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International Co-operation in Science

AT the present time, when all nations are faced with many difficult problems in economics as well as in their political relations with one another, they are being compelled to organise their resources to the best advantage, and this may lead, and in certain cases has led, to preferring a nationalised system to the international co-operation that many would rather aim at. This influence must also be felt by scientific men, and may tend to make them visualise the problems with which they deal from a more restricted point of view.

On the other hand, science itself has been advancing at an ever-increasing pace during recent years, and this has been largely due to the free and active international co-operation which has existed and to the personal relationships which have been formed between scientific men in all countries. Not only has this been the case in the exact sciences and in their various applications to the welfare of the community, but also it is being widely held that investigations carried out on scientific lines will greatly aid in the solution of many of the problems of the present time. Science, which is much more than the mere systematisation of data, has done so much to promote international co-operation in its own field that it may well encourage a similar spirit in other fields of human activity.

International co-operation in science, it may be granted, is generally accepted by scientific workers, but it is by no means certain that the fact is equally appreciated by those who are politically in control of world affairs. The question must often have arisen, therefore, whether or not a clear and formal declaration should be made by a responsible body of the principles of co-operation between men of all nations which have proved so fruitful for the progress of science.

Clearly, such a declaration would have to come from a body as widely representative as possible of scientific thought. There is not at the present time any scientific organisation which includes all nations of the world, but to the International Council of Scientific Unions, which is meeting next month at Brussels, some forty countries have already adhered, and others can join it at their own desire. Moreover, the Unions related to it work through about a hundred and thirty national committees in the various countries, which have adhered to one or more of these

Unions in order to promote international co-operation in their particular fields of science.

Here then is a large and active international organisation which might with advantage discuss at its forthcoming meeting this problem of international co-operation on wider lines; and in fact the Royal Academy of Sciences in Holland has notified its wish as a member of the International Council to bring this question to the notice of the General Assembly. A resolution has been circulated to the countries and the Unions which are members of the Council in which, after expressing the conviction that ultimately a way will be found leading to a more harmonious structure of the world, stress is laid upon the importance of maintaining international co-operation in the domain of science in all circumstances. While realising that in every country scientific men will be drawn more and more into spheres of national organisation, the resolution expresses the hope that they will not lose sight of the international character of science, and will continue to foster the conditions necessary for international co-operation, since the 'brotherhood' of men of science can be an important factor in attaining the mutual understanding and helpfulness so necessary not only for science but also for all aspects of human endeavour.

The International Council cannot dictate a policy to the various Unions, but there is little doubt that the adoption of a resolution on these lines would carry considerable weight. Moreover, although the resolution is directed to allied organisations, it is clear from its tone and general content that it is meant to be an appeal to all scientific organisations, and to all scientific workers as well, urging them never to lose faith in the significance of science, pure and applied, for mankind. It is to be hoped that the appeal will find a response in every country, whether adhering to the International Council or not, for it is a matter which stands above all political and other divisions. The International Council, as the largest existing body representative of international science, is the appropriate body to issue such a declaration, and we trust that it will be given careful consideration. If the immediate effect alone would be to induce those countries which are not yet represented upon the International Council to find an opportunity to join in its work, then the resolution might be regarded as a significant step towards the establishment of fuller co-operation among the scientific workers of the world.

The Description of Nature

Atomic Theory and the Description of Nature. 1: *Four Essays, with an Introductory Survey.* By Niels Bohr. Pp. vi+119. (Cambridge: At the University Press, 1934.) 6s. net.

IT is fitting that the year in which the Bohr theory comes of age should hear a pronouncement by its author on the view of Nature to which it has led. It is true that in one sense the pronouncement is not up to date (the book is a reprint of previously published articles, the latest of which first appeared in 1929), but the scant amount of fundamental progress in the last few years, combined with Bohr's remarkable power of always seeing a little ahead of the existing position, makes this of small significance. The most striking of the subsequent advances have been the discoveries of the neutron and the positive 'electron', and in the other volume "containing a number of later essays on the same subject, in which the general point of view is further developed", which we are promised in the foreword, we may hope to find some account of the theoretical aspect of these discoveries. In the meantime, however, the present volume may be taken as a true representation of the view of Nature afforded by the quantum theory to one of the keenest pairs of eyes in the world of physics.

Two of the four essays which, together with an introductory survey, make up the contents of the book are familiar to readers of NATURE, having been published as Supplements in 1925 and 1927. The third essay appeared in German in *Die Naturwissenschaften* in 1929, and the fourth in Danish in *Fysisk Tidsskrift* in the same year. The introductory survey also appeared originally in Danish in the Year Book of the University of Copenhagen for 1929. Although, therefore, only a portion (a little less than half) of the material now makes its first direct appeal to English-speaking readers, that portion is the latest and, as it happens, the most concerned with the broader aspects of the subject.

Bohr's view of the situation created by the quantum theory is well known, and his principle of 'complementarity' is perhaps the clearest expression yet given to the dilemma by which we are faced.

"The definition of the state of a physical system, as ordinarily understood, claims the elimination of all external disturbances. But in that case, according to the quantum postulate, any observation will be impossible, and, above all, the concepts of