

# Exploration Review

JOURNAL OF THE IMPERIAL COLLEGE

EXPLORATION SOCIETY

FEBRUARY 1961

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**EXPLORATION REVIEW**

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## FOREWORD

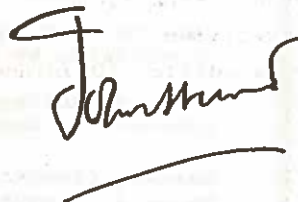
by Sir John Hunt

It is a truism that there is nothing new about geographical exploration. It has been a continuing quest since our prehistoric ancestors started to venture into the jungles filling the valleys in the close vicinity of their cave dwellings. What is significant is that the urge to explore should still be such a powerful force in our highly developed community in this day and age, when the sheer physical need which prompted earlier generations to be adventurous for very existence has long since disappeared, and when we can receive it 'canned' exclusively by Todd A.O. or by remote control from our armchairs, on the television screen.

The reason, of course, is a simple and heartening one. The urge to quest never was purely a physical one, even among the cave dwellers; it never was simply the lust for treasure which moved the mediaeval mariners to set sail, if necessary over the edge of the world. As members of the human race there has always been the deeper spiritual need behind our research for what lies beyond. This need remains as vital in 1961 as it was 250,000 years ago.

In an important sense, the urge to explore is greatly enhanced today by the very fact that the spiritual need is so encompassed and threatened by the many by-products of man's inventive genius. The easier we make life for ourselves, the further the focus of science is projected beyond this planet, the more will most of us want to seek outlets which are neither commercialized nor stratospheric.

The impressive list of expeditions organized and carried out by the Imperial College of Science and Technology since the last war seems to me to be symptomatic of this trend. Those who have taken part in the achievements which your Society has to its credit have, in all probability, not been much concerned with the inner promptings of the spirit which I have touched on. It is quite sufficient - indeed it is highly satisfying - that so many of you are going to so many remote places, not only in pursuance of science, but just "for the hell of it". I hope you will continue "going places" for this very adequate reason.



## IMPERIAL COLLEGE EXPEDITIONS

To date, the College has sent out the following expeditions:

- |      |  |
|------|--|
| 1938 | Jan Mayen Island (Greenland Sea) Expedition.   |
| 1956 | Eastern Iceland Expedition.<br>Carmargue Expedition (Rhône Delta)<br>Norway Expedition (Allfonbreen Glacier)<br>Swiss, Himalayan Training Expedition.  |
| 1957 | Karakorum Expedition (Led by Eric Shipton)<br>Ghana Expedition<br>Arctic Norway Expedition   |
| 1958 | Ghana Expedition<br>Norway Expedition (Voss)<br>Eastern Iceland Expedition   |
| 1959 | Apolobamba Andean Expedition (Bolivia)<br>Azores Expedition (Underwater Swimming)<br>Greek Expedition (Biological)<br>British Guiana Expedition<br>Eastern Iceland Geological Expedition<br>Jan Mayen Island (Greenland Sea) Expedition.   |
| 1960 | St. Kitts Expedition (All-women)<br>Around the Atlantic Expedition (Africa, South & Northern America)<br>Iran Expedition<br>Eastern Iceland Expedition<br>Central Iceland Expedition<br>Cornwall Expedition (Underwater Swimming)<br>Spitsbergen Expedition<br>Ghana Expedition<br>Kashmir Expedition (Overland) |

## EDITORIAL

It is now just over 5 years since the Exploration Board was set up and since then it has supported a total of 25 expeditions. The Exploration Society, by contrast, was not started until 1958, and only in the last year has its influence on Imperial College exploration been shown.

Now that the Board and the Society are running reasonably smoothly, it is possible to try to analyse their separate and co-operative functions.

The prescribed objects of the Board are "... to encourage initiative on the part of all members of the Union in organising scientific expeditions both at home and abroad, and to examine proposals for such expeditions" \* Both at the formal and the informal level this has been carried out in a variety of ways. A formal meeting of the Board is held about twice each year. Proposals for expeditions are discussed at these meetings and successful applications are given support. (This usually takes the form of a grant and the right to use the College name.) Problems relating to the organisation of Board work are also generally discussed. Informally a great deal more detailed work is done. This includes the sorting of Board equipment, the ordering and distribution of expedition supplies, advice on many small points, the production of expedition reports, and a whole range of minor jobs. These tasks fall on a variety of shoulders, but the main weight of the responsibility for routine administration falls on to the Board secretary. By now the amount of work involved is becoming almost a full time job, and, what is more, the individuals who are doing this work, are, in the main, not the same people who are going on the expeditions and receiving its benefits.

So far the Exploration Society has aimed at providing a meeting place for those interested in exploration. It has not organised expeditions officially, but has expressed the hope that there will be sufficient interest and initiative amongst members for them to organise their own. The most it has ever interfered with expeditions is that in this last year it has tried to co-ordinate the ordering of supplies. Complete freedom of ideas and neutrality has been its aim.

Now that the Society has had some time to settle itself, some people think that, bit by bit, it should take over some of the routine administration which has fallen to the Board. In particular, the ordering of supplies and equipment, which has been a tremendous task for the Supplies Administration should be given to a committee under the auspices of the Society. The equipment store could also be maintained and supported by the Society.

Advice on the many small problems which the Board Secretary has had to give could easily be answered by the more experienced members of the Society. Expedition proposals could even be screened and moulded into a suitable form before they are passed onto the Board. Changes like this, which should lighten the heavy burden of Exploration Board work are not without their drawbacks. The main difficulty to be overcome is the lack of any real continuity in the affairs of the Society. In some years, when there are a few keen members, interest will flourish, and in others it will wane. Even the smallest responsibilities can not reasonably be entrusted to an organisation with such an unstable foundation. It seems that the best way to give more stability to the affairs of the Society is by establishing closer and more formal ties with the Board. The Society should be officially represented at Board meetings, and the chairman of the committee for the ordering of supplies should be both a Board and a Society member. In fact, the Society should become more of a student offshoot of the Board than the present free-lance affair. In some ways this is regrettable, since inevitably some of the freedom and initiative will be lost in the "toeing the line to the higher powers." This accepted, closer ties with the Board seem to be the easiest solution to the problem involved.

\* Exploration Board Report 1955 - 57.

## LIFE IN A 'FID' CAGE

by Martin Smith

Close by the remote west coast of Grahamland, Antarctica, are a small number of expedition bases manned by personnel of the Falkland Islands Dependencies Survey (conveniently known as FIDS). The ice age which grips this part of the world has made brave attempts to shroud the amazingly precipitous coast in ice and snow, with the result that we have high alpine scenery of indescribable intricacy and grandeur set in a deep blue sea dotted with icebergs. Little wonder then, that a person can spend two or three years on a base in this region and never tire of the beauty which surrounds him. Moreover, the joys of living there are many and varied; not the least of these involves the satisfaction of getting to know the unusual ways of a harsh and uncompromising nature.

The Falkland Islands Dependencies Survey is a British Government concern which, over fifteen years ago, led the way in the present day trend of occupying scientific bases in Antarctica continuously, for a number of years. The base hut is one's refuge from the difficult weather conditions outside, and more besides: it is 'home' to a minute community of human beings. Eleven of us spent two long years in the hut on the Argentine Islands and we are often asked, 'What did you do?' Well, we ate and we slept and we read and argued, when we were not working. The routine of domestic hut duties, organised on a rota system, kept most of us busy for a few hours, each day. While the Antarctic atmosphere is quite free from dust, the same is not true of the air inside the hut and weekly sweep-outs were necessary. Perhaps when anthracite stoves are replaced by oil-fired central heating, this not unpleasant task will be lost. Routine is most important in keeping men moving in an environment where it is all too easy to become incredibly lazy. Perhaps I may quote from my diary for 29th June, 1959 after over three weeks of almost continuously inclement weather: "Possibly the indoor life and possibly too long in bed has given me an unsettled feeling. It is a reasonably common feeling and makes it so difficult to get down to or on with a job. Yet it is just doing a job which defeats that feeling. I shudder to think what state I (or most other people) would get into if we didn't have certain routine jobs". There is room for individual variation here, but I believe that it is less than one might think. The reader will note that my diary was used as much to discuss feelings as to record facts.

It is difficult to generalise about outdoor activities. These vary greatly between the seasons but are generally of two classes. Firstly, ventures out of doors in all weathers for work purposes; eg., meteorological observations, launching the radio-sonde, removing hoar frost from the solarimeter digging out coal or diesel fuel, changing the tide-gauge

charts or bringing in snow blocks for the domestic water supply. Secondly, outings for recreational purposes. These may not take one more than a mile from the hut and could then be an afternoon's skiing or a short boat trip to a neighbouring island to follow the progress of a pair of nesting birds. Alternatively, they may be longer day trips to the mainland of Grahamland 5 miles to the east, or to a photogenic iceberg or the nearby penguin rookery. Sledging or camping journeys for perhaps a week (transport by the sweat of one's brow as in man-hauling, or more enjoyably by outboard motor) are much more serious undertakings requiring the calculation of field rations and sorting out of camping equipment, and also requiring sanction from headquarters in Port Stanley.

This leads to radio communication, which, more than any other single factor, has made life more bearable than in the days of the 'classic' Antarctic expeditions. No fewer than five rooms in the hut at Argentine Islands had radios. FIDS have their own special BBC programme, a most enjoyable half-hour of family messages and talks, etc., each week. Reception from the northern hemisphere was generally excellent and eight o'clock in the evening would see many of the base members gathered in the sonde office to hear the BBC news followed by home news from Britain. Few people really lost touch with happenings at home.

The cramped conditions of base life impose, at times, a severe strain on the good relations between individuals. Happily, we had no serious rows but there were many minor irritations which one had to endure, not once or twice, but many, many times for months on end. It is this persistent and prolonged exposure to a person's idiosyncrasies which causes one to react to them unreasonably. The present day trend in base building is towards separate rooms or huts for different departments rather than the old style of everyone living (including sleeping) in one main room. This is a strong factor in reducing the strain between individuals. Some sort of separation is almost essential on a base which has to adhere to a round-the-clock scientific programme. In his own cubicle a base member can escape from his companions, and through the medium of letters, books, or day dreaming, he can pass into another world where people don't seem to have so many annoying habits. We found that a good way to put up with a person's peculiar ways was to go and tell a third person about them, and the two of you really tear the offender to pieces. One may suspect, but one can never be certain, that others are doing the same behind one's back.

Base life is simple in that conventions are ignored and the scope of activities is limited, but after the departure of the relief ship and the onset of winter the party are completely isolated and there is no possibility of a change of company. This is not necessarily so at a sledging base but invariably the case at a static scientific establishment

## CONSIDERATIONS FOR AN OVERLAND TRIP BY VEHICLE

by Doug Flak

The most direct route from London to Tehran through Belgium, Germany, Austria, Yugoslavia, Bulgaria, Turkey and Iran may be divided into two sections: the European section and the remainder. For travel in the first section little more is needed than the preparations normally envisaged for a motoring holiday in this country. However, for the remainder the motorist must emulate a mobile repair shop.

The eventual enjoyment of a trip depends on the number of forced halts due to vehicular troubles. Many will ruin the trip while a few minor faults prevent one from becoming complacent. However the aim is for a trouble free trip and this can be achieved in part by a careful pre-departure overhaul of the vehicle.

A workshop manual and a comprehensive set of tools help enormously in relieving the tedium of the check from nose to tail - always double the proposed mileage and consider if the part will last that long - if not, replace it. The electrical system is most likely to cause trouble - chafed wires, worn brushes and poor contacts. While this work is being carried out a motor organization and insurance company should be approached with details of the trip, to give them time to act. It is certainly worthwhile joining a motoring organisation, as much time and effort is saved clearing the vehicle for export and import.

Comprehensive maps outside Europe are unnecessary as there are usually only a few roads fit for motor transport and in Yugoslavia, Bulgaria and Turkey these are well signposted. In addition many new roads are being built in Turkey and Persia.

The addresses of spare part stockists on route should be obtained for every possible component and at the same time a list of recommended spares, usually provided by the manufacturer, obtained, and these parts bought. Electrical spares such as fuses, lamps, brushes and wire are absolutely essential. Bear in mind that the cost and delay in sending out a part from this country may be considerable.

Perhaps tyres are the most important item on the vehicle. They will have to withstand heat and road conditions not easily imaginable in this country. Nothing is more soul-destroying than repairing punctures. However, many tyre repair shops are to be found in Turkey and Persia, by the roadside, who thrive on the high puncture rate. Nevertheless carry a packet of self vulcanising patches for safety.

A hydraulic jack, a small shovel and a strong tow-rope should be carried. It may be worthwhile having towing brackets welded to the chassis at the front and rear if there are no substantial anchor points available. Next a few accessories ought to be fitted.



Man-hauling sledge party  
leaves the P. I. D. S. base  
at the Argentine Islands.



