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The Imperial Trans-Antarctic Expedition

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presented an impenetrable front, upon which, however, a certain impression was endeavoured to be made by the traveller Sir Thomas Holdich. I am sorry that we had not more travellers to speak to us to-night, particularly from Central Asia, because I can truthfully say that, of the men who have distinguished themselves by explorations in those regions, the greater number are strong believers in the increasing desiccation theory. If Mr. Carruthers—our Gold Medallist of a year ago, and the author of an admirable book on Unknown Mongolia—had been here he would have had something to say from the point of view of his own experiences in Central Asia. Sir Francis Younghusband would have said much the same thing; and in the days when I used to travel in those countries I encountered in many cases evidence, supported by historical facts, of desiccation on a large and increasing scale. Therefore, while offering all due deference to the scientific phalanx that I before described, I think there may be something to be said on the other side which has not been said this evening. However, one great debt we owe to the reader of the paper: he has accumulated and placed before us an enormous amount of evidence, which, so far as I know, cannot be found anywhere else; and it may be that although the men of science, led by him, have had their way to-night, some of the authorities on the other side may come up in the *Journal* later on and discuss the views that have been laid down. For the moment it only rests with us to express our hearty thanks to Prof. Gregory for the information that he has given.

THE IMPERIAL TRANS-ANTARCTIC EXPEDITION.*

By Sir ERNEST H. SHACKLETON, C.V.O.

PROF. DAVID has outlined very clearly the main scientific—and especially the geological problems—that remain to be solved in the Antarctic. It is not my intention to deal with these various points, nor am I capable, not being a trained geologist, of discussing them from what I might call an inside point of view, but it is obvious to every layman that an immense amount of work remains to be done in the South Polar regions before the knowledge of this mysterious country is complete.

In my written statement to this Society (*Geographical Journal*, February, 1914, p. 173), I said that first and foremost the main object of the expedition is the crossing of the South Polar continent from sea to sea. Some people condemn this object as spectacular and of no particular use, and consider that no expedition should set forth without the one object of being purely scientific. Until the South Pole had been reached, deep in the mind of every explorer who penetrated into the Antarctic was the desire to reach this goal. Every expedition that set forth equipped to penetrate into the Antarctic, from the leader downwards,

* Statement made by Sir Ernest Shackleton at a meeting of the Society on February 9, 1914, after the paper on Antarctic Problems, by Prof. Edgeworth David, which will be published in a later number.

INDIRA COL, 20,860 FEET, OR WATER-PARTING AT NORTH SOURCE OF ROSE GLACIER, WITH VIEW NORTH TOWARDS CHINESE TURKISTAN SHOWING THE EASTERN SIDE OF GUSHERBRUM GROUP AND GUSHERBRUM GLACIER RUNNING NORTH-NORTH-EAST.



had the desire to get as far south as possible. My desire is to cross the Antarctic continent, and in undertaking this expedition the members of it are the agents of the British nation. If I said differently I would be untrue to my convictions. I have put the crossing of the continent as the great object of this expedition, and there is not one person in this room to-night, and there is not one individual who is under the Union Jack in any part of the Empire, who does not wish the British flag to be the first national flag ever carried across the frozen waste. But though this is the foremost aim of the expedition, it does not mean that science is not to play a part almost as great in the expedition. I am thoroughly alive to the demands of science; I am fully alive to the need of scientific work; I am aware that this gathering here to-night came to hear a scientific discussion. Now, how are the demands of science to be satisfied by the work of this expedition? I will give you briefly the personnel representing science on the expedition.

The trans-continental party will consist of six men, and one of those six will be a trained glaciologist and geologist, and as the main work of the trans-continental party, apart from the journey, will be the study of ice formation and the nature of the mountains we may expect to find, this man will represent science.

The other five members of the expedition will devote their attention when the long day's march is over, and in the intermediate intervals that constitute breakfast and lunch, and on the march itself, take note of the meteorological conditions, and one especially will daily take the magnetic dip readings.

The very nature of the journey from sea to sea will solve, once and for all, the question of a divided continent or a homogeneous continent. Therefore every step taken into the unknown, apart from the sentimental reasons, is an advance to geographical science. Should we do the last 800 miles over known country in order to ensure our certain return, there are 900 miles of new country to satisfy the most exacting critics. Better to go the last 800 miles over a known route and bring home your results and your knowledge, than not to come back at all, for then there would be no results to science, for, the party being dead, there would be no information. So much for the trans-continental journey.

At Weddell sea base there will be eight other men, making three parties. One party of three will move from winter quarters towards Graham Land to the west, and this will be one of the most important of the journeys. This party also will have a trained geologist. They, I hope, will be able to make close examination if they come across mountains—which they should do—and find whether Graham Land mountains link up with the mountains that we found west of the Pole and traced further to the south-east by Amundsen.

