

# NATURE

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## ATOMIC ENERGY

THE series of talks on atomic energy which the British Broadcasting Corporation arranged during the first week of March in the Home Service Programme and afterwards repeated in the Third Programme have rightly been characterized by Mr. J. B. Priestley as a fine, bold enterprise in public enlightenment. No man of science or thoughtful citizen who has any conception of the implications for mankind of recent discoveries in this field can fail to welcome this effort, and the B.B.C. is to be congratulated further in publishing so promptly in the *Listener* (March 13) the whole series of talks, so that they can be studied at leisure by listeners and also by those who were unable or disinclined to hear the whole series. Delivered by such authorities as Prof. J. D. Cockcroft, Prof. M. L. E. Oliphant, Sir George Thomson, Prof. P. M. S. Blackett, Sir Henry Dale and Sir John Anderson, who have been in one way or another closely associated with these developments, they put before the public quietly but frankly the facts, theories and problems of atomic energy and their main implications for good or ill.

The scientific worker will not expect to find in these talks facts that were not already well known to him. Prof. Cockcroft's account of early experiments, and Prof. Oliphant's description of planning in secret add little to what has already been told in the Smyth Report or the "Statements Relating to the Atomic Bomb". On the military side, Group-Captain G. L. Cheshire recorded his experiences in dropping the bomb, Dr. J. Bronowski described the deep impression made on him when assessing the damage done by the bomb at Hiroshima and Nagasaki, and Sir George Thomson's sombre analysis of the question "Is defence possible?" is calculated to bring home further, if need be, the dire prospect if mankind allows such bombs to be used again.

Sir George Thomson was able to say little about the contents of the report of the Atomic Energy Commission now before the Security Council; but he and the other speakers said enough to show clearly how great are the obstacles to agreement, and how compelling is the purpose for establishing a strong and comprehensive international system of control and inspection. These talks well display the genuine concern of the scientific worker at the evil use being made of scientific discoveries and at the danger to the free communication of knowledge, in spite of the recommendation of the Atomic Energy Commission itself that safeguards on research in nuclear physics established by the international control agency should not interfere with the prosecution of scientific research or the publication of its results, provided no dangerous purpose or use is involved. Here, too, is well emphasized the way in which preparation for atomic war diverts from peaceful pursuits the resources of man-power and materials which might otherwise so greatly enrich the life of man. We can have atomic energy for peace or for war—but not for both: we can have freedom of science and the peaceful development of atomic energy, or we can have the slow strangling of science by the

spread of secrecy and restriction on communication of knowledge in one field after another.

These are choices which mankind must make, deliberately or unconsciously. But there is an even sharper choice and contrast. These talks which the B.B.C. has, with so much public spirit and enterprise, promoted, leave no room for rash optimism that a system of control and inspection by itself will be adequate, however efficient. Inspection and control must be supported by a genuine and resolute will to peace, and a world-wide public opinion which understands what is at stake and is prepared for the sacrifices of national sovereignty which are demanded.

There is no sensationalism in these talks, nor pessimism either, even when Sir George Thomson expresses the opinion that the best defence, and that a poor one, is to evacuate the big cities from the start. The strategic significance of the atomic bomb is analysed by Prof. Cyril Falls, who develops the same idea of dispersal and suggests that, from the national point of view, the best defence is in the first instance ability to retaliate in kind, which still requires the support of traditional armed forces. Prof. Falls adds, however, that in his personal opinion he believes profoundly that the only sure hope for civilization lies in abolishing war altogether.

These opening talks alone should do much to dispel that unconcern with the problem and to quicken the sense of urgency, on the co-operative absence of which in Great Britain Prof. H. C. Urey commented during his recent visit. Even more marked becomes the justification for the whole series, when Prof. Blackett and Sir Henry Dale discuss peaceful uses of atomic energy. It is not Prof. Blackett's lucid discussion of the possibilities of atomic energy for primary power stations, or his suggestion that by 1970 a large proportion of the power in Great Britain will be obtained from atomic energy, that is so significant. It is rather his emphasis that the major difficulty in the realization of such hopes is neither technical nor scientific nor a matter of supply, but rather political and international. "If the major part of the scientific and technical effort available for atomic energy continues to be directed towards the production of more and better bombs, there will be insufficient technical effort and insufficient raw material available to allow the rapid development of industrial power." Even if the bombs are never used, the accumulation of stocks by the armed services of the Great Powers may well check decisively the exploitation of atomic energy for peaceful ends.

From a slightly different outlook, Sir Henry Dale drives home the same point when discussing the application of atomic energy for medicine and research. There is perhaps present in his mind still more the fear of every scientific worker, to which Prof. Oliphant referred in his talk, that the very success of the security restrictions and secrecy which surrounded the work on the development of the atomic bomb will surround the work of the man of science for evermore. Sir Henry asks, "Are men of science to be left to explore these great vistas of new and beneficent knowledge in medicine and elsewhere in

peace? Or will the perversion of these same great gifts of science, and others yet to come, to the wholesale destruction of human life and achievement, bring the civilization, which man has been building since before the dawn of history, crashing down into final ruin?"

