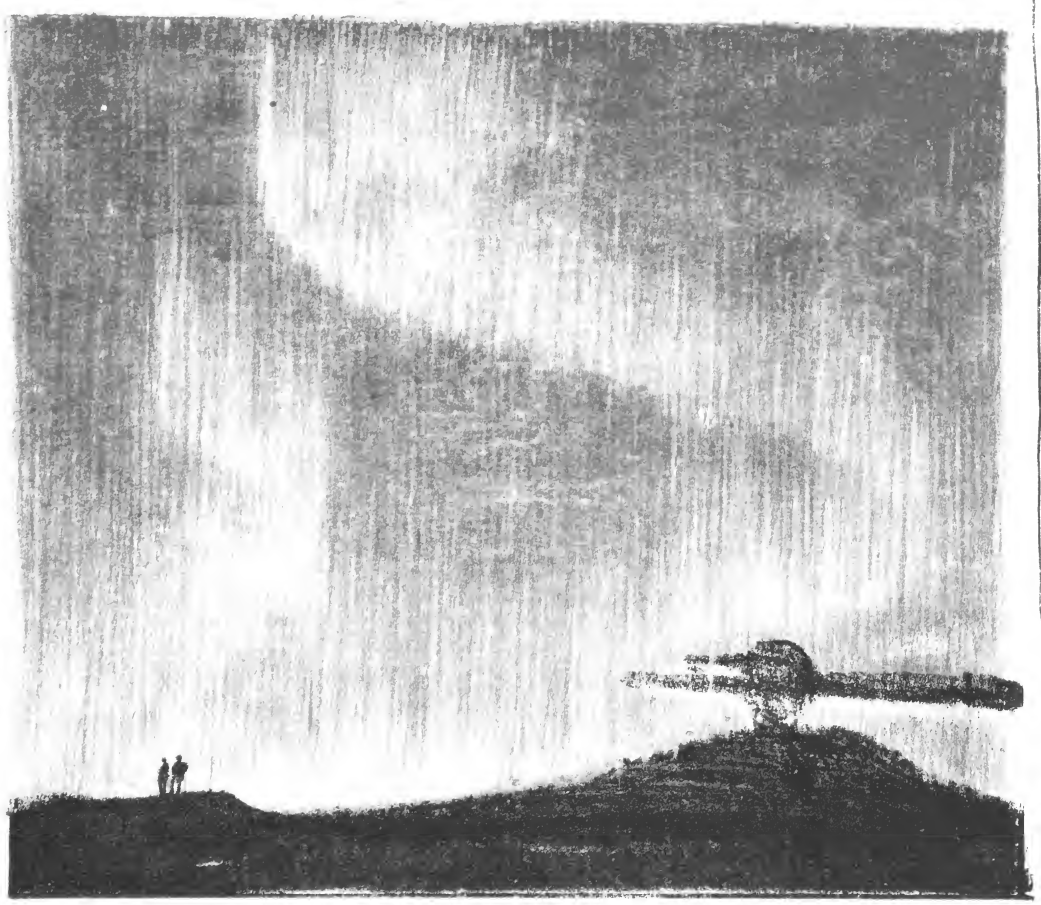
1908 — 09

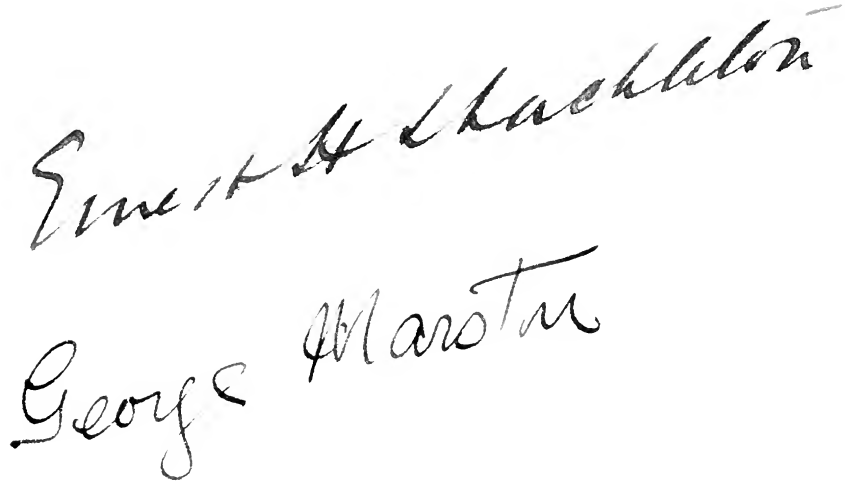
AURORA AUSTRALIS



PUBLISHED AT THE
WINTER QUARTERS
OF THE BRITISH
ANTARCTIC EXPED
ITION, 1907, DURING
THE WINTER MON
THS OF APRIL, MAY,
JUNE, JULY, 1908.
ILLUSTRATED WITH
LITHOGRAPHS AND
ETCHINGS; BY
GEORGE MARSTON

PRINTED AT THE SIGN OF
'THE PENGUINS'; BY JOYCE
AND WILD.
LATITUDE 77° .. 32′ SOUTH
LONGITUDE 166° .. 12′ EAST
ANTARCTICA

TRADE MARK



DEDICATED

TO

MISS DAWSON-LAMBTON.

AND

MISS ELIZABETH DAWSON-LAMBTON.

WHO HAVE EVER SHOWN THE DEEPEST

INTEREST IN ANTARCTIC EXPLORATION,

AND OUR WELFARE.

PREFACE

Some six years ago it fell to my lot to edit and print the first Antarctic publication; it is my fortune now to edit another.

There are essential differences between the two efforts, for The South Polar Times was typewritten and only one copy could be issued, whereas Aurora Australis is actually printed, and therefore allows of a larger edition. Again; the labours of the Editor are light, for the bulk of the work falls on the shoulders of the Printers and Artist.

If it had not been for the great generosity of the firm of Sir J. Causton & Sons, Ltd., we would never have had this opportunity of making such a memento of the winter months, for the above firm not only presented us with an entire printing and lithographic outfit including the necessary paper, but also allowed our Printers and Artist to obtain instruction at their works.

Now; seven years is the usual time to serve as apprentice to the printing and lithographic trades, and as only three weeks could be spared by the producers of this little book to learn the business, any shortcomings will be leniently viewed both by the small public in this colony and by our friends at home to whom we trust these pages will be of interest.

I take this opportunity to specially thank not only the heads of the firm that made this book possible, but also the managers of the various departments and the foremen, who did everything in their power to help our people.

During the sunless months which are now our portion; months lit only by vagrant moon and elusive aurora; we have found in this work an interest and a relaxation, and hope eventually it will prove the same to our friends in the distant Northland.

E. H. SHACKLETON.

ADDITIONAL PREFACE.

Since writing the preface for this book I have again looked over its pages, and though I can see but little not up to usual standard in bookmaking, the printers are not satisfied that it is everything that it ought to be. But the reader will understand better the difficulty of producing such a book quite up to the mark when he is told that, owing to the low temperature in the hut, the only way to keep the printing ink in a fit state to use was to have a candle burning under the inking plate; and so, if some pages are printed more lightly than others it is due to the difficulty of regulating the heat, and consequently the thinning or thickening of the ink. Again the printing office was only six feet by seven and had to accomodate a large sewing machine and bunks for two men, so the lack of room was a disadvantage; but I feel sure that those who see this book will not be captious critics. The printing was entirely done by Joyce and Wild, the lithography and etchings by

ADDITIONAL PREFACE.

Marston, and the covers made of provision cases were manufactured by Day. It is therefore to these four that the carrying out of the Aurora Australis is due; most of us have contributed an article of some sort, and I as Editor feel an interest in the work, as it was a pleasure to see it progressing; and I trust that all who have a copy will think kindly of the first attempt to print a book and illustrate it in the depth of an Antarctic Winter.

E. H. SHACKLETON.

CONTENTS.

Under the Shadow of Erebus

THE ASCENT OF MOUNT EREBUS.

THE ASCENT OF MOUNT EREBUS

EREBUS was discovered by Sir James Clarke Ross on January 28th, 1841, and was so named by him after the leading ship of his famous expedition. Rising rapidly from sea level it rears itself aloft, from near the western side of Ross Island, to an altitude of over 13,000 feet.

If Ross Island be likened to a castle, flanking that wall at the world's end, The Great Ice Barrier, Erebus is the castle keep. Its flanks and foothills clothed with spotless snow, patched with the pale blue of glacier ice, its active crater crowned with a spreading smoke cloud, and overlooking the vast white plain of the Barrier to the East and South, the dark waters of Ross Sea and McMurdo Sound to the North and West, and still further West, the snowy summits of the extinct volcanoes of Victoria Land, Erebus not only commands a view of incomparable grandeur and interest, but is in itself one of the fairest and most majestic sights that Earth can show.

Erebus, as seen from our winter quarters, showed distinctly the traces of the three craters, observed from a distance by the British National Antarctic Expedition of 1901 - 04. From sea level up to about 5,500 feet, the lower slopes ascend in a gentle but gradually steepening curve to the base of the first crater. They are largely covered with snow and glacier ice down to the shore, where the ice either breaks off to form a cliff, or, as at Glacier Tongue, spreads out seawards in the form of a narrow blue pier five miles in length: near Cape Royds, however, there are long smooth ridges of brown glacial gravels and moraines mostly bare of snow.

These are interspersed with masses of black volcanic rock, and extend to an altitude of about 1,000ft. Above this, and up to about 5,000 feet above the sea, all is snow and ice, except for an occasional outcrop of dark lava, or a black parasitic cone, sharply silhouetted against the light background of snow or sky.

At a level of about 6,000 feet, and just north of the second, or main crater, rises a huge black fang of rock, the relic of the oldest and lowest crater. Immediately south of this the principal cone sweeps upwards in that graceful double curve, concave below, convex above, so characteristic of volcanoes.

Rugged buttresses of dark volcanic rock, with

steep snow slopes between, jut out at intervals, and support the rim of this second crater, which reaches an altitude of fully 11,400 feet. From the north edge of this crater the ground seemed to ascend, at first gradually, then somewhat abruptly to the third crater, now active, further south. It is above this last crater that there continually floats a huge steam cloud. At the time of Ross' Expedition this cloud was reddened with the glow of molten lava, and some thought they saw lava streams descending from the crater. The National Antarctic Expedition had also once or twice witnessed a similar glow, and although, during the few weeks we had been at Cape Royds we had not observed a similar phenomenon, we had at times seen the great steam cloud shoot up suddenly, in the space of a minute or so, to a height of fully 2,000 feet above the mountain top. This sudden uprush was obviously the result of a vast steam explosion in the interior of the volcano, and proved that it still possessed considerable activity.

Although several expeditions had been in its neighbourhood, Erebus had never been ascended. For us, living under its shadow, the longing to climb it, and penetrate the mysteries beyond the veil soon became irresistibly strong. But there were difficulties in the

way. In the first place, the only party who had ascended the foothills of Erebus had found their path barred by heavily crevassed ice. That party consisted of E. E. Joyce, F. Wild, and A. Pillbeam, of the National Antarctic Expedition of 1901 - 04. Starting from Cape Barne, in January 1904, they worked their way inland towards Erebus, for about a mile, and estimated that they climbed to about 3,000 feet above sea level. Joyce and Wild informed us that in this direction the ice, owing to crevasses, was practically impassable for sledges. Then too, the winter was fast approaching, bringing with it blizzards, and temperatures likely to be specially low at high altitudes on Mount Erebus.

After careful consideration, Lieutenant Shackleton decided a reconnaissance in the direction of Erebus might be made, and that, if the risk did not appear to be too great, an attempt might be made to reach the summit of the mountain. He fixed the date for starting for the following morning, March 5th, and selected the first part of the route to be followed. After this every one bustled and hustled, and our winter quarters literally rang with the clang of preparation. Provisions, cooking utensils with primus lamps, cooking pots and snow melters and paraffin oil, deer skin sleeping bags,

tents and poles, ice axes, alpine rope, ski-boots, finneskoes and sennegraes, and crampons were all got ready in hot haste. The crampons had to be specially made for the occasion. They are stout leather soles, each furnished with seven iron spikes, and provided with loops, so that they can be strapped on to the finneskoes, to prevent the wearer slipping on hard snow or ice. It was past midnight before the last spike was riveted.

On March 5th, after breakfast at 6 a. m., the packing of the 11 ft. sledge was completed; its total weight, with its load, being about five hundredweights.

The sledging party, arrayed in their antarctic costumes, including Burbery suits, then got into their sledging harness, and were photographed by Lieutenant Shackleton. The sledgers, six in number, were divided into parties of three each. The party for the ascent consisted of Dr. A. F. Mackay, D. Mawson, and Professor David, and was provisioned for eleven days.

The supporting party was formed of Lieut. J. B. Adams, Dr. E. S. Marshall and Sir Phillip Brocklehurst, and was provisioned for six days. The arrangement was that the supporting party were to assist the main party, until the ground became impracticable for a sledge. The former were then to return to winter quarters, unless they saw that it was practicable for

them to continue the ascent with the main party, without lessening the latter's chances of reaching the summit.

A start was made at a quarter to nine a. m. All hands accompanied the sledging party across the rocky ridge at the back of our hut, and along the slopes of Backdoor Bay to the Blue Lake, half a mile distant. There we bade farewell to our comrades.

We steered first straight up a snow slope, then skirted closely some rocky ridges and moraines, in order to avoid crevassed glaciers.

About a mile out, and 400 feet above sea level, a glacial moraine barred our path, and we had to portage the sledge over it by slipping our ice-axes under the load between the runners and the 'bearers' of the sledge, and lifting it bodily over the obstruction. On the further side of the moraine was a sloping surface of ice and névé, on which the sledge soon capsized, but was quickly righted. Light snow was falling, and there was a slight wind.

Pulling the sledge proved fairly heavy work in places; at one spot, on the steep slope of a small glacier, we were struggling for some time, mostly on our hands and knees, in our efforts to drag the sledge up the surface of smooth blue ice thinly coated with loose

snow. This difficulty surmounted, we made the acquaintence of some obstructive 'sastrugi', which impeded our progress not a little. Occasionally we came to blows, but these were dealt accidentally by a long armed finneskoe-shod cramponless sledger, who whirled his arms like a windmill in his desperate efforts to keep his balance after slipping. On such occasions the silence of our march was broken by a few words, more crisp than courteous, from the smitten one, and then once more nothing was to be heard but the soft pad of the finneskoes, the scrunch of the ski-boots, and the gentle sawing sound of the sledge-runners on the hard snow.

Soon after six p. m. we reached a small nunatak of black rock, 2,750 feet above sea level, and about seven miles distant from our winter quarters, and decided to camp there for the night. Our little green tents were quickly set up on their bamboo poles, and their skirts were speedily loaded with snow shovelled on them in place of pegs, to hold them down against the wind. The two primus lamps were soon singing merrily, snow was melted down, and in a few minutes we were each furnished, for the first time in our lives, with brimming bowls of hot 'hoosh', that is, pemmican boiled up with snow water, with chips of plasmon bis-

cuit, or some emergency rations, or both, added. We had all developed a sledging appetite, and found the 'hoosh' delicious. By mistake, as he subsequently asserted, a knowing one put three times the maximum allowance of pemmican into the 'hoosh' of the three dwellers in one of the tents. He declared that this amount contained the irreducible minimum of food fuel needed to keep the lamp of life alight within us, so we ate earnestly that we might live; one of us, however, utterly failed to consume his treble ration, but the knowing one, after finishing the whole of his own allowance, came to the assistance of his distressed tent-fellow, and finished all his 'hoosh' for him, down to the fatty end. A man after such a meal, in any but a polar climate, would have seen in his sleep 'more devils than vast hell can hold,' but it speaks volumes for the climate, as well as for the strength of the quintuple-whacker's digestion, that on this occasion he slept soundly till dawn, and that too, with a volume of Paradise Lost in his pocket, without once seeing a vision of the swart hero of Milton's epic.

The following morning the temperature was -10° Fahr., and when we untoggled our sleeping bags, miniature showers of ice-crystals, formed from the freezing of the moisture of our breath on the rein-

deer hair, fell on our faces. After a hearty breakfast of 'hoosh', plasmon biscuits, chocolate and tea, we struck the tents, repacked the sledges, and started again on our journey. The gradient increased now, as we toiled upwards, to 1 in 5, and we found it very hard work dragging the heavy sledge, especially as numerous large 'sastrugi' ran obliquely to our course. Frequently these 'sastrugi' caused our sledge to capsize, and several times it had not only to be righted, but repacked. Though the temperature at 3 p. m. was −8° Fahr., we found the pulling such warm work that we perspired freely.

Late in the evening we reached a spot a little over half a mile distant from the base of the second, or main cone, and camped this night at an altitude of about 5,630 feet. We had only travelled about three miles during the day, but had ascended over 2,800 feet above our previous camp.