Firstly a powerful mountain horn, preferably of unusual note, must be mounted. The unusual note is to make up for the lack of power when competing with the air horns of the Turkish lorries. The Eastern people although partially insensitive to volume are very sensitive to tone. Secondly, if night driving is anticipated, and it becomes dark in Turkey in the early evening during the summer, very powerful lights - again to compete with the lorries - are necessary. The dipping system fancied by the lorry drivers is three seconds on full beam, three seconds no light at all, alternating with the oncoming vehicle. This system works very well for the vehicle with the greater light power.

The shock absorbers are going to have to cope with more than many years service on European roads within a short period, and it would be worthwhile renewing them if the vehicle had done considerable mileage. Brake linings ought still to have plenty of friction material clear of the rivets, and finally, a change of oil round to one of the major companies' products to ensure the same brand of lubricant on the trip, pretty well concludes the preparation.

On the trip a daily check of petrol, oil, water and tyres should become routine, along with greasing and a check of tightness on road spring and other bolts, perhaps at slightly longer intervals. The distilled water will evaporate fairly quickly from the battery in the hot climate. However, a small supply is easily carried.

The final question, perhaps this ought to have been the first, is that of the type of vehicle suitable for this trip. In winter many roads are snowbound in Turkey and west - east travel may be impossible. Even in late summer several fair sized rivers cross the roads and here a four wheel drive vehicle, with little showroom appeal, comes into its own. I would hesitate to drive a modern car to the Middle East as it would have lost much of its selling price on return, with minor body dents which would not be covered by insurance - almost unheard of in Turkey and likewise in Persia. Land-Rovers, Dodge trucks and jeeps have the advantage of being used in the Middle East in considerable numbers. Therefore spares could be obtained out there, at a price.

## THE UNDERGRADUATE EXPLORER AND THE R.G.S.

by L.P. Kirwan, Director, Royal Geographical Society.

Why do we do it? Why do we support all these undergraduate expeditions, these Long Vacation excursions to remote and curious parts of the world, each year? If one was to judge by some of these summer parties - "stunts" or just holidays in pseudo-scientific guise - the implied scepticism justifiable enough. But then these are not among the expeditions which the Royal Geographical Society supports. Some of them may be very enterprising and adventurous projects, but in so far as they lack any scientific or intellectual content, there is no reason why they should look for funds from us.

Some scientific content we certainly look for, preferably geographical or at least connected with one or other of the Earth Sciences. The expeditions from the Imperial College of Science and Technology have, as one might expect, set praiseworthy standards in this respect. But we look for adventure too; in the choice of territory, for example, which should preferably be beyond the average tourist line, and certainly beyond the British Isles. We look also for some signs of a capacity for leadership and organization and for a programme of work which there is some reasonable chance of completing within the short time, and by the limited number of qualified men available.

People often think that the R.G.S. organizes these expeditions. But the contrary is the case, one of the objects of the exercise after all being that undergraduate expeditions should have the experience, bitter though it may sometimes be, of organizing themselves. Advice, loan of equipment such as survey instruments and cine-cameras, and on occasions even hard cash, are provided. But our policy, born perhaps of some rugged experiences in earlier days, is to interfere as little as possible in the internal arrangements of undergraduate expeditions. Support and not sponsorship is our aim.

This comforting attitude of patronage without, theoretically too much responsibility, is, in so far as approved expeditions can use our name, not quite so easy to maintain as it sounds. Science with adventure is all very well. But there are other problems involved. Some risk is inherent in many, if not most, worthwhile expeditions. But unnecessary risks should be discouraged. Expeditions travelling in foreign countries carry much more than the name of their university, of their college, or of the R.G.S. They are, in their own way, ambassadors abroad and are apt to be judged as such. These are some only of the factors which have to be considered by the R.G.S. Selection Committee when it meets in March to select, from sixty applications or more, the undergraduate explorers of the year.

## GHANA EXPEDITIONS, 1957-1960

by Colin Welch & Martin Luff

Prior to this year's Ghana expedition, there have been two others, in 1957 and 1958, sponsored by the Royal College of Science Natural History Society. These expeditions each had seven members, including both botanists and zoologists, and were led by N.D. Jago (entomologist), and R. F. Sturrock (parasitologist), respectively.

All three expeditions spent most of their time in Ghana in the Bobiri Forest Reserve, about 25 miles East of Kumasi. This is one of the few remaining areas of virgin tropical rain forest in Ghana.

The work of the first two parties was centred around two topics. Firstly, ecological work concerned with soil conservation, breakdown of leaf litter and humus and forest regeneration. The 1957 expedition made one transect across virgin forest, and another in an area which had been cleared for cultivation. An area of forest was also cleared completely of vegetation in the hope that future expeditions could record the regeneration in the area. The 1958 expedition made a species list of the plants in this area, and continued the work on breakdown of leaf litter and humus, attempting to correlate this with the population density of nematode worms and bacteria.

The second main topic of these expeditions was the measurement of the physical factors (i.e. temperature and relative humidity) affecting insect infestation in ships' holds on the U.K. to West Africa run. This was carried out by G. A. Matthews in 1957, and was the first work done in this field. While the rest of the party were inland in Ghana he studied methods of insect control and the handling of cocoa crops on the coast of Ghana and Nigeria. The work was continued by E. C. Neville in the following year, but he was unable to travel on to Nigeria.

On both of these expeditions every opportunity of visiting other places in West Africa was taken, which included E. M. Gerard who went through Nigeria to Agades, in French Sudan, and R.F. Sturrock and J. Webster, who visited Wa in Northern Ghana.

This year's expedition, in common with several others, was reduced in size at the request of the College Exploration Board, due to the general lack of funds. It was decided that the work on the ships should be the main topic, since this had a greater chance of financial backing from interested parties. The number of personnel was reduced to two, and this precluded the possibility of continuing the ecological work carried out on the two previous occasions.

Having the full period of the summer vacation at our disposal, it was decided to use the time in Ghana in making a comprehensive collection of the Coleoptera (beetles) of the areas where we were staying. Although entomologists on the two previous expeditions had made collections of other orders of insects, no detailed collecting of beetles had been done.

After a short delay owing to a dockers' strike in Liverpool we sailed on the 11th July, on the M.V. "Vesteroy", a Norwegian cargo vessel chartered by Palm Line Ltd., who had agreed to provide free return passages to Ghana for both members of the party. The ship was carrying general cargo, although not fully loaded, and measurements were taken of temperature and humidity in number 4 hold, using thermocouples (with associated measuring apparatus and thermohydrographs. The effects of the engine room bulkhead and the propeller-shaft tunnel on the temperature of the hold were two particular points studied. It was hoped to take readings from corresponding positions in a hold full of bagged cocoa on the return voyage, and this proved possible to a large extent.

After a rough trip through the Irish Sea, the outward voyage was sunny and calm, and when not taking temperature readings much time was spent watching for migrant sea birds, and other oceanic life. We called at Freetown, Sierra Leone, on the 21st July for discharge of cargo and bunkering. Here we had our first experience of Africa, and spent some five hours on shore before sailing again the same evening.

Another 3½ days took us to Takoradi, Ghana, where we docked on Monday, 24th July, and were met by Mr. J. H. Wheelan, the Conservator of Forests, Western Region. He had arranged for us to travel on the overnight train to Kumasi, some 150 miles to the north, where accommodation had been organised by Mr. F. G. Browne, of the West African Timber Borer Research Unit. The rest of that day in Kumasi was spent purchasing sundry articles, and visiting officers in other government departments with whom we had corresponded during the initial planning of the expedition.

On the following day we moved to the Forestry Department resthouse in the Bobiri Forest Reserve. A 1½ ton Bedford lorry, and native driver, had been placed at our disposal, for the duration of our stay in the forest, by the Soil & Land Use Survey section of the Department of Agriculture. This was used mainly for our weekly trips to Kumasi to obtain supplies, except for one day trip to Lake Bosumtwe, 35 miles south-east of Kumasi. This lake, the only large one in Ghana, is thought by some to have arisen in a volcanic crater, but this would appear to be, at first sight, unlikely.

Collecting started immediately on arrival in the forest, and continued unabated for the next 2½ weeks. As the resthouse was then required for a forestry school for one week, we moved into Kumasi for the weekend of 13th and 14th August.

Enquiries had previously been made through the Soil and Land Use Survey branch into the possibility of spending the next week in another part of Ghana, preferably one offering different surroundings to those of the forest. A lorry had come down that Friday from an agricultural field station, at Zuarungu, 20 miles from the northern border of Ghana, to pick up supplies, returning on Monday 15th, and we were fortunate in being allowed to travel in it on its return journey. During our weekend in Kumasi we visited the Zoological Gardens, but were unable to visit the Kumasi Fort, where Baden-Powell's diaries, and other relics of the Ashanti Wars, are kept, owing to restricted hours of admission.

After having waited for 4 hours for the lorry to arrive on the following Monday, we had a rather numbing journey of 250 miles to Tamale, the main town of the Northern Territories where we spent the night. The first 50 miles north from Kumasi took us through typical forest country, but after this we climbed up the steep Mampong Scarp, and the vegetation then thinned out gradually until we were in the savannah region of Ghana, with open grassland between the shorter trees and scrubs. We continued on the remaining 100 miles to Zuarungu next morning. Here we were taken over by an American Soil Conservation Officer, who immediately started us off on a high power conducted tour of the agricultural schemes in the district. These include the damming of small streams to provide irrigation for newly introduced rice, and general market gardening, together with other methods of increasing agricultural productivity in this densely populated but primitive area of Ghana. However, these innovations have yet to overcome many of the prejudices and superstitions of the local Fra-fra tribes. These people live in surprisingly clean mud huts, grouped in compounds, each ruled by its own chief. Every family in the compound has its own conical mud silo in which guinea corn and millet from their own plot of land are stored to last them through the dry season, when the land is denuded of vegetation by the sun.

During this tour, we paid a visit to an agricultural field station at Bawku, 5 miles from the border with the Upper Volta Territory. We finally returned to Tamale on the morning of Sunday 21st August, and flew from there to Kumasi, there being no other means of long-distance public transport north of Kumasi.

On the following day we returned to our 'bungalow' in the forest, and collecting continued. In addition to general collecting, we paid special attention to beetles from certain selected habitats, such as under the bark of fallen trees, in trails of driver ants, in leaf litter on the forest floor, and in rotting fruits.

On the 28th August we received a telegram asking us to be on the M.V. "Vesteroy" by 10. a.m. Saturday 27th August. Owing to the short notice, we were unable to accept this offer, and this was acknowledged by Palm Lines; on the 6th September a further telegram arrived, telling us that passages had now been booked on the M.V. "Nordkyn", due to arrive at Takoradi on the 10th.

We travelled to Takoradi by train on the afternoon of the 8th, after two days of frantic packing, and the "Nordkyn" eventually arrived on the evening of the 13th. In the intervening period we were shown methods of storage and insect control used in cocoa warehouses by staff of the Ghana Cocoa Marketing Board Insect Control Unit at Takoradi. Cocoa warehouses previously separately owned were in the process of being taken over by the Ghana Marketing Board and knocked into one to simplify stacking, insect control and loading on to ships. The sheds are treated every evening by fogging with pyrethrin, which has greatly reduced the insect infestation. We were fortunate in being able to see fumigation of bagged cocoa in lighters prior to loading for export. We were also taken to Accra, the capital of Ghana, for one day, by the Cocoa Marketing Board. Here we met Mr. J. Rawnsley, the Board's senior entomologist, and also saw the sights of the capital, and the nearby University College of Ghana.

Eventually we boarded the "Nordkyn", which was a Danish ship also on charter to Palm Line, and we sailed on the 18th September, after installing our instruments in bagged cocoa in numbers 1 and 3 holds. After some appalling weather during the first few days the rain eased, and we were better able to appreciate the large variety of migratory birds that had sought refuge on board. These included such unlikely species as an African Scops Owl, a Hoopoe, and a Whimbrel. A swarm of dragonflies was also encountered 80 miles off the African coast.

After several days of glorious sunshine, and an unusually clear day up the channel, we docked at Rotterdam at midnight on Sunday, 2nd October. Much to our amazement, Palm Line offered to fly us over by K. L. M. Viscount to London Airport on Monday evening. This offer, needless to say, was accepted with alacrity, and thus a very enjoyable and, we hope, successful expedition returned to England just in time for the first lecture of the Autumn Term.

## CENTRAL ICELAND EXPEDITION, 1960

by Nigel Clark.

On a soft and mellow July evening, six purposeful members of Imperial College sailed slowly out of the Firth of Forth aboard M.S. Gullfoss bound for Reykjavik, the capital of Iceland. Perhaps the weather was an indication of things to come, for during the following six and a half weeks, we enjoyed almost continuous sunshine.

