left. The SANAE VI takeover from SANAE V was no exception. Despite the rush the offloading of stores and supplies, including two new Muskegs and a new caboose, was accomplished without hitches, in perfect weather. After the departure of the RSA all were anxious to get organised as regards base work and scientific programmes. Very soon all food supplies, new scientific apparatus, etc., were safe and sound within the base. In the record time of three days 800 drums of diesoline were transported from Tottanbukta to SANAE.

The past month has been an extremely busy one for all. Many programmes have been provided with additional new apparatus. The meteorological team installed a new radio-theodolite which is now working satisfactorily, providing upper wind speeds and directions. Hennie Joubert, Pottie Potgieter and in particular Dries Steyn, as well as surveyor Johnnie Strydom, who supervised the orientation of the antennae, and radio technician Smittie Smit are to be congratulated on this fine piece of work.

In addition to his normal duties Smittie runs the seismograph programme. Johnnie, ably supported by Doc. Jan de Wit, is often out in the field surveying an ice strain network.

It has been a busy time for the geophysicists. Ionosphericist Derek Sharwood has installed and is at present testing a new airglow apparatus. Geomagnetist Zac Ezekowitz is testing the all-sky camera in preparation for the winter auroral programme. A Flux Gate magnetometer has been successfully installed and final alignments will soon be completed. Cosmic ray physicist Danie Joubert is preparing electronic apparatus for a balloon flight to be done simultaneously with a flight by other members of the Potchefstroom University research team during the Marion Island relief. The geological field party, consisting of leader Sewes van Wyk, deputy leader and senior mechanic John Joubert, geologist Dr. Wolf Pollake and Smittie Smit left mid-February for the mountains. However, after a harrowing experience between Dassiekop en Marsteinen, in which Muskeg and fuel sledge fell sideways into a five foot wide crevasse, necessitating the hasty departure of a rescue team consisting of Wilfred Hodson and Zac Ezekowitz, they were forced to return to base, the Muskeg and sledge with fuel having been successfully rescued. A reconnaisance of the region ahead revealed that it was insurpassable, particularly to a heavy vehicle. Radio operator Roy Statt is hard busy erecting a cubical quad antenna for his new self-constructed single sideband transceiver. This is sure to liven the interest in radio hamming.

SANAE, 1e Maart:

Harde werk en min slaap was die eerste ontmoeting van die SANAE IV span met Antarktika. Deur samewerking en inspanning is die RSA van 150 ton voorrade ontlas en op Sondag 24 Januarie het Skroef van Zyl en sy manne ons met 'n mengsel van blydskap en weemoed totsiens gewuif. Ons aan wal het die RSA in stilte gevolg totdat dit as 'n stippeltjie op die horison verdwyn het. Eers op daardie oomblik is SANAE IV as span saamgesnoer want ons was nou alleen.

Jan Dokter het reeds met die aankoms sy messe geslyp en met Tollie Traut se hulp is Ray Statt verlos van 'n wond wat nie wou genees nie. Sy vinnige herstel is moontlik te danke aan die koppie warm koffie waarmee die weerkundiges hom elke oggend wek.

As ons eerste kok het Danie Joubert se eerste baksel brood tot ver onder die pan se bodem gerys. Johnnie Strydom was verplig om weens beperkte kantoorruimte sy intrek in die "Paleis van Justiesie" te neem. Daar het hy slegs gekla oor temperature onder vriespunt en te veel besoekers. Selfs Pottie Potgieter het sy stilte versteur met sy kitaaroefening in die nabyheid.

In lieflike sonnige weer het 800 dromme brandstof in netjiese rye tussen merkerpale verskyn aan die westekant van die basis. Ook die sneeugang is skoongemaak en die voedselkassies netjies opmekaar in numeriese volgorde in die gang gepak.

Op Donderdag 11 Februarie het die eerste veldeskpedisie na die berge vertrek. Alles het vlot verloop totdat die skeurgebied bereik is. Skielik sak die trekker na links in 'n 6-voet breë skeur — dit nadat die beste roete per voet bepaal is en nadat selfs breër skeure reeds oorbrug is. Hulp is per radio ontbied. Bewerig het Smittie gesê:

„Laat ek jou vertel, hierdie wêreld is voos van die karwatse!"