Some of us when we turned into our sleeping bags after tea, found our socks firmly frozen to our ski-boots, and sock and boot had to be taken off in one piece: the temperature that night was − 28° Fahr..

We were camped on a zone of less steep slope than that up which we had just travelled; this zone was continuous to the north east with the lowest and

oldest crater of Erebus, and no doubt, marked the position of its old rim, partly buried at this spot under the material produced by later eruptions. We noticed at this second camp, and for over a mile before reaching it, small black fragments of very fresh volcanic slag lying on the surface of what appeared to be this year's snow. Here the fragments were as big as a cricket ball, and about a mile nearer to Erebus an occasional piece might be seen as large as a football: these were obviously volcanic bombs, and are evidence that Erebus has probably been producing a little lava within its crater either this year, or at all events only a very short time ago.

On the following morning Lieutenant Adams decided that the supporting party might accompany the main party in the final attempt to reach the summit. We accordingly made a depôt of our sledge and of part of the provisions, as well as of the tent poles, floor cloths of the tents, and part of the cooking utensils, and marked the spot with a black flag on a bamboo pole. We each had to carry a weight of about forty pounds, consisting chiefly of sleeping bags, two tents, and rations for three days. Dr. Marshall having photographed us, we filed off in a procession more bizarre than beautiful. Some of us with our sleeping bags

hanging straight down our backs, with the foot of the bag curled upwards and outwards, resembled the scorpion men of the Assyrian sculptures: others marched with their household gods done up in the form of huge sausages; yet another presented Sindbad, with the place of the 'Old Man of the Sea' taken by a huge brown bag, stuffed with all our cooking utensils; this bag had a knack of suddenly slipping off his shoulders, and bow-stringing him around his neck.

There were not enough crampons for the whole party, and when we arrived at the steep hard snow slopes of the main cone, many were the slips, and nautical and naughty the expletives. At one of these snow slopes Mackay, who was in the van, and was cutting steps in the hard snow with his ice axe, slipped suddenly and glissaded with his heavy load for about a hundred feet, when fortunately his downward career was checked by a projecting ledge of snow. It was hard going, but borne up by 'hoosh', hope, and chocolate, we succeeded in reaching in the evening a small recess in a rocky arête, 8,750 feet above sea level.

When we turned into our sleeping bags, directly after tea at 8-30 p. m., the temperature was -20° Fahr.; the sunset had been clear and glorious, but an ominous cloud was creeping down upon us from the

top of Erebus. Between nine and ten p. m., it began to blow hard, and when we awoke the following morning, we found a strong blizzard rushing over us from the south east. It increased in fury as the day wore on, and swept with terrible force down the rocky ravine where we were camped. So dense was the whirling snow, and so loud the roaring of the wind, that although our two parties were only about ten yards apart we could neither see nor hear each other. Neither of the two tents were set up, as we had no poles with us, but they were just doubled over the top ends of our sleeping bags, so as to protect their closely toggled slits from the drifting snow. Nevertheless a great deal of fine snow found its way into the bags.

In the afternoon Brocklehurst emerged from the three-man sleeping-bag, and instantly a fierce gust whirled away his wolf-skin mit; he dashed after it, and the force of the wind swept him some way down the ravine. Adams, who had left the bag at the same time as Brocklehurst, saw the latter vanish suddenly, and in endeavouring to return to the bag to fetch Marshall to help him to find Brocklehurst, was blown down by the force of the wind. Meanwhile Marshall, the only remaining occupant of the bag, had much ado to keep himself from being blown, sleeping-bag and

all, down the ravine. Adams had just succeeded in reaching the sleeping bag, on his hands and knees. when Brocklehurst appeared, also on his hands and knees, having just succeeded by desperate efforts in pulling himself back, over the rocks: it was a close call. He was all but completely gone, so biting was the cold, before he reached the haven of the sleeping-bag. He and Adams crawled in, and then, as the bag had been much twisted up, and drifted with snow while Marshall had been holding it down, Adams and Marshall got out to try and straighten it up; a moment later the violent wind doubled the bag right over, and they had become so benumbed by the cold that they were unable to turn it over again. Providentially, just when they too were beginning to feel gone with the cold, the wind blew the bag right way up again, and opened it for them; they lost no time in slipping in.

There was nothing for it, while the blizzard lasted, but to lie low in our sleeping-bags. At intervals we munched a plasmon biscuit, or a piece of bovril chocolate. We had nothing to drink all that day and the following night, as of course, under the circumstances, it was impossible to keep a primus alight in order to thaw the snow for water. We got some sleep that night, in spite of the raging of the storm.

When we awoke at 4 a. m. the following morning, we found that the blizzard was over, for which we were devoutly thankful. The primus was soon got going under the shelter of a rock, and we all turned out at 4 - 30 a. m.. After a good breakfast we repacked our loads, and started again about 5 - 30 a. m..

The angle of ascent was now steeper than ever, being 34°, that is a rise of 1 in 1½. As the hard snow slopes were mostly much too steep to climb, without resorting to the tedious expedient of cutting steps with an ice-axe, we kept as much as possible to the rocky arêtes. Occasionally, however, the arête would terminate upwards in a large snow slope, and in such cases we cut steps across the névé to any arête which seemed to persist for some length in an upward direction. Often this second arête would end upwards in a névé field, and then we had to cut steps as before.

Burdened as we were with our forty pound loads, and more or less stiff after thirty continuous hours in our sleeping-bags, and beginning besides to find respiration more difficult as the altitude increased, we felt exhausted, while we were still 800 feet below the rim of the main crater. Accordingly we halted at noon, thawed some snow with the primus, and were soon revelling in cups of delicious tea, hot and strong, which

at once reinvigorated us. Once more we tackled the ascent. When close to the top Mackay, who had become separated from the rest of the party, started cutting steps with his ice-axe up a long and very steep névé slope. The task was almost impossible for one so heavily loaded as he was, but nevertheless, he won his way unaided to the summit.

By this time we had reached the rim of the main crater. Often, while toiling up its slopes, we had tried to picture to ourselves the probable scenery at the summit, and had imagined an even plain of névé, or glacier ice, filling the extinct crater to the brim, and sloping up gradually to the active cone at its southern end: but we now found ourselves on the very brink of a massive precipice of black rock, forming the inner edge of the vast crater. This wall of dark lava is mostly vertical, while in places it overhangs: it is from 80 to 100 feet in height. The base of this cliff was separated from the snow plain beyond by a deep ditch, like a huge dry moat. The ditch was evidently not a 'bergschrund', but was due chiefly to the action of the blizzards. These winds blowing fiercely from the south-east, and striking against the great inner wall of the old crater, give rise to a powerful back eddy at the base of the cliff, and it is this eddy which has scooped

out the deep trench in the hard snow; the trench was from thirty to forty feet deep, and was bounded by more or less vertical sides.

Beyond the wall and trench was an extensive snowfield, with the active cone and crater at its south end, the latter emitting great volumes of steam; but what surprised us most were the extraordinary structures which rose every here and there above the surface of this snowfield. These were in the form of mounds and pinnacles of the most varied and fantastic appearance. Some resembled bee-hives, others were like huge ventilating cowls, others like isolated turrets, or bits of battlemented walls; others again in shape resembled various animals. We were wholly unable at first sight, to divine the origin of these remarkable objects, and the need for rest and refreshment cut short contemplation for the time. We hurried along the rampart of the old crater wall, in search of a suitable camping ground. It was at this time that our figures, thrown up against the skyline, were seen through a telescope by Armytage from our winter quarters at Cape Royds, over twelve miles distant. We selected for our camp, a little rocky gully on the north-west slope of the main cone, and fifty feet below the rim of the old crater. Here we had the satisfaction of being

able to ease our shoulders at last from their burdens.

While some cooked the meal, Dr. Marshall examined Brocklehurst's feet, as the latter stated that for some time past he had lost all feeling in them. We were all surprised and shocked, when his ski-boots and socks were taken off, to see that both his big toes were black, and had evidently been 'gone' for several hours, and that four more toes, though less severely affected, were also frost-bitten. It must have required great pluck and determination on his part to have climbed almost continuously for nine hours, up the steep and difficult track we had followed, with his feet so badly frost-bitten. Doctors Marshall and Mackay at once set to work with a will to restore circulation in the feet, by warming and chafing them. Their efforts were, under the circumstances, eminently successful, but it was clear that recovery from so severe a frost-bite would be slow and tedious. Brocklehurst's feet having been thoroughly warmed were put into dry socks, and finneskoes stuffed with sennegraes; and then we all had lunch at about 3-30 p. m..

Leaving Brocklehurst safely tucked up in the three man sleeping bag, the remaining five of us started off to explore the floor of the old crater. Ascending to the crater rim we climbed along it, until we came to a

spot where there was a practicable breach in the crater wall, and where a narrow tongue of snow bridged the névé trench at its base. As soon as we arrived on the hard snow on the far side, Mackay joined us all up with the alpine rope, and with him in the lead we advanced cautiously over the snow plain, keeping a sharp lookout for crevasses. We steered for one of the remarkable mounds which had so interested us at a distance; when we reached the nearest of them, and cursorily examined it, we were as far as ever from understanding how it had formed: we noticed some curious hollows, like large drains partly roofed in, running towards the mound, and at the time we supposed these to be ordinary crevasses. Pushing on slowly we reached eventually a small parasitic cone, about 1,000 feet above the level of our camp, and over a mile distant.

Here peeped from under the snow brown masses of earthy looking material, which we found to consist of lumps of lava, large felspar crystals, from one to three inches in length, and fragments of pumice; both felspar and pumice were, in many cases, coated with sulphur. We now started to return to our camp; we were no longer roped together, as we had not met with any definite crevasses on our way up. We directed our steps towards one of the ice mounds, which

resembled a lion couchant. To our surprise the lion appeared now to be blowing smoke out of his mouth.

The origin of the mounds was no longer a mystery; they were the outward and visible signs of fumaroles. In ordinary climates, a fumarole, or volcanic vapour well, may be detected by the thin cloud of steam above it, like breath exhaled on a frosty day, and usually one can at once feel the warmth, by passing one's hand into the vapour column; but, in the rigour of the Antarctic climate, the fumaroles of Erebus have their vapour turned into ice as soon as it reaches the surface of the snow plain. Thus ice mounds, somewhat similar in shape to the sinter mounds formed by the geysers of New Zealand, of Iceland, and of Yellowstone Park, are built up around the orifices of the fumaroles of Erebus. When exploring one of these fumaroles, Mackay fell suddenly up to his thighs into one of its concealed conduits; he saved himself however, from falling in deeper still, with his ice axe. Marshall had a nearly similar experience at about the same time. Eventually we all arrived safely at our camp soon after 6 p. m., and found Brocklehurst progressing as well as could be expected.

As we sat on the rocks at tea, we had a glorious view to the west. While the foothills of Erebus flush-

ed rosy red in the sunset, a vast rolling sea of cumulus cloud covered all the land from Cape Bird to Cape Royds. McMurdo Sound, now rapidly freezing over, showed warm ochreous tints, where the floe ice had formed, with dark purplish gray streaks marking the leads of open water between. Far away the Western Mountains glowed with the purest tints of greenish purple and amethyst. That night we had nothing but hard rock rubble under our sleeping-bags, and quite anticipated another blizzard; nevertheless, 'weariness can snore upon the flint,' and thus we slept soundly couched on Kenyte lava.

The following morning had two surprises for us; first, when we arose at 4 a.m. there was no sign of a blizzard, and next, while we were preparing breakfast, some one exclaimed, "Look at the great shadow of Erebus," and a truly wonderful sight it was. All the land below the base of the main cone, and for forty miles to the west of it, across McMurdo Sound, was a rolling sea of dense cumulus cloud. Projected obliquely on this, as on a vast magic lantern screen, was the huge bulk of the giant volcano. The sun had just risen, and flung the shadow of Erebus right across the Sound, and against the foothills of the Western Mountains. Every detail of the profile of Erebus, as outlined

on the clouds, could be readily recognized. There to the right was the great black fang, the relic of the first crater; far above and beyond that was to be seen the rim of the main crater, near our camp; then further to the left, and still higher, rose the active crater with its canopy of steam faithfully portrayed on the cloud screen. Still further to the left the dark shadow dipped rapidly down into the shining fields of cloud below. All within the shadow of Erebus was a soft bluish grey; all without was warm, bright and golden. Words fail to describe a scene of such transcendent majesty and beauty.

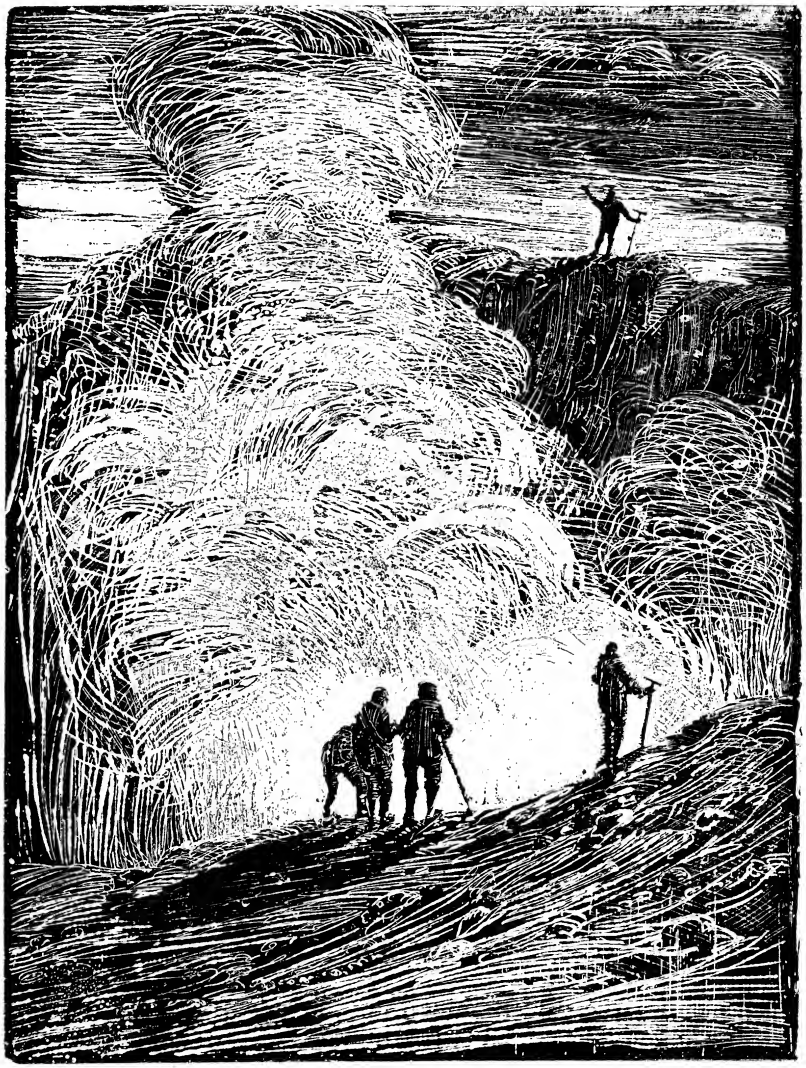
After breakfast while Marshall was attending to Brocklehurst's feet, the hypsometer which had become frozen on the way up, was thawed out with the heat of the primus, and a boiling point determination was made. This when reduced, and combined with the mean of our aneroid levels, made the altitude of the old crater rim, just above our camp, 11,400 feet. The highest point reached by us on the preceding evening, according to our aneroid, was about 1,000 feet above the preceding level, and thus was 12,400 feet above the sea.

At 6 a. m. we left our camp, and made all speed to reach the crater summit. As soon as we had crossed

the snow trench, at the foot of the cliff, we roped ourselves together in the same order as before, and stood over towards a conspicuous fumarole. This was the one which bore some resemblance to a lion; it was about 20 feet in height; Mawson photographed this from here, and also took a view of the active crater, about one and a half miles distant. There was considerable difficulty in taking photographs on Erebus, owing to the focal plane of the camera having become frozen. Near the furthest point reached by us on the preceding afternoon, we observed that there were several patches of ice of a lemon-yellow colour, the yellow being due to sulphur. We next ascended several rather steep slopes, formed of alternating beds of hard snow and vast quantities of large and perfect felspar crystals, mixed with pumice; all these beds dipped away from the active crater. A little further on we reached the foot of the recent cone of the active crater; here we unroped, as there was no possibility of any crevasses ahead of us.

Our progress was now painfully slow, as the altitude and cold combined to make respiration difficult.

The cone was built up chiefly of blocks of pumice, from a few inches up to three feet in diameter. Externally these were grey, or often yellow, owing to



AT THE EDGE OF THE CRATER.

incrustations of sulphur, but internally they were of a resinous brown colour. A shout of joy and surprise broke from the leading files, when a little after 10 a. m., the edge of the active crater was at last reached. We had travelled only about two and a half miles from our camp, and had ascended just 2,000 feet, and yet this had taken us, with a few short halts, just four hours.

