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WINTER ON ELEPHANT ISLAND

by Professor R. W. James†

(Honorary Member of the S.A. Antarctic Association)

On 27 October, 1915, Shackleton's ship, the *Endurance*, was crushed in the pack-ice of the Weddell Sea in latitude 69°S, and shortly afterwards sank. The party camped in tents on the ice, which after a northward drift of five hundred miles, occupying nearly six months, broke up about 70 miles south of Elephant Island, one of the most easterly of the South Shetland group. After a six days' boat journey, partly in the pack-ice and partly in the open sea, the party landed without loss on the north coast of Elephant Island on 15 April.

The penguins had already left their rookeries, and the chance of getting enough food for the party during the winter that was approaching seemed small, so on 24 April Shackleton began his famous boat journey to South Georgia to try to get relief, leaving the Elephant Island party of 22 men in charge of Frank Wild.

The immediate problem to be faced was to obtain adequate shelter from the weather. We had no clothes other than those we were wearing, and which we had worn for the last six months. Our tents were no longer weather-tight, and during the first week after our landing gales were almost continuous. At night we had to sleep with the tent poles lowered, lying beneath the canvas, lest the wind should carry the whole tent away, and we usually awoke covered with drift snow. Sleeping bags, frozen when we got into them, would thaw out a little with our bodily warmth, but would be stiff again by morning; and it was quite evident that unless better shelter could be found it was unlikely that the whole party would survive, should it be necessary to winter, as in the event it was.

It occurred to someone, I think it was Wild, that our two boats, each about 22 feet long and 6 feet in beam, would, if inverted, form the roof of a hut. The whole party was set to work collecting boulders, with which two thick walls, about 3 feet high and 18 feet apart, were built. On these the two boats were placed, bottom upwards, bows on one wall, sterns on the other. The tents were then cut up, and their canvas was tacked along the gunwales of the boats and brought down to a pair of oars, buried on the shingle, to form the long walls of the hut. One of the tubular tent entrances served for a door, and the canvas floor-cloths of the tents were stretched over the roof, so as to fill up the gaps left between the two boats at their bows and sterns. The floor, which had formed part of a penguin rookery, and was not very fragrant, was excavated to the depth of a foot and filled with clean shingle, and finally the

whole structure was firmly lashed down with ropes to prevent blizzard winds from carrying away the boats. The building was completed in a single day, and in the evening we moved into our new house.

The dimensions of the hut were such that 12 men could lie down on the floor, and since 22 men had to find beds it was plain that two layers would be necessary. The ingenious architect, who was not bothered by any municipal regulations about overcrowding, pointed out that although the house was only six feet high it was double-storied. It had two attics, the boats themselves, each of which, if suitable flooring were placed over the thwarts, could accommodate 5 men. There was at first a good deal of competition for these attics, for they were dry; but those of us who were not successful in gaining a place were often very glad of it later, for the floor dried up, but the ventilation problems upstairs remained.

The new hut proved to be dry, warm, and by our recent standards very comfortable, and life took on a rosier hue. There were of course, minor inconveniences. The ground floor, our real living room, was only about three feet high, and one had to learn how to move about in such a confined space, but as time went on we became used to it, and the hut seemed to be quite lofty. The blubber stove on which the cooking was done had to be placed near one end of the hut, so that its chimney could go out between the two boats. At first we took our meals sitting round the stove in an elongated ring. This meant that some seats were very much nearer the stove than others, and to avoid any possible trouble and discontent caused by this, Wild gave orders that we should sit in a definite order, and move up one place at each meal. So, like comets, we approached perihelion in turn, and wandered away again into cold outer space. Later on, meals were taken sitting in our sleeping bags, which was far more comfortable, and much less confusing.

Food by now had become very monotonous. We were fortunate enough to get penguins, always gentoos, throughout the winter, whenever the sea was ice-free. Meals consisted almost entirely of penguin, relieved for a time by three or four biscuits a week. The most obvious results of this ill-balanced diet were wonderful dreams about food, nearly always of puddings, cakes and sweet-meats—the things we could not get—never, so far as I remember, about meat.

The cooking was done on the blubber stove, and penguin skin, which is very fatty, was the main fuel, and was burnt feathers and all. The fireman of the day turned out at 7 a.m. and lit the fire for breakfast, not an easy job, and always a smoky one. The inhabitants

†Professor James suddenly died in Cape Town on 7th July.

of the attics would look down and explain to the fireman in the very frank language that we used on the island just how little he knew about making fires. He would reply suitably, but the smoke went on, and the dwellers in the boats would close the flaps of their sleeping bags until breakfast was ready.

