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Glimpses into the History and Prehistory of Antarctica

By Edna P. Plumstead, D.Sc., Rand

HISTORY

7th Century

Antarctica is an immense continent and yet its very existence was a matter of speculation until a few centuries ago. The earliest known record is preserved in Polynesian folklore which tells that in approximately 650 A.D. a great seafaring hero of these South Pacific islands set off southwards in his canoe and travelled for many days. History does not record whether storms played a part or whether he deliberately sailed as far south as he dared, but ultimately he returned with the story that he had voyaged so far south that he had seen things like rocks whose summits pierced the skies and that these projected from a sea of pia (a term for arrow root). Those of you who have experienced the area or who have seen pictures of great icebergs glistening in the sun, and floating in a sea of pack ice will readily understand the allusion to "milk pudding" and the terrifying height of the pinnacles above his small canoe. Remember also that this adventurous navigator knew no ice in his native islands.

16th Century

Nearly a thousand years later in 1506 and ten years after the Portuguese first rounded the Cape and found the sea route to India, one of their captains recorded that in the east he had met a Malay captain who said that he had been far to the south and there he had come to an area where the day lasted only four hours and it was the coldest place on earth. We now can estimate the time of the year and the latitude he must have reached. Very soon after that, in 1520, Magellan managed to navigate his small ship around Cape Horn, but the existence of Antarctica was still just a legend. In 1570 a map was published by Ortelius labelling an area in the south "Terra Australis nondum cognita" (the Southern Land not yet known).

17th Century

Legends must have persisted because in 1605 a Portuguese Captain, Quiros by name, obtained an order from Philip III of Spain, to sail to the South Polar continent, annex it for Spain, and convert its inhabitants to the true faith. He did not reach Antarctica but if he had it is doubtful whether the seals and penguins would have appreciated this first missionary enterprise. Gradually knowledge of the south began to increase. The Dutch navigator, Tasman, discovered Van Diemens Land (Australia) and North Island, New Zealand in 1642, and thought the latter was the great southern continent of which there were vague rumours.

18th Century

It was not until the second half of the 18th century that any real advance was made in the form of three famous voyages by the British Captain Cook between the years 1763 and 1773. During these he was the first to sail right round the earth on latitude 60° S. On his return from the first voyage, he was instructed by the First Lord of the Admiralty to sail still further south and was equipped with two small but sturdy ships, aptly named *Resolution* and *Adventure*. On this all-important mission he visited Cape Town in 1772 and from there sailed due south and was the first to cross the Antarctic Circle in Longitude 38° E. On the same night he saw pack ice. He wintered in New Zealand and set out again next year reaching 71° S, the furthest south ever visited. His return visit to Cape Town on the way home was after an interval of two years but much had been accomplished. South of the pack ice he had seen unbroken ice which rose in altitude. He had counted 97 ice hills but was still uncertain that they were land. He now knew, however, that there was no land until very far south and that if these hills proved to be land they would be uninhabitable. He wrote that they were "countries condemned to everlasting rigidity by nature, never to yield to the warmth of the sun, for whose wild and desolate aspect I find no words." It is not surprising that others were discouraged.

19th Century

Other countries began to play a part and in 1819 the Russian, Admiral Bellingshausen, crossed the Antractic circle six times on his voyage and was the first to see actual land in the form of two great islands off the coast of West Antarctica which he named Peter I Island and Alexander I Land.

From this time onwards both commercial and scientific enterprises operated in the southern seas. The whaling industry reached enormous proportions so that in the year 1840 it was reported that 400 ships were engaged in whale hunting and indeed these creatures would probably have become extinct had the various nations not imposed a limit to the annual catch. The various whaling ship captains, however, were experienced navigators and contributed a considerable amount of knowledge about Antarctic seas and occasionally also about the coast line. Scientific expeditions, too, increased. The British Association for the Advancement of Science had petitioned the government to send a scientific expedition to Antarctica to investigate terrestial magnetism and as a result Sir James Clark Ross was commissioned to undertake the task. The expedition lasted from 1838-1841. There were two small ships, the *Erebus* and *Terror*, 370 and 340 tons respectively. Their bows were reinforced to breach the Ice Barrier. Their names have been commemorated for all time in the Antarctic volcanoes discovered on this voyage. When the ships, having negotiated the ice pack for five days, broke through into open water and entered the sea now known as the Ross Sea, they saw a great mountain range, now Victoria Land, and two volcanoes, as well as the edge of the ice shelf of which Sir James said: "One might as well try to sail through the cliffs of Dover."

About the same time a French expedition discovered Adelie Land and collected the first rock samples from small islands off the coast. An American expedition under Wilkes, equipped with very poor ships, nevertheless closely circumnavigated the continent during four years and virtually proved its existence and extent.

In 1895 a Norwegian expedition once again entered the Ross Sea, landed and collected for the first time some rock specimens from the continent itself and four years later they returned as the Southern Cross British Expedition and ten men stayed ashore to

winter there. It was a daring exploit and one fitting to mark the beginning of the 20th century during which such dramatic advances have been made.

20th Century

In 1900 only a little of Victoria Land and a mere hint of the coastline of the continent was known.

The expeditions of this century are known to all of you. Many nations have taken part and all have advanced our knowledge. During the first decade interest was confined largely to the Victoria Land coast of the Ross Sea where a number of traverses were undertaken, especially by the first polar expedition under Captain Scott (1901-1903).

It is interesting to record that Sir Joseph Hooker, who sixty years before had been the surgeon of the Antarctic expedition under Sir James Clark Ross was on the quay to welcome the return to Britain of the expedition. History repeats itself in a strange way for in 1904 Dr. Harvey Pirie, now resident in Johannesburg, was surgeon to the Scottish National Antarctic Expedition and sixty years later he was here to welcome Sir Vivian Fuchs and other members of the Transantarctic Expedition when they visited Johannesburg and Pretoria.