The scene that now suddenly burst upon us was magnificent and awe-inspiring. We stood on the verge of a vast abyss, and at first could neither see to the bottom, nor across it, on account of the huge mass of steam filling the crater, and soaring aloft in a column 500 to 1,000 feet high. After a continuous loud hissing sound, lasting for some minutes, there would come from below a big dull boom, and immediately afterwards a great globular mass of steam would rush upwards to swell the volume of the snow-white cloud which ever sways over the crater. These phenomena recurred at intervals of a few minutes during the whole of our stay at the crater. Meanwhile the whole of the air around us was extremely redolent of burning sulphur.

Presently a gentle northerly breeze fanned away the steam cloud and at once the whole crater stood

revealed to us in all its vast extent and depth.

Mawson's measurements made the depth 900 feet, and the greatest width about half a mile. There were evidently at least three well-like openings at the bottom of the caldron, and it was from these that the steam explosions proceeded. Near the south-west portion of the crater, there was an immense rift in the rim perhaps 300 to 400 feet deep. The crater wall opposite to the one at the top of which we were standing, presented features of special interest. Beds of dark pumiceous lava, or pumice alternated with white zones of snow; there was no direct evidence that the snow was interbedded with the lava, though it is possible that such may have been the case. From the top of one of the thickest of the lava, or pumice beds, just where it touched a belt of snow, there rose scores of small steam jets, all in a row; they were too numerous and too close together to have been each an independant fumarole. The appearance was rather suggestive of the snow being converted into steam by the heat of the layer of rock immediately below it. While at the crater's edge we made a boiling point determination with the hypsometer, but the result was not so satisfactory as that made earlier in the morning at our camp. As the result of averaging aneroid levels, to-

gether with the hypsometer determination at our camp at the top of the old crater, calculations made by us show that the summit of Erebus is probably about 13,370 feet above sea-level.

As soon as our measurements had been made, and some photographs had been taken by Mawson, we hurried back towards our camp, as it was imperatively necessary to get Brocklehurst down to the base of the main cone that day, and this meant a descent in all, of nearly 8,000 feet. On the way back a traverse was made of the main crater, and levels taken for constructing a geological section; we also collected numerous specimens of the unique felspar crystals, and of the pumice and sulphur.

On arrival in camp we had a hasty meal, and having hurriedly packed up, shouldered our burdens once more, and started down the steep mountain slope. Brocklehurst insisted on carrying his heavy load, in spite of his frost-bitten feet. We followed a course a little to the west of the one we took when ascending. The rock was rubbly and kept slipping under our feet, so that falls were frequent. After descending a few hundreds of feet, we found that the rubbly spur of rock, down which we were floundering, ended abruptly in a long and steep névé slope.

Three courses were now open to us; either to retrace our steps to the point above us, where our rocky spur had deviated from the main arête; or to cut steps across the névé slope to this arête; or to glissade down some 500 to 600 feet to the rocky ledge below. Naturally, in our then tired state, we preferred to move in the path of least resistance offered by the glissade; accordingly we all dumped our burdens, and rearranged such as needed to be altered, so that they might all well and truly roll. We were now very thirsty, and some of us quenched our thirst, satisfactorily for the time, by gathering a little snow, squeezing it into a ball in the palm of one's hand, and then placing it on the surface of a piece of rock. Although the shade temperature was then considerably below zero, Fahr., the black rock had absorbed so much heat from the direct rays of the sun, that the snowball, when placed on it, commenced to melt almost immediately, and the thaw water started to trickle over the surface of the rock. The chill having been taken off the snowball in this way, the remainder could be safely transferred to one's mouth, and yielded a refreshing drink.

Our loads having now been modelled into the shape of sausages, we launched them down the slope, and watched them intently, as, like animated things,

they bumped and bounded over the wavy ridges of the névé slope. Brocklehurst's load, consisting largely of all our cooking utensils, done up in a large bag, if not the most erratic, was certainly the noisiest, and recalled, on a small scale, Kipling's Bolivar, 'clanging like a smithy shop after every roll'. The battered remains of the aluminium vessels fetched up with a final big bang against the rocks below. Mackay now led the glissade, and firmly grasping his ice-axe, slid to the bottom in less than a minute; we all followed suit.

As we gathered speed on our downward course, and the chisel edge of the ice-axe bit deeper into the hard névé, it sprayed our faces and necks with a miniature shower of ice. The temperature was low, and whenever the steel of the ice-axe touched one's bare skin, it seemed to burn it like a hot iron. We all reached the bottom of the slope safely, and fired with the success of our first glissade, and finding an almost endless succession of snow slopes below us, we let ourselves go again and again, in a series of wild rushes towards the foot of the main cone. Here and there we bumped heavily against the opposing edges of hard 'sastrugi', or tore our nether garments on projecting points of sharp rock. Unfortunately it was not only clothes and cookers which suffered in our wild career:

a valuable aneroid was lost, and one of the hypsometer thermometers broken. It seemed as though we should never reach the bottom of the cone, but at last the slope flattened out to the gently inclined terrace, where our depôt lay; altogether we had dropped down 5,000 feet in level by glissading.

Adams and Marshall were the first to reach the depôt, the rest of the party, with the exception of Brocklehurst, having made a detour to their left, in consequence of having to pursue some lost luggage in that direction. At the depôt, the blizzard of Sunday the 8th, had made sad havoc of our gear; the sledge had been overturned, and some of our belongings blown right away, while the remainder had been scattered to some distance, and were now partly or wholly covered by drift snow. After setting up the tent, Adams and Marshall returned over half a mile to rejoin Brocklehurst. Meanwhile a slight blizzard had sprung up, which completely blotted out the depôt from view; fortunately the wind soon died down, and Adams, Marshall, and Brocklehurst were able to regain the camp. Tea was soon brewed with the help of the primus. The remainder of the party arrived at the depôt at about 10 p. m..

It was suggested that, as a blizzard seemed to be

impending, we had better abandon our gear, and push on for winter quarters that night, but as it was somewhat dark, and we had already had a very hard day, having been going since 4 a. m., we decided to rest there that night, and to make an early start the next morning; so we camped that night at our depôt, and at 3 a. m. Adams stirred us out, and made ready the breakfast. After breakfast there was much ado about hunting after missing articles, which had been flung about by the blizzard. The quarter-plate camera was found by Marshall in a small snow drift, some little distance from our sledge. At last most of our belongings were recovered, the sledge packed, and we resumed our march at 5-30 a. m..

We now found the 'sastrugi', which were from four to five feet in height, and oblique to our course, very troublesome. We put rope brakes on the sledge-runners, and while two of us pulled in front, and two steadied the sledge, two pulled back behind; but the sledge either refused to move, or suddenly took charge, and kept overrunning those who were dragging it, and capsizes occurred every few minutes.

Marshall devised the best means of making progress: he let the sledge take charge, then, before it had got up much speed, he jumped on behind, and steered

it with his legs, as it bumped and jolted over the 'sastrugi'; but frequently the muscular ex-captain of the Bartholemew's Hospital Rugby Union Football Team, found that not all his thirteen stone weight could save him from being bucked right over the sledge, and flung on the névé on the other side. Fortunately no bones were broken, and we reached the nunatak at our first camp, six miles distant from Winter Quarters at Cape Royds, at about 7-30 a. m..

By this time there was every symptom of the approach of a blizzard, and already the snow was beginning to drift before a gusty south-easterly wind. This threatened soon to cut us off from all view of our winter quarters. We were beginning to feel dog tired: one of our tents had a large hole burnt in it, the oil supply was almost done, one of our primus stoves had been put out of action, as the result of our glissade; so we didn't relish the prospect, under the circumstances, of weathering another blizzard in our tents. We decided therefore to make a dash for Cape Royds.

In the uncertain grey light of a windy sky, the 'sastrugi' did not show up in relief, and literally at about every twenty yards some member of the party stumbled, and fell sprawling over the snow.

At last we were gladdened by the sight of the

shining ice surface of the Blue Lake, only half a mile from our winter quarters. Now that the haven was at hand, and the strain and stress over, (for it had proved a pretty severe strain for most of us,) we suddenly felt our limbs grow heavy and leaden, just as they sometimes seem to in a nightmare, when one imagines oneself pursued by wild beasts.

When close to the hut, we formed in line, and saw Lieutenant Shackleton and the rest of our comrades rush out to meet us; he hailed us with the cry, "Did you get to the top"? At first there was no response, presumably because each one of us was waiting for the other to speak, and what's everybody's business is, of course, nobody's business. Then Adams sung out "Yes", and they all gave us a hearty cheer.

Many were the hand-shakings, and warm the welcome. How cosy and luxurious were our winter quarters after the wind-swept slopes of Erebus! and how delightful it was to pour our travellers' tales into the ears of willing listeners! These tales probably lost nothing in the telling, from the fact that the doctor administered to each of us, just as an antidote to collapse, of course, a small dose of champagne. Fearing that our listeners might suffer from collapse through excess of strain upon their credulity, the doctor pre-

scribed for all of them a similar treatment.

Never shall we forget the delicious hot porridge and milk which our good friend "Bobs" produced for us, at a moment's notice, as if by magic, and the prime boiled ham and sweet home-made bread and the fresh butter which followed. The way we made those victuals vanish must have astounded all but the old hands among our comrades; they had evidently been there before. After the meal came more talk and more congratulations, which filled the cup of our happiness to overflowing. Then followed rest, and the long sound sleep that comes to weary travellers.

The rest of the story is soon told. After some delay, on account of unfavourable weather, a party consisting of Adams, Armytage, David, Joyce, Wild and Marshall, started with a 7 ft. sledge, tent, and provisions, to fetch in the 11 ft. sledge, left near the nunatak at our first camp. After a fairly heavy pull over the soft new fallen snow, in cloudy weather, with the temperature at mid-day $-20°$, and the wind blowing from the south-east, we just managed to sight the nunatak, recovered the 11 ft. sledge, placed the 7 ft. sledge on top of it, and pulled them both back together as far as the Blue Lake. The following morning two of the Manchurian ponies were harnessed to the

sledges, and dragged them up the rocky ridge which bounds the Blue Lake on the west, and then took them on to our winter quarters. Our specimens collected on Erebus all arrived safely.

The scientific results of the ascent of Erebus will, it is hoped, prove of considerable interest. Probably there is no more important spot in the world for studying the movements of the upper atmosphere. The place for scientific results is not here, but rather in the contemplated meteorological, geological, and mineralogical memoirs of this expedition.

On looking back at our trip to Erebus, one cannot but be impressed with the wonder of the sights and scenes that had unfolded themselves to us during our brief journey. The glorious sunsets, the magic of the sunrise seen from our camp above the clouds, when the great shadow of Erebus swept across McMurdo Sound, and touched the far-off Western Mountains, the weird shapes of the green and white ice mounds built around the fumaroles of the old crater, its pavement of sparkling felspar crystals interspersed with snow and pumice; the hissing and booming caldron of the modern crater, with its long lines of steam jets, and its snow-white pillar of steam, will never fade from the memory.

One cannot but be impressed with the fact that

throughout the whole of our trip, we were singularly favoured. In the first place the route followed proved eminently satisfactory, for while it gave us good snow surfaces for our sledge, it kept us entirely free from any dangerously crevassed ice. Next the blizzard, though very trying while it lasted, on account of its violence and low temperature, commencing at −30° Fahr., proved a blessing in disguise, for it lasted just long enough to considerably raise the temperature, as well as to check the high-level south-westerly wind, and so produced a calm. Thus the task of reaching the summit of Erebus at the beginning of winter, was made much easier for us than it would otherwise have been.

Providentially the journey to the top of Erebus and back has been accomplished without any very serious accident, for which we are devoutly thankful.

These notes cannot be concluded without an expression of our hearty gratitude to our comrades who welcomed us back at our winter quarters, and who contributed so much by their generous help and sympathy, to the success of our ascent.

T. W. EDGEWORTH DAVID.

NIGHT WATCHMAN.


TO THE POLE

MIDWINTER NIGHT.

MIDWINTER NIGHT.

The acetylene splutters and flickers,
The night comes into its own.
Outside Ambrose and Terror
Are snarling over a bone.

And this is the tale the watchman,
Awake in the dead of night,
Tells of the fourteen sleepers
Whose snoring gives him the blight.

The revels of Eros and Bacchus
Are mingled in some of their dreams,
For the songs they gustily gurgle
Are allied to bibulous themes.

And subjects re barmaids and bottles,
Whisky and barrels of beer,
Are mixed with amorous pleadings
That sound decidedly queer.

AURORA AUSTRALIS.

Darling you really love me?
Stutters one dreaming swain;
The watchman whispers "Never,"
And the dreamer writhes in pain.

From the corner cabin a mutter,
The listener kens not what;
It sounds like "yon pale moon,"
Or some other poetic rot.

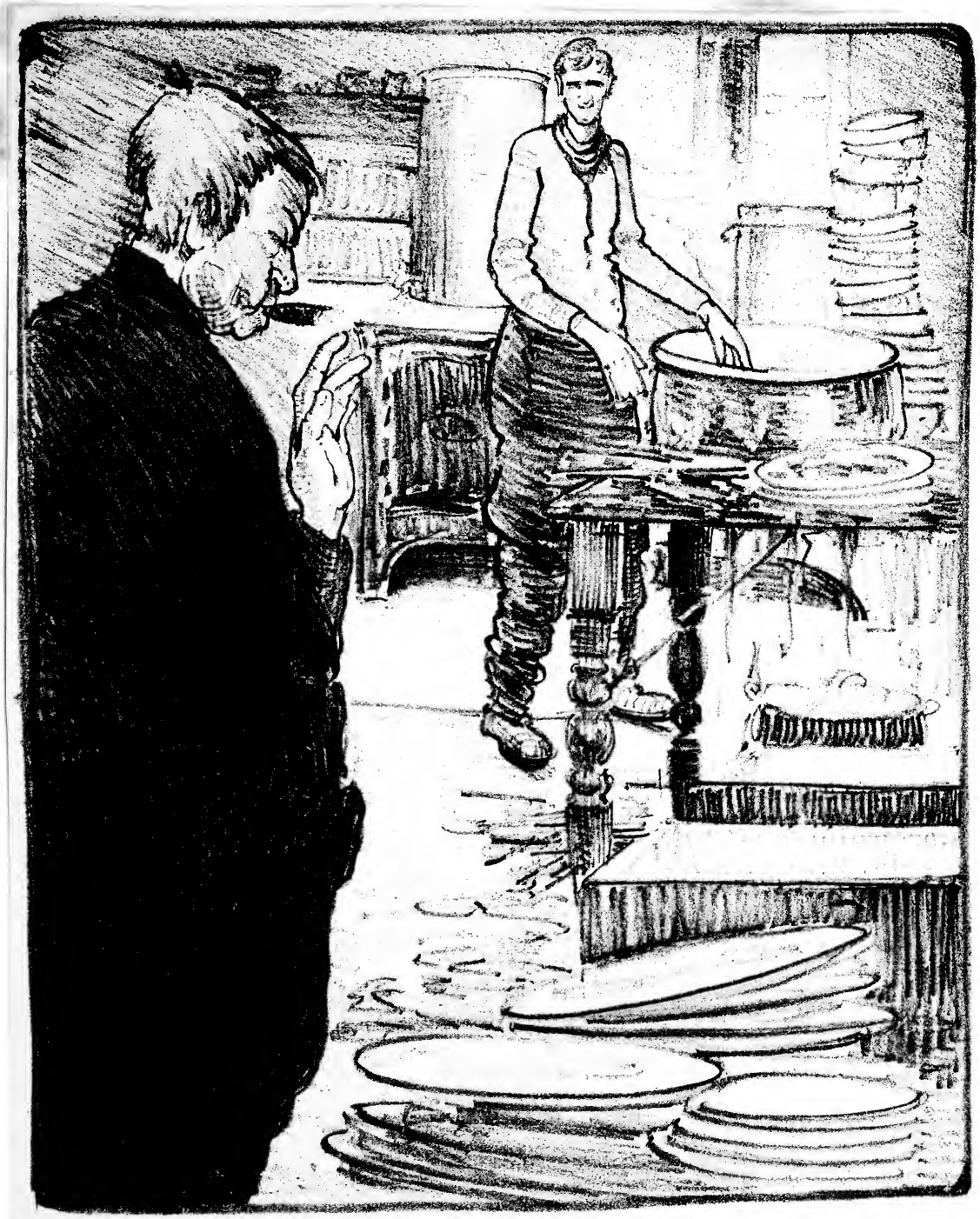
Murder is done in another's dream
And falls from shuddering heights;
Erebus rises to dance on the sea
And the dreamer flees south in tights.

Another sails north on the broken ice
Just dressed in Nature's clothes,
Whilst seals and penguins grin in delight
And the frost plays hell with his toes.

And some see tailors they knew of yore,
Stalk in with their mile-long bills;
And everyone when morning broke
Made a rush for calomel pills.