(Deur „karwatse" het hy natuurlik „crevasses" bedoel).

Danksy die spoedige optrede van Ezekowitz en Hodson is die toerusting in ere herstel, maar vordering is pas daarna deur 'n spinnerak van skeure beëindig.

Met die manne gaan dit almal goed. Baarde en hare raak weelderiger en die minder bedeeldes skeer selfs. Smittie se baard ruk egter handuit en daar word gereken dat hy eersdaags 'n merkerpaal sal moet gebruik om vir die vurk die rigting na sy mond aan te dui.

SANAE, 30th March, 1965:

The registration of a minimum temperature of minus 35 degrees Celsius must surely be an ominous sign that winter is rapidly approaching. During the past month the summer lull was broken by frequent storms, though as yet no storms have reached true Antarctic proportions. At present it is day and night as we know it in the Republic but this is rapidly changing to a predominance of night.

Some dazzling mirages in which the whole surrounding coastline and nearby icebergs are revealed, show that there is much beauty and many breathtaking spectacles in this white continent.

We have all now settled into the routine of life at an Antarctic base. The fellows are all in good health, so that after attending to minor complaints Doc. Jan de Wit, is able to devote his free time to studying and "gardening". Many interesting growths have already blossomed in the garden and it is rumoured that greens may be available by midwinter.

The met. team, Hennie Joubert, Pottie Potgieter and Dries Steyn have had extremely successful balloon flights recently and the average maximum height reached during March should be very close to a record for SANAE. Surveyor Johnnie Strydom has been most fortunate in his search for supposedly lost beacons in the SANAE region and he is now surveying the network.

Geologist Wolf Pollake and geomagnetist Zac Ezekowitz recently undertook a field trip which took them to the sub-station, Pingvin Base, and along the northeast coast to the last ice rise before the Trolltunga. Magnetic and gravity determinations were made, as well as some glaceological observations. Geophysicist Danie Joubert recently launched a partially successful cosmic ray balloon. He was given valuable assistance by the met. team who inflated the balloon. Nico Smit operated the antenna tracking system. Ionosphere expert Derek Sharwood, besides keeping his beast, the ionosonde, in check, is on night duty for the airglow programme. Radio operator Ray Statt has obtained very promising results with his single sideband radio equipment. Smittie has constructed a field strength meter enabling the cubical quad antenna to be properly tuned. Leader Sewes van Wyk gave useful assistance to the Diesel mechanics, Johan Joubert and Wilfie Hodson, who completed a long needed overhaul of the snow melter and a Diesel engine.

NEWS FROM THE ASSOCIATION

After the summer "hibernation" period, which lasted for three months, the Association held its first meeting of the year on 22nd February. Unfortunately Mr. W. van Zyl, leader of SANAE V, who had been invited to address the meeting on the activities and programmes carried out at the station during 1964, could not attend and Dr. J. J. Taljaard consented to show his colour slides and a fifteen minute cine film on the expedition to Bouvet, Gough and Tristan da Cunha Islands during March, April and May, 1964. The substance of his talk is contained in the report on the expedition published in "Antarktiese Bulletin" No. 4 of July, 1964.

The Award Committee for the South African Antarctic Medal decided to award the Medal this year to **Victor von Brunn**, geologist/glaciologist/geomagneticist of SANAE I. Details of the motivation will be published in the May issue of the *Bulletin*.

BERGY BITS AND GROWLERS

MOUNT EREBUS IN NAMAQUALAND

by V. von Brunn

The 1:125,000 Geological Map of the Richtersveld (Geological Survey 1958) shows two trigonometrical beacons Mount Erebus (4225 ft.) and Mount Terror (4027 ft.) about seven miles apart, situated in the north-western part of Namaqualand.