FIRST JOURNEY TO THE POLE

In 1910 Britain and Norway vied with one another to reach the South Pole first. The Norwegian party under Amundsen won the race against the British party under Captain Scott, who perished on the homeward journey.

Today some tend to view Captain Scott's journey as a frightful waste of effort and of magnificent lives, but two very important things came out of that sacrifice. One was the importance of vitamins in regions like this, and the other was the discovery in the Beardmore Glacier of coal, and associated with it, some plant fossils of quite large leaves, which Dr. Wilson compared to Beech leaves and later American explorers to Bluegum leaves. (Any of us would have done the same unless we were aware that in the southern hemisphere the plants which formed the coal were made up largely of plants called Glossopteris, meaning a tongue-shaped fern, although they are not ferns at all.) Notwithstanding their plight, Dr. Wilson felt this discovery was so important to science that he collected 23 lb. of rocks, which they carried to their last resting place where they were eventually found together with their diaries recording the discovery. Subsequent scientific writers agree that by far the most important scientific discovery of Scott's last expedition was the finding of these leaves, which indicated that large-leafed plants had once been able to grow in an area where nothing whatsoever can grow today.

Advancing Knowledge

By this time one important fact about the continent had emerged. The outline was now roughly known, and it became realised that Antarctica was made up of two portions which came to be known as West and East Antarctica respectively. West Antarctica, which runs directly southwards from South America and from the Andes, consists of a mountain fold belt of very high mountains with many volcanoes and has no land fossils older than the Jurassic. East Antarctica is continental in origin, being a great plateau made up of ancient rocks covered by sediments. There was a suggestion that between the two there was a rift valley, a sunken trough, separating them because geographically and geologically they looked completely different and their structure and their history appeared dissimilar. It was probably more because of this problem than any other, that scientists began to realise that further investigations must be undertaken. Thus, one of the main projects of the IGY was to investigate Antarctica, to establish whether this trough between the two was sea, whether there were two land areas and whether Antarctica was actually a continent or a collection of islands.

As a result of the traverses and seismic soundings conducted by Sir Vivian Fuchs and other IGY parties, it has been found that the average depth of ice overlying the continent is over 6,000 ft. In several places it is over 10,000 ft., and in one area it is over 14,000 ft. The weight of this ice is stupendous and depresses the land beneath it. Investigation has proved that both the Ross and the Weddell Seas extend far further south than anticipated and there is a sea connection between the Ross and the Bellingshausen Seas but the connection with the Weddell Sea appears to have a small land barrier which has not yet been breached, although there is some speculation about it. They found also that the ice radiates from the region of the Pole in all directions across the great continent. The currents around Antarctica have been examined, as well as the rocks. They found that the rocks of the Ross Sea and of many other areas along the margin of the continent were ancient rocks called "gneiss", which is normally found in very old parts of continental shields wherever the basement of the continent is exposed, so that it is often termed "continental shield rock", for it indicates that this was a land mass from more or less the beginning of time. A little way inland up any of the glacier paths, however, they found that, although the lower portion of the land masses consisted of granite, gneiss and schists (twisted, distorted, altered rock) on top of them there lay almost invariably tablelands of horizontal sedimentary rocks.

PRE-HISTORY OF ANTARCTICA

The sedimentary rocks provided the important opportunity to discover something about the pre-history of Antarctica. Granites can be of any age—they can be forming now, they could have been formed hundreds of millions of years ago. The only way in which to discover details of the pre-history of the continent was to discover fossils, to know from the life buried in the rocks what kind of life had existed—whether it was land or shallow sea, whether it was plant or animal, whether the conditions were dry, desert-like, wet and swampy or icy cold, and for this purpose, plant fossils are far better than any others because plants are very sensitive to climatic conditions. In West Antarctica no plants were found earlier than the Jurassic. East Antarctica now includes the Ellsworth mountains, where the same Glossopteris fossils have been found recently so that the margin between East and West Antarctica must bend to include this area and does not run in a straight line from the Weddell across to the Ross Sea. In East Antarctica the plants were found to be of ages ranging from the Devonian right up to the Tertiary but the latter in pollen only. As far as plant history is concerned, there were no land plants until the Devonian period (in round figures, roughly 300 million years ago) and these first ancient land plants were found in Antarctica, and then successively in every subsequent stage up to the Tertiary.

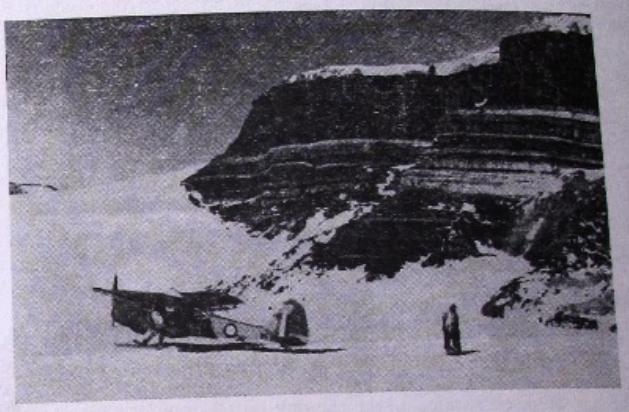

Fig. 1: Part of the Theron Mountains, showing clear stratification of sedimentary rocks and vertical jointing of thick intrusion of dolerite at the top. *(Photo: Trans-Antarctic Expedition)*

When Sir Vivian Fuchs left Shackleton Base on the Weddell Sea on his Trans-Antarctic crossing, they first saw the Touchdown Hills which had not previously been known. Continuing their journey they discovered three other new ranges, namely the Theron Mountains, the Shackleton Range and the Which-a-Way Nunataks separated from one another by glaciers. The Theron Mountains proved to be made up of horizontal sedimentary rocks, quite vivdly coloured, and between the layers several great precipices of black igneous rock, called dolerite, such as we often see on mountains in the Karoo. There were also five seams of coal in this succession, and three horizons in which plant fossils were found. Two of them included Glossopteris leaves. The first specimen was found by Sir Vivian Fuchs himself when the first reconnaissance plane touched down at the Theron Mountains. It proved to be a species which had not previously been described from other Southern countries and I named it after him Glossopteris fuchsii. None of the ancient underlying granite or gneiss is exposed. The Shackleton Range was quite different in appearance. It was made up of ancient rocks, and had horizontal sediments lying only towards the tops of the mountains, the lowest of which contained many big boulders; but no fossils were found.