At night, light in the hut was provided by small wicks of cotton wool floating in tins of seal oil, which shed a small gleam for a yard or two, but on the whole emphasized the gloom. The general dinginess was relieved by a glint of light reflected from an aluminium mug or a tin plate, or from the pipe of some unfortunate trying to get satisfaction out of dried seaweed, tobacco having long since given out. Probably an argument would be going on over some point that could not possibly be settled without reference to a book we did not possess; but, as always, lack of knowledge stimulated argument. After supper Hussey would generally play on his banjo, and we would sing sea chanties or sometimes topical songs of our own composition. At an early hour all lights but one would be put out, and we would retire to dream of food.

Thus the winter passed, not unpleasantly. We were dry and warm and not actually hungry, so that our physical needs were more or less satisfied; but we had read and re-read our few books, and I fear that our mental existence was not very brisk. At last on 30 August, 1916, just as we were sharing out a stew made of seals' backbone and seaweed, a small steamer appeared out at sea. It was the Chilean vessel *Yelcho*, and from it a boat was lowered, standing in the bows of which was the very characteristic figure of Shackleton, who had reached South Georgia safely, and after three attempts at rescue that had been prevented by drift ice round the island, had at last succeeded in reaching us. Within an hour we were sailing northwards towards Punta Arenas in the Magellan Straits, hearing of the madness of a world at war, from which we had been cut off for two years. Nowadays, it is sometimes hard to remember that wireless communication with an Antarctic expedition was at that time still impossible, and that once communication by sea was severed a party was literally cut off from the world and from all news of it.

WHY I WENT TO THE ANTARCTIC

by Dr. J. H. Harvey Pirie

(Honorary Member of the S.A. Antarctic Association)

Ever since boyhood, when I scoured the countryside for miles around my home hunting for birds' eggs, I have tended to be a bit of a roamer or explorer.

Chemistry was my favourite subject at school and I went to Edinburgh University with the idea of becoming a research chemist. At the end of the first year, in an interview with the Dean I was asked what were my plans. I told him and he then looked up my examination records, finding mathematics—50 per cent. He clapped my shoulder and said: "Laddie, you might become an analyst, but you'll never be a chemist". That changed my plans and I switched over to the natural sciences, with Geology as my major subject.

Apparently I did fairly well in this for after getting my B.Sc. I was offered a job in the Scottish Geological Survey. But, somehow this did not appeal to me and I decided to go on with a medical course. Soon after finishing this and doing a hospital residentship, I heard of Dr. W. S. Bruce organising the Scottish National Antarctic Expedition. This aroused my roaming instincts and on going to see him I got appointed to the double post of Medical Officer and Geologist.

The "Scotia" was mainly fitted out for oceanographical work in the Weddell Sea area; no extensive land work was contemplated, so that an expert geologist was not required. Nevertheless in the months before sailing I managed to rub up my field work with an officer of the Survey in the Hebrides. In my other capacity I acquired some skill at something which I had not been taught as a student, viz., pulling teeth. I thought that might come in useful, and it did. But now for the actual work in the Antarctic.

During the two summer cruises in the Weddell Sea (early months of 1903 and 1904), there were two outstanding events. (1) Wiping the "Ross Deep" off the map; this was based on *one* sounding of 4,000 fathoms, no bottom, taken 60 years earlier by Sir James Ross. With modern sounding gear we found the true depth was only 2,660 fathoms. (2) Finding and tracing for about 150 miles, the

continental ice-shelf which forms the southern boundary of the Weddell Sea. This was nearly 400 miles north of where it had been hypothetically placed on the basis of Ross' one sounding. We named it "Coats Land" in honour of the chief subscribers to the funds of the expedition. The blank area on the map to the northeast between it and Enderby Land has since been filled in by the Norwegian discovery of Queen Maud Land, in which the South African Antarctic Station is located. The blank area to the southwest is now filled in by the Filchner Ice Shelf.

For eight months our ship was frozen in at the head of Scotia Bay, Laurie Island, South Orkneys. Here there was good opportunity for surveying and geological work. Although only in 60°S latitude the climate was polar in type; we had temperatures as low as minus 40°C—cold enough when a wind blew, which it did for about six days a week. But it was seldom we could not get around on skis. Laurie Island may be described as the top of a buried mountain ridge, 12 miles long from west to east, with peninsulas jutting out north and south. On my longest trip, with three companions, to the eastern tip of the island, we were away for several weeks. We mapped the whole south coast, taking the risk of travelling over the sea ice. Hauling a laden sledge over the rough pack was mighty hard work and often we could not do more than a mile an hour. We also did the eastern part of the north coast, with much easier going over glacier-covered, flattened-out land. The rest of the north coast was mapped later by boat.