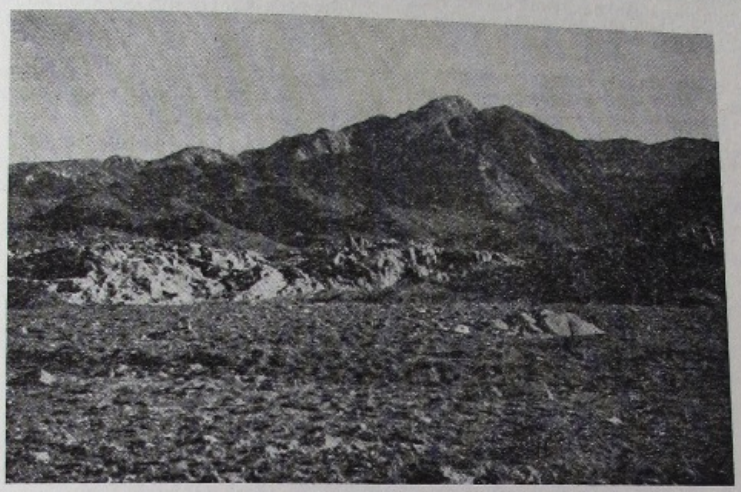
The immediate question which arises is: how and when did these Antarctic place names find their way into such a remote and barren mountainous desert of the Republic? In a geological sense there is no relationship between the Richtersveld peaks and their namesakes in Antarctica, (Mt. Terror (10,755 ft.) and the still active Mt. Erebus (13,200 ft.) of McMurdo Sound are two volcanic cones on Ross Island, whose summits are separated by a distance of about twenty-six miles.) In the Richtersveld Mount Erebus and Mount Terror form two high domes in the Rosyntjiebos Mountains which are principally composed of some of the oldest sedimentary rocks found in the Republic.

With the kind co-operation of the Trigonometrical Survey Office in Mowbray, Cape Town, it was possible to sort through volumes of reports and to find the following notes by land surveyor N. F. Stewart: ". . . trekked with donkeys to Mount Erebus . . . visited and selected station MOUNT EREBUS (3rd August 1937) . . . a high outstanding peak of about 4200 altitude, with a clear view in all directions . . . donkey transport can be taken up the mountain to the foot of the upper stony ridge . . ."

". . . visited and selected station MOUNT TERROR (13th August 1937) . . . very difficult approach from every side . . . nearest Post Office is Port Nolloth about 130 miles . . ."

At the time the late Mr. Stewart was conducting secondary triangulation reconnaisance work in the area and it can tentatively be assumed that he named these stations. The names of Mount Erebus and Mount Terror cannot be found on any of the earlier maps of the Richtersveld. Other possible persons who could have named these peaks at an earlier date are Dr. A. W. Rogers of the Geological Survey, or Major J. G. W. Leipoldt who carried out survey work in these parts. It seems apparent, however, that the names were officially recorded in 1937.

Any further information in this connection would be welcome.



Mount Terror in the Richtersveld

Photo: Dr. E. A. K. Middlemost

BRITISH ANTARTIC CLUB'S 36th REUNION DINNER

by A. B. Crawford

On the occasion of my visit to England in January, 1965, I was invited as an official guest of the Club to their Annual Reunion Dinner at the Criterion Restaurant, Piccadilly Circus on 22nd January. The fact that I had flown in from a conference in Geneva, and hence did not have the appropriate "rig" did not disturb these gentlemen from the far South, and I was bidden to attend in a dark suit.

Strolling up and down Haymarket killing time before the dinner, the venue was soon evident as an occasional bearded "penguin" mounted the steps. I was soon at ease as more and more gentlemen arrived whom I knew and whom I had entertained in Cape Town on their passages to and from Antarctica.

The procedures at the Annual Antarctic Club reunion make the occasion one of the most interesting and unique dinners that one can attend. During the course of an excellent meal, the Secretary starts a series of toasts by calling upon the survivors of the oldest expedition present to drink a toast, with the President giving of course brief details of the expedition concerned. On this occasion two old gentlemen rose to their feet and drank a toast with Sir Vivian Fuchs, the President of the Society. This is immediately followed by a similar toast to yet another famous expedition, on each occasion the elderly members present of these early expeditions rising to exchange their toasts, to the applause of all present.

And so it goes on right up to the present-day expeditions, when sometimes 15 or 20 young fellows rise to drink their toasts.

There were three official guests, the Hydrographer of the Royal Navy, the Director of the Royal Geographical Society and the writer from South Africa, who were collectively honoured in the official toasts.

