

THURSDAY, NOVEMBER 26, 1874

## THE ENGLISH ARCTIC EXPEDITION

HER Majesty's advisers can by no means be accused of precipitancy in the decision they have recently come to, to send out a new Arctic Expedition; they have certainly waited for "the fulness of the time," which, for the lay mind, may be said only to have been accomplished with the return of the Payer-Weyprecht expedition. We believe that the scientific societies of the country had good grounds for urging upon Government the propriety of fitting out an expedition for Arctic discovery years ago; all who understand the Arctic question, we are sure, will coincide with us in the opinion, that had energetic measures been taken when the subject was first urged upon the attention of Government, the earth's surface around the North Pole would by this time have been on our maps. Still, Government cannot be blamed for this tardiness; it cannot be expected that men who have no occasion to make a special study of scientific questions can see them in the same light as those whose great work in life is scientific investigation; and, moreover, in a country governed as ours is, Ministers, before coming to a decision on any important matter, are bound carefully to feel the country's pulse, not to mention their duty in respect of the country's purse. Her Majesty's advisers have, then, no doubt been, from their point of view, wise in deferring till now their decision that England should once more come to the front in the exploration of the unknown "Polynia;" as they also would have shown themselves extremely unwise and unable to read the country's wishes had they postponed the matter any longer.

That the Ministry have rightly divined the general wish in reference to the part which England should play in Arctic exploration is evident from the all but unanimous approval with which their decision has been met by the press. The unaccountable roar—undignified howl, we had almost said—which, either too late or too soon, fell from the (evidently, in this case, ill-informed) "leading organ," need not be made much of. It was evidently not the result of a candid and comprehensive consideration of the whole question by one competent to decide. Were the objections so bitterly uttered by the *Times* against Arctic exploration to have force, they would equally hold against all abstract scientific investigation whatever, and indeed against all work not undertaken for the lust of gold. Happily, however, it is long since the race has become convinced that "man cannot live by bread alone," and that there is a hunger that will never be appeased so long as a shred of mystery hangs to this earth of ours and to the mighty universe of which it forms part; and there is no danger of man's noblest appetite becoming extinct for lack of material to feed upon. But, indeed, the *Times* article is a puzzling one; it is so inconsistent with its opinions on questions of a similar kind, and with its advanced opinions on scientific questions generally.

As to the propriety of Government undertaking the organisation of an Arctic expedition, we have said so much already on this subject, both directly when the subject was formerly before the public, and indirectly in

connection with the advancement of scientific research, that we need not refer to it here again. That any but a Government expedition under naval discipline is inadequate for the work of thorough polar exploration has been practically proved over and over again; what can be accomplished by an expedition so organised, under comparatively favourable circumstances, may be seen in the valuable work already achieved by H.M.S. *Challenger*. For similar reasons, we need not refer to the many important advantages to science, and therefore to mankind, which are certain to result from a thorough exploration of the regions and the terrestrial conditions around the pole. For one thing, it is scarcely any exaggeration to say that all the civilised world is looking to Britain for the final unravelling of the Arctic mystery, to complete the work which has already added so considerably to the general sum of her glory: witness Dr. Petermann's letter, vol. xi. p. 39:—

"I do not know," Petermann says, "the views held in England now, but I know that to us outsiders the achievements and work of a man like Sir James Clarke Ross or Livingstone have done more for the prestige of Great Britain than a march to Coomassie, that cost nine millions of pounds sterling. That great explorer, Livingstone, is no more; his work is going to be continued and finished by German and American explorers; we shall also certainly not let the Arctic work rest till it is fully accomplished, but it surely behoves Great Britain now to step in and once more to take the lead."

How keenly the resolution of the Cabinet has been appreciated by naval and scientific men, is shown by the number of competent volunteers which have already come forward for the expedition; so many, indeed, as to make the task of selecting embarrassing; so far as suitable men are concerned, a dozen Arctic expeditions might be efficiently fitted out.

As to the route, herein also has the Government shown its discernment; there can be no doubt that any expedition, one of whose objects is to attempt to reach the pole, is shut up to adopt the Smith's Sound route. Capt. Koldewey's work in 1869-70 proved finally the impossibility of penetrating to the pole between Greenland and Spitzbergen; the recently returned Austro-Hungarian expedition proves that the task is equally hopeless on the Novaya Zemlya side of Spitzbergen; Behring Strait is out of the question. Thus the demonstration that the route by which the *Polaris* accomplished so much is the gateway to the pole, has been completed by the attempt of the Payer-Weyprecht expedition; and thus, no doubt, the Government has shown considerable prudence in delaying its decision until the data were complete, as well as its generous readiness to step in at the right moment. As we said last week, now that the expedition has been decided on, its equipment will be carried out on a thoroughly liberal scale. A note this week tells what has been done by Sir Leopold M'Clintock as to the selection of the vessels which are to carry the expedition, and, as we learn from an evidently authoritative article in Saturday's *Daily News*, the strength of the expedition will probably consist of from 100 to 120 officers and men. Preparations have been already begun, and as the expedition will probably not sail till the month of May next year, we may expect that it will leave our shores more perfectly equipped in every respect than any expedition that has hitherto sailed to the same quarter of

the globe; what Government will do when it takes such work in hand, we have a good example of in the *Challenger* expedition.