In the Which-a-Way Nunataks, composed of horizontal sediments just projecting above the snow, they also found beautiful plant fossils. The three ranges were obviously separated by fault planes.

Meanwhile the geologists of Sir Edmund Hillary's Ross Sea party were conducting similar investigations as far north and south in the Ross Sea area as they could. Having more time, they found an amazing collection of plant fossils which ranged from Devonian to Jurassic in age. This is the area as stated earlier which was broken up into a number of blocks, the horizontal rocks having been raised or lowered, but nobody could tell at that stage how thick the horizontal rocks were originally because the amount of their movement was not known.

It was only when the plant fossils were found that it was possible to tell that the vertical movements had been considerable. For example, at sites on the southern side of the upper Taylor Glacier, Devonian plant fossils—the first known land plants—were found, whereas on the northern side of the glacier were Triassic plants —very much later in time, and yet at about the same altitude, suggesting a large movement of the southern side upwards and of the northern side downwards to be on the same level. They also found coal seams in the Ross Sea area, but black layers of dolerite sills—the igneous rock which had been injected in a molten state between the sediments—had baked the coal until much of it was unusable. This had happened also on the Weddell Sea side and has occurred in Natal and in many parts of the eastern Transvaal where similar dolerites burned the coal and made it useless. In these areas they also found plant fossils. There are now ten areas where coal has been found in Antarctica.

Details of the Plant Fossils

The New Zealanders found the hollow mould of a stem on which there were regularly arranged round scars in a very hard quartzite. Exactly the same impressions can be found in Witteberg quartzite of the Cape Province. This very primitive plant was found on a mountain high above the upper Taylor Glacier and the moment I saw it I knew that I was dealing with Devonian rocks for it was one of the first land plants, and that the formation was comparable with the Cape folded mountains. They found also several coal areas and in all of them there were the large net-veined Glossopteris leaves. There are a great many different species of Glossopteris, and among the Antarctic fossils I found 17 species of Glossopteris alone, one of which had previously been found only once, and in Australia.

In addition to the 17 species of Glossopteris there were five species of the leaf Gangamopteris which is always associated in the southern hemisphere countries—here there is no single midrib but a whole series of ribs crowded together and then spread out sideways. They too are net-veined. Gangamopteris and Glossopteris together are sure signs of the southern coal measures. There were also some strangely jointed stems, which we find in Africa and Australia, called Vertebraria because they look something like backbones, and there were portions of trunks of great big trees, now replaced by silica. The wood shows very clear annual rings. We are all accustomed to wood which shows rings, because the cells grow rapidly and are big in the springtime, grow slowly and then cease to grow in the winter, with the result that each year's growth tends to form a ring and the number of rings gives an indication of the tree's age; but in the tropics, rings do not form because trees go on growing all the time as there is no marked winter or summer. So obviously these trees grew in an area where there were very pronounced seasons, but the coal plants of the northern hemisphere in Britain, North America or Germany do not show annual rings, because they were formed in a tropical area.

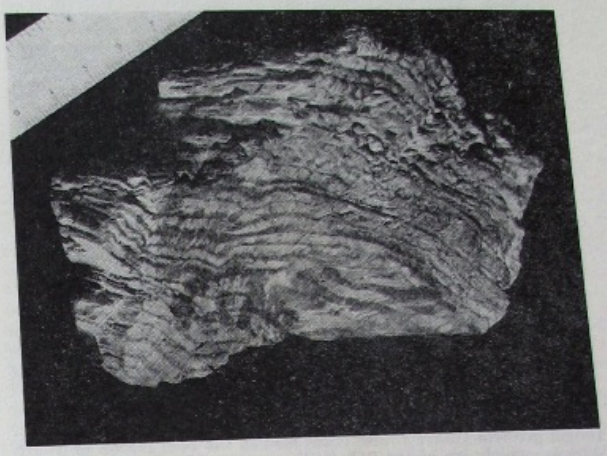

Fig. 3: Fossilized wood, showing annual rings.

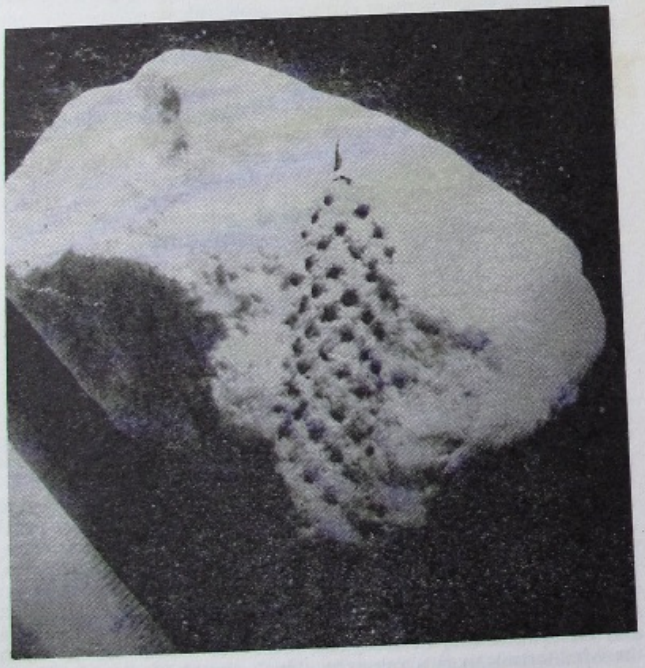

Fig. 2: Stem of primitive Devonian plant.