The rocks of Laurie Island are entirely sedimentary, consisting of sandstones, greywacke-conglomerates with some interbedded shales; they are much faulted and folded. I searched the shale assiduously for fossils but only found a few graptolites and some fragments of a custoocean carapace. They were sufficient, however, to identify the rocks as being from either the topmost Lower Silurian or from the base of the Upper Silurian. The rocks as a whole are almost identical in character with rocks of these periods found in Northern Wales and in the Southern Uplands of Scotland.



Bouvetøya as seen from 3 miles east of the Island by the United States cutter West Wind on 1st 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

*Published with the approval of the Secretary for Transport.

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 mechanic, 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 geological 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.

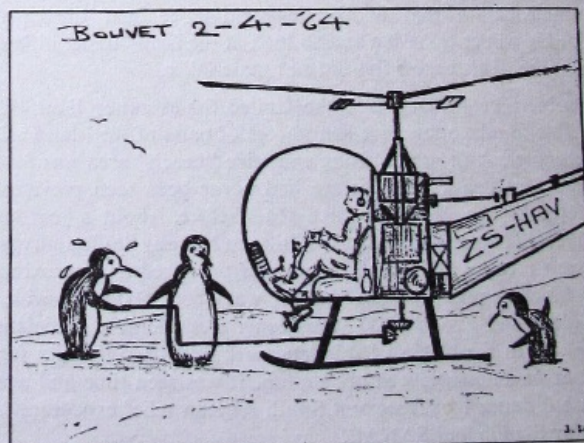
After about one-and-a-half hour's scrambling around over the rough terrain our party wanted to return but the helicopter engine refused to start and finally wore down the battery. A new battery had to be flown in from *Protector*. This event illustrates very clearly the dangers of operating on Bouvetøya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

A GARDEN IN ANTARCTICA

(Summarized from an article by I. du Plessis for Philips of Eindhoven, Holland)

When the South African research ship R.S.A. sailed from Table Bay just after Christmas last year, bound for Polarsirkelbukta, with the members of the 5th South African National Antarctic Expedition on board, its cargo included among many impressive instruments and equipment a modest pre-fabricated plywood and frame cabinet which was to house the first Antarctic garden at SANAE. This was accompanied by several pockets of garden soil, a translucent foam plastic box containing a variety of greenhouse plants in pots, and a carton of seeds, bulbs, fertilizers, insecticides, as well as the usual gardening paraphernalia. My son, André, was one of the two men who were to spend a second year at SANAE and the garden was my contribution to the Base, with the object of relieving the tedium and drabness of the winter months when the men are confined to their quarters deep under the polar snow cover, while blizzards rage outside and temperatures drop to -50°C .

The garden cabinet, a lightweight, easily assembled contraption of light timber, hardboard, plywood panelling and shelving, was designed according to the principles employed by the Philips research laboratories at Eindhoven, Holland, where advanced research is being done into the effects of various types of light on plant life. It rather resembles a squat man's wardrobe, without doors. It is divided into two compartments of 2 ft. by 2 ft for pot plants and 2 ft. by 3 ft. for the vegetable garden.

Garden soil of a light sandy loam texture, enriched by excellent compost donated by Mr. Bernard Hill of Durbanville, was provided. Two types of Lush fertilizing compounds, organic iron and the trace element mixture were supplied, together with strict admonitions from Dr. Jaaback, the originator of Lush, against the dangers of over-fertilizing.

Daylight, or the approximate equivalent thereof, is provided by a battery of seven 80 watt standard type Philips fluorescent tubes fitted into a canopy which forms the roof of the cabinet.

Ironically, heat presented the greatest obstacle to the successful operation of the garden unit at SANAE. The correct relationship between light intensity and temperature, an important factor in growing plants indoors, is indeed a *sine qua non* for rearing plants exclusively in artificial light. For this seven tube installation, technically rated as approximately 600 watts per square metre of growing surface, the maximum ambient temperature prescribed by the Philips research people was 20°C . The room temperature at SANAE base is maintained at approximately 16°C . Despite the fact that the fluorescent tubes generate a minimum of heat compared to conventional tungsten lamps, it was found that the temperature close to the lamps still rose to an alarming 30°C , in spite of the

relatively low room temperature. However, by devious means we were successful in maintaining a temperature of 20°C at a distance of nine inches below the lamps.

Another vital factor to contend with is the day-length, or seasonal requirements, of the various plants. Most plants can be divided into the categories long-day (18 hours of artificial light), short-day (10 hours) and daylight-neutral. Of the salad vegetables being grown at SANAE at present, lettuce and parsley, for instance, will only thrive under long-day conditions. Radishes, on the other hand, require short-day lighting, otherwise they are apt to run into leaf and seed. Pot plants all prefer long-day conditions. Flowering plants, particularly those grown from seed, are much more fastidious in their day-length needs and will often stubbornly refuse to flower until subjected to just the correct day-length conditions.