There is now such a vast stock of experience in Arctic exploration from which to derive lessons for guidance as to the equipment of the new expedition, that we have every assurance the new expedition will be organised in such a manner as to secure the maximum of efficiency with the minimum of danger and discomfort. But, indeed, Mr. Markham has clearly proved, in his "Threshold of the Unknown Region," that the cry of danger has no foundation whatever, and his statement is only confirmed by the three most recent and by no means adequately equipped expeditions, those of the *Polaris*, the *Germania-Hansa*, and the *Teggethof*.

It is calculated that the expedition will cost about 30,000*l.* a year, "which," as the *Daily News* justly says, "is surely a very moderate expenditure for an object so important. The officers and men of the expedition will belong exclusively to the Royal Navy; the former will be selected for their scientific qualifications, and will at once enter on the study of the special subject, a knowledge of which the purposes of the expedition demand." No doubt, then, every branch of science on which exploration near the pole of the earth is likely to throw light will have a competent representative on the staff; and here we would urge upon the organisers the great importance of the spectroscopic examination of the aurora in those regions where often it can be studied almost nightly; no doubt there will be some competent man on board to look after this investigation.

From this expedition, then, entered on after the most mature deliberation, and likely to be organised on the most liberal basis, science may expect to reap a rich harvest. To quote the concluding words of the article already referred to: "As the object of the expedition is not merely to reach the pole, there will be no hurried racing to attain that point. The whole phenomena of the polar area is of deep and still mysterious interest. The opportunity now is within reach to lay open to the scientific world a mass of invaluable data relating to the region which lies concealed behind the 80th parallel of latitude and within an area of two million square miles. It may be shown that no such extent of unknown area in any part of the world ever failed to yield results of practical as well as of purely scientific value; and it may be safely urged that, as it is mathematically certain that the area exists, it is impossible that its examination can fail to add largely to the sum of human knowledge."

#### OBSTACLES TO SCIENTIFIC RESEARCH

SOME remarks with which Prof. M'Nab prefaces a paper "On the Movements of Water in Plants," recently published in the Transactions of the Royal Irish Academy, deserve serious consideration as an instance of the obstacles which exist in the way of scientific research in this country quite apart from the personal difficulties of those who may wish to engage in it. He complains that "the chief difficulty I have had to contend with has been the impossibility of obtaining in Dublin, in the same locality, the two essentials for experimenting, namely, a laboratory and a botanical garden. The appliances of a

chemical laboratory must be within easy reach of the plants to be experimented on; if not, then errors are sure to be made; and as much time would necessarily elapse between procuring the plant for experiment and the commencement of the experiment itself, the results obtained would certainly be untrustworthy. In fact, the nearer the plants are to the laboratory the better; the results will be more accurate, and the experiments much more easily performed. . . . A large number of most interesting and valuable experiments might be made if only a few pieces of apparatus could be placed near the plants to be experimented on. A balance, a water-oven, spectro-scope, and the like, are essential; while the few chemicals and small pieces of apparatus could easily be had. There can be little doubt that the reason why so few physiological experiments are made in this country is to be looked for in the absence of the necessary laboratory accommodation near our gardens. In Germany and France the agricultural stations supply most of the researches in vegetable physiology. Here, however, all depends on private enterprise; and when there is an observer capable of undertaking experiments, he may not be willing to incur the expense of supplying plants and apparatus."

At the present time there is no place in the whole country where facilities for investigations in Physiological Botany are in any way afforded. Even Vegetable Chemistry is confined to the laboratories at Cirencester and Rothamstead, both private property and with a scope somewhat limited by their immediate relation to agriculture. Besides these it would be hard to mention, even in the whole British Empire, any other place where this kind of research is carried on, unless we except the Government manufactory of cinchona alkaloids under Mr. Broughton's charge on the Nilghiris, which has yielded, incidentally, new information on many interesting points. It is true that the Science Commission has reported in favour of opportunities for the pursuit of investigations in Physiological Botany being afforded in the Royal Gardens at Kew. But there seems but faint hope of anything of the kind being done—or in any adequate way. Even the action of our Universities, munificent as it has been in some directions, has been reactionary in this. As long as Dr. Daubeny was Professor of Botany at Oxford, the small chemical laboratory belonging to Magdalen College, adjacent to the Botanical Garden, was available for purposes of research of this kind. Now it is separated altogether, and used for purposes of college instruction. And it may be added that this laboratory will always be a classical spot as having been the place where the first researches on the relation of light of different degrees of refrangibility to the elimination of oxygen from tissues containing chlorophyll were carried on. Hunt, Draper, and Sachs have arrived at a better knowledge of the subject, but Daubeny was able to show first that the effect is principally due to the influence of rays in the neighbourhood of the yellow portion of the spectrum, and that those of higher refrangibility are practically destitute of any influence in the matter—a result, even now, that it is firmly established far indeed from being *à priori* explainable.

So much has now been clearly worked out in respect to the physical details of the "vital" processes of plants,