The expedition was under the leadership of A.W.D. Larkum, a botanist; while the scientific programme was organised by Dr. K.A. Kershaw. The party was completed by D.A. Farr and F. Pickering (botanists), J.A. Cleator (geologist), and P.N. Clark (physicist). The intention was that the four botanists should work from a base camp, concentrating mainly on the problems of ecology and taxonomy, while Cleator and Clark would establish a second camp from which they could investigate some glaciological problems. The valley of Landmannahellir was chosen as the site of the base camp, a choice which, on paper at least, placed the glaciologists within reasonable distance of the Torfajökkel, a small ice-cap to the north of the Myrdsjökkel. However, owing to unforeseen circumstances, things did not turn out as simply as this.

The phrase "unforeseen circumstances" must take precedence over all other phrases in an expedition report, for not even the most experienced of organisers can possibly foresee all the difficulties likely to occur. Our first difficulties came about on the morning we docked in Reykjavik. We had arranged to contact our guide, Gudimar Jonasson, immediately on landing, with a view to leaving Reykjavik before midday. Unfortunately, the Customs authorities, despite prior warning of our arrival, decided that duty would have to be paid on our equipment. Afraid of a repeat of the difficulties experienced by last year's Azores Expedition, Larkum and Kershaw, accompanied by Jonasson, raced off to see the Icelandic Minister of Finance. By late afternoon, permission for duty free transit was granted.

Meanwhile, the remainder of the party were keeping a close watch on the unloading of the ship in an effort to prevent the equipment being carried off to a warehouse. The worry was ~~fr~~ ~~und~~ ~~less~~ however, for contrary to instructions, it had all been deposited at the bottom of the largest hold. This created a new problem. At the apparent rate of unloading, it didn't look as though we would be away for the next twelve hours or so. A rather chaotic conversation with the dockers then ensued -- no mutual language was known ---- after which the latter kindly agreed to try and extract our equipment. An hour or so later they succeeded.

At approximately seven o'clock the same evening, a heavy American truck, quite literally stacked to the roof with the now re-united Central Iceland Expedition, ground its way steadily along the unmetalled and dusty road out of Reykjavik, heading towards the interior. To an unusually large number of people, Iceland conjures up visions of vast snowfields, cold winds and bleak featureless tundra, with the occasional community dotted here and there. In the last respect they are probably right, but the journey across a fair portion of the country was enough to convince us that, though these regions do exist (and they certainly are bleak), this northern land can be very beautiful as well. For six hours or so, we followed our lengthening shadow eastwards, bumping and grinding across endless green plains, with the setting sun delightfully picking out the small white houses and farms dotted here and there in tiny communities. And yet, as we neared our destination, the grass became sparser; the gently undulating hills became prolific mountains and the glacial-fed rivers became churning torrents of foam. Eventually the vegetation died out altogether, to be replaced by an extensive sea of solidified lava, looking most uncanny as the twilight transformed its fantastic formations into the most grotesque shapes imaginable. At this point the botanists were acutely worried as to the actual existence of vegetation at Landmannahellir. By one o'clock in the morning however, we were at our destination. There was vegetation there; there was also rain --- lots of it ---- and it was cold. There was also a small shepherds' hut into which we promptly moved, and having said goodbye to our guide, we immediately fell asleep.

Rising early the following morning, we set about dividing the food and equipment into two parts so that the glaciologists could be ready to move off in the evening. Arrangements had been made for them to be picked up by a weekend overland expedition about three miles from base camp, which would be able to convey them to within about six miles of the ice. A rather hectic day ensued, with crates being broken open, divided up and then carried the three miles over a lava desert to the rendezvous. Later in the day, we were beset by duststorms... whirlwinds about ten to fifteen feet high which swept across the flat desert at about twenty miles an hour, depositing dust and grit in the most inconceivable places. Almost as the last load was brought up from base camp, the vehicle arrived. Farewells were said, and then Cleator & Clark moved off with the group of Icelanders.

Their interim destination, Landmannalaugar, was an extremely popular tourist centre. A small green valley surrounded on three sides by mountains proved to be part of the attraction, but more important were the hot springs there. The Icelanders had, by the prodigious use of dams and earthworks, converted these springs into a series of naturally heated swimming pools; a situation of which we took splendid advantage in our brief free moments.

The journey from here to the ice was much more hazardous than we imagined, the only possible route being to follow a river gorge. As it undercut the cliffs on alternate sides every thirty yards or so, the journey necessitated a complete soaking about fifty times altogether. Four hours later we were on the ice. To our dismay we could see no obvious signs of glacial action. A trek across the ice-cap ... three miles or so .... only served to heighten our depression. It seemed apparent that the Torfajökell was just one vast snowfield. Miserable, soaked and utterly exhausted, we returned to Landmannalaugar about 10 o'clock. The next day was spent in drying out our wringing clothes and debating the pro's and cons of returning to assist the botanists in their already ambitious programme. Finally, it was decided that more useful work could be done if we adopted this line, as not only were we unsure of the theory of static ice etc, but the weekly journey through the river gorge with heavy packs could be rather dangerous - especially after a hot day when the river would be in full spate. Thus decided, preparations were made for the trek back to Landmannahellir. After an arduous and soul destroying six hours tramp, over some of the bleakest country imaginable, contact was again established with a rather surprised group of botanists. When another laborious day had been spent bringing back the remainder of the stores from Landmannalaugar, the expedition then settled down to five weeks' intensive botanical work. Cleator worked on the geology of the area while Clark worked out the ecological statistics for the botanists.

After a week of mediocre and yet bright weather, the clouds dispersed and it would not be exaggerating to say that for the next four weeks almost continuous sunshine was enjoyed. The sun was so warm that most of the day was spent in shorts and swimming costumes, and one or two of the party were slightly sunburnt. It was learnt from the Icelanders that this was the best summer they had enjoyed in living memory. Apparently in 1955, a surveyor had been camped in almost the exactly the same location for fifty days before the cloud lifted enough for him to take a sighting!

Of the work, very little of interest can be said, except that we worked steadily and diligently for the five weeks. The day was usually spent in collecting specimens or in ecological counting, the evening in cataloguing, and pressing specimens and working out the statistics involved in the ecological work. While the botanists were working in the field, Cleator spent his time tirelessly walking around the district to unravel some of the complicated structures into which the rocks of the district had wound themselves. In the end, he produced a very reasonable geological map of the district which was correlated with the ecological results quite effectively. A minor burst of scientific excitement was provided by the finding of neuropogen ... a lichen hitherto only recorded in the Southern Hemisphere. All jubilation was quickly quenched when the Director of the Natural History Museum at Reykjavik produced a trayful for our inspection some four weeks later.

On the lighter side, moments of relaxation were generally provided each weekend. About 100 yards from the camp was a prominent rock, at the base of which nestled a dark cave, some ten yards in length. A week after our arrival, a small convoy of three jeeps came speeding across the desert leaving great plumes of dust behind them. We all dropped our work and prepared to greet our guests. The vehicles slowed down in front of the hut, gave us a passing nod, and then proceeded to the cave, whereupon their occupants tumbled out and ran into the cave. Ten minutes later they re-appeared, got into their vehicles and moved off. We puzzled over the whole operation, came to the obvious conclusion and promptly forgot the whole affair. However our curiosity was distinctly aroused when the process was repeated a further two or three times before the weekend was over.... some of the travellers actually coming up and looking over the hut with nothing more than a brief nod or "hello." The following weekend our curiosity was satisfied when an English speaking tourist rolled up. Having completed the now apparently normal survey of the cave and hut she came up to us. "You don't live in there do you?" she asked in an incredulous voice. Ruefully, Dr. Kershaw admitted that he did. Thereupon she burst into a torrent of Icelandic at which her compatriots also looked very worried. "But the ghost!" she said. Then it dawned. Apparently, as we learned later, the cave and hut were renowned as the habitats of a famous Icelandic ghost. Needless to say we never had any trouble with him. Apart from ghost troubles, the tourists generally brought us our mail and also occasionally a can of milk from the nearest farm and so proved very welcome visitors. Some of them, in return for our gifts of Kendal Mint Cake (they really loved it) and sweets gave us.... more civilised presents... coke, tapes and cigarettes being among them.

During the stay the party embarked upon two day-long expeditions, partly to see how the botany of the surrounding districts compared with that of Landmannahellir and partly to see two of Iceland's attractions. The first of these was a twenty odd mile trek to the River Tungnan. This is Iceland's largest and most torrential river, having its source beneath the vast snows of Vatnajökell - the largest ice-cap in Europe. For many years the river cut the country almost in two, but in 1949, our guide Gudimar Jonasson managed to effect a crossing in a Bedford 3 tonner. As he puts it, "The water was almost spilling over the upstream side of the cab." It was not really surprising. In the narrower parts, the river was simply a raging churning torrent travelling at quite an incredible pace; while in its wider reaches where it spreads out to about 100 yards the banks are lined with quicksand. However, we found an old rowing boat obviously used for ferrying purposes and spent a pleasant hour or so (the time required for the boat to fill with water) trying our hand at shooting rapids. The terrain over which we tramped to reach this inspiring spectacle was utterly devoid of botanical specimens for vast stretches.

Nothing could be seen for miles save the continuous volcanic dust.

The other expedition was rather a longer tramp and took us to the top of Hekla, Iceland's active volcano. By setting off at midnight, we not only ensured that we would have the maximum length of daylight for the rather "signposted" trip, but also that we had a magnificent view of the aurora. Though not in colour, this vast semi-circular band of ever changing light was quite awe inspiring. Of the Volcano itself little can be said - though plenty was. Not really a mountain as we understand them, it consisted of cinders, ash and more cinders piled precariously on top of one another. Needless to say, it refused to give the slightest whisp of smoke for us. The journey back was extremely arduous - two of the party excelled themselves by getting lost while taking a "short-cut" through a lava-desert and running out of water, Eighteen hours and forty miles after setting out we managed to crawl back into base camp, when all except Dr. Kershaw enjoyed a richly deserved sleep. Dr. Kershaw was sleeping in the hut at this time, and around two o'clock in the morning, he was rudely awakened from his almost unconscious state by torches. A party of Icelanders had decided to spend the night in the hut. Coffee was prepared and a rather stunted conversation followed owing to language difficulties. After finding out the reason for our presence, one of the Icelanders asked bluntly "Where are the women?" After receiving his reply he went on "And you have been here for four weeks?" He received his reply in the affirmative. The Icelanders then descended into a huddle, chattering vigorously, after which two of them raced out of the hut. They returned carrying an extremely pretty girl who seemed to prefer to have no part in the ensuing demonstration. Depositing her on the floor, they then began with the aid of a torch to point out some of her more desirable qualities. Dr. Kershaw's night was completed by the arrival of two more golden haired beauties complete with guitars, who then, in accompaniment with the rest of the party, serenaded him a selection of Icelandic melodies.

Slowly, as the expedition drew to a close, the nights became longer and colder. No longer was it unusual to wake up and find the ground lying thick in frost. Significantly, during the last two or three days, the weather began to break, culminating in a fierce storm on the last night when fortunately we had broken camp and were sleeping in the hut. Such was the strength of the wind that a party of British Schoolboys on a nearly ice-cap had their tents and belongings torn away and irretrievably lost. The following morning, as we awaited the arrival of the transport back to Reykjavik, it seemed obvious that the weather had also decided we had stayed long enough. The storm had capped all the surrounding mountains in their first white mantle of the winter, a sure indication that the small green valley would itself soon be feet deep in snow.

## UNDERWATER GEOLOGICAL MAPPING OF THE SEA-BED IN CORNWALL

by Richard Garnett

It rose suddenly; a gurgling, tumbling mass of silver. Frozen for only a second it then exploded into a myriad of dancing bubbles. From the grey depths they rose slowly, but gradually their pace quickened and with the rapidly decreasing pressure they sped upwards. Faster they moved until they burst upon the dark green surface. A few seconds later they were nothing more than a little foam upon the water, soon to be obliterated by the crest of the swell advancing towards the diving boat. But they did not go unnoticed: a pair of tired eyes sharpened, and blistered hands tightened on the oars.

The divers had gone down 30 minutes previously. The sun had been shining then and apart from a few white horses the sea was reasonably calm and had been recorded on the diving log sheet as 'fairly calm with swell'. He was in charge of the diving boat that day and it had taken several minutes to help the divers to put on their equipment. They had been in good spirits for they had already made five location dives, finding outcrops on all of them. But it had been a tiring day, since they had launched the diving boat at 11.0. a.m. and it was now four hours later. As soon as the two divers had somersaulted over the sides of the boat he had hoisted the red and white diving flag on the small pole from which it had hung limply. The survey stations were clearly visible and for once he could be sure that those small cairns of white painted stones were not clusters of sitting seagulls. One, two, three, four, five stations visible..... and with two readings on to each of them, there would be no doubt about the position of the sample.