The eastern party will proceed towards Enderby Land to the east, and will also have a geologist and glaciologist, and two men will remain at

the base station of the Weddell sea, one a biologist to deal with the biological problems that present themselves as regards the sea fauna and land fauna, and another, a meteorologist, will be a trained meteorologist, and will, with the aid of self-recording instruments, study continuously the meteorological conditions of the Weddell sea, which, in conjunction with the South Orkney station of the Argentine Government, help to throw light on the rainfall of South America, to show the importance of meteorological observations in the Antarctic. It has already been found that there is a close relation between the rainfall of Chili and South America generally with the open or close season of the Weddell sea. This, by the way, has already an economic result and will have, when further known, a more far-reaching effect on the agricultural industries of this great country.

The Weddell sea ship will do hydrographical work under the complete charge of Captain Davis, who has had a great deal of experience in trawling, dredging and sounding in the Antarctic ocean, and I am glad to say that Sir John Murray has agreed to take charge of all the samples we recover from the bottom of the ocean, and he stands pre-eminent as regards this work, as is well known. Also on board the ship there will be a biologist. So much for the Weddell sea scientific party.

On the Ross sea side, a depôt party of six, who may proceed south of the point that I shall definitely select later, will have in their complement one trained geologist. It may be that I shall decide to go down the Beardmore glacier, which we discovered during the *Nimrod* expedition, and this party may proceed to the top of the Beardmore glacier and camp, if time permits, for three weeks, whilst waiting for the trans-continental party just about the position of Mount Buckley where we discovered for the first time seams of coal in the Antarctic. This area is a veritable paradise for the geologist, and here he may read at first hand the story of the rocks and all that has been before and that has passed in the remote geographical periods before this land was hidden beneath the ice. I think it is only fitting that this area, which we had the good fortune to discover and to bring back specimens from, should be further explored by an expedition consisting of largely the same members.

Therefore, to sum up from the scientific point of view, I hope to have on the expedition, four geologists, two biologists, one meteorologist, all of such calibre and knowledge as will ensure a certainty of good work, and I would add that the laymen of the expedition will be no whit less enthusiastic and desirous of helping the experts in the acquirement of this scientific information.

As I said at first, and I want it to be the last thing in your memory, I do not hide the fact which I have already stated openly that the crossing of the continent lies first and foremost in our hopes, and I feel that whatever it may be called, sporting feat, or whatever name it may go by

amongst the sympathetic or the unsympathetic, this work is the primary work of the expedition.

If there is anybody in this hall to-night or in the large audience that will read this to-morrow, who is ready to put up ten, twenty, thirty, or forty thousand pounds to aid the scientific side of the expedition I will take as many geologists as they are ready to provide me with. It has always been the case with Polar expeditions of making bricks without straw, and it really ought not to be any part of the work of the leader of an expedition to have the anxiety of collecting funds; his energy should be entirely devoted, and the energies of his comrades, to the organization of the expedition.

REVIEWS.

EUROPE.

THE YORKSHIRE MOORS.

'The Moorlands of North-Eastern Yorkshire: their Natural History and Origin.' By Frank Elgee, F.G.S. London: A. Brown & Sons, Ltd., 1912. Pp. xvi., 361. 70 *Illustrations* and 2 *Maps*. Price 15s. *net*.

IN this book the author has gathered together the results of over fifteen years' research into the biology and geology of the moorlands of north-eastern Yorkshire. Moors in different parts of the British Islands have been described by Robert Smith, W. G. Smith, C. E. Moss, W. M. Rankin, F. J. Lewis, R. Ll. Praeger, and G. H. Pethybridge, and the results summarized in A. G. Tansley's 'Types of British Vegetation.' On the continent of Europe valuable work on moors has been published, especially by Schröber, Weber, and Graebner. Mr. Elgee has duly taken this work into account in the valuable contribution which he makes to the subject.

The first nine chapters deal with the botanical aspects of the moorlands, the next four with the geology, and the three following with the zoology (chiefly birds and insects); and there is a well-written concluding chapter in which the results of the author are summarized. An appendix gives valuable particulars relating to the moorland butterflies and moths of Europe; and there is a very good index. The work is illustrated by about seventy photographs, reproduced in half-tone, and there is a fully coloured geological map of the district, and a map indicating the extent and boundaries of the moors. The book is written in an interesting way; and, although it can scarcely be described as a popular work, its technicalities are not so pronounced as to render the study of the book difficult to non-scientific readers.

Many controversial points are discussed, and naturally, therefore, the conclusions stated by the author will not be accepted by all specialists; but it is right to add that the author makes it clear whenever he is dealing with disputed matters, and that his opinions are stated with due modesty, though with perfect frankness and without ambiguity. It may be pointed out that the author differs with Mr. Clement Reid on the important subject of the influence of the glacial period on the flora of this country, for Mr. Elgee believes that the driftless portion of his area supported some kind of vegetation throughout the period of