VERITAS.

THE MESSMAN.



TRIALS OF A MESSMAN.

"RISE and shine! Rise and shine! All hands lash up and stow hammocks! Show a leg there, you're the man of the moment;" followed by a few remarks on my personal appearance and habits, as I try to lie and seem to be asleep, and I awake to the realisation that I am "Messman."

Until a few weeks ago I didn't even know what the name meant, except that he was not a man who was expected to make messes, and that unpleasant personal remarks were made to him if he did. Now, however, I have learnt by experience that he is expected to do everything and to do it all at the same time. Finding it impossible to impress on the night-watchman the fact that, having a delicate constitution, I ought not to be expected to turn out with the temperature at 20° Fahr., I gave him my candid opinion of his powers of stoking, and said I was pretty sure that in a future sphere, he was likely to give dissatisfaction.

AURORA AUSTRALIS.

Having turned out and donned a fair supply of clothes, I reported myself to my chief, and was told in very concise terms to go to a warmer clime; it afterwards turned out that he expected me to do my duty as messman first, and I laid the table for breakfast.

A meal in the Antarctic is a very different affair from one at home, and a description will come better from the messman than from anyone else, for as the saying is, "The onlooker sees most of the game," and as far as my experience goes, the messman at a meal is very much in the position of a spectator.

At a quarter to nine he gives the order, "Boats crew," and four men proceed to unsling and let down the table, which between meals is kept slung above our heads, occupying much the same position in our imaginations as the sword did in that of Damocles. I have not liked to walk underneath it since the supports gave way, and landed the majority of the tin-ware on the heads of one or two members of the party.

The table in itself is a curiosity; it is built rather ingeniously of the lids of cases, and in one place a legend informs the diner that the table contains a theodolite, some ranging poles and other surveying apparatus, while another legend remarks that it is only "To be opened on Christmas Day," etc..

TRIALS OF A MESSMAN.

Laying the table is an art in itself. The tastes of all members have to be catered for, and that means that it is necessary to have two or three different kinds of jam, marmalade, honey and golden syrup, dripping and butter. I have seen men spreading chutney on their bread, and putting honey in their porridge, and from the way it has disappeared, I have reason to believe that they take worcestershire sauce with their fruit.

At nine o'clock I serve the porridge, distributing it about equally between the inside and outside of the bowls, and at five or ten minutes past, the company condescend to turn out of bed, and the first thing they do is to find fault with the laying of the table.

On one never-to-be-forgotten occasion I forgot the pepper. Now the menu for the morning was porridge, fruit and preserves; what use anyone could find for pepper in that breakfast, I do not know, but within ten seconds of their arrival at the table, every other man had asked for it, and told his neighbour what he thought of me for not putting it on the table. If it happens to be a fruit day, i. e. a day when for second course fruit takes the place of meat, the next order given is, "Bowls up and lick spoons," there being only about fifteen of each article on the Continent, and

the bowls and spoons which have been used for porridge, are cleaned in this alfresco way and used for fruit.

For about a quarter of an hour everybody is too busily engaged to be captious, but about the time tea or coffee are being passed round, they begin to find their tongues, and I sit down to my breakfast, which is stone-cold, beneath a fire of criticisms as to my fitness, or rather my lack of fitness for the post.

After breakfast I wash the crockery and tinnery, being allowed a pint of water and a couple of lumps of soda to do it with. Volunteers have been known to assist in getting the grease off the plates and in drying them, and it is possible to get through the work in about an hour.

It is a sight for the gods to see a well-known F. R. S, drying a wet plate with a wetter cloth, and looking ruefully at the islands of grease remaining, after he has spent five minutes hard work on it. I suppose that nowhere else in the world is it a common sight to see two geologists and a meteorologist washing up dishes as if they had been used to nothing else.

The above programme is repeated three times in the day, with slight variations at lunch, tea, and dinner, and is in itself, in my opinion, sufficient work to

last three men and a boy for a week.

The messman also enjoys quite a number of other privileges. He is allowed to go out into the cold, and obtain enough ice to fill both the boiler from which we ourselves drink, and the eighteen gallon melting pot which provides the fresh water for the Cavalry Commissariat Department, and he may do this as often as he likes. He is allowed to fetch bags of coal and strips of frozen blubber for the fire, while on Sundays as a great treat, he may dig out the frozen mutton from the snowdrift on the roof.

With everything apparently united to afford him plenty of employment and make him happy, yet, strange to say, he has his moments of despondency. No other occupation could cause a man to have such a low opinion of his own powers.

To a casual observer stoning raisins appears to be easy enough, and until my first day as messman I had been a very casual observer, and when the autocrat at the head of the Food Department gave me some raisins after lunch, and told me to stone them, I looked forward to a restful interlude in what had so far been a strenuous day. I washed my hands until they were of a colour which I thought could not show on the raisins, even if it did come off, took a tin of raisins and

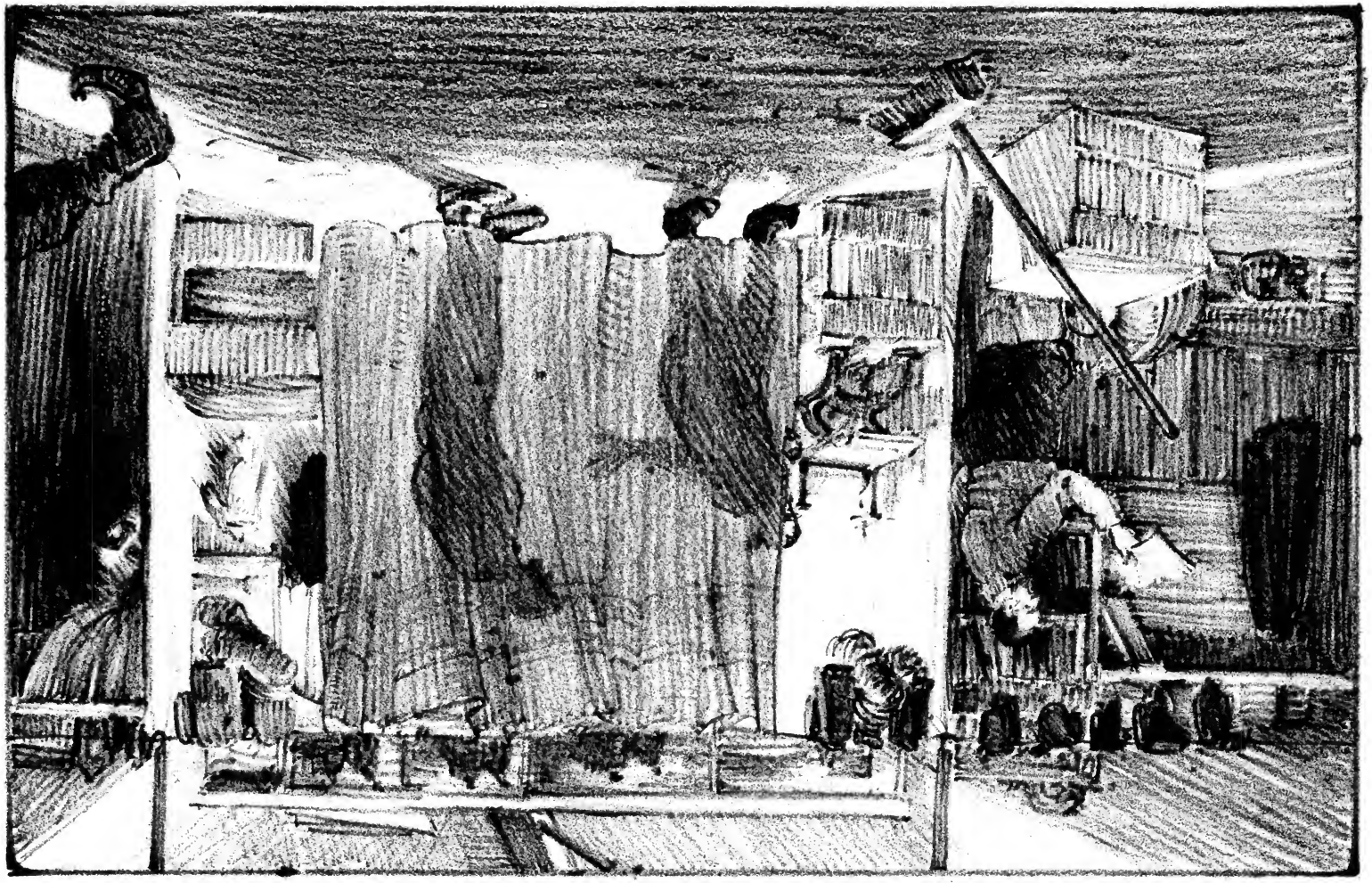
a basin, settled myself in a comfortable position and started.

At the end of half an hour there were seven whole raisins and forty-nine pieces in the basin, stones scattered all over the hut and myself, raisin in my hair and in everything else within reach, and about two hundred raisins inside various members of the Expedition. There was raisin in everything at dinner from the soup to the tea, and I meet raisin stones in my bed, on all my clothes and in all my books.

Last but not least I retired from the fray, with my respect for all people who make cakes and puddings greatly enhanced. In the words of a prominent scientist on the Expedition, "To a man of my refined and sensitive nature, it is singularly repulsive to be beaten by a fruit."

Another duty new to me is making tea, and it is by no means a light one. The capacity of this Expedition for tea is simply marvellous; some of the members take it in a bath, and among the many things I have learnt is that some Scotchmen take more tea than 'whuskie', (though that may be because they can get no 'whuskie',) and that they are more particular about it than even Australians. It is either too hot or too cold, boiled too much or not boiled at all, too

STRUGGLE? FOR THE BROOM.



sweet or not sweet enough, and whether it is good, bad, or indifferent, there is never enough of it. Like most other messmen, I have decided now to make it to suit myself, and have ceased to pay any attention to criticism.

I should not like to finish without expressing my gratitude for one thing. To a lover of human nature it is very gratifying to see artists, geologists, biologists, meteorologists and other 'ologists' and 'ists' fighting in vast numbers and with earnest purpose, for the privilege of sweeping out the hut after dinner, and relieving the messman of this exercise. I have not liked to thank them to their faces, but thought they might blush unseen when they saw in print my appreciation of their eagerness.

MESSMAN.

A PONY WATCH.

IN THE STABLES.

A PONY WATCH.

AFTER watching the man painting the lamp post with a brush fixed on a breast drill, for some time in silence, I say to the boy with green hair, 'I believe I could do it better myself.' The brush catches me a blow in the ribs, and the man rushes at me with a chopper in one hand and a hammer in the other, when realising that I can fly I take huge leaps without any effort, a most delightful sensation.

To my horror I find that though the leaps are high yet they do not carry me far; and on the fourth or fifth the man is waiting for me with the hammer. I give myself up for lost, and come down receiving a fearful blow on the head. A voice says, "Come on, this is your pony watch and it has gone two."

By the dim light of the oil lamp, I see standing by the side of my bunk, a figure clothed in oilskins streaming water. Joyce is sitting on his bunk growling out in a voice hoarse with sleep, "Now then

Chucks, you've been called twice". The first time must have been the paint-brush in the ribs.

I realise that I have to stand my two hours watch in the stables, so struggling out of my blankets, I grope sleepily for the socks I have been sleeping on, in the vain hope of drying them; stepping on the spot where a box should be, I land with a bump on the deck.

Down "Oyster Alley" I am thrown by a roll of the ship, 'Sorry', I say to the bunk into which I am thrown, before I notice it is empty. Clutching everywhere I return to where my clothes should be, only to find that the box has returned, and I stub my toe against it. I don't say 'sorry,' but make a grab at my trousers and gingerly push one leg into their damp cold recesses. I wish I had not taken them off, but before I can settle in my mind which would have been the better plan, I am thrown violently against a moving box, and together we roll and slide until the deck is fairly level; then as Joyce runs up the ladder with practised steps, I struggle into the rest of my clothes and follow as best I can.

The watch we are relieving come along muttering, "Rough night, pony still down," and literally dive below. I am deafened by the roaring wind,

blinded by the driving spray, but struggle past the black motionless figure of the helmsman, and get safely under the shelter of the deck house. We seem to be sliding into a gigantic bowl of water, I shudder, but continue to fight my way stableward.

Watching for what I think to be a favourable moment I release my frantic hold of the motor car stays and dash forward; I am caught by a sea which fills my boots but does not upset me, then as I walk confidently past the galley, the lee rail is buried under water; I am more than ever convinced that it is a rough night and long for daylight.

A wild struggle through the stable entrance, and I am greeted by a pained silence from Joyce. The ship is fairly level but the ponies have obviously had a bad time; one is down and all efforts to raise it having been useless, we wait for daylight to decide its fate. We stare ahead listening to the gale screaming overhead, and feel the ship giving sudden plunges as the cable strains at her bows.

The timbers of the stable groan and creak, and we doubt their ability to carry the weight of boats and gear resting on them. Gaining confidence we seat ourselves on a sack of wet bran and fall to talking fitfully, the lamp splutters, goes out, and is lit with

difficulty; the ponies snort, stamp, kick and keep us anxious.

Crash! a sea aboard and the sack on which we are sitting is swept from under us, we are rolled into the smother of sea, mixed up with trusses of hay, sacks of oats, food-boxes etc.. The ponies on the weather side kick frantically, one has his fore legs over the bar; Joyce is up and pushing him back before I can extricate myself from the tangle, when I do I only hold on to a rope and render what assistance I can.

This is followed by a succession of seas aboard, and we heap curses on the helmsman for letting us fall off our course. Occasionaly we are swept off our feet, and can only hold on and do little to soothe the ponies. They suffer continually and we pity them, hoping for finer weather. The mats are slipping from under their feet, we replace them with difficulty and repeat the performance at intervals.

Another period of comparative calm follows; I volunteer to raid the galley and make some cocoa. Here there is a scene of wild confusion; the floor is flooded, littered with coal, and slippery with grease; after many mishaps, "Scottie" coming along gives valuable assistance.

A PONY WATCH.

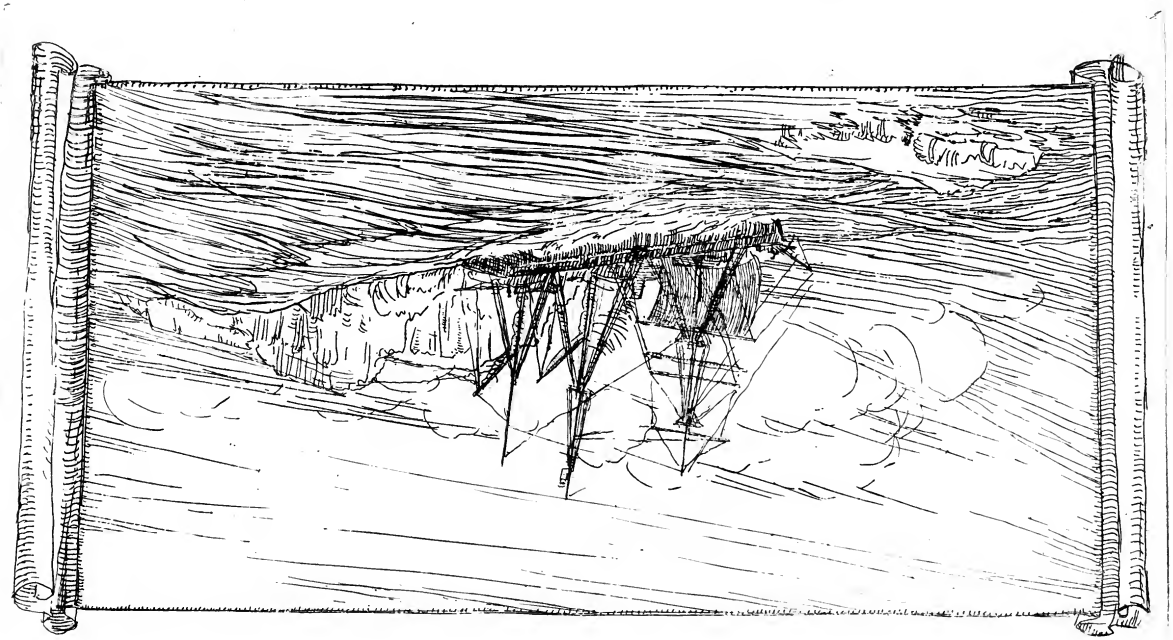
Crash! a huge sea strikes us, and the ship literally staggers with the weight of it; water pours through the door, roof, and every available crevice; the fire is smothered and the galley fills with steam; another rush of water and I am carried through the door into the scuppers, clinging to everything within reach, then as the water pours off, "Scottie," soaked but quite unconcerned, says he is afraid that there is some sea water in the cocoa, but I abandon the idea of cocoa and rush for the stables.

Joyce is having a rough time, the bulwarks are stove in and we are now constantly awash. The rest of the watch consists of fierce inrushes of water, which terrify the ponies and send every loose article, regardless of weight, swinging about the confined space. The grey dawn at length appearing, we begin to have faith in the coming day.