The surveying completed, he sat back in the boat and taking a spare face mask began to bale out some of the water that had flowed in as the divers had gone overboard. Suddenly something wet brushed across his face and he realized with a start that the flag was flapping vigorously in the wind. Already the crests were being whipped off the advancing waves and the skyline was merging with the sea to form a dull grey blur. 'Here it comes!' he thought to himself, 'more wind and more rain'. Normally he would not have minded for they had been lucky with the weather for the last two days, but now he was cold and hungry. They had had breakfast as usual at 8.0. a.m. and apart from a few sweets he had eaten nothing since. Only one thing to do; continue with the baling and help the time to pass.

At first he thought it was just his imagination. But no, the boat really was drifting. The tide had changed and he knew exactly what was happening. With the increased swell the anchor had lifted and was now being dragged through the sand. He looked at his watch. The divers should have surfaced by now. They had had plenty of time to collect the necessary specimens and to take the photographs of the outcrop. But he guessed what was happening.

They were counting on this being the last dive, and ignorant of the deteriorating weather, they were using up the remaining air in their cylinders whilst looking for crayfish. Surely they would notice the anchor dragging.

He felt his stomach move as the boat slid down the back of the swell, only to be drenched in a cross wave. There was little chance of seeing their exhaust bubbles break on the surface, and by holding on to the bow of the boat he managed to raise himself into a half-standing position. Looking along the anchor line, he could follow it by eye for a few feet under the surface. Mechanically, he let out a little more rope and, then tightened the hitch and secured the end again beneath the rowlocks. The rain was pitting the surface of the sea now and he felt that indescribable feeling sweep through his body as each patch of foam on the water proved to be nothing more than the backwash of a breaking wave.

Why on earth had he volunteered to go out that day? He could imagine the other members of the team; they would be overhauling the equipment, but at least they would be working under cover. Anyway, why was he even in Cornwall, tossing around on the sea a mile from land and in a leaking boat that was not much larger than his own bath? All in aid of some madcap scheme for mapping the sea-bed. But it was working, and he could not help feeling some pride that they had already mapped half of their area of two square miles.

But there it was - the tell-tale foam that he had been looking for. It must be the divers, for no waves had broken in that oil black patch on his left. - And there again, stronger this time. He put his hand on the anchor line and felt it jerking rhythmically. They were hauling themselves up the line and he moved forward ready to take aboard their equipment. With a gush of bubbles the leading diver surfaced and edged his way round to the other side of the boat. 'Why had they taken so long?' But at least they had collected plenty of rock specimens, he thought as the diver removed his lung in the water and, together with the remainder of his gear, handed it aboard. With the first diver already in and helping the second over the side, he pulled the starting rope and was relieved to find the out-board start. - For once the plug had remained dry.

It was good to feel the tiller in his hands once more and he turned the boat slowly before the wind so that it rode with the swell. He did not mind the fumes that the motor coughed into his face, although one of the divers was vomiting by now in the bottom of the boat. The tide was in now and the waves would be crashing on the shingle. They would have to change it and ride in through the surf. And then there was tomorrow; look at the weather before breakfast, decide on the diving site and select the divers. They would have to fill the air bottles that same evening and then there was the plotting to bring up to date.

## FINANCING AN IMPERIAL COLLEGE EXPEDITION

by Howard Lovenbury

"And I tell you", wrote Cherry-Garrard, "if you have the desire for knowledge and the power to give it physical expression go out and explore..." Before the last war, there were few Universities who followed this axiom and then the expeditions were self-supporting. Since the war, there has been a great surge in University and College exploration, especially in the last few years, but few of these expeditions have been privately supported. This has been accomplished as a result of the generosity of certain scientific societies, foundations and certain industrial firms. But the scope of these expeditions has outwardly changed; adventure type exploration has been replaced by scientific exploration. More and more expeditions are incorporating scientific aims in their programmes, to obtain financial aid. This is because expeditions are expensive and beyond the range of most students' means. It is fast becoming the tendency that grant providing bodies who are approached for help will generally only finance those expeditions with some scientific objective. How, then, are Imperial College expeditions placed as to financial aid?

Fortunately the College has realised the value of expeditions both to the individual members and to the College itself. The Imperial College Exploration Board is a body set up to consider proposals for expeditions by members of the College and Union, and to assist with the cost of these expeditions (the board has an income of about £1,200 per annum). When considering proposals, the Board aims at supporting ideas incorporating both scientific and adventure exploration, more especially it considers the ability of the party to carry out the proposed aims. It is only reasonable to expect the Board to invest in an expedition which it can be certain is capable of bringing back results, which, although perhaps not beneficial directly to the College itself, will have ensured the worth and the success of the expedition. It is by this method of selection for recognition aid through the success of past expeditions that it has recognised, that the Imperial College Exploration Board is rapidly gaining status in the field of exploration. Hence recognition as an official College Expedition alone puts the party in good stead when seeking outside financial aid. In most cases, recognition carries with it a grant towards the cost of the expedition, loan of instruments and of equipment. The Board also accepts responsibility for fully insuring every expedition it recognises. Grants vary with the type of expedition, experience, size, location, proposed objects, etc. Expeditions to distant places are naturally most expensive and some money each year is reserved to mount such an expedition every few years.

When considering an expedition, attention is to be attached to experience, probable programme and the size of party;

These factors all determine eventually the area in which the party will work, and it is the cost of transport to such a location that constitutes the major cost of an expedition, since as the distance of the location from this country increases and as the size of the party increases, the ratio of the transport cost to the total cost rises steeply. In applying for support from the College or outside, a satisfactory estimate of the total cost of the expedition should be made. This entails a thorough investigation into most factors that the expedition is likely to encounter. The transport costs should be estimated, bearing in mind any increase in fares that may occur and not neglecting freight charges; the amount of food required ought to be known for costing purposes; a list of equipment needs to be drawn up to decide how much will have to be bought, borrowed and provided by the party themselves. Scientific equipment is almost always obtainable on loan from the College itself or outside authorities. More personal equipment may be needed on a mountaineering or Arctic expedition than on one to a desert or tropical region. Depending on the work envisaged, extra special equipment may also be needed such as aqualungs, ice drills, a boat, or sledge, upon which additional expenditure may have to be made. Extra costs such as reports, photography, stationery etc., ought not to be neglected. Thus after careful preliminary research an application can be produced and possible means of finance can then be considered.

The amount of personal contributions (usually between £10 - £50) is fixed and the sum of money required to put the expedition in the field is known. Application for support is then requested from the Exploration Board, hoping that recognition will be obtained and that a grant towards the total cost will be made. The existence of the expedition at all is determined entirely by the Board and its backing is a great asset when authorities outside the College are approached for financial assistance.

There are many grant-aiding assistance bodies, in particular, The Royal Geographical Society, The Mount Everest Foundation, The Royal Society, who have money available to donate to expeditions which they consider fit to support. There are also many other private bodies, such as foundations and some industrial firms, who are sometimes prepared to donate money in order to set an expedition into the field, and a multitude of food and equipment suppliers who are prepared to provide expeditions with their goods at generous price reductions and sometimes free of charge. It is upon all these bodies that an expedition relies in order to leave this country at all and to all of them should be expressed much gratitude.

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## ST. KITTS EXPEDITION

by Anne Phillips and Shelagh Hocking

In the summer of 1960, Imperial College sent out its first all-woman expedition. The party consisted of two zoologists, Shelagh Hocking and Anne Phillips and their destination was the British owned island of St. Kitts in the West Indies. The aims of the expedition were to collect a representative selection of the fauna of the island for the British Museum of Natural History and also for the College Museum. The specimens obtained on the island were of special interest as St. Kitts is one of the few West Indian islands about which little is known zoologically.

St. Kitts itself is included in the group of islands called the Leewards and has an area of about 70 square miles. The central part consists of a high volcanic mountain range covered in tropical forest and surrounded by an alluvial apron under intense sugar cane cultivation. The southern part of the island is extended into a long mountainous sand spit only accessible by sea, and supporting a thick scrub of acacia and cactus. The habitats thus offered were various and it was found that the fauna differed widely in the different areas.

The main work was the collection of zoological specimens. Transport was supplied by car, boat, horses and donkeys and trips to the more inaccessible parts were made on foot. The most important items of collection were the insects with especial emphasis on the beetles and plant bugs of the island. Calico sweep nets were employed for sweeping the herbage and the majority of specimens were obtained in this way. In the case of the beetles, a simple light trap yielded the best results although the numbers collected were most disappointing. Other insects such as butterflies, moths, dragonflies, bees and wasps were collected using an ordinary kite net. Collecting by means of a beating tray in the forest undergrowth proved most unrewarding and was abandoned after the first attempt. The captured specimens were put into glass tubes or metal boxes for transport to the laboratory.

Other important groups of animals were the reptiles and amphibia and eighty specimens of these were preserved. Collecting was done by hand, entailing climbing trees for the tree lizards and frogs and running down the ground-living forms. The specimens were kept alive in linen bags and killed in the laboratory to prevent digestion of the intestine and internal organs. Certain species of Anolis, a tree lizard were very common, one specimen being found on nearly every tree on the fringe of the island. In the forest however, reptilian fauna was very scarce, owing probably to the damp conditions and lack of sunlight. Only two amphibia were found, one being a very common little tree frog captured by hand at night using a flashlight.



The other was a tiny frog found high in the mountains of which only one specimen was seen. St. Kitts is thought to have supported a much more varied fauna before the introduction of the mongoose, but owing to the predations of this animal it has been sadly depleted and the majority of reptilian species exterminated.

The more spectacular members of other groups of animals were also collected, mainly for the College museum. The majority of the spiders were small and uninteresting, but a few specimens of the huge, furry Tarantulas were captured. The largest of these measured 5" across and lived in a burrow nearly a foot deep in the earth. Other specimens included huge centipedes and millipedes and two different genera of scorpions, contrary to the belief of their absence from the island. Some marine collecting was done on the coral reefs and sandy bays surrounding the island, the majority of specimens being Echinoderms. The commonest of these was a large, purple coloured sea urchin with spines eighteen inches in length. These were very dangerous as they were poisonous and broke off easily in the flesh if one brushed against them while swimming. Apart from the fore-mentioned animals, individual specimens of other less common species were collected, mainly for personal interest.

The soft bodied animals were all preserved in a dilute solution of formalin. The best way of killing the reptiles and amphibia was to inject ethyl acetate into their brains through the ear drum. They were then labelled, catalogued and dipped in soap solution to make them wettable before immersion in the formalin. In the case of large specimens the abdomen was slit open to allow entry of the preservative and prevent decomposition. Some of the larger invertebrates such as spiders, echinoderms, fish, centipedes etc., were also preserved in formalin and were killed by immersion in the liquid. The insects were killed by ethyl acetate vapour and placed in paper triangles bearing location and other data and allowed to dry. They were stored in airtight tins with paradichlorobenzene to prevent fungal decay. For shipment, the specimens in formalin were individually wrapped in tissue paper and packed tightly to prevent breakage.

As St. Kitts is a predominantly sugar growing island, some interest was taken in the pests attacking the crop. Experiments were done on the control of the Yellow Aphid which was at that time ruining several cane fields. This insect attacks the leaves of the cane and sucks the sap, at the same time injecting an irritant which turns the leaves yellow. In bad cases, the plant is killed but usually the ravages leave a sharp drop of sugar content in the cane. As a result of the experiments, a predator, Cycloneda sanguinea, was discovered, bred in large numbers and released in the fields. This ladybird beetle controlled the aphid and, within three weeks, the fields were clean again.

Other animals investigated were the Sugar Cane Mealy Bug and the Small Moth Borer. During our stay in Antigua, a neighbouring island, we were shown a laboratory where a species of parasitic fly is specially bred and released for the control of the latter pest.

During our ten days in Antigua, a survey of the local lizard population was made for the purpose of comparing it with the population in St. Kitts. It was found that several species were common to both islands and others, common in Antigua were not found in St. Kitts. One interesting fact that emerged was the relative abundance of the species common to both islands. In Antigua, the commonest Anolus species was about six inches long, green and with a dark grey and white mottled head. In St. Kitts however, this species was supplanted by one very similar but with no such markings on the head although the grey-headed forms were found occasionally. The problem of the distribution of the lizards in these islands is a very interesting one that could do with more investigation.

Finally, we should like to thank all the people and firms who helped us in any way and especially the people of St. Kitts who gave us hospitality and help during our stay there. Owing to the bad weather, our expedition would have been a complete failure without their aid.

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Continued from page 7.....

like ours. Men are therefore called upon to display an unusual combination of tolerance and openness, for the introvert is a danger to the base as well as to himself. The base leader is usually one of the more senior members of the party and he has the job of handling official telegrams, which are sent in code if secrecy is required, as well as organising base routine and taking his part in ordinary chores. On a smoothly run base he has little extra work to do except when the annual relief ship arrives sometime in January; his responsibility is, however, heavy. How difficult the base leader's task becomes, depends very much on himself, and academic ability is of little help to him in this onerous position.