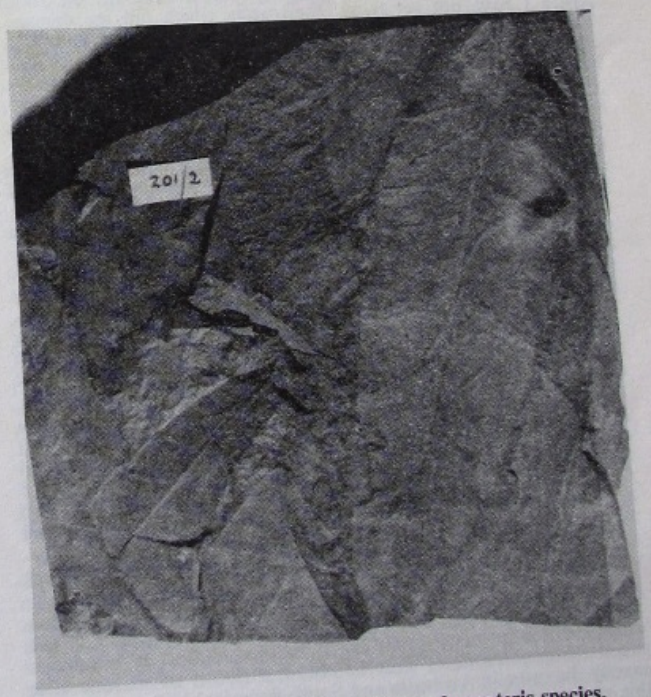

Fig. 4: Glossopteris fuchsii and other glossopteris species.

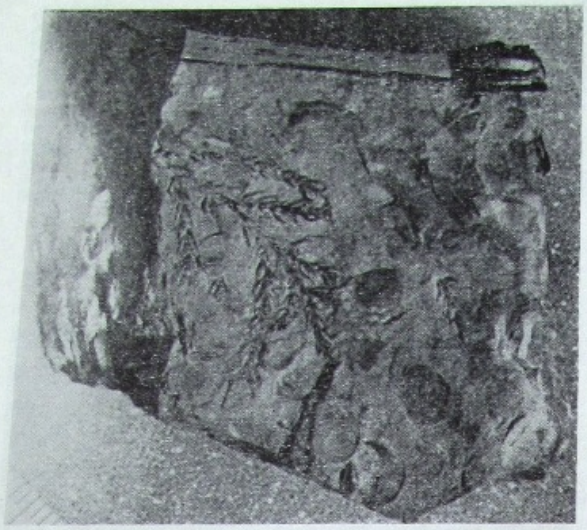

Fig. 5: Coniferous twig, ancestral to South African yellow-wood.

There were also ribbed and jointed stems on which the leaves grew in a whorl or ring at each joint. There was a typical little sporangium, a small crinkly form which had tiny spores inside it and which is well known in Australia, South Africa, India and South America in rocks of this age. Some spots were found on a Glossopteris leaf which were caused by plant disease, probably a fungal growth. I have found them also in the coal plants of South Africa—which are about 250 million years old—so that our pest problems of today are not new.

It is a strange thing that the fossil plants of the South show these fungal spots which have not been reported, I think, from plants of the same age in the north. In addition, quite a number of them have been eaten by insects, nibbled round the margin. In South Africa I have not yet found the insects which did the damage, but amongst the Antarctic leaves I looked carefully and eventually found a couple of insect wings lying on top of the impression of a leaf. It is the only fossil insect record, up to now, from Antarctica.

You have probably been wondering what the Glossopteris plants were like. They were woody shrubs or small trees with branching woody stems on which the leaves grew in clusters of ten to twenty leaves which were possibly short shoots. The trees were deciduous and in the winter time the leaves fell off to form great banks of leaves. The reproductive organs, corresponding to modern flowers, were bisexual. There was a two-sided cupule growing on a single stalk out of the midrib of the leaf. In one half of the cupule there were small seeds while the other side formed a protective cover, but in its early stages, when it was young, the protective part supported long pollen organs which fell off after pollination. That means there were seeds and pollen organs in the same "flower" many millions of years before they were found anywhere else in the world, so that this group of plants was very highly advanced.

Many of the fossil plants were closely comparable in South America, India, Africa, Australia and Antarctica during the coal period. Of the 43 species of plants of this period which I found amongst the Antarctic specimens, 28 of them were actually of the same species as in India, while 27 of the 43 species were common to South Africa; and slightly smaller numbers to Australia and South America. Some of them were common to the whole lot—to every one of these southern continents, but were never common with anything in the north.

Further north in the Ross Sea area, there are rocks which are Triassic in age. Their characteristic plant had a fern-like frond which divided into two branches. It is Dicroidium and is what is called the zone fossil of Triassic rocks in South Africa and it is exactly the same in Australia and South America. In fact, wherever this plant is found in the southern hemisphere we know that the rocks are Triassic in age, and we expect to find associated with them many jointed, bamboo-like stems, and also cycad-fronds. This proved to be the case in Antarctica also. Still further north the rocks contained little twigs of conifers and a small cycad frond which obviously belonged to the Jurassic, the conifer period. They were not like the fossil conifers in the northern hemisphere, but exactly like those of the south. One of them was ancestral to the yellow-wood trees of South Africa. Both this particular fossil conifer and the same cycad have been found in Portuguese East Africa near the base of the Drakensberg lavas and are Jurassic in age. Finally, up in West Antartica and also in the Ross Sea, in very recent deposits on the beach, pollen grains were found, and the pollen grains included some of the Proteaceae, our national protea, as well as of other families of flowering plants which can still be found in southern continents but are now more advanced or specialized forms. The areas where Proteaceae can be found today are South America, Southern Africa, India, parts of the East Indies and Australia, and now the pollen has been found in Antarctica.