At four o'clock I go aft, report to the officer on watch, then dive into the fearsome depths of 'Oyster Alley;' rouse the watch, and when they are up, tumble into my blankets with a sigh of relief; despite a wild medley of scientific snores, sleeping on until "Rouse and shine, rouse and shine," from Wild brings me out to a welcome breakfast, and I learn with regret that the pony has been shot; and so another day begins.

PUTTY.

SOUTHWARD BOUND.



SOUTHWARD BOUND.

The Nimrod sailed for the Southern Seas,
On her voyage of venture bent;
She left the Heads with a westerly breeze
As the Flagship's cheers grew faint.

She was taken in tow by the "Koonya",
With seven score fathoms of wire,
And for twelve long days and nights she strove
With a southerly buster's ire.

Watch by watch for two hours at a stretch
To the pony stalls we clung,
With the water knee-deep on the for'ard hatch,
And the decks a'swimming with dung.

"Doctor" was down on the third night out,
And eight hours later was dead;
For the efforts of man in a gale were 'nowt,'
So his end was an ounce of lead.

We slept in our sodden bunks by night,
Abaft the after hold;
And wished for the day to bring in the light
And the tale that was yet to be told.

AURORA AUSTRALIS.

On the fifteenth day we sighted the ice;
So the "Koonya" cast us free;
With ten of Boyle's sheep aboard in a trice,
And another ten lost in the sea.

With all sail set and a following breeze
Toward that distant land we sped;
And crept through a field of a thousand bergs
Which guarded a virgin bed.

To the Great Ice Barrier's edge we come
And search on that lonely shore,
For the spot we should make our winter home,
Which was known to be there of yore.

Not a sign was there of the Bight we sought,
But ten miles south sailed we
Of a place that was marked by a skipper named Scott,
In a ship called "Discovery".

So east we turned to the land of our King,
For there we would plant our flag;
But the heavy ice pack on our starboard tack
Prevented us landing our swag.

SOUTHWARD BOUND.

Then westward toward the setting sun
Along the Barrier's edge.
As a last resource, to land our force
On a place from which we could sledge.

In a solitary hut on a lonely isle
Beneath a smoke capped height,
Hemmed in by the ice that grips us awhile
We wait in the long dark night.

When the sun returns from his tropical home,
And smiles on these desolate quarters,
May the ice hold fast till sledging is past,
Then 'What Ho'! for our wives and daughters.

LAPSUS LINGUÆ.

AN INTERVIEW WITH AN EMPEROR.

AN INTERVIEW WITH AN EMPEROR.

IT was a perfect Antarctic winter night. A — and I were trudging merrily along over the sea-ice, under the cliffs to the north of Erebus, for in such weather it seemed a crime to remain indoors.

The moon shone full, dimming the stars and paling the sky in the zenith, though round the horizon its colour deepened into a rich ultramarine. On our right towered the mighty volcano, swelling up at first in long glittering snow slopes, which formed a noble pedestal to the beetling rocky spurs which buttressed the summit cone and ice-cap.

From the active crater jetted a delicate pure white stream of curling vapour, clear-cut against the sky, like a cameo tracery. It was a scene in whites and blues, only relieved by the rich brown of the rocks.

But such whites and blues! They were livid, ethereal, electric. Artists speak, I believe, of a dead

white, but such an adjective could never be applied to the whites of the Antarctic snows by moonlight.

It would be a platitude to compare the whole to a vista of fairyland, and perhaps an anticlimax to say that it was like some lovely transformation scene, viewed by the wrapt gaze of childhood.

One thing is certain, that the whole effect seemed almost supernatural, and it did not require an impressionable mind to be uplifted by it to a height almost more than mortal.

So we swung along; it seemed as if fatigue were one of those earthly ills left far behind us in prosaic temporate climes.

The creaking snow, blown down and packed hard by the southerly blizzard from the slopes above us, made the most perfect going. The ever-changing views of the broken ice-cliffs and mountain slopes drew us on. We felt as if we could have gone on for a week.

Yet it was strange, and almost uncanny to think that in all the miles and miles of land over which our eyes ranged there was not one living, breathing creature, — no, not one!

The Adélie penguins, those cheery summer visitors, had gone far north with the sun, ten degrees

below the horizon. The seals were away out on the edge of the sea ice, and that was farther away, at any rate, than we could see.

True, the Emperors, most majestic of living birds, are said to conduct their royal accouchements in this region in July, that is, the depth of our winter, and it was June as yet.

But we were going in the direction of the Emperors' rookery at Cape Crozier, and in this wonderland anything might happen.

Trudge, trudge, trudge we went, saying very little. It was no time for conversation. Those who don't know what a polar climate is like, might think we felt cold, but no such discomfort dashed our elated spirits.

This goodly portion of the Earth's fair surface was ours. No polluting foot save ours defaced its virgin solitudes. We might fare where we list; none could say us nay.

No "TRESPASSERS WILL BE PROSECUTED." here —

No "PRIVATE GROUNDS, NO THOROUGHFARE."

No uniformed park-ranger, or corduroyed gamekeeper could bar our way, with horrid threats, and

perhaps still more horrid action.

But stay! — What form is that emerging from the shade of yonder ice-berg? It strides towards us with swinging gait, recalling to my mind unpleasant memories of my bird-nesting days.

I cannot control a strange flutter of apprehension in the slack of my trousers, a sort of prophetic sensation of tenderness behind.

That is strangely like a knotted cudgel carried, with ill-concealed menace, under the left arm. "No Gamekeepers" did I say? It must be a gamekeeper.

But he is upon us! All doubt is banished. He is the most enormous Emperor Penguin I have ever met. Full six feet high, and broad quite out of proportion, his appearance is so extraordinary that I must describe it minutely.

The large, angry eyes, glaring from beneath a close-fitting cap, drawn down over the ears, flank a prodigious black bill, a foot long and curved like a scythe-blade. He wears a black velveteen coat with long skirts, and underneath this a white moleskin waistcoat with brass buttons, and baggy trousers of the same colour. The delicate creamy tinge which I have observed on the throats of common emperors is developed into a gorgeous red and gold collar or stock.

AN INTERVIEW WITH AN EMPEROR.

Under his arm, or flipper, he carries a heavy truncheon, fashioned from the backbone of a seal. As he stood before us, all this could be taken in at a glance.

I have had many a painful interview with game-keepers, and people of that kidney, but this one would take all my diplomacy to meet. But a bland smile and a voluble tongue might pull us through.

"If you please game-keeper, park-officer, I mean," I began:–

But he interrupted me in a harsh voice, and with an accent strongly reminiscent of the land of cakes:–

"Noo then, you twa," he cried, "what the deevil are ye daein' here? Ye ken vara weel this is private property. Let me see what ye hae got in your pockets."

When I had first seen him I had instinctively plunged my hands into these receptacles, with the idea of dropping anything of a compromising nature into the nearest ditch. But my fingers came in contact with something of a different nature.

I seldom go for a long walk without that vade-mecum, universal panacea, and open sesame, a pocket-flask.

I grasped it, and my courage revived. If "wi' usquebaugh" I could face the deevil, why not an

Emperor Penguin. I was in case to justle a constable.

Our enemy, however was in an aggressive mood. We hesitated at the idea of turning out our pockets to this truculent fowl, so he without more ado, passed his stick over my clothes. It struck my flask with a full sound. At once his worst suspicions were redoubled.

"Come away, noo, oot wi' it," he cried. "Yon's an egg, ye young rascal, if I'm no vera much mistaken."

"Indeed it is not," I replied, with new found confidence. "That's my pocket flask, by the way have a dram, will you?" For I thought this was the psychical moment for the introduction of this delicate, but at the same time not disagreeable subject.

"Na, na, laddie," he said, "no sae fast as a' that. I'll jeest take your names and addresses and what's your business here."

Now there are many ways of revealing one's identity and asserting one's position on an occasion like this, but there is none so dignified, not to say majestic, as the display of a clean visiting-card. A lightning thought struck me, and plunging my hand into my breast pocket, I produced the required piece of pasteboard, with an austere flourish and a general air of

hauteur. True, it was curled up at the corners, and rather soiled with tobacco ash, and, in place of my own august cognomen, it bore that of an enterprising washerwoman, who had sent it on board at our last port of call.

But it fixed our friend the enemy. He scratched his head, looked at it upside down then backside foremost, and finally pulled off his cap, stuck the card in the lining and replaced the cap on his head.

"Weel Gentlemen," he said, "I'll jeest show ye aff the estate if ye'll tell me whaur ye come frae, and what's yer beesiness?"

"Well! come now my man," I replied, "have a dram, and I'm sure we're very sorry to have caused you any trouble."

With that I again brought forth the flask. He took a long gurgling swig, coughed and threw back his head, shutting his eyes and smacking his bill in a way half human, half galline.

"Man, yon's the richt stuff," he murmured, handing it back. "It's gey scarce aboot here."

"And pray," I went on, thinking it well to avoid an answer to his last question. "Whose estate do we happen to have trespassed upon? I was not aware that there were any private grounds in this district."

"Oo jeest Mr Forsteri, Aptenodytes Forsteri, a cousin o' the M. P., I'm surprised ye didna ken, man! Its a vera auld family."

"No doubt" I replied, "but you see we are strangers here. But does all the ground about here belong to Mr Forsteri?"

"Oo aye, sir, ye'll see the march burn ahint ye there, by the laich side o' yon big scaur? The Maister's vera parteeklar about this time o' year. Ye see a' the gentry will be comin' for the nestin' in June, and if he was tae see ye here then I dinna ken what he would say."

"But we're very inoffensive people, you know. We're geologists, we just go about collecting stones for our own amusement."

"Wha-at, gatherin' stanes, are ye? Ye're surely no nestin' tae? Ye canna possibly dae it about here. The maister wouldna hear o' it!

I should explain that the penguin builds his nest of stones only, so I hastened to explain.

"Oh! no no," I said, "we merely collect the stones to take home, and show to people who are interested in them."

"Besides," said A— in a tone of deep melancholy, "we've no hens with us."

"Aye, aye," he replied, nodding his head thoughtfully, "ye'll be frae yin o' they expedeetions, are ye no?"

"Yes," I said boldly, seeing that the cat must come out of the bag. "We are from the British Antarctic Expedition of 1907."

"Mphm! are ye though? Ye're queer folk, man! I often wonder what brings ye here. I mind the last yin that was here, somewhere about seven years syne."

"A pack o' them cam' ower tae the rookery, after the maist o' us was gane. We thought they were sea-leopards at first, and some o' the weans was gey scared."

"But as far as I ken, they ta'en naething but a wheen auld rotten eggs. What in a' the world they were gaun tae dae wi' them is a pairfect meestery tae me."

"The Maister was no at hame at the time, but he was awfu' vexed when he heard tell o' it. He said he would ha'e the law o' them if they ever came again."

"Well! I hope we will get on better with you," I said. "We'll try not to annoy you in any way."

I wondered at the time if he would object to

being stewed, for we were all growing rather tired of Adélies.

All this time we had been walking slowly back towards the hut. I kept hoping that our new acquaintance would leave us, for I dreaded what might happen if we met any of our dogs.

The sight of this majestic bird, pursued by half a dozen yelping curs, tobogganning along on his stomach, and tearing all his brass buttons off on the ice, would have been most painful to me.

But my mind was soon relieved. Our friend stopped and looked round him, squawked thoughtfully, and, extending a flipper to me he said:—

"Weel! here we are at the march. I'll jeest say good-bye tae ye."

"I would advise ye no tae come ower here again till the Maister's gane."

"It's no that I care much mysel', but he's vera parteeklar."

We shook hands with him, and started away for home.

"Quite a civil bird," I said to A—.

"Yes," he replied, "and I thought, rather intelligent." But his voice 'far, far away did seem.'

I pinched myself surreptitiously, glanced at my

companion and then over my shoulder. Not a sign of our late acquaintance was to be seen, and there was hardly an ice-hummock about that could have concealed him.

Was it all a dream then?

At any rate, we have obeyed his orders.

A. F. M.

EREBUS.

EREBUS

Keeper of the Southern Gateway, grim, rugged, gloomy
and grand;
Warden of these wastes uncharted, as the years sweep
on, you stand.
At your head the swinging smoke-cloud; at your feet
the grinding floes;
Racked and seared by the inner fires, gripped close by
the outer snows.
Proud, unconquered and unyielding, whilst the untold
æons passed,
Inviolate through the ages, your ramparts spurning
the blast,
Till men impelled by a strong desire, broke through
your icy bars;
Fierce was the fight to gain that height where your
stern peak dares the stars.
You called your vassals to aid you, and the leaping
blizzard rose,
Driving in furious eddies, blinding, stifling, cruel
snows.
The grasp of the numbing frost clutched hard at their
hands and faces,
And the weird gloom made darker still dim seen
perilous places.

AURORA AUSTRALIS.

They, weary, wayworn, and sleepless, through the long
withering night,
Grimly clung to your iron sides till with laggard Dawn
came the light:
Both heart and brain upheld them, till the long-drawn
strain was o'er,
Victors then on your crown they stood and gazed at
the Western Shore;
The distant glory of that land in broad splendour lay
unrolled,
With icefield, cape, and mountain height, flame rose
in a sea of gold.
Oh! Herald of returning Suns to the waiting lands
below;
Beacon to their home-seeking feet, far across the
Southern snow.
In the Northland in the years to be, pale Winter's first
white sign
Will turn again their thoughts to thee, and the glamour
that is thine.

NEMO.

FOURTEEN GOOD AND TRUE.

AN ANCIENT MANUSCRIPT.

AN ANCIENT MANUSCRIPT.

NOW it is written in the 21st chapter of the 2nd book of the chronicles of the Great King, how that he did in the first year of his reign, and six moons after the Good Queen his Mother had been taken to her fathers, send forth the ship which was called Discovery;

And did say unto the captain, who was a captain of one of the King's own ships, even a fighting ship;

Go thou unto the uttermost ends of the Earth, to that place where no man has yet trod, and which the wise men of the land do call Antarctica, and spy it out, and come back to me with tidings thereof.

And also it is written that the captain whose name was called Scott, did go with his ship and a goodly company of officers and men, and did diligently seek for that land until he found it.

And all the great works they did accomplish, and the trials and tribulations which did beset them, are they not also inscribed therein, and it is not of

these things I would speak unto you.

¶ Now it came to pass that one of the officers of the ship, who was possessed of a spirit which did make him restless, so that he soon did weary of abiding in one place;

And who had wandered over nearly the whole face of the Earth, both on land and on the sea, in small ships and in great, did commune with himself in this wise.

Lo! this many years have I been like unto an outcast, and have spent my substance in travel; now will I take unto myself a wife, and abide henceforth in the land of my fathers.

¶ But! Behold! the spirit which did possess him was not yet dead, but only scotched, which is to say being interpreted, spiflicated, and at the end of the third year it did again awaken, and began to bestir itself forthwith, saying unto the man whose name was Shackleton;

Lo! much of the land which ye went forth to spy out in the ship Discovery is yet undiscovered, and has not therefore been added to the dominions of the Great King.

Now I say unto ye, great shall be the benefit to the people of thy country, when the way to this land

has been opened up, and the ships of the King shall be able to travel in safety thereto, and trade with the peoples who dwell therein.

Also, do not the wise men say unto us, that in that land there is set up a great pole of value, which all the nations of the Earth do strive to possess.

Go thou therefore, dwell in this land, travel over the face of the same, tear out its secrets, and should it also be that thy hand shall uproot the great pole which the wise men do call the South Pole; then do I say unto thee that it shall not be forgotten of thee in the years which are to come.

¶ And it came to pass that these words did sink deep into the heart of him who was called Shackleton, so that he did say unto the wife of his bosom;

Behold! though it grieveth me sore to leave thee, yet am I about to gather together my goods and my chattels, and sell them for monies, so that I may buy me a ship, and with men whom I shall myself choose, go again to that land of ice and snow, and of burning mountains;

And there sojourn until I come to the place where is set up that pole which the wise men call the South Pole, and with that and many other things of value in my ship, will I return to the land of my

fathers, and great will be the joy of the Great King and of his people.

¶ And because that his wife did see that his heart was set on this thing, she sayeth unto him;

My Lord, not because I would see thee gone from me, but because I would fain see thee accomplish this thing for which thy soul yearneth, I say unto thee; go and sell thy house and thy cattle and all that is thine and take also the gold and silver that is in my privy purse and do with it what thou wilt.

¶ Thus was made light the heart of the man Shackleton, but many were to be his sorrows;

For when he had gathered in all the monies for which he had sold his lands and all his goods, he did yet require many talents of gold wherewith to furnish his ship, which was not yet bought.

Then in his trouble did he say, Lo! are there not many men in the country of the Great King who possess many thousands of talents of gold and of silver, now will I betake myself unto them, and they will gladly give me of their shekels.