A few aspects of base life, as seen from the inside, have been described. Whilst most people who go South to spend one or more winters with FIDS are of similar type, interested in adventure and the open air, one still feels on arrival at a base the need to make sacrifices and a conscious effort before things will 'go'. It is somewhat remarkable that the method of personnel selection which involves an interview, medical examination and character references, rarely falls down badly. The departure of the relief ship is usually a happy moment, for a sense of unity descends on the party and in time this grows into deep feeling of happiness and security. We were acutely aware of our isolation but this rarely led to a feeling of loneliness. It is an experience thoroughly to be recommended.

## SUMMER IN SVALBARD

by John Fraser

About nine months ago, four members of this College found themselves in possession of a considerable pile of camping and climbing gear, enough food to keep one man alive for the best part of a year, the loan of several surveying instruments, a bank-balance of some hundreds of pounds - all the wherewithal in fact for an expedition to Jan Mayen Island - but, suddenly, without any means of actually getting there. Two courses of action presented themselves in this dilemma: we could seek alternative transport to Jan Mayen, or we could try re-routing the expedition somewhere else. The third course of inaction was, mathematically speaking, the trivial solution. So whilst persevering in the attempt to get to Jan Mayen, we also began to think of going to Spitsbergen, or Svalbard as the Norwegians call it. What could we usefully do there? There was no time to plan a programme of glaciological work there, such as we had hoped to carry out in Jan Mayen. Careful planning, involving reference to previous work, is an essential prerequisite to serious glaciological research. However we were told by Mr. W. B. Harland of Cambridge that there was a piece of work as yet undone in Spitsbergen, which involved land surveying. When he explained what it was, it seemed just the sort of well defined problem which we could most usefully tackle at this short notice: the triangulation of a peninsula in Vestspitsbergen, the peninsula of Dicksonland.

Thus it was that instead of seeing the huge white cone of the Beerenberg loom over the horizon ahead, it was the long grey coast of Svalbard that greeted us. We had voyaged from Norway on one of the coal boats which ply to and fro during the summer. For coal is to be had in plenty in this bleak land: it is coal, in good thick seams and high quality, which is the economic reason for the presence of a thousand or so men, women and children living at the five mines.

The ship brought us into Longyearbyen, the Norwegian 'capital' of the archipelago. We saw little of it on this occasion, since we set out for Dicksonland that same evening, on board a launch owned by a local boatman, Odd Skog. He was anxious to make use of the current spell of dull, calm weather for the long crossing of Isfjord to Dicksonland. Once we were out in the fjord it was a little unreal somehow; the hills of Dicksonland never seemed to get any nearer and we chugged over the glassy water for hours. Birds of all kinds were very numerous and took little notice of us; their presence seemed oddly to emphasize our solitude. Inside the cabin we were entertained by Odd's flow of reminiscence, of Svalbard, the War, Britain. Away to the west lay an impressive array of rugged hills bearing great glaciers. Ten miles of water lay between us and them - or was it fifteen, or twenty? Odd was speaking of life in Longyearbyen, the evening classes in the long winter months, the school, the occasional visits to the Russian coal mines.



View of Base Hut and  
Dicksonfjord, looking  
south-west.

Eventually we entered Dicksonfjord, and ran parallel to the land we had come to survey. It had an uncompromising appearance. From the shore rose mountains ringed with fortress-like buttresses, fluted bastions barring access to rounded summits. They were not too high, these cliffs, but sheer and rotten, as we saw from the screes that swept down from their feet.

We based ourselves on an old trapper's hut by the shore; it was a one-man hut but served as living room, cook-house, stores and drawing office, and tents were used for sleeping. From this base we made sorties along the coast in our open boat and up the valleys to the interior. There we set up camps from which we climbed the mountains, building cairns and taking bearings. The first weeks were spent cairning, and once a network of cairns was available theodolite work began.

The boat, lent to us with an outboard by Cambridge, proved quite invaluable and greatly extended our scope because of the time and energy it saved. Apart from this the boat trips added interest and enjoyment - another welcome aspect to expedition life. Not soon will I forget one journey up the fjord, into waters like blood in the midnight sun, off a sombre and silent shore. Nor for quite another reason the tempestuous crossing of Isfjord which we later had to make. Birds, seals and once a school of whales enlivened the boating and we never tired of admiring the fulmars' mastery of the air.

Mechanical assistance was lacking once we left the coast and back-packed up the valleys. A wet and tiring business this, and the valley always longer than expected. The main difficulty was crossing rivers which even late in the season could be dangerous. We used every method of crossing, from jumping to removal of trousers. Vegetation consisted of spongy mosses, lichens, flowers and fungi and, in a few favoured spots, grasses. Naturally it made for easier camping if we could bed down on vegetation but often it was lacking and we had to contrive our own padding.

It did not take long to get used to 24 hours daylight, which, indeed, was very handy during fine clear spells since we could then work with the theodolite right round the clock using two parties in shifts. We became as accustomed to rising at 2 p.m. as at 6 a.m. and the only real difference was that the sun was in a different direction. Later on in August the midnight sun became too weak but by that time we were working a normal day anyway.

Mountaineering was not difficult technically, although distances were long and the going sometimes rough in the extreme. A typical ascent was that of Kinanderfjellet in North Dicksonland. It was climbed from a high camp set near a glacier-dammed lake. Our route went easily up the glacier and up tiresome soft snow to a col on the east ridge of Kinander.

Then we could climb over rock and snow to the summit ridge, a narrow twisting arête of very rotten rock. Here we were gratified to discover a natural cairn - a stack of horizontally weathered rock with a top the size of a card table. I composed myself on this with the theodolite and prepared to take the bearings.

The weather was perfect, the sky pale blue from horizon to horizon, and the sun low in the north glowed golden light over the tumbled landscape of rock, ice and snow. Northwards lay the trough of Austfjord, fed by long glaciers winding through jagged ranges of hills, on their way down from the ice-cap. The ice-cap itself lay to our north-east, swelling in broad waves up to the distant skyline, its smooth bare curves broken only by occasional nunataks. Southwards lay our area of Dicksonland and beyond, far across Isfjord, still more mountains. The bed of resistant rock which persists over most of Dicksonland, producing wide summits defended by steep cliffs, dips slightly southwards. So where we were on Kinander it lies at a higher level and in fact constitutes the final hard capping to the summits of North Dicksonland. Though not of spectacular grandeur they are unique in variety of shape - pyramids, truncated cones, open belfries, castles, narrow ridges supporting overhanging pinnacles like Indian clubs - the Mountain Builder has been playful here.

We were not there merely to admire the scenery however, and settled down to four chilly hours of taking bearings. As we worked, a change occurred in the scene; clouds stealthily rolled up the valleys and drowned the lower ridges. They insinuated their mists over the cols and filled the high corries, and before we finished a sea of cloud lay across the land. We retraced our steps down the ridge and decided, because of the mist, not to attempt reaching another peak as we had hoped. It was no time to begin traversing several miles of unknown ridge and glacier. So we plunged into the corrie and down the glacier, closely followed by the writhing mist. Lower down we stopped and watched it lightly veil the mountains, translucent and beautiful. Half an hour later we were picking our way over the endmoraine, just beneath cloud level. It was dull and grey, threatening drizzle. Such can be the speed of changes in the weather.

One of the most interesting trips was when we visited the Russian coal mine on the east coast. Russia was granted certain mining rights in the Treaty of 1924 which ratified Norwegian sovereignty over Svalbard. We had to take bearings from a mountain near the mine and called in to let them know what we were up to. As soon as we had finished explaining ourselves, they offered us a hot bath and very kindly put us up in one of the houses. Communication was achieved by signs, with the help of a very little French and English. Half of our party stayed for a couple of days waiting for surveyable weather and were shown round the local sights, the cinema, chess room, gym, etc.

To us, the strangest aspect of life there was the way in which Radio Moscow was broadcast outside over loudspeakers. They started up at 6 a.m. and shut down at 11 p.m. There were extension speakers in the houses but they didn't provide any variety since they produced just the same sounds.

The southern half of Central Dicksonland was quite different from the area farther north; wide stony plains, deeply cleft gorges, rounded scree-clad hills, small ice-caps - a land almost devoid of vegetation but with a charm of space and openness to it. The screees were incredibly tedious on the ascent, no matter how cunningly one picked a route. But the descent was pure joy - 1000 feet of height could easily be lost in five minutes. Here as elsewhere the cast-off antlers of reindeer were often to be found, but we never saw any other trace of these beasts. Indeed, the nearest we got to seeing any of the land animals was when we found some fox tracks on a sandy beach.

Many other aspects of the expedition demand at least a mention, but space hardly permits. Pages could be filled with amusing incidents which enlivened our camps and climbs, starting perhaps with the tale of how the expedition leader came to be forcibly washed, in the public interest. Then there was the argument that if one fell from an aeroplane over the North Pole did one fall north, south or what?..... The camps we set up, each had its own atmosphere and 'feel', sometimes intensely so. Camp Coal was found when we ran the boat ashore in a tiny sheltered cove onto a beach largely made up of coal shale. Camp Wave we established when seas forced us to abandon a crossing of Isfjord; we turned back, landed at the first possible spot and there it was, a lovely campsite with water supply and springy turf. I have not, possibly, sufficiently emphasized the considerable amount of work which was done. In terms of area, a fairly close second order triangulation was extended over 250 square miles and a plane table map covering about 25 square miles was also produced. To do this we had had to work days of fourteen, eighteen and occasionally even more hours.

It was late in the season towards the end of our stay, and sometimes when the skies were grey and the wind thrust the cold in through our clothing, we felt in it the chill breath of the coming winter. We were there on sufferance, for the long days of summer make up only half the Arctic year. For five winter months the only light is of the moon, the stars and the flickering aurora. But to the Norwegians of Longyearbyen this is the best time. As one of them said, 'We live, we sleep, we work - a little. And all the troubles of the world are far down in the south and do not reach us.'

## IMPERIAL COLLEGE AFRICA AND AMERICAS EXPEDITION

by Dave Hyde

In mid-March, 1960, the Imperial College Africa and Americas Expedition left London to travel by land through Africa and South America in order to study light aircraft operations and requirements in these two continents. Eight months later the team had travelled more than 40,000 miles, 32,000 of these by Land Rover; from over 150 personal interviews which were conducted, a knowledge of the potential market for small civil aircraft in these under-developed areas was established.

The Commonwealth crew, consisting of an Englishman, a Canadian and an Australian, met at Imperial College (University of London) while doing postgraduate study in the Aeronautics Department. Although the expedition was mainly financed by its three members, both the Society of British Aircraft Constructors, through the John de Havilland Award, and the Imperial College Exploration Board provided sponsorship. Most of the ancillary equipment was supplied by other generous organisations.

The first part of our route from London took us through France and Spain, from Gibraltar to Morocco, then across Algeria and the Sahara Desert to Nigeria; from here we motored eastwards through Equatorial Africa and the Congo to East Africa, and then southwards via the Federation into the Union of South Africa.

The trans-Saharan journey now holds few insuperable dangers, probably the greatest barrier being psychological. Regular convoys of commercial vehicles are traversing this vast plain of emptiness for eleven months of the year. We chose to travel in convoy with three such vehicles, so avoiding an insurance fee levied on all lone travellers. The Arab truck drivers, battling along at twenty miles per hour, travelled most of the 940 miles from Adrar to Gao in three days of hard work, snatching only a few hours sleep each day. In places the track was half a mile wide, further routes being added on each side of the original whenever it became too corrugated or covered with sand drifts. Only on a few isolated occasions did we have to use our four-wheel drive facility, thus avoiding the need to dig or push our vehicle out of the sand drifts.

After the tarred Nigerian highways, the arterial roads in Equatorial Africa came as a reminder that we were still in the heart of Africa. Many miles of the main road suffered from a complete lack of maintenance and our speed was reduced to fifteen miles per hour because of large potholes and extremely bad corrugations. Passing through the Congo in the dry season, we avoided most of the violent tropical storms. However, an isolated downpour soon showed us how quickly the road conditions could change; from a smart fifty miles per hour we were slowed to a crawl along slippery channelled tracks, stopping frequently to remove bamboo stalks which had been blown over the road by the high winds accompanying the rain. Nevertheless, certain fruits grow in profusion here, and for a mere three pennies we bought a large bunch of bananas and a king-sized pineapple in one of the native markets.

British East Africa and the Federation provided an unending panorama of subjects for photography; the White Highlands of Kenya, the big game, the huge Kariba Dam project and the unspoiled beauty of Victoria Falls were particular highlights.

All too soon our journey to the Cape came to an end. We had already driven 15,000 miles and, on the aeronautical front, we had consulted representatives from the majority of the light aircraft operators in Africa south of the Sahara.