Viewed against the background of routine domestic duties and scientific tasks of the men at SANAE, the achievements of André du Plessis (geologist) and Trevor Robertson (geomagnetician) in successfully operating the garden unit are quite remarkable. It must take up much of their leisure time which would normally have been spent in playing snooker, chess, bridge and seeing cinema shows. These facts are mentioned to emphasize that the garden is not an official project and can therefore not always be run to schedule, bearing in mind such essential factors as the correct day-length requirements of the various plants grown.

Tulips undoubtedly provided the most spectacular floral show at SANAE. The first batch to come into bloom created great excitement—indeed the men claimed that they were the most photographed flowers in the world. A variety of some six or seven dozen specially treated bulbs were donated to the expedition by Ruyteplaats Estates, Hout Bay. They were imported from Holland to SANAE. The reds were most abundant and most successful. They produced perfect flowers while specimens of all other shades, except blue or mauve, also flowered. André reported that the last two batches, including speckled pink, yellow and white tulips, were apparently specially reared to be in time for the mid-winter celebrations.

Ruyteplaats have kindly undertaken to supply hyacinth, daffodil and lily of the valley, in addition to tulips, for next year's expedition to SANAE.

Among the pot plants cultured successfully are rubber plant, miniature ivy, creeping fig, wandering Jew, mother-in-law's tongue, African violet and philodendron. Vegetables include radishes, lettuce, garden cress, parsley, chives and mint. Flowering plants are petunias, cyclamen, red salvia and nasturtium.

The mid-winter festive menu proudly featured "André's vegetables out of season" and "radishes a la Robertson".

Nuus van SANAE en die Eilande

SANAE:—9 Mei:

Hier op SANAE begin die winter ons nou ook in alle erns oorval. Stormweer, jagsneeu, kort skemerdae en skerp koue is tekens van sy koms. Die laagste temperatuur tot dusver gemeet is minus 42 grade celsius en windstote van 70 myl per uur is al aangeteken. Meeste werk buite is afgehandel maar binne die basis gaan dit nog steeds bedrywig. Die weerkundiges probeer toe te stop sodat die koue daar by u afgeweer kan word. Al die ander wetenskaplike programme vorder goed. Pieter de Waal en George Bentley het in almal se harte 'n sagte plekkie vir die instandhouding en verbetering van kommunikasie met die tuistes. Goeie verbindings en gereelde pos word deur almal waardeur. Behalwe werk is daar tyd vir ontspanning en meeste van die manne beoefen 'n stokperdjie. André du Plessis se tuiniersvernuf het nuwe hoogtes bereik toe daar nou die dag elf rooi tulpe gelyktydig in sy tuin gebloom het. Saterdaggaand is fliekaand en onder leiding van Franco du Toit as teaterbestuurder, het ons nou die laaste rolprent gesien. Bernie Booyens en Tienie het hulle huweliksdatum al vasgestel en Bernie klim van die een boot, die RSA, reg in die ander bootjie, in. Nog ander aankondigings word mettertied verwag. Fanus du Preez se verstrooidheid is 'n ander voorbeeld van wat die koue aan 'n mens kan doen. Hy het laas week in die middel van die nag begin ontbyt

maak en tussen die derde en vierde eier eers tot volle besef gekom. Skokbehandeling was gelukkig nie nodig nie. So bied die lewe hier heelwat grappies en afwisselings. Aan al die mense tuis stuur ons liefdegroefte en beste wense.

SANAE—25 May:

We here at SANAE base have seen the last of the sun on the 21st instant. We hope to see it again at the end of July. Thus, outside working can only be done in the few precious hours of twilight at midday. Each day at about 12 o'clock midday Trevor Robertson, the big ginger-bearded geomagneticist goes outside to change his magnetogram in the variometer hut, or to read his BMZ or QHM magnetometers in the absolute magnetic hut situated some 100 yards from the main hatch. He says that regular adjustments to his instruments are necessary as a result of slight drift in the position of the base. His walk to his hut is often likely to be accompanied by a loud chorus from the huskies chained close to the magnetic hut. Trevor usually returns the compliment by calling to his furry friends of whose feeding he is in charge, together with Bernard Ezekowitz and André du Plessis. Every second day the huskies are fed with either seal or whale meat and kitchen scraps. The hard frozen meat is chopped up into suitable pieces

in the dog-tunnel. To make things easier for the dogs the meat is defrosted in the diesel shack before feeding. Trevor has a very full research programme for besides the magnetic work he is also responsible for the airglow and auroral programmes. He has successfully installed the new airglow photometer developed and built in the Physics Laboratories at the University of Stellenbosch under the direction of Professor P. B. Zeeman. Incidentally the airglow work forms part of Trevor's research for his M.Sc. degree. A new Allsky camera developed in New Zealand has also been installed. This is a great improvement on the old camera and was installed in a new raised hut built specially for this purpose. This new camera is likely to give very interesting results with regard to the Aurora Australis. Life here is rather unique and Trevor and Bernard have taken rather well to it, so much so that they are thinking of wintering over again next year. Should their venture succeed the experience gained this year will be invaluable to the next team.