If you study a chart of all the zone plant fossils of South Africa from the oldest Devonian rocks up to the Tertiary period you will find that all of them have been found in Antarctica. In other words the plant history of this great southern continent shows not just an isolated resemblance but a complete sequence, which parallels that of Africa with the sole exception of modern plant life. There are other things too. In Africa and in each of the other southern continents a great ice age occurred between the formation of the Devonian and the Coal Period rocks, so that when the plant fossils were found in Antarctica there was always the hope that underneath them in the lower part of the Beacon sandstone, which is the formation corresponding to our Karoo System, rocks formed by glacial action would be found, and that has now happened. In the last few years, they have found these glacial beds lying between rocks with Devonian plant fossils and those with coal fossils in four or five different parts of Antarctica. One other important comparison still awaits confirmation. In South Africa the Beaufort beds lie between the coal measures and the Triassic beds. They contain an amazing collection of fossil reptiles, which have not yet been found in Antarctica, but I think this is because they do not know what to look for. Most of us would be completely fooled by a large nodule in a rock and would not recognise that it contained a part of one of these strange great reptiles. Possibly the geologists have not yet come across areas where there are reptile fossils, but I shall be extremely surprised if, with the intensive investigation now in progress, they are not found in Antarctica, because there are now so many close parallels.

CONTINENTAL DRIFT

I said earlier that plants were most sensitive to climate and yet we have the apparently absurd situation of East Antarctica, where not a single vascular plant can now grow and where the low temperatures, the gales and the months of darkness prevent the growth of all but a few scaly lichens on the rocks and algae, which lie dormant in the lakes till the summer temperatures melt the ice, and yet this frozen, almost lifeless continent has a geological prehistory and especially a record of plant life identical with that of sunny South Africa. The only feasible explanation is that both continents once shared a common climate and this could only have been possible if the position on the globe of either or both had been altered; with respect to the pole and the equator. This is known as the theory of continental drift, which the German scientist, Wegener, was the first to publicize. He believed that at one time all the continents were jammed together into one great land mass, which he called Pangaea, and he thought that this began to break up until it finally reached the condition of the present land and sea distribution. Of course, many scientists were appalled at the thought, others were intrigued. Wegener himself went to Greenland investigating the movement of continents and eventually died there whilst he was trying to prove his theory. But in South Africa our own Dr. du Toit was fascinated by the idea, and followed it up. He found that there was much evidence in the southern hemisphere of this pushing apart of some of the continents, but that their structure and history differed from the northern continents. Du Toit therefore imagined two great land masses, and gave the name Laurasia (a combination of Canada, Europe and Asia) to the northern one and Gondwanaland to the southern combination of South America, Africa, Australia, India and Antarctica. India geologically belongs to the south and not to the north, in which it now lies, and there is evidence to suggest that its present position is some 60° N of its former resting place. Between Laurasia and Gondwanaland, he imagined there was a wide sea of which the Mediterranean is a remnant, which completely separated the two.

Evidence of Drift

Since then geologists have been trying to see whether they could fit together the opposing sides of different continents and whether they could be matched. They have found some extraordinary similarities. For example, I mentioned previously that in each of the southern continents there was a great ice age. The strange thing is that in Southern Africa the ice moved away from the equator but nowadays ice never moves away from the equator; it moves from the poles towards the equator. In the Transvaal it moved southwards and westwards, but in Uganda the scratches left on the rocks by the ice show that it was moving northwards. In South America the ice was moving from what is now ocean on to the coast of Argentine and Brazil. In Australia it moved also from what is now ocean, northwards—which is at least a reasonable direction—but it moved from the ocean on to the land (no one has ever heard of ice moving from the ocean up onto the land). In India, equally ridiculous, the ice moved from the equator on to the peninsula of India. If these continents were pushed together a normal radiating pattern of ice movement would result. In every one of the countries the ice age was followed by the formation of coal and by a vigorous Glossopteris flora. The modern flora, too, shows many remarkable similarities and botanists are often appalled trying to explain how a particular plant could originate in one continent and spread across the oceans, but if you push the continents together then it is a simple matter to explain the present distribution of these plants. Remember there were no birds to carry the seeds when the plants spread. Modern botanists say that flowering plant seeds cannot be carried across great stretches of ocean by currents or by wind and remain fertile. There are a few specially adapted plants, like coconuts and so on, but I'm not speaking of those. Other evidence can be found in the Great Rift Valley of Africa. It looks as if a new crack is developing and Africa is splitting.

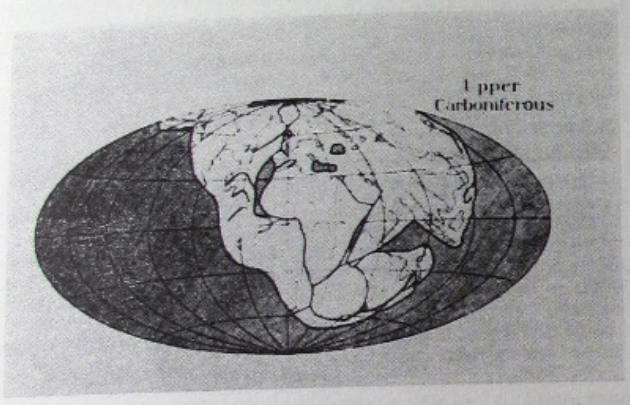

Fig. 6: Wegner's idea of how the present continents fitted together in the primitive continent of Pangaea.

