

## POWER PRODUCTION BY NUCLEAR ENERGY

A CONSIDERABLE measure of agreement was revealed at the discussion on power production by means of nuclear energy held in the hall of Jesus College, Oxford, on August 30 as part of the International Conference arranged by the Atomic Scientists Association.

Lord Perwell, who opened the discussion, held that great harm has been done by the exaggerated stories which have appeared in the Press, suggesting that these new sources of energy would usher in the millennium. As only about one twentieth of the national effort in Great Britain is devoted to producing and distributing power, and the greater part of this is in costs of distribution, there would be only a small gain even if power could be produced at no cost at all by atomic energy, and of this there is at present no prospect whatever. To pretend, as has been suggested, that it would lead to a 4-hour day or 20-hour week is, therefore, manifestly absurd. On the other hand, these tales have provided an admirable opportunity for every country in the world to produce bombs under the guise of developing atomic energy. He doubted whether Governments would have provided the large sums of money which had been made available in various countries for nuclear research if this had been merely directed to civil use; it seemed to him that the military aspects were the driving force and the industrial applications were the excuse. Why otherwise should expenditure on purely peaceful research, that is on metallurgy, or on plastics or on getting power from sunlight, which would probably yield a bigger return than expenditure on nuclear energy, be on such a comparatively small scale if indeed it were incurred at all by many governments?

There would probably be valuable applications of atomic power production for special purposes, such as warships or even ordinary ships, or opening up desert countries; and great benefits would accrue from the use of tracer elements, and possibly there might be direct medical applications. For these reasons, research and development should, of course, proceed. But scientific workers should combine to decry the exaggerated tales which are going the rounds. They provide the excuse for any government minded to make bombs to insist on building large piles, and thus to make international inspection and control very much more difficult than would be the case if it were frankly recognized that such activities could be postponed without serious loss to the various nations. It is so vital to the survival of civilized life on the earth that some form of control be established, that anything which stands in the way of this should be avoided.

Prof. M. L. Oliphant, who was the first speaker in the ensuing general discussion, laid stress on the importance of finding a new source of power, particularly so far as Britain is concerned, now that there is so much reluctance to mine coal from the narrow seams prevalent in Great Britain. In certain other regions, for example, parts of Australia, a thousand miles or more from the nearest coal-field, some alternative source of power would be especially valuable, exposed as they are to such a variety of industrial vicissitudes. On the other hand, the uncertainty of being able to obtain the necessary amount of uranium to produce any notable addition

to world power supplies was mentioned, and it was emphasized by Prof. F. Simon that it may well be easier to derive energy from sunshine if a comparable effort in research and development were to be made. Indeed, he cast some doubt on the reality of the fuel shortage, observing how wastefully energy as a whole is used, not only in our inefficient domestic heating, but also in industrial processes. It seems to be generally agreed that the benefits to be expected from the use of nuclear energy would be in the main due to its special characteristics of great concentration per unit of weight and unit of volume, rather than to the total energy to be derived from fissionable elements.

Some of the foreign representatives (in particular Dr. L. Kowarski and Prof. F. Perrin from France) said that their countries were only interested in the power project and had no intention of making bombs; Prof. Oliphant thought it would be desirable to adopt this same line in Great Britain. Dr. H. L. Anderson told the Conference that atomic power was taken very seriously in the United States as being an important development the effects of which were likely to be felt quite soon, and that large industrial firms were pressing to have the whole matter thrown open to private enterprise to develop. A pile specially designed for production of useful power was being built, and it was expected that it would be possible to run a turbine within a year. But, of course, there was no promise that this would be an economic proposition.

Everybody agreed about the great importance of the use, for investigations and research, of radioactive tracer elements which may be obtained in abundance from piles. But many felt, as Dr. S. Devons pointed out, that fissionable elements might well prove more valuable to humanity on account of developments totally unforeseen than merely as substitutes for our present sources of power.

On the whole, the discussion proceeded on sober lines, and the balanced view prevailed that the world is not entering upon an 'atomic age' in which power would be plentiful and cost virtually nothing, but that atomic energy has great possibilities which should be explored and developed.

## HUMAN ECOLOGY IN RELATION TO THE PHYSICO-CHEMICAL FACTORS

A DISCUSSION on "Human Ecology in Relation to the Physico-Chemical Factors" was held at the Royal Society on May 30.

Prof. J. B. S. Haldane, who opened the discussion, pointed out that a human environment may be specified by the time of exposure to it, and by its various constituents, which may be scalars (for example, partial pressure of a gas or temperature) or vectors (for example, acceleration). There are safety regions within which less than a certain fraction of those exposed are affected in a specified way. Human response to some variables is far less constant than to others. He instanced the wide differences in response in subjects exposed to high-pressure oxygen and the variability in response of the same subjects on different exposures. On the other hand, the response to low oxygen pressure is much more constant between individuals and on successive exposures.