SANAE—2 June:

It was news to us to hear on the radio that we at SANAE have seen the sun for the last time this half of the year on 15th May, because due to refraction we still managed to see part of the sun up to the 24th of May when it finally disappeared. According to our sun tables we might manage to see the sun again on the 19th of July if weather conditions permit and refraction is of the same magnitude as on the 23rd of May. A new record low temperature of minus 51 degrees centigrade was recorded on the 29th of May. The previous lowest temperature was minus 47.2. At this temperature a definite rasping sound is audible when exhaling due to instantaneous freezing of water vapour. Good seismograms were recorded of the big earthquake at the Sandwich Islands in the South Atlantic. Republic Day was observed by having a flag-raising ceremony at midday. A guard of honour was formed by three SANAE members who presented arms and fired a salute, after which the national anthem was sung.

SANAE—25 June:

The past month was certainly one long preparation for the mid-winter festivities. The living quarters were completely redecorated and everyone's heart went into it. With well-wishes and salutations from home and a great many foreign countries we all felt on top of the world. We hereby wish to extend our sincerest gratitude to all those who helped in the making of our day. Sunday morning the 21st we had a taste of what the day had in store for us when a news interview was held with the SABC by radio.

MARION—25 Mei:

Meer as drie maande is ons noual weg uit Kaapstad en dit voel nog maar soos gister. Die dae gaan vinnig verby maar die aande is te lank; dis dan wanneer die verlange langs mens kom sit en begin fluister van al die dinge en veral die mense wat jy mis, mense wat jy gewoon was om elke dag te sien en nou ewe skielik 'n jaar lank glad nie. Dis dan wanneer al die verliefdes onder ons sommer so ewe stil-stil verdwyn na hulle kamers toe. Intussen lag ons dikwels, soms sommer oor niks nie en net vir die lekkerte, want hier op Marion is agt manne wat uitstekend met mekaar oor die weg kom. Ons is nou baie alleen op die eiland; die pikkewyne het na hulle wintertuiste vertrek. Steve Quinn en Christo Wolfaardt het 'n vlot aanmekaar getimmer om op die dammetjie naby die huis te gaan ry. Soos mens kon verwag, kandel die spulletjie om en Steve en Christo beland in die water. Al die ander het die moleste baie geniet.

MARION—Einde van Mei:

Hier op Marion gaan dinge maar op die ou stryk aan. Die wind waai, dit reën en soms skyn die son selfs ook. Erg koue weer het ons nog nie juis gehad nie. Almal sien uit na die sneeu wat volgens die vorige bewoners van Marion nog sal kom. Al die geboue op die eiland begin nou baie mooi lyk te danke aan die fluks werk van die D.P.W. personeel. Wat die bolugwerk betref, gaan dinge voor die wind soos ons gemiddelde maksimumhoogte van 32 mb kan getuig. Ballonne word baie stadig en sorgvuldig opgeblaas. Quinn en Wolfaardt het die tegniek so baasgeraak dat daar hierdie maand nie een radiosonde beskadig is by loslating nie.

Ons wou Republiekdag vier met 'n vlaghysingseremonie, maar toe waai die wind die hele dag omtrent 35 knope. Op die ses-entwintigste is ons net mooi drie maande uit die Kaap weg en om die sake te vier hou ons toe braaivleis op die strand in die romantiese maanskyn.

MARION—1 July:

At present Marion is a drought-stricken area, or more specifically Marion House. Our water supply has been cut off since the 25th due to freezing of waterpipes. The tanks in the house are empty and carrying water for the kitchen has become a daily chore. For other purposes no water is available, which makes life a bit uncomfortable, to say the least. Up to midwinter's day we had very pleasant weather and reports of bad weather and snow in the Republic filled us with glee. After midwinter's day, winter caught up with us and snow fell almost daily and everybody enjoyed the snowfights which were inevitable.

On the 6th we had a quite impressive thunderstorm with big bangs and lots of lightning. This phenomenon seems to be very rare on Marion. Midwinter's day was celebrated in the usual manner. Our maximum radiosonde height this month was 0.6 mb which was reached after 100 mins. on the 6th, with a Dorex 800 gm balloon. We are all looking forward to the arrival of our scientific visitors in December, especially since we have run out of supplies of tomato sauce.