Meteorologists will agree the world over that it is seldom they meet men of the same profession as themselves at social functions. The Antarctic Club dinner was, however, the exception to the rule and I had many an interesting conversation after the dinner with meteorologists who had not only worked in the far south, but in many other parts of the world. The writer is most grateful to have had the privilege of attending such an historic occasion.

BELGIAN-DUTCH ANTARCTIC EXPEDITION MEMBERS VISIT CAPE TOWN

Victor von Brunn spent several hours with some of the members of the Belgian-Dutch expedition which returned from Antarctica in February. He writes as follows:

Members of the 1964 Belgian-Dutch Antarctic Expedition arrived in Cape Town on board the *Magga Dan* on February 15th, and are due to be flown back to Belgium from here on the 22nd of this month. On the entire journey from *Roi Baudouin* base to Cape Town only a narrow strip of scattered pack-ice, which took half a day to cross, was encountered. The return journey lasted ten days which included stops for oceanographic work.

According to reports, the 1964/65 summer programme, for which an additional twenty-one men together with a light aircraft (Cessna) and a helicopter (Alouette) were sent down, proved to be particularly successful.

The summer party was divided into three groups. The first of these was engaged in aerial photography (obliques) of parts of the Sør Rondane mountains. The photogrammetric data is to be included in a new map of this area, which is being compiled in co-operation with the Norsk Polarinstitutt. The second group participated in oceanographic research which included depth soundings, tidal measurements and biological studies. A deep-sea television camera was used for the work. The third group concentrated on the geology, geomorphology and glaciology of the Sør Rondane Mountains (mainly in the western parts). The party, consisting of seven members, revisited geologically important areas to carry out more detailed work on migmatites, and to collect rock samples for palaeomagnetic studies and age determinations. The journey to and from the mountains was undertaken on two toboggans and a muskeg. The helicopter was used later for work in the mountain area.

The 1965 sixteen-man wintering party at *Roi Baudouin*, under leadership of W. Bogaerts, will carry out meteorological, ionospheric, geomagnetic, etc., programmes in addition to ozone measurements which will be made there for the first time this year. It is furthermore intended to establish a stake network on the most actively flowing parts of the ice shelf in order to obtain an idea of the relative deformation.

Among the members of the Belgian-Dutch Expedition at present awaiting transport back to Belgium is T. van Autenboer (geologist) and K. V. Blaiklock (surveyor) both of whom members of SANAE I became acquainted with during friendly discussions on radiotelephone between *Norway Station* and the Sør Rondane Mountains in 1960. Ken Blaiklock (former member of the T.A.E.) is the "oldest Antarctic citizen", having spent a total of eight winters on the ice in addition to several summer campaigns with other Antarctic expeditions.

VOYAGE OF THE "R.S.A." TO SANAE

by A. B. Crawford

The South African Antarctic relief vessel "R.S.A." left Cape Town for the Antarctic on 29th December, 1964. On the way south six scientists were landed at Marion Island to study birds, geology and to undertake some geographical survey work. One day was spent at the island (4th January), and the weather was reasonably kind while ten tons of stores and mails were landed for the weather station. One small iceberg (bergy-bit) was recorded at the island.

Towards evening on 4th, "R.S.A." set course for SANAE and entered the pack in latitude 67°S on the Greenwich meridian nine days later. The going, however, was relatively easy and the Barrier was reached on 15th January.

Here the relief party was landed with some forty tons of stores which included 150 drums of dieseline, two tractors and an aluminium caboose for use as living quarters on sledging journeys. Whilst waiting for the hand-over, survey work was carried out by the R.S.A. and soundings taken.

On 23rd January the ship left the base and by 28th was clear of the pack ice. On this day the Danish vessel *Kista Dan* was sighted (64° south, 10° west) on her way to the British base *Halley Bay* and signals were exchanged between the two ships.

On 31st January Bouvet Island was passed at two miles distance, but visibility was poor although the wind was only force 2 to 3 (north-westerly).

Cape Town was reached at 0312 S.A.S. time on 6th February, the voyage to the ice and back having been accomplished at the record speed of 8.326 knots (including ice passage).

J. G. I. & S. 93409 5/65