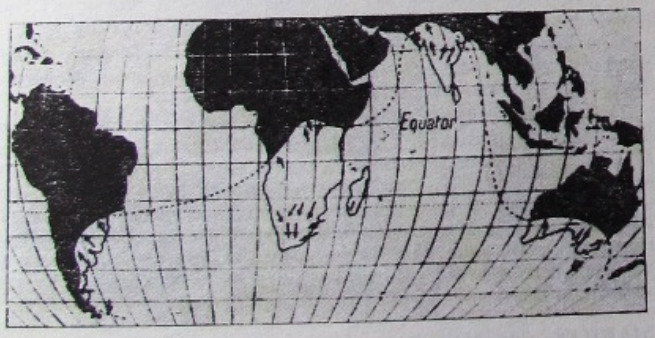

Fig. 7: Distribution and direction of movement of the ice-sheet which covered part of Gondwanaland during late Carboniferous.

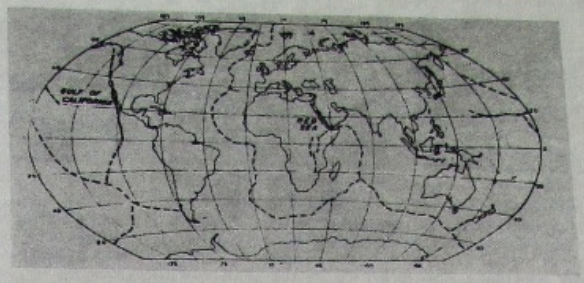

Fig. 8: Map showing the distribution of the ridge-rift systems of the world today, with obvious preference for positions in the oceans midway between the continents.

Geophysicists suggest that India has moved 60 degrees northwards since the Jurassic, that is since the time conifers became dominant; and that it moved northwards towards the sea which lay between Asia and this portion of the southern continent. Gradually the force of this great continent, driving northwards, crumpled up the bed of the sea to form the present huge mountain ranges of the Himalayas while further east they formed a fold mountain chain, which bends around abruptly and swings southwards through the Malay peninsula, Sumatra, Java and also through Borneo. That brought the northern area which had completely different flora into contact with a southern continent with a Glossopteris flora. Just in the last two years, the Royal Society of Great Britain has organised an expedition to Borneo, to examine the strange plants which are found there, and which are such a strange mixture of southern and northern plants that they could not be explained, save by assuming that the origin of flowering plants had taken place in this area. The leader of the expedition was unaware that a map had been published just before the war illustrating the land movement which could explain exactly why in Borneo today we get this strange mixture of plants.

Mechanism for Drift

The greatest problem in accepting this theory has always been to find a reason for the movement of continents and even more, a mechanism strong enough to operate it. The geophysicists have now come to light with a possible and feasible solution. They suggest that continents move like icebergs, floating on a slightly denser surface, for the earth is known to consist of a number of concentric layers of increasing density. Because of increasing heat the layer beneath the solid crust is believed to be plastic so that under pressure it would move and if it were squeezed to the surface it would liquify and pour out as lava. It is further suggested that in this plastic layer convection cells could develop. In each cell hot currents would rise and then diverge. Where they diverged they would cause tension which would ultimately fracture the continental block above them and drag the portions apart to form a new ocean. Where the cool convection currents descend, they would drag down the continent, thickening the sediments and tending to crumple them into chains of mountain ranges.

In the last couple of years, a number of countries have combined to investigate the ocean floors in an attempt to prove this theory and they have found running right down the middle of practically all the oceans, but particularly the Atlantic, and parallel to the lines of the broken coasts, that there are mid-oceanic ridges on which there are many earth quakes and frequent volcanoes.

These ridges are assumed to mark the emergence of ascending currents which even today are widening the Atlantic and Indian oceans. Mountain belts like the Andes would mark the position of descending currents causing crustal thickening. It is significant that one of these ridges surrounds Antarctica.

I am sorry to have given you such a very rushed impression, but it was with the idea of indicating that Antarctica which started off as "terra incognito" far away in the land of legend may really have been our next door neighbour and have had a great deal in common with Africa, until in comparatively recent geological time Africa chose to move northwards to these very pleasant climes, while Antarctica moved southward until it lay completely within the Antarctic circle and all the life which had been so richly distributed across it was blotted out.

NEWS FROM SANAE AND THE ISLANDS

SANAE—16e April:

Na drie maande se verblyf op SANAE het die manne reeds deeglik kennis gemaak met die onmeetlike ysvlaktes met sy wispelturige weersomstandighede. As die wind die sneeu nie opwaai nie dan spook ons buite dat die sneeu so waai. Selfs 'n graaf het 'n onmisbare vriend van die ywerige werker geword. Hiermee word letterlik en figuurlik dinge uit sneeu en sneeu uit dinge gegrawe. Janee, moeder natuur laat haar nou eenmaal nie voorskryf nie.

Sommer nou die anderdag besluit die Sanniesposters dat ons dansaal met sy sakkende dak en gebreekte balke in ere herstel moet word. Die enigste oplossing is om die dak deur 'n 9 voet dik sneeulaag oop te grawe en die saak van die vloer na bo te herbou. Met die volgende dag se timmerasie in gedagte asook 'n jolige dansparty in die toekoms het die manne vroeg gaan slaap. Andermaal egter het moeder natuur haar respek op die nietighede van die mens afgedwing en woedende winde so sterk as 70 myl per uur op ons afgestuur. Die tekens van ons arbeid het soos mis voor die son verdwyn asof geen mensehand ooit daar naby was nie.