GOUGH—15 Junie:

Dit het al gereën, dit was ook al koud, maar toe kom die see en neem die 60 voet leer af na die see wat die kranse vasgebout was met wortel en tak weg. Die gure weer het weereens die verskillende departemente hier op Gough se werksaamhede tot stilstand gebring. Die reën en wind het die nasionale padraad se poging om 'n pad na nie dorp by die Glen te kap tydelik tot stilstand gebring. Die rede vir die pad is natuurlik die gerug wat ons te hore gekom het dat die fliek op die dorp al die nuwe fliekaand eerste kry en Saterdag-aand is mos fliekaand. Fliekaand dan staan almal se koppe dorp-toe.

GOUGH—29 June:

The past three months were, from an educational point of view, very enlightening. Much time and effort were spent acquainting ourselves with the finer points of releasing balloons countering the hazards of cross-winds or radio theodolite antennas. Changing charts in the ever-present pouring rain has also been developed to a fine art. Although we are so far removed from civilization and its drawbacks and disadvantages we have still found the temperamental nature of the human present in both the low pressure hydrogen generator and the radio theodolite. Fortunately a general brains trust has been formed to cope with the mentioned problems with fair results so far. Little of the freak conditions which lately dominated the weather have been experienced here.

NUUS VAN DIE VERENIGING

Vergadering van 25 Mei 1964: Dr. S. M. Naudé, President van W.N.N.R. en Voorsitter van die Wetenskaplike Komitee vir Antarktiese Navorsing, het 'n gehoor van 80 (waaronder 23 lede van die Vereniging) toegesprek oor sy besoek aan Australië, Nu-Seeland en Antarktika gedurende Desember verlede jaar en Januarie vanjaar. Hy het eersgenoemde land besoek om die navorsing wat daar gedoen word i.v.m. die produksie en verwerking van wol te bestudeer. Daarna het hy op uitnodiging van Skout-by-nag J. R. Reedy, bevelvoerder van die Amerikaanse taakmag belas met vloot- en vervoeraangeleenthede vir die Amerikaanse ekspedisies in Antarktika, oor Nu-Seeland na McMurdo Sound, gevlieg, waar die hoofkwartier van die Amerikaanse ekspedisies geleë is. Dr. Naudé het sy praatjie met kleurskyfies aangevul.

Die vlugafstand tussen Christchurch in Nu-Seeland en McMurdo Sound is 2,260 myl en dit is met 'n Super Constellation afgelê.

Dr. Naudé het slegs ongeveer 'n week in Antarktika vertoef, waar hy en ander besoekers (insluitende Mnr. Pieter van Vuuren van die Suid-Afrikaanse Ambassade in Washington) op 'n hele aantal ekskursies geneem is, insluitende die Suidpoolstasie (Amundsen-Scott), Byrdstasie, Scott Base (Nu-Seeland se stasie), Kaap Roysds (Shackleton se stasie in 1908) en Kaap Evans (Scott se tweede stasie, opperig in 1911).

By die Suidpool het Dr. Naudé en Mnr. van Vuuren die eer gehad om die Suid-Afrikaanse vlag te hys en lede te word van die "Society of the South Pole". Die Suidpoolstasie is geheel met sneeu bedek, maar die vertrekke, laboratoriums, gange en selfs 'n hospitaal met teater is alles heel gerieflik ingerig. Daar word weerkundige, ionosferiese gletserkundige, geomagnetiese en ander navorsing gedoen. Die stasie is ongeveer 10,000 voet bo seevlak en die dikte van die ys is 8,000 voet.

McMurdo Sound vanself is eintlik 'n dorpie met 'n bevolking van 'n paar honderd mense by tye in die somer. 'n Atoomkragstasie verskaf elektrisiteit. Dr. Naudé het die hutte van Scott en Shackleton se ekspedisies in die nabyheid van McMurdo Sound besoek en kon ook die pikkewyne by Kaap Crozier gaan besigtig.

Sy indruk is dat die Amerikaners 'n groot voorsprong bo meeste ander lande se navorsingspanne in Antarktika het omdat hulle op groot skaal van vliegtuie en helikopters gebruik maak vir byna alle bewegings wat hulle uitvoer. Amerika spandeer 20 miljoen dollar alleen aan logistiese aangeleenthede (voedsel, olie en vervoer) in Antarktika.

Vergadering van 25 Junie 1964: By hierdie geleentheid is 'n gesamentlike vergadering van die Antarktiese Vereniging en die Pretoria-tak van die Suid-Afrikaanse Vereniging vir die Bevordering van Wetenskap gehou in die Wetenskapsaal, Tentoonstellingsgronde, Pretoria. Die onderwerp van bespreking was:

Die Internasionale Sonstiltejaar (I.S.S.J.) van 1964/65

As sprekers het opgetree Prof. S. P. Jackson (beskermheer van die S.A.A.V. en voorsitter van die S.A. Komitee vir die I.S.S.J.) en Prof. P. H. Stoker (Fisika-departement, Potchefstroom Universiteit en lid van die S.A. Komitee vir die I.S.S.J.).