¶ Nevertheless it was not so, for one who owned many million pieces of gold did say unto him,

Nay, for I know naught of the land of which ye speak, nor of the pole of value which ye say is set up

therein.

And another who did own vast tracts of land and many herds of cattle, answered him thus; Owing to possible territorial changes in the laws of the land do I stand in fear of losing all my possessions, therefore must I say thee nay.

Yet another did speak long and loudly of the many pieces of gold which he did give to the poor, and to the sick and needy, and then did press into the hand of the man who would go exploring, three rolled pieces of dried leaves, which the people of the land do burn in their mouths, in order that they may be comforted.

¶ And it came to pass that the shoes of Shackleton did wear thin on his feet with his wanderings, when he did come to one who had of his stores of wealth given unto the people of the land many thousands of books of great price, so that the people who did receive them became sadly in want by spending their money in keeping them in order, and to him he did say;

Give unto me I pray thee, a little of thy gold that I may fulfil my labours. But the rich man answered him saying, Nay, for in this thing have I no interest.

And one there was who scoffed saying, Go to,

what is there in this thing in the which I can make more gold.

And one who was called a broker, which being interpreted meaneth gambler, answered, A business man cannot afford to be sentimental; for which saying no interpretation can be found.

¶ And the heart of Shackleton was heavy, and was sunk even unto his shoes, when there arose a great and mighty man who did build ships for the Great King, and who wrought cunningly in iron, with which he made the ships so strong that they could not be broken, and he did speak in this wise saying;

My son, though my house in which I do dwell, lieth a long journey to the north of the chief city of the Great King, even the city of London, yet hath it come to my ears of the work which ye would perform, and it seemeth good in mine eyes.

It hath also been told unto me that because thy purse is not too heavy, thy way is not clear before thee.

Behold! I have here great stores of gold and of silver, and because thy design hath found favour with me, take of my wealth sufficient for thy needs.

¶ Then indeed was Shackleton a happy man, and he straightway cast about him for a ship which should

be strong enough for his needs.

And a certain man rose up and spake unto him saying, Behold! I have a ship which is so strongly built that no tempest can do it any hurt, neither can it be crushed by ice.

Give unto me six thousand pieces of gold, and I will deliver the ship unto thee, with all things in good order and ready for thee to start on thy journey.

And because he was in great haste, Shackleton bought the ship which he had not seen, for it was in a far country, but when it had been delivered unto him, he found that many shekels were needed to make the ship fit to go forth.

¶ Now it will of a surety be seen by all men of understanding, that no man could of himself do everything in this great work; so Shackleton took unto himself a portion of one of the great houses in the city, in the street which is called Regent;

And there did he work for many days assisted by his steward, a man who had had much dealings with food and with raiment, and all such things as would be needed.

Now this house was occupied at the lower part by people who sell food and drink, and above by some who did anoint the hair of those inhabitants of the

city who could afford to pay a certain sum of money, so that it would grow strong and it might not be said to them as to the prophet of old, Go up thou bald-head.

¶ And it came to pass that Shackleton, having got together his ship and men to work the ship, and his steward to gather stores of food and raiment, did look round for men tried and trusted whom he might take with him to dwell in that distant land of snow and of darkness.

First did he choose one who was skilled in the arts of reading signs and portents in the clouds and in the stars, and of steering his way on land, or on the waters by means of a wondrous piece of metal marked with divers figures.

Then took he one who had studied at the seats of learning and had knowledge of all kinds of sickness, and who could join together bones which were broken asunder.

And because that they had been in the ship Discovery, and knew of the land and the people and the beasts that dwelt therein, he did take two from the ships of the Great King.

Also one cunning in the art of making pictures in many colours and pleasing to the eye.

And another who was of few years but of great wisdom, in that he could by looking at a stone or a handful of earth, tell whether the land round about had been peopled by man, beast, or creeping things, and could say also if gold, silver, or precious stones might be found, and in how great quantity.

Then was there one who had contrived a chariot of fearsome design, which would travel over the land without horses, even up steep hills and over rocky places, and could also make great noises and noisome stenches to frighten the wild beasts.

Also did he take one greatly skilled in skinning and preserving birds and beasts, and in the art of making dishes to tickle the palate, which he had learned and practised in many lands.

Also chose he one, who though yet a youth was large of muscle and had gained honour at the seats of wisdom, by reason of his knowledge in the art of fisticuffs.

¶ Now! Behold! when all things were made ready, there came unto Shackleton a messenger from the palace of the King, yea, even from the Great King himself, saying nnto him;

Lo! The King, may he live for ever, hath heard from his Councillors of the noble work which thou

wouldest do, and he would have thee take thy ship Nimrod to the city of Cowes, and there abide for a space till he may come to thee.

¶ Straightway therefore, did Shackleton bestir himself, and with all haste betook his ship and his company to the city aforesaid.

And in due time, amid the clang of mock battle and the flaring of trumpets, came on board the Great King, and also did he bring with him the Queen, and the Royal Princes and Princesses his children.

And after that he had surveyed the ship, the King did bestow upon Shackleton a mark of honour, and the Queen did with her own hand graciously entrust unto him a banner of the country, and spake kind words to him and his company, so that their hearts did swell within them.

¶ Now it was even so that the ship Nimrod, although made so strong, did not possess great speed; Shackleton did therefore bid the captain whom he had chosen, to take the ship to that portion of the dominions of the Great King which is called New Zealand, and did also send in the ship two men who were to dwell with him in the strange land.

One of these was of the number of wise men, who did know all things about the fish that swim in

the sea, and the beasts and creeping things which do abound therein;

And the other was also a healer of the sick and a mender of sundered bones.

And Shackleton and the rest of the company did abide yet a few days more with their own people, and then departed in large and swift ships to the land of New Zealand.

¶ Now it is well known of all men that many thousands of miles south of the rising of the sun, there lieth a vast continent which is also part of the dominions of the Great King, and is called Australia.

And it is also known that ships which go to the country of New Zealand, do often call at the ports of this land on their journey thither.

And it came to pass that the ship in which was Shackleton did stop at some of these ports and there abide a space.

And when the people of the country did learn he was there, even in their own cities,then were they rejoiced and made exceeding glad, for the knowledge of the work he would perform had spread unto every country.

¶ Then did the great men of the land and the wise men, gather together and commune amongst

themselves, saying;

Behold! the task which Shackleton hath set himself to perform is great, and the good which shall come from it, will it not also be unto us, as unto the country of the Great King.

Let us therefore of our plenty, give unto him five thousand pieces of gold and thus give him a leg up, which being interpreted is to say, help him over the stile. And they all with one consent did exclaim,

Yea! let it be even so.

¶ Now amongst the wise men of the land was one whose fame was noised abroad over the whole earth, for he had travelled from his youth up in every country in pursuit of knowledge and the furtherance thereof, and whose name was called after that of one of the mightiest kings of old time, even David.

And though his years were not few and his hair was whitened unto the likeness of hoar frost, yet was his blood still full of fire and did flow swiftly through his veins;

And his body was lusty and strong as that of a young man, for could he not with one biff, which is to say, sallikatowzer, of his clenched hand, totally flummax, or in the modern tongue, put to sleep, a fullgrown and stalwart man.

AN ANCIENT MANUSCRIPT.

And he approached Shackleton, saying, Many things have I heard of this land to which thou art journeying, and fain would I see with my own eyes the mountains of fire which are reared up amidst the snow and ice, and all the wonders of this strange country.

Let me therefore bid farewell to my wife and to my children, and come with thee; and Shackleton bade him be of good cheer and come.

Also from this land of Australia took he two more; one of whom was a man learned in many arts and sciences, and who did bid fair to become known amongst the wise men; he was also of great length of limb and appetite.

The other was dark of hair, and short of stature, and had fought in the armies of the Great King; also was he a mighty hunter.

In the fulness of time came Shackleton and all his people to New Zealand, where his ship Nimrod did await him, and for the space of fourteen days did he abide there.

And the people of the country, both great and lowly, did make him welcome, and did give him and his people many blowouts, which is to say being interpreted, banquets.

And so that they also might assist him in his labours, did they give unto him one thousand pieces of gold, and did lend unto him a great ship built of iron, to help his ship Nimrod through the water.

¶And it came to pass that on the first day of the year, that all was in readiness, and Shackleton with all his people went into the ship;

And after the High Priest had blessed the ship and the company, they did sail away, and all the inhabitants of the country did come to bid them farewell;

Many thousands of them going on the sea in ships, to see that they went the right way, and had in very truth departed, and the noise of their shouting reached up to the heavens.

¶ Now on the second day there arose a mighty tempest of wind and sea, so that many of the people on the ship were sore afraid, and did yearn for the land.

And it came to pass that the storm did rage for seven days and seven nights without abating, and the waters did rush with great fury over the ship Nimrod and the ship that was with them.

And many of the timbers of the ship were broken by the strength of the waters, and the horses and the

dogs which were on the ship were in sore distress.

But behold! on the eighth day there came a calm and the waters were stilled, and the winds did cease their raging.

And the wise men did again begin to take sustenance, which they had not done for many days, by reason of their interiors being disturbed by the tossing of the ship.

Yet were they not healed, for when the sun had set, another storm arose, so that many and oft were their journeyings from Oyster Alley where they did live, to that side of the ship which the sailors call the lee.

¶ Now after many days of sore travail and danger, for oft times the ship was threatened by mighty islands of floating ice;

They did come to that great high wall of ice which is there set up, and which is called the Great Ice Barrier.

And there did they diligently search for a certain haven in which to place the ship, and in which the ship Discovery had rested beforetime, but lo! it was not.

Then turned they the ship towards the rising of the sun, and would have gone to that land which has

And so that they also might assist him in his labours, did they give unto him one thousand pieces of gold, and did lend unto him a great ship built of iron, to help his ship Nimrod through the water.

¶And it came to pass that on the first day of the year, that all was in readiness, and Shackleton with all his people went into the ship;

And after the High Priest had blessed the ship and the company, they did sail away, and all the inhabitants of the country did come to bid them farewell;

Many thousands of them going on the sea in ships, to see that they went the right way, and had in very truth departed, and the noise of their shouting reached up to the heavens.

¶ Now on the second day there arose a mighty tempest of wind and sea, so that many of the people on the ship were sore afraid, and did yearn for the land.

And it came to pass that the storm did rage for seven days and seven nights without abating, and the waters did rush with great fury over the ship Nimrod and the ship that was with them.

And many of the timbers of the ship were broken by the strength of the waters, and the horses and the

dogs which were on the ship were in sore distress.

But behold! on the eighth day there came a calm and the waters were stilled, and the winds did cease their raging.

And the wise men did again begin to take sustenance, which they had not done for many days, by reason of their interiors being disturbed by the tossing of the ship.

Yet were they not healed, for when the sun had set, another storm arose, so that many and oft were their journeyings from Oyster Alley where they did live, to that side of the ship which the sailors call the lee.

¶ Now after many days of sore travail and danger, for oft times the ship was threatened by mighty islands of floating ice;

They did come to that great high wall of ice which is there set up, and which is called the Great Ice Barrier.

And there did they diligently search for a certain haven in which to place the ship, and in which the ship Discovery had rested beforetime, but lo! it was not.

Then turned they the ship towards the rising of the sun, and would have gone to that land which has

been called King Edward VII Land, in honour of the Great King;

But they could not, for their way was barred by mountains and plains of ice, which were broken up and scattered abroad over the whole face of the waters, in such quantity that no ship fashioned by the hand of man could force its way through, or withstand the pressure thereof.

Many of the great leviathans of the deep did they see, like unto the one which the traveller Jonah of old time did explore, and also vast numbers of the fierce beasts of the sea that do abound in this strange country.

¶ And it came to pass that after many more troublous and weary days, they came to that mountain of fire and smoke which is called Erebus.

And near unto the foot of this burning mountain did they build them a house, and for the space of nineteen days they did lustily labour until they had taken out of the ship sufficient food and raiment and all their goods and chattels, their horses and dogs, and everything that was needed;

Then did the ship Nimrod return to the land of sunshine, where women and men do dwell, leaving Shackleton and his people to sojourn and to labour

in the land of darkness.

And the rest of the acts of Shackleton and his people, and the dangers and tribulations that did beset them, will ye find in the next book of these chronicles, which are not yet completed.

WAND ERER.

LIFE UNDER DIFFICULTIES.

LIFE UNDER DIFFICULTIES.

IT is not intended in these notes, as the title might lead one to expect, to make any reference to the difficulties which we experience in camping during the long polar night in this latitude of somewhere between 77° and 78° south. Attention is invited rather to some of our very humble fellow-creatures, animals quite microscopic in size, which are able to live under conditions which seem to us extremely unfavourable.

Some of these deserve our interest as being, in the absence of Penguins and Skuas, the only land animals at present living in this region, perhaps the only living things besides ourselves on the whole Antarctic Continent.

The instances of Life under Difficulties are all selected from the class of the Rotifers. The animals of this class, though so small, are comparatively very highly organised and sensitive, yet they share with the simplest animals, (the Protozoa) the power of

surviving all kinds of climatic rigours, heat, cold, drought, etc..

Larger animals may protect themselves from heat and cold in various ways, or they may migrate to avoid them. Emperor Penguins and other animals which winter in polar regions, keep up their heat by means of thick layers of fat and warm coats of fur or feathers. No such protection can serve our microscopic animals. A thin-skinned creature, measuring when contracted no more than one hundredth part of an inch in diameter, can hardly have a coating which will keep out cold and heat, and we can only suppose that they are able to live although they do become very hot and very cold when subjected to these conditions.

Too Small To Hurt.

A heavy swell is rolling in from the Atlantic and breaking on the rocks of a rugged little western seaport. On the cement wall of the pier the waves are rushing and climbing high up, till they are thrown

back shattered into clouds of spray. Amid all this turmoil what of the little fragile creatures which are known to swarm everywhere in the water of the sea? Do they retire to calmer depths? If not, how will they fare as the water which is their home is shattered into dust? Surely they must be crushed to death, and perish in multitudes! Let us see!

A net is repeatedly thrown into the foaming crests of the waves as they tumble back, and a large quantity of spray allowed to strain through it. When the contents of the net are transferred to a little clean sea-water, and a drop of this is examined under a microscope, a busy and interesting scene meets the eye.

The water is alive with beautiful little cone-shaped animals of crystal transparency, with a ruby red eye in the middle of the large head. They swim powerfully by means of rapidly vibrating cilia on two projections at the sides of the head.

The animals are Rotifers, Synchæta by name, one of the comparatively few kinds which live in the sea. They dart about in every direction, pursuing some invisible prey: the scene is like a fair. But what of the numbers of maimed and dead which one would expect to find after their stormy experience of a few

minutes ago? They do not exist. The water is pulsating with vigorous life, and the rotifers appear quite unconscious that anything unusual is toward.

These delicate animals must escape destruction by reason of their small size. When they have a drop of water to swim in they have a world. However small the drop of spray in which they may be enclosed, it will be covered by the elastic surface film, which will save the animals from jars. They are too small to hurt.

If, then, they cannot be hurt under these conditions, the conditions are not unfavourable, to Synchæta. They only seem so to us, since those breakers would kill us, and would destroy a strong ship. It is even so in all the other instances: conditions which would be quickly fatal to us do not really present any difficulty to animals which have become adapted to them.

Endurance Of Drought.

The leech-like creeping rotifers of the order Bdelloida supply the most remarkable instances of the

capability to resist drought, as well as heat and cold. They are essentially aquatic animals, and can only remain active so long as they are surrounded by water. Yet many of them live in situations which are liable to become dry; streams and ponds go dry in summer, and moss, among which most of the kinds live, only receives occasional moisture from rain and dew and snow. If the rotifers could not cope with this difficulty they would perish in great numbers in dry weather, as rotifers of other orders do. If dried too quickly they are actually destroyed.

If dried more slowly, as when mixed up with grains of mud or sand, or when sheltered in the axils of moss leaves, they appear to have warning of the approaching crisis. They contract into little balls and the skin exudes a kind of varnish which dries and seems then to be quite impervious to air. In this condition they may remain for an indefinite time, and may be blown about as dust by the wind, and thus distributed to all regions of the earth.

Thus the sand of the desert, and the polar snows may receive these living dust particles, which may last have pursued an active existence in the woods or moors of temperate regions; and in either case, if they happen on moist places they may in a few hours

resume their interrupted life.

It is a curious result of this faculty of resisting dessication that animals which would terminate their natural life, probably in a few hours, at the utmost in a few weeks or months, may live over a long period of years.

Whether an individual, after hibernating in this manner for many years, could again enter on a long hibernation, is not known, but groups of individuals have been revived again and again after shorter intervals, though in diminishing numbers, some dropping out after each resuscitation.

Endurance Of Heat.

The capacity to resist heat is intimately related to that of withstanding drought. In a state of nature, some Bdelloids when dessicated, must also suffer very severe scorching from the tropical sun; yet mosses from tropical regions are found to be as productive of Bdelloid Rotifers as any others, and they readily revive when conveyed to temperate regions and steeped in cold water.