Nietemin ons gooi nie tou op nie en sal weer 'n poging aanwend. Te wyte aan hierdie sneeustorm kon Zac min beweegruimte in sy aurorahut vind weens die indringende sneeu. Die weerkundiges het die weer op 'n dag trotseer en 'n ballonopstyging geloods. Pottie wat die ballon sou lanseer, het vergeet van die klein hondjies op die werf. Met die wegspringslag het hy oor een gestruikel en die instrumentjie pap geval. Ons is dus maar verplig om ons te berus in die wel en wee van die Antarktiese weer. Een ding is egter seker, en dit staan soos 'n paal bo die sneeu dat die winter snel in aantog is. Die termometerkwik kuier reeds snags hier by die minus 36 rond.

Ekstra komberse word in gebruik geneem en die outamatiese verwarmers dreun ook meer dikwels. Hierdie maand het ook 'n jolige verjaarsdagparty opgelewer. Ongelukkig moes die heerlike gebraaide kalkoen sy einde in menige skiewiedrom vind. Na Saterdagaand se biltong word gemerk dat baie manne in hulle slaap praat. Miskien kan dit toegeskryf word aan die skaars boodskappies van familielede, geliefdes en vriende.

As die rugbykeurders dalk belangstel, hier op Sanniespos is 14 fikse manne wat hulle sal uithelp daar in Skotland. Nogtans hoop ons dat die Bokke sal wip oor die Skotse velde en sy tong sal uitsteek vir die teenstanders.

SANAE—26th April:

The past month has been one of extremes in natural phenomena. One of the most violent storms experienced yet occurred at SANAE, with the wind gusting well over 90 knots. Many of us had the first experience of braving such a storm, but as the case usually is, the novelty soon wore thin. Feelings of utter helplessness developed for those who ventured outside, and the hatch entrance disappeared from sight in the swirling drift snow. However, calm mild weather soon followed and we were able to examine the storm damage. Most of the installations above the surface were buried under and filled with the drift snow. The cabin of one of the Muskegs was filled to the roof. The newly erected cubical quad antenna and the cosmic ray balloon tracking antenna suffered moderate damage.

After a period of considerable geophysical activity, a brilliant auroral display occurred on the night of 8th and 9th April. The rays were often seen to pulsate, indicating considerable activity. The all-sky camera photographs and the riometer and airglow records will surely form interesting research material. A large number of seismic disturbances were also recorded recently.

At last we are able to sigh with relief at the completion of the so-called "Danssaal Project". The sagging produced by tons of compact ice in the space between the kitchen and sleeping quarters, known as the Danssaal, caused supporting beams to bend and eventually to shatter. Undoubtedly, this was a dangerous situation which, if ignored, might have caused the caving in of the whole area. A hole about 12 feet deep and 14 feet on each side had to be cleared of snow to uncover the sagging roof. On the first occasion the hole was almost completed when, to our great sorrow, a storm set in which filled the hole completely with drift snow. The second attempt met with more success, and the last sections of the roofing were laid in nearly total darkness, with a storm brewing.

There was a stage when elaborate plans were being drawn up by some of the more ambitious members for the construction of an ice yacht. It is with considerable relief that this project has now been temporarily shelved, otherwise some of the chaps might have had to winter in the middle of the Weddell Sea.

SANAE—28th May:

The sun has set for the two months long winter night. The most important task of replenishing diesoline supplies within the base was accomplished recently, under very trying conditions. With temperatures in the vicinity of minus 37 degrees Celsius, it was impossible to pump the jelly-like diesoline from outside. The drums had to be skilfully dropped down the hatch and stored in the snow passage, for at least a day before mechanics Joubert and Hodson could pump the partially defrosted and less viscous fuel into the storage drums.

With the sun low on the horizon, phenomena such as sun pillars and parhelia were frequently to be seen and the cameras clicked. Recently, surveyor Johnny Strydom, assisted by Doc de Wit, Sewes van Wyk and Derek Sharwood attempted a tellurometer survey for the purpose of linking points on the 1,000 feet high Bloenga ice rise west of the base with points near the station. However, extremely poor visibility forced them to abandon the project after they had covered only half the distance to the ice rise.

Radio technician Nico Smit is at present busy constructing a two-way, short-range VHF transreceiver which is certain to prove invaluable to field parties when contact between caboose and muskeg is desired. The unfortunate men whose duties require them to go outside into the bitter cold regularly every day, are geomagnetist Zac Ezekowitz and radio technician Smitty who has to tend to the seismometers, and then, of course, also the meteorologists Joubert, Potgieter and Steyn. The Met. fellows usually run into trouble when they have to launch balloons in winds exceeding 25 knots. Until recently it was a familiar sight to see the young huskies Kiek and Fidel accompanying geologist Wolf Pollake on his daily round to the accumulation network. Now, with both dogs on chain, it is a solitary figure that strides out.

MARION—1st April:

Die nuwe aflosspan het net blye gesigte gesien met ons aankoms by Marion. Maar voor ons verder gaan, wil ek eers ons Marioniete bekendstel.

Weerkundiges:	B. Sciocatti (beampte in bevel) A. S. Cronje, F. Clements, D. van Schalkwyk.
Radio-öprateur:	B. R. (Charlie) van der Riet.
Mediese ordinans:	D. Jooste.
Radiotegnikus:	H. J. Steenkamp.

Dan is daar nog B. J. Huntley (plantkundige) en E. M. van Zinderen Bakker (voëlkundige) wat reeds vanaf Desember hier gevestig is.

Ons het 'n baie aangename vaart hierheen gehad, alhoewel Dok Jooste en Manie Steenkamp nie juis hulle gesigte veel verder as die kajuit se deur wou laat vorder het nie. By hulle was al wens om weer so gou as moontlik voete op ou moeder aarde te plaas. Saddie Cronje is ook verras deur die baie kaste wat op een of ander manier steeds voor sy voete beland.

Met die eerste beurt koskook, het Dok Jooste besef dat dit nie onmoontlik is om die artappels teen die dak te laat beland deur middel van 'n drukkoker nie.