Prof. Jackson het aangedui dat die I.S.S.J. 'n opvolging van die Internasionale Geofisiese Jaar (I.G.J.) van 1957/58 is. Die I.G.J. het saamgeval met die aktiewe fase in die 11-jaar siklus van die son, terwyl die I.S.S.J. nou saamval met die stil fase van die siklus. Enkele aanhalings uit Prof. Jackson se toespraak is die volgende:

"It has been said, maliciously, perhaps, that the I.Q.S.Y. is just a little I.G.Y., another device to create a scientific emergency, and so press unwilling governments to support scientific research which they might prefer to neglect. . . nevertheless there is a big difference between the I.G.Y. and the I.Q.S.Y. and there are good reasons for extending the programme of the I.G.Y. in this way in preference to others. The difference is that in spite of rockets and satellites the I.G.Y. was never intended to get far away from the solid earth, whereas the I.Q.S.Y. gets right off the ground; it is concerned mainly with the upper atmosphere".

Prof. Jackson het skyfies gewys wat sommige van die uitstaande resultate van die I.G.J. aandui, b.v. Zhivarov se tektoniese en geomorfologiese kaart van die bodem van die suidelike oseane, soos saamgestel uit dieptepeilings en geologiese monsters wat opgepik is. Verdere voorbeelde is die kaarte van Thiel wat die dikte van die Antarktiese yskors en die topografie van die vaste gesteente onder die ys van Antarktika aantoon. Nog verdere voorbeelde is die meridionale snitte van atmosferiese sirkulasie en globale weerkaarte wat vir die tydperk van die I.G.J. opgestel is. Uitstaande ontdekkings is die stralingsgordels van Van Allen en die "ontplofende" verwarming van die Antarktiese stratosfeer in die lente.

"These exciting discoveries directed attention to the high atmosphere and the new methods of observation rockets and satellites and other possibilities of high altitude sounding which have made it possible to observe directly in the regions where previously we could not . . . and so it was decided that the I.G.Y. should be followed by an I.Q.S.Y."

Professor Stoker het die volgende opsomming van sy voordrag verstrek:

Vir die gewone man is die son 'n helder skyf, wat aan ons aardbewoners warmte en lig verskaf. Vir hom kom die sonoppervlak rustig voor. Wanneer die sonoppervlak egter in fynere besonderhede bestudeer word of wanneer bepaalde golfengtes of straling vanaf die son waargeneem word, blyk dit dat die son alles behalwe 'n rustige lig- en warmtebron is. Dit is al vir baie jare bekend dat op die sonoppervlak donker vlekke voorkom wat in grootte en aantal wissel. Vir die afgelope 200 jaar al word hierdie vlekke op die son genoteer. Uit hierdie waarnemings blyk dat die vlekkegetal elke elf jaar maksimaal is met tussenin 'n minimum van enkele persent van die maksimum vlekkegetal.

Vanjaar of volgende jaar behoort die vlekkegetal van die son 'n minimum waarde te bereik terwyl dit in 1957 'n maksimum vlekkegetal gehad het. Die son is dus nou in hierdie tyd betreklik rustig, want die aktiwiteit of woelinge op die sonoppervlak staan in verband met die aantal sonvlekke.

In die Internasionale Sonstiltejaar, wat op 1 Januarie 1964 begin het en op 31 Desember 1965 ten einde loop, gaan dit om die son, die interplanetêre ruimte en die omgewing van die aarde. Teen vroeëre verwagtinge in blyk dit nou dat die ruimte tussen die son en die planeete nie leeg is nie. In die interplanetêre ruimte is daar yl of dun gas, meestal waterstofgas, waarvan die druk baie laer is as wat ons in 'n laboratorium op aarde kan verkry. Die huidige gedagte is dat hierdie gas toegeskryf moet word aan die son se

korona. Die korona is 'n laag van effens liggewende gas om die son, wat alleen sigbaar is tydens totale sonverduisterings. Tydens minimum sonaktiwiteit is die korona tot 'n minimum gekrimp. Vanaf die korona ontsnap daar blykbaar voortdurend gas, waterstofgas, sodat ook die aarde blykbaar in die uitgestrekte gas van die son se korona beweeg. Hierdie stroom van gas, of solêre wind, vervorm ook die aarde se magneetveld in die buitenste ruimte.