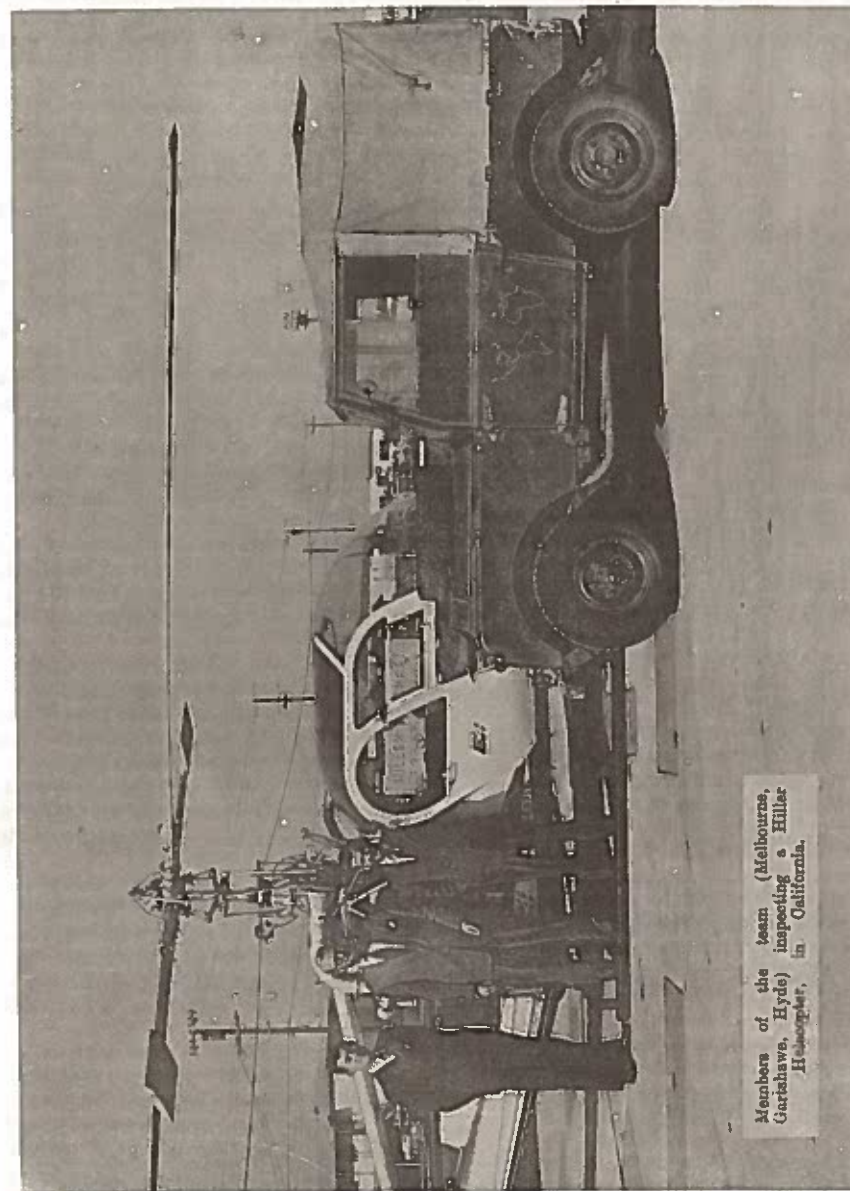
After a welcome 18-day rest aboard the Royal Interocean Lines' ship Tjisadane, the crew and car landed at Buenos Aires and soon set off across the rich cattle-covered pampas of the Argentine. Our first challenge, the snow-clad Andes, soon glistened in the distance. We were impressed to realise that in this range, the highest in the world outside the Himalayas, was Mount Aconcagua, America's highest point at 23,100 feet. As we expected, the pass was blocked with snow and rock slides when we arrived, and even the railway had only just been opened after a two week closure.

With a little persuasion (in the form of cognac!) the station agent located a flat-car for the Land Rover. We boarded the guards' van, a sooty windowless box with a smoky wooden stove, for the journey over the pass. The crossing of about 200 miles took our cog-driven steam train more than 36 hours; snow, rock and soaring peaks often lifted our attention above the soot and smoke of our temporary home. We rode for some time with the friendly Argentine engine driver who stopped the train on several occasions for us to take pictures, or to see more clearly some particularly spectacular sight on his Andean route.

The Atacama desert of northern Chile reminded us of our Sahara crossing completed four short months earlier. The wind blew dust and sand in every corner of the vehicle; a series of flat tyres caused by the nails remaining from deserted and rotting wooden shacks (relics of more prosperous days in the nitrate fields) made the corrugated roads in this area seem longer and less pleasant.

Bolivia's Lake Titicaca, at 12,000 feet, was once a major centre of the Inca civilisation. To reach the vast altiplane on which the lake lies we had once again to climb into the Andes, this time on a steep gravel road which wound past herds of llamas and passed through picturesque villages. The natives in Bolivia are among the most colourful in the world and their markets, filled with a curious variety of foods and herbs, provided excellent material for photography.

Often travelling near old Inca roads, we motored into Peru. The ancient Inca Capital of Cuzco, whose stonework is famous throughout the world, contrasted sharply with the present capital, where supermarkets and broad highways reflect a great American influence.



Members of the team (Melbourne, Garbshaw, Hyde) inspecting a Hiller Helicopter, in California.

In Ecuador we encountered some of the worst roads of the trip, but the patchwork of colours on the precipitous sides of the narrow valleys which characterise the country helped to compensate for the difficulties which the same valleys have created for the road-builders and the motorist. We could sometimes see our road only a few hundred yards away but on the opposite side of a valley - 25 miles by road!

The Pan-American highway will some day pass through Colombia and into Panama, Central America. As yet however, no connecting road exists between these countries, so that motorists must ship their vehicle from Colombia to Costa Rica. Our Land Rover was shipped from Caragena, a Caribbean port, to Puntaronas in Costa Rica, and we ourselves had the luxury of a flight to the Costa Rican capital of San Jose. Picking up our car, we pushed northwards again through Central America. Customs and immigration difficulties we found were avoided by arriving at border points between 9 a.m. and 12 noon or between 3 p.m. and 5 p.m. Monday to Friday; at other times the service is still good but heavy charges are levied for 'special service out-of-hours'!

Another short train journey awaited us in Mexico, just north of the Guatemalan border. The 120 miles, 10 hours ride aboard a flat carriage with the Land Rover was a hot, uncomfortable, but very interesting experience. The train jolted and swayed through very verdant country and past dusty mud and thatch huts surrounded by tall beautiful palms. The Mexican roads north to Mexico City itself are excellent and we lost no time in motoring north to the Gulf of Mexico and then west to the capital.

Mexico City is a large attractive metropolis, with wide tree-lined streets, beautiful fountains and statues, many striking modern buildings and great deal of traffic. The attention to the arts is very pronounced with a comprehensive fine arts palace situated in the heart of the city, next to a cultural museum and display centre. Many American tourists visit this area every year, and Mexico derives over one quarter of its revenue from this source

We had enjoyed our rather hurried visits to twelve south and central American countries, but it was with a great deal of relief that we heard the Texan customs officer ask in his slow drawl 'And where have you all been?'. We realised, suddenly, that we would soon be back in England.

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Continued from page 24.....

We must consider ourselves to be at an advantage here at Imperial College, over many other institutions, in that not only have we a source of finance within the College but that this source, the Imperial College Exploration Board, has already established a name for itself in the sphere of exploration.

## IMPERIAL COLLEGE IN EASTERN ICELAND, 1959-1960

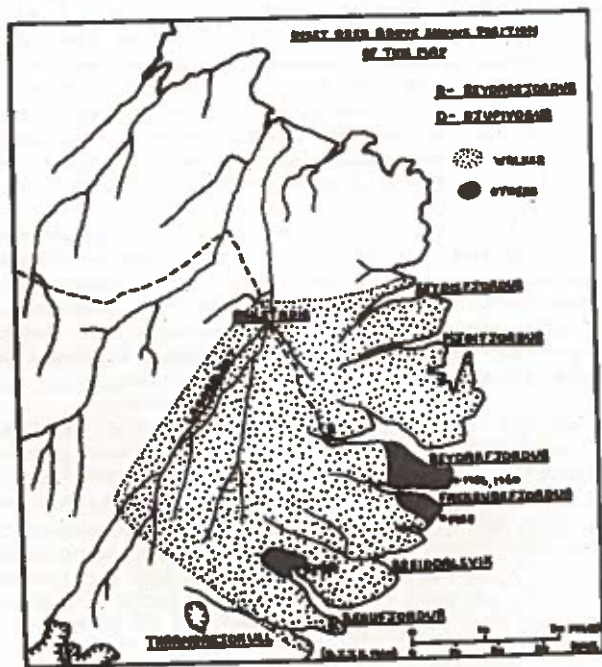
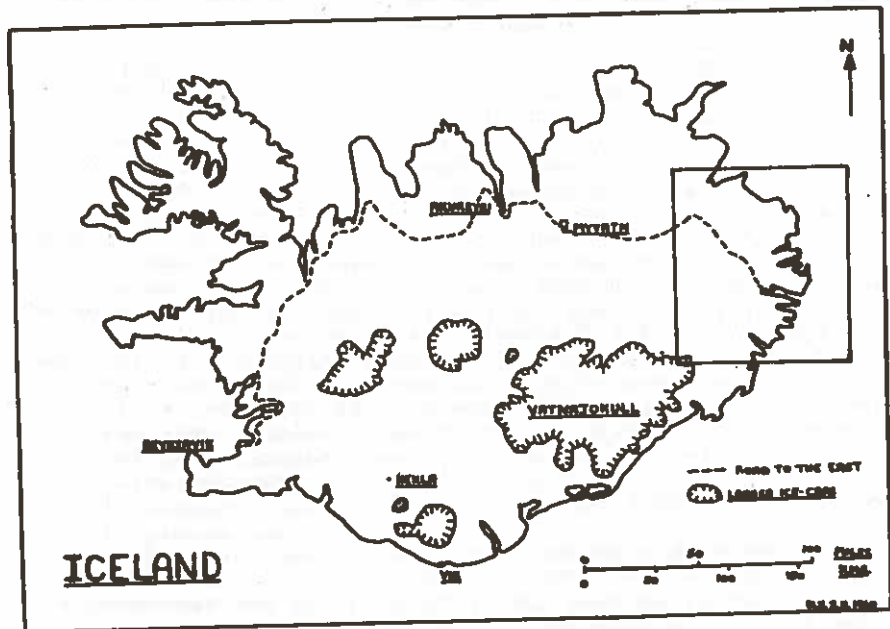
by Dave Kinsman

Iceland conjures up many different pictures in peoples' minds: to the more imaginative it is the land of ice and fire, this being the picture which the Iceland tourist Department most energetically spreads about! This picture though highly coloured, can be regarded as an expression of Iceland's near-unique combination of features. Something over one tenth of Iceland is covered with permanent snow and ice sheets, and in Vatnajokull, the largest of these, Iceland can boast the largest ice sheet in Europe. The Island is well known for its volcanos too, many of which have been active within fairly recent times, over 100 eruptions having occurred in the past 1000 years. The most recent was the great eruption of Hekla in 1947/48 which covered large areas with molten lava and explosive showers of volcanic debris. These two widely different phenomena, the ice-caps and the volcanos, at times combine, as when eruption occurs beneath the ice, and they produce the unpredictable and dangerous 'klaups' or water and mud floods following melting of the ice by this subglacial extrusion of volcanic materials.

To those with a deeper knowledge, Iceland is a land where one can go pony trekking on long trips into the interior, into the stony desert, to the inland ice-caps, to the spectacular thermal areas of hot springs, steam spouts and boiling mud pots, or to present day active volcanos. Much of Iceland can even now only be visited on pony-back or on foot. Great road development has taken place during the last few years and many fords are now spanned with new concrete bridges, but even so these roads allow access to only a very limited part of the country. It should be explained here that the roads are without the tarmac surfaces to which we are accustomed at home: the only tarmac roads are to be found in the capital Reykjavik, and in Akureyi, the capital of the north.

It is then to this Island that expeditions from the College have journeyed for the past five years. These several expeditions have visited Iceland largely to carry out geological research on the Tertiary basalt lavas in the eastern districts. Dr. Walker of the Geology Department commenced a long-term programme of geological research in eastern Iceland in 1954 and has visited the island each summer since then,

In 1956 on the first expedition supported by the newly formed Imperial College Exploration Board, four geologists, Walker, Carmichael, Ibbotson and Mc Queen visited the Island. Upon arriving in Reykjavik they drove eastwards and south-eastwards to Vik, the southernmost tip of Iceland, on route paying a visit to the Solheimajokull glacier. A detour was made on their return to Reykjavik to the recently active volcano of Hekla where lavas, poured out in 1947/48 were found to be still slightly warm, an excellent demonstration of the excessively slow rate of cooling of rocks from the molten state (rocks are notoriously bad conductors of heat).