Artificially some of these Bdelloids have been raised to very high temperatures. The actual figures given by Davis and others are not here available, but the temperature to which they were raised was certainly higher than anything to which they would be subjected under natural conditions anywhere on the surface of the earth, and many were revived after this treatment.

Endurance Of Cold.

The Rotifers which are able to endure cold should interest us especially in our present circumstances, as they are at the moment under observation in the lakes around us at Cape Royds, and we have some personal experience of the cold which they have to undergo.

Bdelloid Rotifers abound in the lakes of Cape Royds, and there are several species. The conditions to which they are submitted are extremely severe. They are frozen into the ice very early in the autumn, and must remain frozen solid for at least the greater part of the year. With the ice of the smaller lakes and the margins of the larger lakes they must take the

lowest temperatures that occur in the district. We know by observation that they survive after experiencing a temperature of $-30°$ Fahr.. They were found living in the Blue Lake under 15 feet of ice, there being some reason to believe that at this depth melting may only occur at intervals of years.

It has been generally assumed that animal life ceases at the temperature at which water freezes, and this is in the main true of animals which swim in water, but whether the death is due to cold or to mechanical causes is not known.

Those who have worked at the microscopic life of the Arctic Region know that it must survive extreme cold somehow. The Arctic Region has a genial summer climate of some months duration, with abundant water and a vegetation of higher plants. The winter might be passed by resting eggs, and a new generation produced each summer. Professor Richters revived Water Bears from Spitsbergen some years after they were collected, but it could not be known whether the adult animals would have survived the winter of their native land.

At Cape Royds there is no doubt that the adult animals survive through the winter. Some of the species lay eggs, but the eggs are not plentiful. One

species (Adineta Grandis) produces living young, being an exception in this respect in the genus. The life both of parent and young may apparently be arrested at any stage. Animals bearing from one to seven young may be seen, some well developed, some at a very early stage. This species is further remarkable as living in water so saline as to be a sort of brine.

Whether the same species which endure great cold can also endure great heat, can only be settled by experiment. All the species found at Cape Royds have been brought quickly from $-30°$ Fahr. to $+60°$ Fahr., and have then been found actively feeding.

Some of the rotifers found at Cape Royds are supposed to be species widely distributed over the world. Others are peculiar, and unknown as yet anywhere else, and one is of a very peculiar form.

Portraits of some of these Cape Royds natives are shown on the plate, highly magnified.

From the instances given above of kinds which can resist heat and drought, it will appear that the Bdelloid Rotifer is one of the hardiest creatures in the world. It promises now to shed much light on the limits of temperature at which life is possible on the earth.

J. MURRAY.

BATHYBIA.

BATHYBIA.

A faint stirring seemed to be going on about, which gradually made itself felt on my yet somnolent senses. Rising time was evidently drawing nigh. The uncertainty shortly came to an end when, in harsh tones, the familiar call sounded; 'Lash up and stow, lash up and stow; 8-30 and time all hands were up.'

This announcement, coming as it did from a pair of lungs boasting of an early training in St. Paul's Cathedral, and matured in the Navy, was calculated to effectually wake the profoundest slumberer, but did not prevent me turning over for a final doze.

It hardly seemed any time, however, before we were exerting our best efforts dragging the sledges onwards towards the southern goal. The drudgery of the journey over the great 'sastrugi' ruffled plateau of Victoria Land had now become felt by all.

Everlastingly our eyes wandered over the horizon in search of new objects, but as yet nothing greeted

our gaze more than had been the bane of our march these last 250 miles, since leaving Mt. Lister behind.

Why we had ever come to choose our present route to the South—S.S.W. over the Victoria Land Plateau—seemed impossible of explanation. It was generally believed, however, that the strength of the meteorological element had prevailed in this decision, as it was decidedly a chance to get abundance of high level data.

Some of the more outspoken, irritated by the monotony of the journey, now expressed themselves in no measured terms regarding the alteration of the original plans. More especially had discontent arisen because of the fact that this had entailed the substitution of man power to the extent of the combined strength of the expedition in place of the ponies.

Today the march proved more interesting, as scarcely had we got properly under way, before the Commander drew our attention to a peculiar appearance in the sky, somewhat to the west of our course. It was like nothing he had had experience of in this latitude during his previous exploration with Captain Scott along the Great Ice Barrier.

Resembling open water, it suggested possibilities we had never till now entertained. As the day wore

on, the more real did this phenomenon appear, so that every one was fired with a new enthusiasm. The sledges no longer seemed to offer any resistance, so that we pressed onwards at a brisk pace for two days.

The S. W. middle current wind, so prevalent to the north, had now cut out, and the warmer south-seeking anti-trade came down to the plateau level, helping us onward. Some miles ahead a fog bank hanging low upon the land obscured the horizon.

On the morning of the third day, we felt a crisis was close at hand, as the sky in front contrasted strongly with the uniform ice blink we were now leaving behind. The temperatures perceptibly rose as we came up to the fog bank. The tiny particles of ice floating in the air and producing the fog, were now so much more abundant that it was impossible for us to see more than about 100 yards ahead. The increased temperature was due, evidently, to liberation of latent heat set free by separation of the fog particles.

Camp had been pitched and the 'hoosh' served, when the hungry Scotchman was interrupted in his occupation of devouring any remaining tit-bits, by a shout from without. Enquiring heads appeared from the tents, and amongst the turmoil that ensued could be heard cries of, –'The Bottomless Pit,'–'Gehenna.'–

A moment later our astonished gaze was greedily devouring the situation. The mist had temporarily rolled back, revealing a steep slope commencing shortly in front of us. The gradient increased rapidly until lost to sight in the mist, a couple of thousand feet below.

We appeared to be standing on the ruin of a huge volcanoe of unprecedented proportions. The wall on which we stood extended far to the North and South. Even as we watched, the cloud bank rolled yet further back, and a more extended view unfolded to our rapt gaze. The steep gradient, already noted, ended below in a yet steeper slope, almost wall like, whilst dimly, in the depths below, snowless undulating plains were visible.

What a mighty wall guarded the secrets of the abyss. What grandeur beyond anything to be expected. Our very souls were elevated and burned with a desire to penetrate the depths before us: yet how impossible this seemed. How could mortal man scale such a wall as barred our progress.

Whilst our thoughts ran thus, a better view being obtained to the South, we descried a steeply dipping slope leading from the plateau down to the depths below. This was developed in the form of a semi-

cone against the face of the wall and appeared to be of volcanic origin. This volcanic slope was certainly quite scaleable, and we unanimously decided to attempt a descent by it. Many hours afterwards, camp was pitched on the plateau hard by the cone, and all were oblivious of the sounds of revelry occasioned by the snorers.

The following day the fog again enveloped the landscape, and the time was spent making the necessary preparations for the continuance of our journey with packs in place of sledges. The depth of the abyss before us was very great, but difficult at the time for us to judge. Afterwards it proved to be about 30,000 feet, or some 22,000 below sea level.

When at last the mist rose and we were able to proceed, advance proved rapid for the first 12,000 feet as we could glissade for long stretches at a time; at this level, the temperature having steadily risen during the descent, the ice cap began to dwindle and a lobed front was met extending amongst great accumulations of morainic material stacked in the form of terraces along the mountain side. Thaw water, developed in pools investing the erratic boulders distributed over the ice, trickled away to unite and form crystal clear stream, soon lost in crevasses, whither

they plunged to swell the muddy waters of sub-glacial channels.

Camp was pitched at this stage and we indulged in the usual hoosh. The air felt quite warm and moist, so much so that instead of immediately crawling into our sleeping-bags, some time was spent in surveying the new scene before us.

At intervals spouting streams leapt from the glacier faces, and ploughing deep furrows in the morainic terraces at our feet, continued their downward courses as mountain torrents, till, almost lost in the distance below, they appeared as silver streaks threading their way by winding courses across the undulating plains of Bathybia, as we had unanimously designated this region.

Loud booming sounds proceeded upwards periodically from the depths below, occasioned by the precipitation of small avalanches breaking away from the ice-cap above.

Our biologist was busy examining lichens which coloured the boulders bright hues. There was abundant evidence of low forms of plant and animal life though curiously restricted in range.

Affairs had assumed such an interesting pitch, that we lost no time in getting under way on the following day. Novelties appeared on every hand, until we were

in a condition to accept unmoved any new discoveries however radical.

When at last the steep slopes had been negotiated and the undulating plain reached, a much fuller insight into the conditions prevailing in Bathybia had been gleaned. The summer temperature averaged about 70° Fahr., and was evenly toned by abundance of water vapour and carbon dioxide in the atmosphere. The air was distinctly oppressive on account of its density and moisture, but even this passed unheeded in the general excitement. The plant life had rapidly increased in abundance as lower altitudes were reached. These were chiefly algæ fungi, though representatives of the mosses, liverworts, and ferns were not wanting. On the plains, a dominant red colour pervaded the vegetation, owing to prolific growth of red algæ.

The existence of red coloured plants was of course to be expected, existing as they did in sunlight from which a large proportion of the blue end of the spectrum had been eliminated in its passage through so great a thickness of atmosphere. Finally, the vegetation had already become very rank, and the odours distinctive of some species were not at all pleasant.

However much the plant life interested us, it did not claim our attention so much as less pretentious

examples of the animal kingdom. Small crawling spider-like beasts had been noted close below the glacier zone; since then larger forms had made their appearance, some of which looked distinctly formidable.

The biologist had an encounter with one of these large bodied, short-legged animals, and was generally regarded as lucky in securing the specimen without harm to himself. It measured a foot in length and was armed with vicious looking mandibles. Though not identical with anything we had ever seen before, it much resembled a giant Tick, and was pronounced as belonging to the mite family. The existence of these great ticks constituted a distinct element of danger, and precautions were taken to guard against possible injury from that quarter.

With this object in view, we were careful always in future to keep our ice axes within reach.

Our first camp on the plains was never to be forgotten: most of the time intended for sleep was spent in ridding ourselves of an almost microscopic species of mite, which infested our camping ground and invaded our persons. We learnt that a camp in comfort could be expected here only after taking the precaution to previously burn off the vegetation from the site. In this way obnoxious creatures were removed.

Already our progress was much impeded by the luxuriance of the vegetation, and as this state of affairs did not show signs of improving, we decided to attempt navigation on a river which lay about three leagues to the north, and appeared to be the main drainage line of this portion of Bathybia.

Some time elapsed before this new method of procedure could be put to the test. Raft building was not without its troubles, as we were unacquainted with the materials available and consequently their floating qualities had to be determined. At length a structure was completed which rode lightly on the water, and was regarded by the sea-farers amongst us as distinctly promising. In its construction we employed the dead trunks of huge fungi of a variety capable of resisting water-log. Large sheets of fungus several inches in thickness, found growing over the ground in moist localities, furnished an excellent decking, whilst a spyrogyra like alga was found to answer splendidly as a cord for binding the structure.

Whilst these preparations were in progress, several incidents of special interest occurred. One of these came near proving fatal to one who had gained much in favour by rendering signal service as a mountaineer during our descent. Provisions had become alarmingly

scarce, and a section of the company decided that members of the scientific staff were much more likely to excel as connoisseurs in the matter of food stuffs, than prove experts in ship-building. As the labour of examining the natural products at hand did not present an arduous aspect, the scientist above referred to came manfully forward, and offered his services in this domain.

Instructions were issued to the effect that explorations should not be conducted far from camp, and the route proposed to be taken should be clearly defined before setting out. The investigator had been absent on his quest for over two hours, and the commander becoming anxious set out in search of the wanderer.

The search party had gone hardly a couple of hundred yards into the jungle, when they stumbled upon the prone body of the missing man. A giant Tick was investigating the carcase and apparently just about to commence operations on its prize. The obnoxious creature was forthwith despatched, and the body of the martyr reverently taken back to camp.

He still breathed heavily, but no wounds could be found on the body. A dread feeling seized us for, though living things had no terror for us, yet the intangible found us weak.

For long the doctor diligently attended, in the uncertainty of the stroke, administering small doses of alcohol from our limited medical store. At last, after twelve hours, success crowned his efforts and the patient regained consciousness. Even now his senses seemed to have lapsed, and in his delirious ramblings, amongst inarticulate expressions, could be heard, "Yon's the reght stuff, man, aye it is!" Later on he seemed to come to himself again as he weakly asked for tea. Indeed so frequent became his cravings for this beverage, that one of us was told off especially to keep up the supply. It was not till the evening of the second day that the matter was cleared up.

All but the night watch had retired, when the supposed invalid suddenly stepped briskly from his bed, and made towards the food bags with a determination boding ill for our now inconsiderable stores. On this occasion the night watchman proved the value of the institution by quickly alarming the sleepers and averting what might have been a serious catastrophe.

Explanations ensued, and we discovered that the miraculously healed patient had merely had the good fortune, as he described it, to discover a succulent alga giving abundance of intoxicating liquid. No further explanation was required, as his subsequent behaviour

was obvious to everyone.

Whilst this drama was being enacted, more valuable discoveries were made by others. The senior geologist, in company with a body-guard, had studiously applied his tasting faculties over a wide range of vegetable products, narrowly averting serious consequences in the case of several apparently poisonous substances. As a result of his investigations, three varieties were finally selected as good for human sustenance. One of these was a mushroom type of fungus, the others sweet tasting algæ.

Some of the algæ contained abundance of oil and made perfect kindling. With this material, spluttering torches could be made on a moment's notice.

We now had abundance of carbohydrate food, but did not feel disposed to try the culinary qualities of the monster ticks.

Today, an unusual disturbance took place in the atmospheric conditions, so that instead of the general calmness which usually existed in this region, we experienced a succession of cold blasts descending the valley walls. This change reminded us again of the conditions under which we existed here in Bathybia; a land where the sun shone red in the morning, pink at noon, and red in the evening. Our eyes accomodated

themselves surprisingly rapidly to these new circumstances; possibly owing to previous exercise in the dull pink illumination of modern drawing-rooms. In the jungle the light was exceedingly dim and our exploits had to be conducted with great caution. Although since the recent discoveries, the food supply presented no immediate difficulties, we were loth to remain a winter in these regions for, though the summer conditions were bearable, there was no guarantee of their remaining so during the long dark night of the winter. As soon therefore, as the raft was completed, we launched out on our down-staeam voyage, intending to make the most of our time collecting facts concerning this wonderful land.

Oars of a kind had been fashioned, but were mostly serviceable in polling the craft off weed banks, the current being quite sufficient to take us along at about two miles per hour.

Many were the suggestions offered for cooking our new food, but finally the amateurs gave over in favour of the chef, who had the power of making the most tasteless dishes appetising by attaching names. The concoctions usually served up in Bathybia were purées which, being translated, simply meant freshly gathered this or that, immersed in pure river water,

and brought to a temperature of 212°Fahr. for an hour or more.

Naturally more attention was now bestowed upon the denizens of the river, and indeed their abundance and variety surprised us. Minute organisms belonging to the rotifers and tardigrada abounded, whilst larger species occasionally came into view. We spent many an hour peering into the waters in search of new finds, and were abundantly rewarded by queer sights. For several days our progress continued thus without serious event. The jungle, however, became alarmingly denser so that it was now almost arched overhead and presented a gloomy outlook. Unaccountable noises and glimpses of strange forms came to us through the weak light, but fortunately nearer acquaintance had so far been avoided.

Matters did not improve, so that we were soon hastening along beneath a complete covering of dense matted vegetation so effective in blotting out the daylight that, but for the fact that here was the home of phosphorescent fungi, we should have been in utter darkness. This greenish-white luminescent forest seemed weird in the extreme after the red light to which we had become so much accustomed.

Presently our meditations were disturbed by a

volley of strong expletives of a nautical character coming from the starboard bow. We were just in time to rescue our comrade from the clutch of a dangerous-looking spider-like monster, several feet in length, that had attempted to board us. Invasions of these monster water bears, as well as unavoidable affrays with giant species of rotifers were all too common during this extraordinary voyage.

However, in accordance with the adage which states that necessity is the mother of invention, we soon discovered that these beasts without exception retreated in the face of fire, with which they were entirely unaccustomed. A supply of torches was kept in readiness as weapons in the event of need. By the aid of these, also, a better knowledge of the conditions around us was obtained. The river was now to all intents and purposes a subterranean stream cutting through the accumulated remains of dead sunlight-seeking plants, which still lived only far above, within range of the daylight at the upper surface of this dense mass of dead and living vegetation. This lower zone through which we now passed, was not altogether composed of dead material, but supported abundance of saprophytic types, chiefly fungi and bacteria.