Op die sonoppervlak kom daar ook voortdurend klein ontplofinkies, veral in die omgewing waar alreeds sonvlekke gevorm het, voor, en met tye ook groter ontploffings, wat soos 'n vlam van kort duur op die sonoppervlak voorkom. Met hierdie ontploffings word energieke atomêre kerndeeltjies vrygestel en die plasmastroom voer ook 'n magnetiese veld met hom saam, wat die aarde se magnetiese veld versteur wanneer die plasmastroom die aarde bereik. Ons praat dan van 'n magnetiese storm. Hierdie plasmastroom kan dan ook verantwoordelik gehou word vir die voorkoms van aurora of poolligte en liggloed in die atmosfeer as die plasmastroom die atmosfeer tref. Enkele minute na 'n sonvlam kan langafstandradio-verbindinge onderbreek word as gevolg van 'n groot toename in absorpsie in die D- en laer E-lae van die ionosfeer. Elektromagnetiese strale vanaf die sonvlam, vermoedelik X-strale, moet verantwoordelik gehou word vir hierdie beïnvloeding van die ionosfeer.

Al hierdie en nog ander effekte wat deur sonvlamme veroorsaak word in die aarde se magneetveld, die ionosfeer en die atmosfeer, is tot 'n minimum gereduseer gedurende die onaktiewe tydperk van die son, waarin ons nou is. Die omgewing van die aarde kan dus sonder veel steurende effekte, veroorsaak deur die son, bestudeer word. Ons kennis van die boonste lae van die atmosfeer en die ruimte daarbo is nog baie beperk. Die bo- en buiteatmosferiese verskynsels is alreeds ingewikkelde en moeilik om te verstaan in hulle onderlinge samehang en die rol wat die son en die strale vanaf die son daarin speel, sonder die steurende effekte van sonvlamme. Daarom dat daar in hierdie rustige sonydperk op internasionale skaal georganiseer is en saamgewerk word op verskillende aspekte van die bo- en buiteatmosferiese verskynsels om meer van die prosesse wat hierin 'n rol speel te wete te kan kom.

Nie alleen is dit die oogmerk om meer van die bo-atmosfeer en die aarde se onmiddellike omgewing agter te kom nie, maar ook om meer van die interplanetêre ruimte te wete te kom. In hierdie rustige tydperk kom daar baie min energieke atomêre kerndeeltjies, of sg. kosmiese strale, vanaf die son. Kosmiese strale wat ons nou waarneem moet dus van buite ons planetêre stelsel vanuit ons, of ander, melkwegstelsels kom. Wanneer die son onaktief is, kan kosmiese strale van veel laer energie die aarde bereik as in die aktiewe tydperk. Gevolglik is die intensiteit van kosmiese strale nou hoër. Die verklaring hiervoor word gesoek in 'n wegbuigings-effek vanaf die aarde waarskynlik deur die plasmastroming vanaf die son, wat met hom magnetiese velde saamvoer. In die onaktiewe tydperk is die plasmastroming veel geringer as in die aktiewe tydperk, en gevolglik is die wegbuiging van die deeltjies van laer energie van buite ons planetêre stelsel minder sterk. Die spektrum van kosmiese strale kan nou tot laer energieë bestudeer word, en kan die huidige aard van die interplanetêre ruimte teenoor die aard daarvan in 'n aktiewe tydperk daaruit afgelei word. Wanneer die son dan eersdaags weer aktief begin word kan die invloed van die aktiewe son op die interplanetêre ruimte waarin ons aardbol beweeg ook goed bestudeer word.

Die verwagting is dat gedurende die huidige Internasionale Sonstiltejaar ons kennis van die aarde se omgewing, die son en die interplanetêre ruimte heelwat sal uitbrei, en moontlik dat ook afleidings gemaak sal kan word in verband met die oorsprong van kosmiese strale. 'n Waarnemingsprogram op internasionale basis georganiseer beteken 'n maksimale benutting van hierdie tydperk. Ook Suid-Afrika dra sy deel by met waarnemings by die Magnetiese Observatorium te Hermanus, by die Rhodes-Universiteit te Grahamstad op die ionosfeer, by die Potchefstroomse Universiteit op kosmiese strale, by die Nasionale Telekommunikasie Navorsingslaboratorium van die W.N.N.R., by die Universiteit van Natal op Witwatersrand op die ionosfeer, by die Universiteit van Stellenbosch op die eksosfeer, by die Universiteit van Stellenbosch op luggloed, terwyl die Weerburo gereeld meteorologiese waarnemings doen. In die Antarktika by ons basis SANAE en tydens aflosreise daarheen word ook al die genoemde waarnemings gedoen. Ook ons sterrewagte sal hulle deel doen. Verder is in Suid-Afrika waarnemingsposte deur Frankryk en Duitsland opgerig vir speelputwaarnemings tussen hierdie poste en laboratoriums in hulle tuislande. Behalwe waarnemings deur grondstasies speel waarnemings deur ballone, vuurpyle en sateliete 'n groot rol in die Internasionale Sonstiltejaar. Suid-Afrika het 'n ballonprogram op klein skaal vir die tydperk, maar ons laat die duurder vuurpyl- en satelietprogramme oor aan die buiteland.