The world-famous Geysier was visited, and also the large and beautiful waterfalls of Skogafoss and Gullfoss. Just east of Reykjavik the party stopped at Thingvellir, the site of the ancient Icelandic Parliament or Althing, said to be the oldest true Parliament in the world, having been first constituted early in the tenth century A.D. The party then drove northwards to Akureyri, passing on their way Hvalfjordur - fjord of the whales: a small whaling station still exists there- and many other notable places of interest. This stretch of road is the best in the Iceland: large buses daily complete the 250 mile trip in under twelve hours, including quite substantial stops for meals. North of Akureyri a stop was made to examine the rocks and also the now abandoned waterfall of Asbyrgi and the large, active waterfall of Dettifoss. At Dettifoss the water tumbles over a series of beautifully columnar basalt lavas similar to those of the Giants Causeway in Northern Ireland, although not as perfect in development.

The road eastwards from Akureyri is interesting and exhilarating, for here one climbs the mountain ridge and then descends to the valley by way of a fine series of hair-pin bends. Here in the valley is one of the four expanses of trees to be found in Iceland today. These trees are mainly birch and reach a height of twenty or thirty feet. It is interesting to note that very large areas of Iceland were covered with trees at the time of the Settlement, late in the ninth century A.D., when the Island was first colonised. Continued felling of these trees, overgrazing by domestic animals, and possibly the deterioration of climate which set in during the late Middle Ages have caused this widespread deforestation. Eastwards again the route passes the large lake of Myvatn, crosses the northern part of the central desert and reaches Egilsstadir situated at the lower end of the Lagafjot, a long and narrow lake. The route to the east coast from Egilsstadir crosses the mountains and finally descends to the head of Reydarfjordur.

The 1956 party moved to the southern shore of Reydarfjordur where Ibbotson and McQueen spent most of their time geologically mapping the basalt, lavas and rhyolites of that district. Meanwhile Carmichael began the detailed mapping of the Thingmuli Volcano, a vast pile of lavas, several thousands of feet thick and representing the copious outpourings of an ancient shield volcano. Walker mapped in several localities in the east and then joined two Icelandic geologists on a journey into the interior to the mountain of Snaefell.

In 1957, Walker and Carmichael went to Iceland, Carmichael to continue the work on the Thingmuli Volcano, while Walker was to extend his earlier mapping from Reydarfjordur into Seydisfjordur in the north, and in Breiddalur in the south. Two undergraduate geologists, Kassler and Bridgwater, were to have joined the party later but owing to a shipping strike were unable to reach Iceland.

At the end of their stay Walker and Carmichael visited the south-eastern parts of the Island to examine gabbro and other intrusions and also the intensely altered lavas which occur there.

In 1958 a larger expedition of four geologists and five surveyors went to eastern Iceland. The geologists worked largely on the southern shore of Faskrudsfjorur, mapping the area containing the well-known Sandfell Laccolith, Walker mapped in several localities throughout the region, partly filling in and partly extending the area which is being studied. The survey teams worked on the raised beaches and platforms, eroded remnants of which are to be found in many places along the east coast. The work was concentrated on the well developed 40-45 m. beaches and proved quite successful. The survey party also visited the small ice-cap Thrandarjokull, and despite unfavourable weather built a series of large marker cairns and surveyed the present ice-edge. Their work suggests a slight recession of the ice-edge to have occurred since 1947 although the rate of recession is markedly less rapid than that observed during the fifty years previous to 1947. Apart from the work on the ice cap, that year was blessed with quite good weather and the majority of the objectives of the expedition were able to be completed.

The 1959 expedition comprised three geologists, Walker Gibson and Edwards: work was concentrated in the south, at the head of Berufjordur and in Breiddasvik. The mapping was considerably hampered by bad weather throughout. Plans had been made to revisit the ice-cap, Thrandarjokull, but these had to be abandoned for even the geological programme could not be completed.

In 1960, three geologists again visited the Island, Walker, Gibson, and Kinsman. Gibson and Kinsman confined their studies to the Reydarfjordur-Faskrudsfjordur peninsula: following a somewhat wet start the work progressed well in the fine weather which followed, Iceland this year boasting its best summer since 1928. Walker again mapped in various areas throughout the region.

These various expeditions have reached the east of Iceland by either road or sea, from Reykjavik. A coastal steamer sails from Reykjavik, about once a week, calling in at the larger communities or towns on its way: these "towns" have usually less than a thousand inhabitants (one must consider in this respect, Iceland's total population, which amounts to only 170,000, over half of whom live in and around Reykjavik).

Those expeditions which have largely used the coastal steamer service, such as the 1958 party, have had opportunity to see the magnificent coasts of the Island: sea cliffs are often very precipitous and may reach more than 2000 feet in height; in contrast to these are the extensive glacial sand and gravel areas, to be seen especially on the low-lying south-eastern coasts.

The expeditions which have used the overland route to reach the east have had the opportunity to view other features of Iceland's heritage. Perhaps the area most constantly visited has been that of Myvatn and the surrounding district. Myvatn - meaning lake of the mides' - is the third largest lake in Iceland, although its greatest depth is nowhere more than few metres. This whole area is a paradise for the volcanologist, for here he can see fairly modern lavas, ash-cones, eruptive-fissures, hot springs, and a host of other absorbing and interesting features. Many ornithologists visit Myvatn, for here are to be seen large numbers of duck and other birds which inhabit the lake itself and the adjacent areas of birch scrub. These varied features of the rocks, the trees and other plants, the birds, and the lake makes the area perhaps the most beautiful in Iceland. Near Myvatn too are the hot spring waters in which one can bathe in underground pools and a little further afield are the Sulphurous steam spouts and boiling mud pots.

This brief survey of the expeditions which have visited Iceland shows that although the scientific purpose of each expedition has occupied the major portion of its time, time has also been spent in less exacting manners in visiting and seeing the many strange and curious beauties and phenomena which are truly such a large part of this fascinating Island. The programme of geological research has advanced, for during these years, many hundreds of square miles of lavas now have been studied and mapped. Several scientific papers have already been published on this work and other papers and publications are in various states of preparation. There still remains much to be done and field-work will have to be continued for several years to come.

The finance for these expeditions has come from several sources. Dr. Walker was financed initially by the Central Research Fund of the University and since 1956 has received a Royal Society grant and a grant from the University of Iceland to cover his expenses. The other members of the expeditions have received financial assistance from a number of bodies including the Royal Geographical Society and our own Exploration Board.

To those with simple tastes and a keen appreciation of the world around them, of the natural world, this sub-arctic island had much to offer. The strange beauty of Iceland and the hospitality and kindness of the Icelanders themselves make those who have once visited this Island want to return. Surely no country can offer more than this?



## KASHMIR EXPEDITION, 1960

by R.L. Grasty

In the winter term of 1959 our plans were made. The five of us (all members of the Physics Department) decided that we would like to form an expedition which was of a different kind to those previously sponsored by College. Our aim was to show that it is possible to drive overland to Kashmir and the North West Frontier of India in a normal production car. On the way we hoped to make a detailed survey of such commodities as petrol and water, and return with detailed information on the state of the roads encountered. We were extremely fortunate in being loaned a Standard Vanguard Estate Car for the duration of the trip.

Before we started, the preceding months were spent in deciding what should be taken in the way of food, camping equipment, obtaining all the documents necessary and having injections. For this purpose each member was allotted a certain task. About 3 cwt of food was ordered through the College, most of which was dehydrated to cut down on the weight. It was planned to eat this in the desert where food would be difficult to obtain.

On June 28th 1960 the expedition started out from London, the beginning of a 17,000 mile journey which was to last just over 12 weeks.

As expected the first few hundred miles through France, Switzerland and Italy were uneventful and it was not until Southern Yugoslavia that we hit our first bad stretch of road. We had just completed the 250 miles from Zagreb to Belgrade along the Autoput in 4 hours when the road deteriorated very rapidly and became just a badly pot holed mud track. We were forced to do the next 100 miles in 6 hours, as the vehicle was greatly overloaded and we didn't want a broken spring at this point of the trip. From the Greek frontier the roads were good right through Turkey to the Persian border. Although they were made of loose gravel, in Turkey we found they were fairly fast to travel on as they were kept very flat and even. At one point in the middle of Turkey we almost drove through a heavily guarded military zone but were stopped, then given a military escort through.

Almost as soon as we entered Persia the roads became very bad indeed and remained so throughout the country; the only decent stretches to be found were those a few miles either side of the towns. The main trouble we found was that the roads were very badly corrugated or ridged and that unless one could maintain a fair speed to ride over the corrugation the whole car would feel as if it was being shaken to pieces and practically every nut on the car would work loose.

The heavy lorries which were the only means of communication between towns seemed to be the cause of this peculiar effect. As the roads were all of loose gravel, the rear wheels of these lorries would bounce up and down and cause the corrugations to build up in this way.

Nearing Tehran the scenery was becoming very barren and desert-like, with little or no vegetation, and to break the monotony we decided to have a day's rest by the Caspian Sea, as we had been told that this particular area of Persia was well worth a visit. To get to the coast we had to cross a very high mountain range through an 11000 foot pass and on descending the other side we were pleasantly surprised to see the vegetation becoming more abundant and semi-tropical, with vast fields of rice and many rich green trees; it was really remarkable that in such a short distance the scenery could change so much.

The roads in Afghanistan were by far the worst of the whole trip, and we could never rely on the bridges, for they were liable to have collapsed, or to have large gaping holes to the river bed below. Here we had our first illness on the trip. Two of our party went down, one after the other, with a mild attack of dysentery and we were forced to stop for a couple of days for them to recover. Fortunately this was our one and only hold up due to illness.

Regularly while we were camping down at night we would have practically the whole village, which was perhaps a few miles up the road, surrounding us while we were cooking up our evening meal. As we had heard unfavourable reports of the Afghan Tribesmen, we retired every night with tyre levers, shovels and axes in the tents, but fortunately our fears were ungrounded: we had no trouble at all with the locals. However, when we were camping down for the night in Pakistan, a group of the villagers came up to us making hissing noises and waving their arms about on the ground. It turned out that in the region where we were camping there were snakes around, the bite of which would cause death in seconds. That night we packed out tents in record time and slept in a village school house.

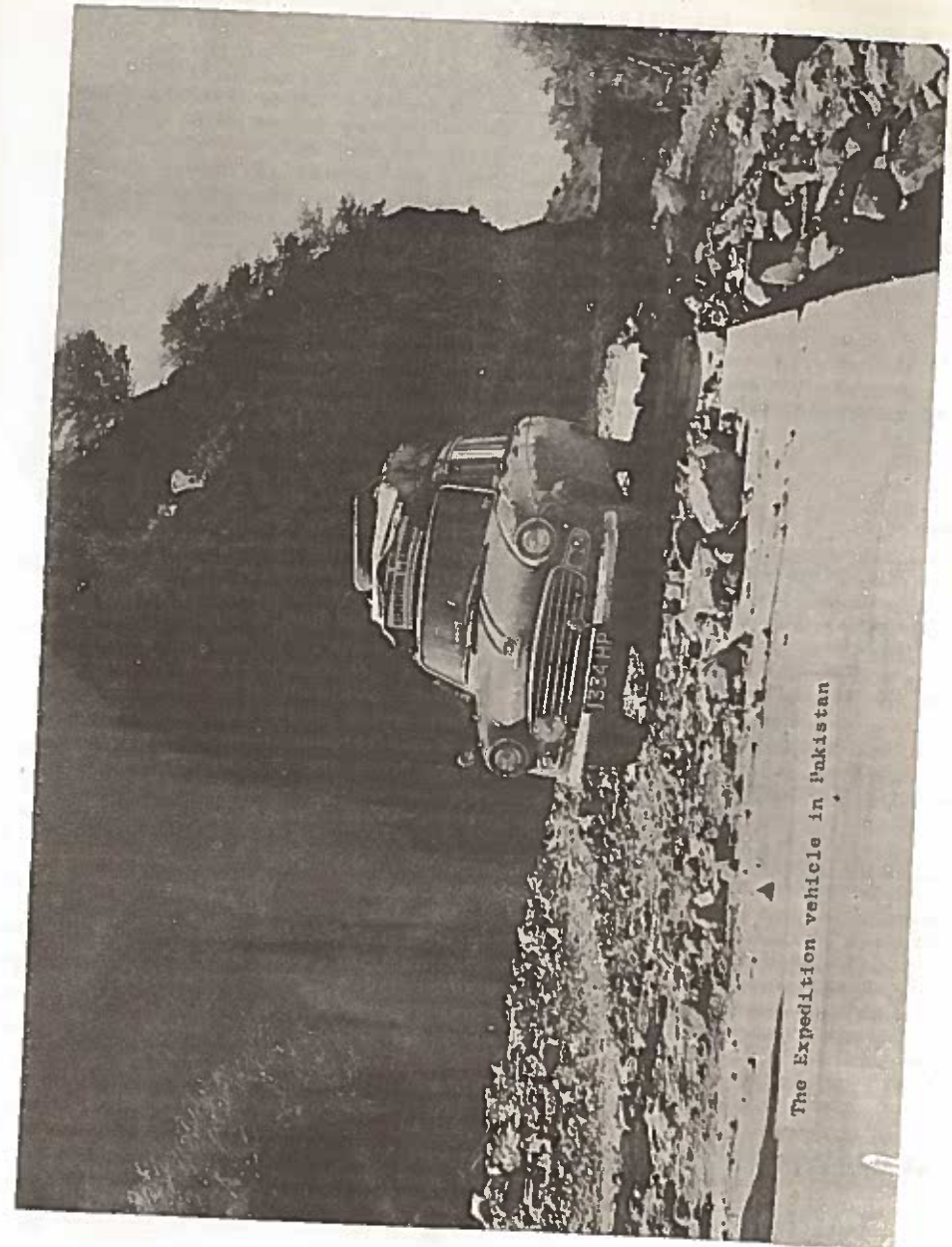
Throughout Pakistan and India the roads were of exceptionally good asphalt, much to our surprise, but the very common bullock carts were a danger, as the drivers appeared to have no road sense. The only road into Kashmir was reputed to be very prone to landslides. We were held up by one which had occurred that morning after a heavy monsoon type shower; the military, who were working on the road, escorted us through one day before it was open to general traffic.