MARION—26e April:

Ons eerste sneeu was toe maar 'n bietjie maer vir die wat nog nooit so iets gesien het nie, nogtans was dit genoeg. Intussen begin die manne kla dat dit koud word en die koue het tog ook maar sy probleme. Hoe, veral, gaan die radioteodoliet se kabels vervang word as 'n temperatuur van 30 grade Celsius 'n vereiste is? Die mense daar in Finland het seker nie aan Marion gedink nie.

Charlie sien toe sommer 'n klomp skepe een middernag. Vroeg die volgende oggend egter kies hulle toe weer koers sodat ons nie eens weet wie ons besoekers was nie.

Die uittog van ons plaaslike bewoners is ook nou in volle swang en die strande begin maar bra leeg daaruit sien. Intussen word die ouens slim sodat ballonne nou in sterk winde met 'n ou visnet losgelaat word. Dit is nogal besonder effektief. Grietjie begin nou ook al 'n woordeskat kry al gaan dit nog soms maar swaar. (Terloops vir die ouens se vriendinne daar in die Republiek, Grietjie is nou ons pappegaai). Wat die weer betref, wag ons nog maar in spanning vir daardie sterk winde wat dit tog so moeilik maak met die loslaat van die ballonne.

MARION—11e Mei:

Op 26e April tydens 'n kwaai storm is ons landingsplek heeltemal weggespoel. Ons het die golwe so tussen 15 en 25 voet hoog geskat

MARION—25th May:

So far this month we have had six days of snow but no heavy snowfalls occurred. The lowest surface pressure that has been seen by most of us was also recorded, i.e. 968.9 mbs. With most of our supplies stored and unpacked, more time is now available for walks inland and along the coast. During two exceptionally fine days with plenty of sunshine and no cloud or wind, our cameras really worked overtime. The two biologists, however, are not very satisfied with the spells of bad weather which at times persist for days, keeping them from doing their research which is done mostly in the field.

GOUGH—5e Mei:

Dit is ons span se eerste nuusbrief hier van Gough-eiland en ons wil onsself eers voorstel. Daar is soos gewoonlik weer sewe manne, maar wat wel uitsonderlik is, is die feit dat nie een van ons ooit tevore op enige eiland was nie. Tot dusver verloop alles nog asof ons al jare hier is en dit beloof om so te bly. Die sewe manne is Gawie Viviers, Jannie Herbst, Willie Taal, Du Toit Olivier, Carl Booysen, Ernst Scholtz en Nico Venter. Met die vaart hierheen in die RSA was ons gelukkig in die opsig dat net twee van die sewe manne seesiek geword het.

Ons is almal baie in ons skik met die voorkoms en plantegroei van die eiland, want dit bied aan elkeen die geleentheid om 'n groot verskeidenheid fotos te neem.

Die koskokery kom nou reeds so goed op dreef dat almal teen hierdie tyd al oorgewig is. Ons het tot dusver nog vars groente, vrugte en vleis gehad, maar selfs ons blikkieskos is so genoegsaam dat mens feitlik enigiets te enige tyd kan voorsit.

NUUS VAN DIE VERENIGING

ALGEMENE JAARVERGADERING

Die vierde Algemene Jaarvergadering van die Vereniging is op 29e Maart in Pretoria gehou. Dit is opgevolg met 'n lesing deur Dr. Edna Plumstead van die Paleontologie-afdeling van die Bernard Price Instituut, Universiteit Witwatersrand (die inhoud van hierdie lesing en enkele van die illustrasies word hierbo weergegee).

Twee mosies is voorgestel en aanvaar. Die eerste mosie hou verband met die ongelukkige situasie dat daar nog net een tak van die Vereniging in die land bestaan, naamlik in Pretoria, sodat slegs die lede wat in of naby Pretoria woon, die volle voordele verbonde aan die vergaderings en funksies van die Vereniging, asook lidmaatskap van die Bestuur, kan benut. Om die gehalte van voordragte en die bywoning van vergaderings te kan verbeter, asook om die lede in Johannesburg, Potchefstroom en ander plekke binne redelike afstand van Pretoria tegemoet te kom, is die volgende besluit aangeneem:

"Dat, om die aansluiting en deelname van lede wat nie in Pretoria woonagtig is nie aan te moedig, daar slegs vier gewone vergaderings per jaar gehou sal word, verkieslik in Februarie, Mei, Augustus en November, maar spesiale byeenkomste kan gehou word by geleenthede wat vir een of ander rede besonder gepas of geskik is."

'n Tweede voorstel is aanvaar ten effekte dat die Konstitusie van die Vereniging voorsiening maak vir die voorwaardes en wyse van toekenning van die Suid-Afrikaanse Antarktiese Medalje, soos uiteengesig in die *Antarktiese Bulletin*, No. 2, van Maart 1964 en dat 'n verdere eienskap in die beoordeling van kandidate bygevoeg word, naamlik:

"*Lojaliteit. Die lojaliteit bewys teenoor die ekspedisie en medelede van die ekspedisie.*"

Die finansiële verslag vir 1964 is gelees en aanvaar. Die Voorsitter se verslag vir die tydperk vanaf die vorige Jaarvergadering is ook voorgedra (weens gebrek aan ruimte staan dit oor vir die volgende nommer van die *Bulletin*).

Die volgende nuwe Bestuur (Nasionale Uitvoerende Komitee) is gekies:

Voorsitter:	Mnr. D. G. KINGWILL.
Visevoorsitter:	Komdt. W. J. B. CHAPMAN.
Komiteelede:	Prof. P. H. STOKER.
	Mnr. M. DU PREEZ.
Ere-Sekretaresse:	Mev. C. M. TALJAARD.
Ere-penningmeester:	Mnr. C. SANBY.
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