No human being could exist long under these

trying conditions, so that it was with joy that, after two days, streaks of daylight began to penetrate the tangled mass above. In a comparatively short time, clear sky stood above us, and the walls of rank vegetation on either bank slowly dwindle as we proceeded. With the return of daylight our spirits rose. During the same day we witnessed a fight between a water bear and a rotifer, both of giant size. Each of these several feet in length and must have been immensely powerful. The water bear seized on the rotifer from behind, and had commenced sucking the life fluid of the victim when, with amazing alacrity, the captive swung round his free end and seized his adversary in a bunch of tentacles. A furious combat ensued in which the water bear though much mauled, proved victor. We judged, from the action of rotifer, that something of the nature of an anæsthetic had been injected by his enemy. Definite proof of this was shortly forthcoming in an unexpected manner.

One of us, who had been in the habit of daily treating himself to a wash, whether he required it or not, when we floated out into daylight again, hastened to make up for lost time ; whilst dangling his legs over the stern and, at the same time, conducting an animated conversation on the relative merits of deer stalking in

the Highlands and in more populous centres. Somebody had just made an unusually fitting salley when, above the ripple of applause, there sounded a wild yell followed by an apprehensive exclamation, "He's got my ruddy toe !" Quick was the word and sharp was the action that followed, else we could never have saved the bather from the malicious grasp of a giant water bear. The beast had already punctured the toe referred to, but was driven off before serious damage was done. It had had time however to inject an anæsthetic, as our comrade passed into a comatose state after about one minute, and did not revive for over half an hour.

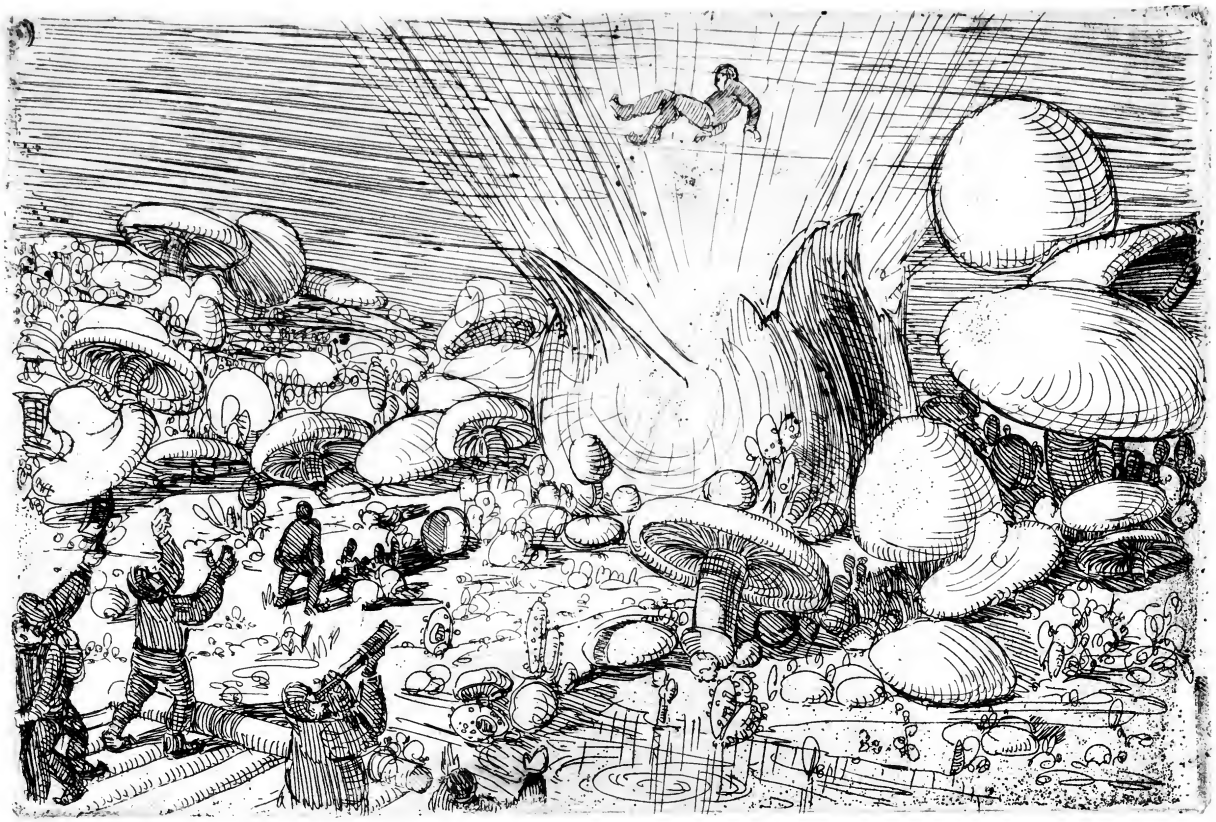
So accustomed had we now become to our new surroundings that we passed a few days not unpleasantly, drifting down stream.

The vegetation, though luxuriant of its kind, grew much less dense, and we came at length to more or less open country. There plant life was represented by mushroom-like fungi arranged in clumps over the plain. Our artist was in specially good spirits and, on our mooring alongside the bank, took the opportunity to scramble on to the top of a clump of giant toadstools hard by, intending to size up the sketching possibilities of the neighbourhood. A sharp report shortly after attracted our attention in time to see him executing

evolutions in mid air about fifteen feet above the summit of the toadstools and some thirty feet from the ground. It happened that this particular toadstool was matured and required to burst it only the slight irritation supplied by our comrade in mounting; fortunately the bed was soft to fall back upon, or a serious accident must have resulted. Our ingenious engineer was much struck with this demonstration, and conducted a series of experiments among members of the genus fungi represented in the neighbourhood. As a result, he brought to camp some time afterwards a huge flat specimen which, he averred, would make a fine mattress. In kindness of heart the specimen was given to his companion of the afternoon's adventure. Judging by the remarks made by the recipient during his sleep, he must have passed an unusually pleasant night. Indeed the mattress appeared to be still exerting a magic influence close on to the breakfast hour, when several attempts failed to arouse the slumberer. Then up came the ingenious engineer who, with a prick of an ice-axe in the proper place, fired the mattress, and shot its burden from the depths of sleep into broad daylight viâ the tent roof.

From this point on the river water became increasingly more brackish, so that we were much exercised

EXECUTING EVOLUTIONS IN MID AIR.



in our minds regarding the future source of our water supply. After traversing several shallow lakes, the matter became critical and we decided to moor up to the bank. The neighbouring country was almost deserted compared with the jungle left behind. The saline soil supported only stunted vegetation, except for occasional clumps of mushroom-like fungi standing on local elevations of the ground. We were some distance from camp, making a reconnaissance, when a heavy rain storm commenced. Perfect shelter was obtained beneath the umbrellas of the fungi. As time went on, however, and the downpour did not abate, we grew anxious for the safety of our commissariat. Shortly afterwards, we might have been seen marching back to camp each sheltered under one of these novel umbrellas. The adjacent country already showed signs of flooding; it was, therefore, deemed best to pack our gear and remove it to one of the elevations. The waters continued to rise even after the rain ceased, so that our position was again threatened. We were now thoroughly alarmed, and hastily transferred our possessions to a flotilla of queer craft, consisting of fifteen large mushroom shaped fungi set in the floating position, and lashed together with alpine rope. Hardly had these preparations been completed, than the lapping waters

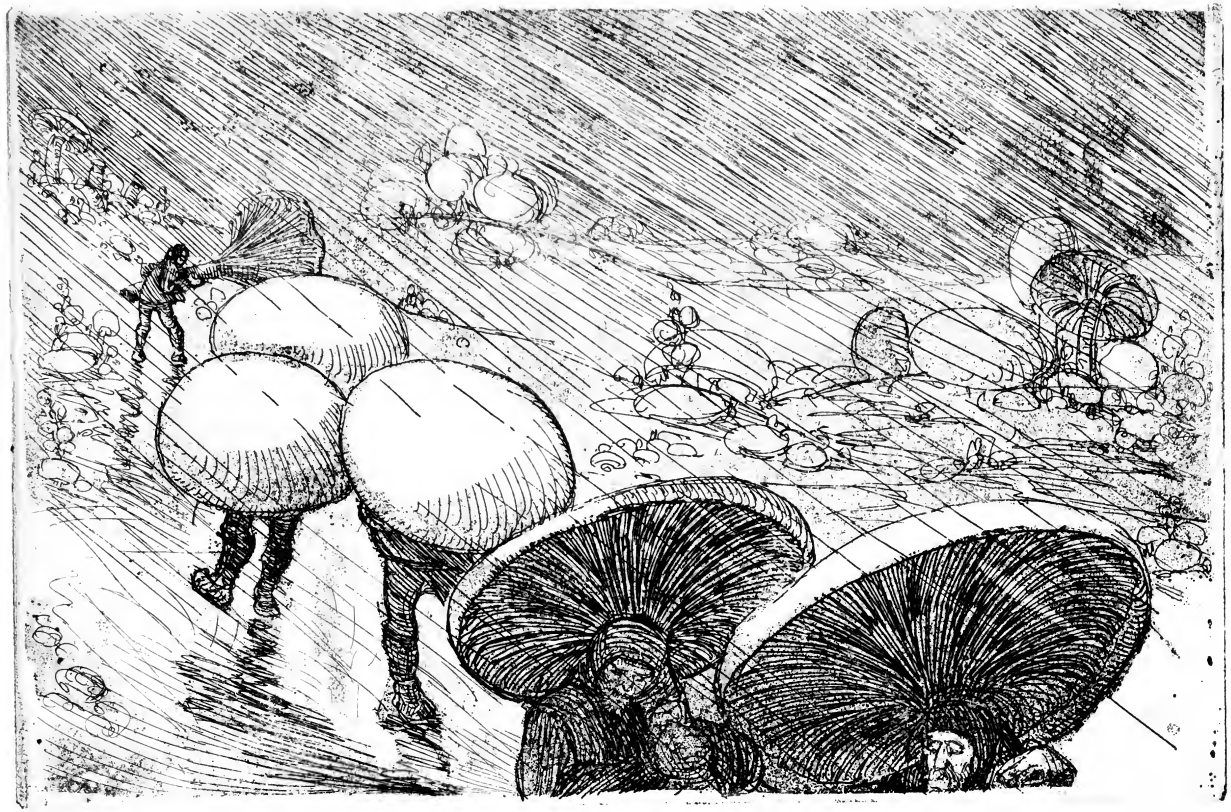
swept us off in the strong current; we were eventually carried into a great salt lake.

As the only fresh water available for drinking purposes consisted of that which chanced to have been caught in the bilges of our craft, great relief was felt when a steady wind set in driving us gently before it. Two days later we were fortunate enough to reach the further shore and, entering the debouchure of a large stream, succeeded in travelling some distance up it with a still favourable wind. Finally, on account of the opposing current we had to abandon the water and march on land.

One morning, just as most of us were rising, a scampering noise was heard without, accompanied by encouraging shouts of "Hi yah! hi yah! stick it, boy." Presently one of the equestrians, who had risen early to take his accustomed morning walk, came riding up, mounted on a new species of a monstrous mite. He pulled rein with a "How's this for a specimen, Mr. Biologist?" "Go to ——" was the answer, which meant that scientist was not having any.

This portion of our journey proved very wearying, as our daily marches were extended as long as possible. The direction in which we had been travelling, being across the main topographic features of Bathybia, was

EACH SHELTERED UNDER ONE OF THE NOVEL UMBRELLAS.



calculated to yield a maximum of information in a minimum of time. Time, however, was now becoming a serious matter. though new information never failed. Since leaving the great salt basin of the central regions, our track had consistently risen. The total amount of this elevation now amounted to close on 6,000 feet. The jungle was fast becoming too dense to penetrate. Therefore, as a final coup before retracing our steps, we decided to ascend a high volcanic cone lying close by our course. From its summit, some 17,000 feet above, much information might be gained.

A summer snow cap descended for about 4,000 feet, whilst a perpetual wreath of smoke curled upwards from the summit.

It was noon three days later when we made our camp just below the snow line. The afternoon was spent by most of us in a visit to the summit.

Hydrocarbons were escaping from fissures in the ground near the summit, whilst continuous flames played about the crater, where the greater heat kept the escaping gases ignited. The rocks were very basic and heavy. Metallic iron occurred in many of the outcrops, and copper fibres were observed in not a few.

However interesting these observations were, they did not prevent us drinking in the distant panorama.

Far behind was the great salt sea and saline borderlands. Ahead was a sea of jungle spread over gradually rising plains. Beyond, where frigid altitudes are reached, a great snowy plateau carried the picture beyond the horizon.

The whole party was overcome with the wild grandeur of the scene and, when it was time for return, we retraced our steps down the snowy slopes in silence. From this reverie we were suddenly awakened by a shout from the foremost, who had come upon the body of a huge animal, about four feet in length, partly buried in the ice. The biologist reported the beast to have affinities between the water bears and the mites, but distinct from anything we had so far noted in Bathybia. We got to work with our ice axes and soon had him out. The body being more or less cylindrical, we found no trouble rolling our prize to the camp near by. In the first instance our intention for so doing was merely to astonish our comrades. However, the biologist, seeing the specimen still intact, asked that it might be spared till further investigated. It was the peculiarity of our biologist to save his specimens for examination in the early morning hours.

After supper, it being the eve of our returning journey, a general discussion regarding the natural

history and physical data so far experienced in Bathybia, was instituted. Summarising the various points brought forward as bearing on a scientific elucidation of the phenomina observed, the following are worthy of note.

Bathybia was a great depression some hundreds of miles across, bound on the East by a great fault face, but with more gently rising boundaries in other directions. In fact it might be likened to a portion, for example, of the basin of the Pacific Ocean from which the water had been removed.

It seemed to us almost certain, that the folding and faulting of the earth giving place to this configuration, must have taken place at a period corresponding to a maximum phase of a great ice age, when the Antarctic regions supported an ice cap of stupendous thickness. The ice must then have played the rôle of rock, when the great earth movement referred to occurred.

At a later date, as the ice age passed away, ablation, removing the ice strata, exposed the deep basin of Bathybia. The lower portions of this basin, situated below so great a thickness of atmosphere, was blanketed from the great cold of the upper regions.

To this end also, the humidity and increased abundance of carbon-dioxide in the atmosphere aided.

Although in succeeding times, the highlands above were deeply buried under snow-fields, this deeply plateau locked basin could keep its floor for the most part unencumbered with water.

The atmospheric circulation, being distinct from that of the outer earth, presented special features. What was most to be remarked with respect to the atmosphere is that it contained a minimum of dust particles; so that, though the air was saturated with moisture, condensation seldom took place, except along the border lands, where fogs were very prevalent. The great rain storm, producing the flood we experienced, was probably due to an unusual disturbance of anti-cyclonic nature, whereby dust-mote loaded air of the anti-trade belt above had descended, causing sudden condensation. The waters, continually draining into a central basin and there evaporating, led to the production of a residual salt sea.

A knowledge of the strata underlying the basin would have been of the greatest value, but of course exposures were not available. However, a great accumulation of coal producing matter was presented in the jungle zone.

Extinct volcanic activity had been noted along the fault scarp, and specially interesting was the active

volcano on which we now stood. The great basicity of the lava, and the fact that it contained metallic elements, and probably also metallic carbides at a depth, as indicated by the exhalations of hydrocarbons, showed it to be typical of the deeper earth crust.

The abundance of both plant and animal life, and especially the curious restrictions governing their range seemed, at first aquaintance, inexplicable. The biologist now drew attention to the fact that all the species represented were but curiously developed forms of types already known to the scientific world. They had suffered but little variation, though many had increased enormously in size. Furthermore, it was known that such species could at one stage or another in their life-history be transferred for great distances by wind agency. Also many, even in adult state, after remaining frozen for long periods, maintained the power of re-animation when thawed out.

In the light of this information, it seemed most reasonable to suppose that the invasion of plant and animal life had come from warmer climates through the agency of the anti-trade winds.

It was just about two a.m., when a select few were in the act of brewing their tenth cup of tea since supper, that a movement in one of the sleeping bags

attracted attention. An arm and then a head appeared followed quickly by the rest of the body. Silently the figure slipped on his boots and a moment later passed out of the tent with the intention of inspecting his specimen.

Almost immediately a wild commotion rent the air and, as we burst from the tent, a terrifying spectacle met our gaze. The beast we had left frozen a few hours ago had thawed out, and come to life as is the wont of the water bears when subjected once again to congenial conditions. In this case, however, the term of hybernation had been extended to centuries, so that no doubt in the interval this savage species had become practically extinct.

Our comrade was frantically struggling with his specimen, and into the mêlée we threw ourselves. The din grew louder and slowly but surely, out of the confusion rose a voice, which smote clear upon me. "Rise and shine you sleepers, 8-45, time for down table!"

There in the passage was the horrid figure of the night-watchman replacing our washing-up bowl, which had just served him as a breakfast gong.

As I sleepily drew on my clothes, regretful at sacrificing Bathybia for Cape Royds, I meditated how

much can happen in dreamland during a short quarter hour.

DOUGLAS MAWSON.


CHICKEN