Our fortnight's stay in Kashmir was taken up with a 3 day pony trek into the mountains and climbing a few small peaks around 15000 feet. We also stayed for three days on a houseboat in Srinagar, the capital of Kashmir, and from here visited some of the local woodcarving and papier maché' factories. One of the leading wood carvers in the district invited us over his factory and also to a 17 dish Indian meal which we ate, as was their custom, barefoot and crosslegged on the floor.

As time was by now getting short, we then left the temperate climate of Kashmir and drove down to the extremely hot and humid places of India, to Delhi. There we were privileged to spend three nights in a Hindu temple, on one night of which was celebrated the birth of one of their gods. Most of Delhi appeared to be massed in the temple and street outside, and we joined them by shedding our shoes and walking round the temple. The other days in Delhi were spent in buying up supplies for our return trip and in visiting the Taj Mahal in Agra about 100 miles further south.

Our first major spot of trouble occurred soon after leaving Delhi when one of the rear springs snapped. Fortunately Standards had given us a good supply of spares and it only took us a few hours to repair the fault. We took the southern route back through Pakistan and Persia, missing Afghanistan, as we had hoped to visit the Holyland. This part of Pakistan and Persia was completely barren and desolate. The only vegetation was at the few oases scattered every 200 miles or so. Several times the road disappeared in the sand and now and then we had to get out and push the car when it got bogged down. The temperature was high, all the day around 115° F. and we were forced to travel so slowly that the water in the radiator boiled away. We were very glad of our two jerry-cans which we kept full of water for the radiator and each of us found it necessary to drink at least a gallon of fluid a day.

On arriving at the Iraq customs we were informed that we couldn't get into the country, supposedly because we had been through Pakistan where there was a bad Cholera epidemic and so we had, reluctantly, to miss out our planned visit to the Holyland and return via our outward route. That night was spent sleeping in the Customs at the Persian side, on the floor. On the two following nights we were woken up in the middle of our sleep by a soldier with a loaded rifle who indicated bandits on horses and cutthroats, by signs. We spent those two nights at the army posts, once on their roof.



The Expedition vehicle in Pakistan

At the Turkish Customs we were told we would have to have injections as we had been to Pakistan and we were taken to a hospital. The hospital doctor tried to keep us in quarantine for five days but we were released after sending a telegram to the British Embassy at Ankara, after only 12 hours.

Two members of the party caught the train at Istanbul as they had to leave England in time to start post-graduate courses in America and Canada. The three of us then returned in comfort but in almost continual rain along the Greek and Yugoslav Coast, having to buy a second hand tyre in Switzerland to get the last few miles back to England. We had started out with six of the best new tyres, and all these had been worn and cut to pieces, so that returning through Europe we were getting two punctures a day.

On our return to England the car was returned to the makers. The way in which it had stood the strains of such a rigorous journey is most praiseworthy. We are grateful to the Standard Motor Company for the loan of the vehicle.

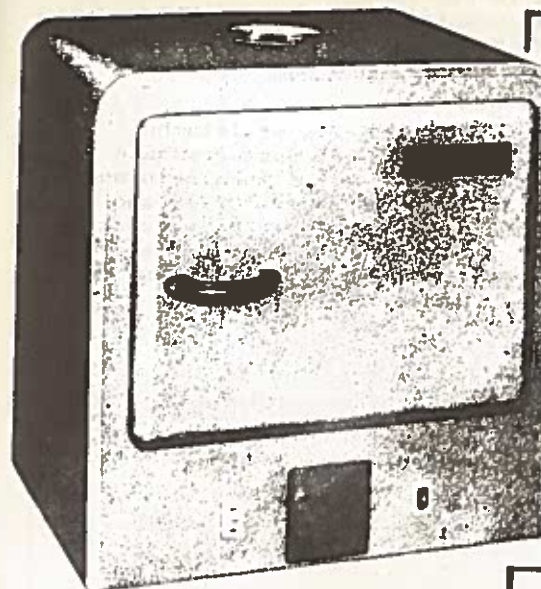
Continued from page 22.....

But despite all the hard work they were having a good time and even if it did entail being chilled to the marrow trying to hammer pieces of rock from the sea-bed they were at least proving something. He ceased feeling the water slopping around his legs in the boat, and the beach seemed no longer to be a battlefield of rollers and rocks.

Continued from page 20.....

The four day stay in Reykjavik while awaiting the boat home was spent in generally tying together the loose ends of the scientific work, eating fish and drinking coffee.

In conclusion, it should be realised that although this account has been concerned primarily with the lighter side of the expedition, there was a sizeable amount of work done (and much remains.) However, as botanical and geological field work hardly make interesting reading, the details of these are left to the Expedition Report.



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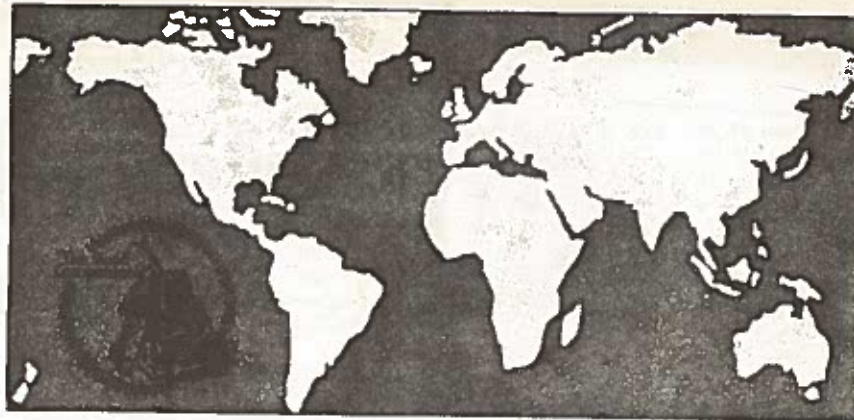
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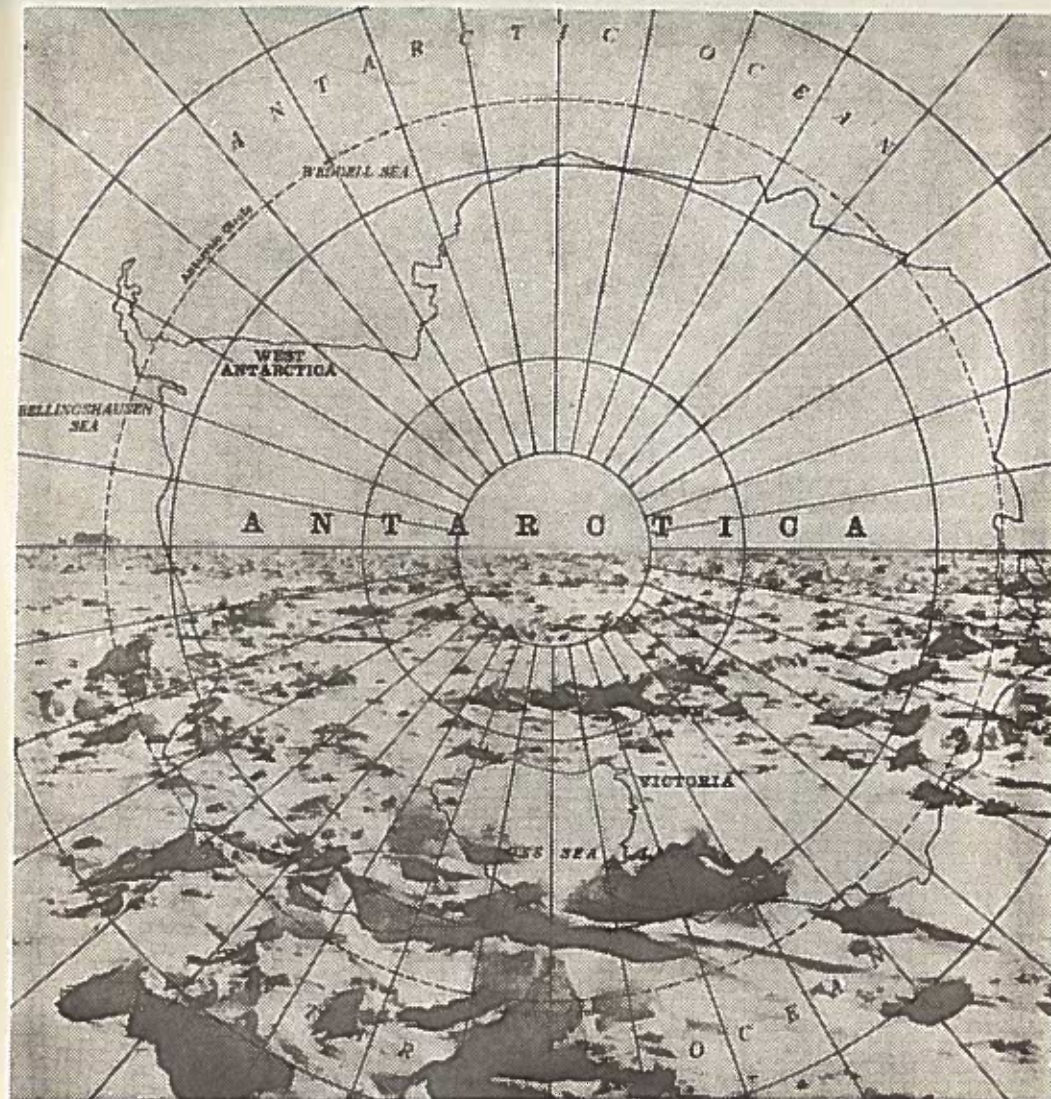
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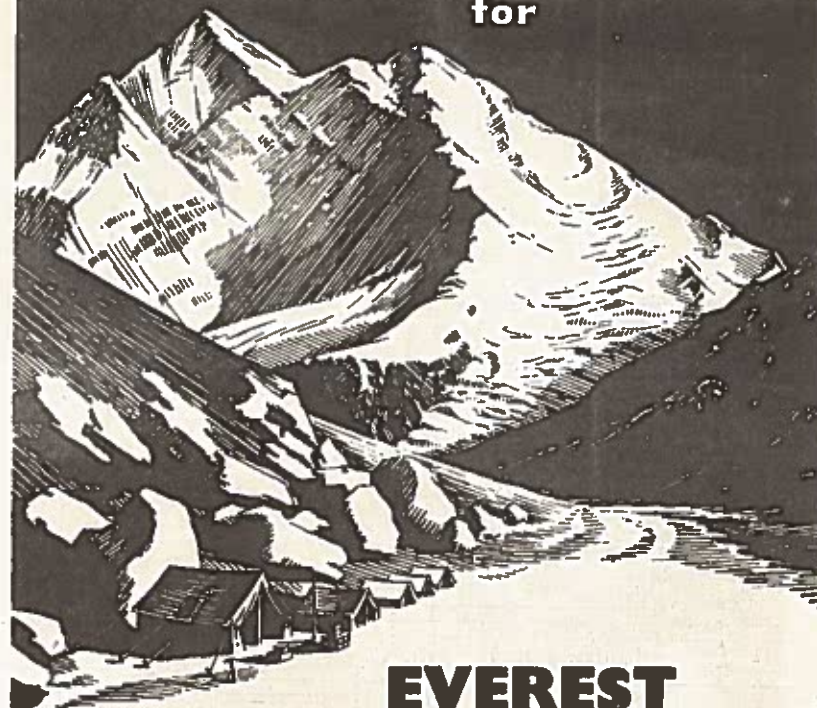
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