That this is the most important of all the questions facing mankind to-day is supported by Sir George Thomson's following talk on "International Control". Sir George testifies to the profound conviction of men of science, and especially those who played any part in preparing this weapon, of the need for action. However impersonal the scientific attitude may be, and whatever views one may take of the duties of a scientific worker in war, none of us who are physicists, said Sir George, has escaped the feeling of sick horror that what ten years ago seemed a triumph of intellect now adds a supreme danger to our badly shaken civilization. No one is more determined than the physicist that this danger should be turned to a blessing.

Before coming to an extremely lucid review of the work of the Atomic Energy Commission of the proposals known as the Baruch plan, Sir George points out that industrial and military uses are closely interlocked. No real security is achieved, he said, by destroying the bomb case and keeping the plutonium; destroying the whole thing means destroying the very material most needed for industrial development, and material which must be made again if atomic energy is used at all. The difficulty about the Baruch proposals is that a really rigorous international inspection is essential. It is the only way, he said, in which nations can be convinced that their possible rivals are not secretly preparing weapons they have themselves promised not to prepare; and that, knowing themselves to be honest, they will not suffer from the sharp practice of others in whom they, perhaps wrongly, have little confidence.

One of the great advantages of the Baruch Plan is that it allows scope for development work and, in fact, runs development work and inspection in double harness; but when it seemed unlikely that the U.S.S.R. would accept any form of international inspection, the Scientific and Technical Committee was asked to report on the feasibility and the methods of control. This Committee stated definitely that there is nothing on the technical side to make control impossible, and when, while a further systematic study of methods of control was proceeding, the U.S.S.R. accepted, in principle, the idea of an international inspectorate the day-by-day working of which should not be subject to the action of the veto, the easing of the situation encouraged a feeling of optimism. Sir George hopes that the Atomic Energy Commission would be allowed to continue detailed work on the lines of its report to the Security Council of December 31, 1946, and he indicates a number of questions of the highest importance which have yet to be discussed which do not touch that of the veto.

This realistic talk brings home the difficulties with which international control is hedged, but was

not too pessimistic, Sir George being convinced that mankind has too much to lose if agreement fails for him not to believe that some way round would be found. Bertrand Russell's talk on the outlook for mankind is perhaps the most sombre of the series. He painted a picture, sober but realistic, of the consequences of failure to reach agreement and of the outcome of atomic war; and he urged, like Sir George Thomson, the adoption of an international system of control of the use of atomic energy as an immense advance towards security. Such control would make possible the peaceful use of the new discoveries without the constant menace of atomic 'Pearl Harbours'; it would demonstrate the possibility of international co-operation and would represent the first step in that limitation of national sovereignty without which nothing can be achieved. Like Prof. Falls, he insists on the impossibility of isolating the question of atomic energy, and emphasized that the real problem is to prevent great wars, for once they have begun no previous agreement will prevent the use of the most terrible weapons available.

Lord Russell based his main appeal on this point and the imperative need for drastic limitation of national sovereignty. He urged that it is the duty of those who realize the implications of modern weapons to devote themselves to a campaign of enlightenment addressed to the peoples of the West and the governments of the East. If mankind can be brought, while there is yet time, to realize that the most elementary motives of self-preservation demand this revolutionary change as regards national sovereignty, he believes a new era of unprecedented happiness and prosperity will almost inevitably result. It is necessary to overcome ancient loyalties, prejudices and deep-rooted suspicions, and to learn to think of mankind as a whole.

Sir John Anderson, in the concluding talk on British interests, does not take quite so grave a view, but his able summing up of the whole series emphasizes once more the impossibility of isolating atomic bombs from other weapons of war. He points out that in the Washington Declaration of November 1945, President Truman, Mr. Attlee and the Prime Minister of Canada pledged themselves to work for the elimination from the armouries of the nations not merely of the atomic bomb but also of all weapons of mass destruction. Like Lord Russell, he stresses the fact that the international body suggested as a means of protecting the world against the military use of atomic energy and encouraging its peaceful use would be something entirely new in human experience.

The ultimate choice before mankind is between a richer and a healthier world, and the virtual extinction of civilized life as we know it. That the choice should thus be put so fairly and squarely before every citizen is no mean contribution to the formation of enlightened public opinion; for it is on such opinion that every democratic government must rely, if it is to frame and pursue a policy of peace and co-operation, with all their implications, which these broadcasts so clearly displayed.

## ATOMIC SCIENTISTS' ASSOCIATION

**I**N the United States, the scientific workers concerned in the investigation of nuclear fission in its application to the atomic bomb quickly banded together to make known their views on the scientific, social and international problems raised by the controlled release of atomic energy. In Britain, there were not so many with experience of the subject, and they were scattered up and down the country. Nevertheless, in the early summer of last year, the Atomic Scientists' Association came into being, with the main purpose of providing a forum for discussion of the subject.

In the recent series of broadcast talks on atomic energy, Sir George Thomson referred to the work which the Association is trying to do in Great Britain in impressing on public opinion generally, and on the Government in particular, the critical nature of the position. So far as scientific men themselves are concerned, there can be little question that they are awake to their social responsibilities in this matter, and endeavouring to induce their fellow citizens to consider realistically the new proposals and the departures from previous ideas and practice which the situation demands. That is indeed an encouraging feature of the situation. But the work and aims of the Atomic Scientists' Association deserve indeed to be much more widely known. They go far beyond the technical contributions the Association has already made to the development of an adequate plan of control, either for immediate action or for future operation.

Suggestions to these ends, such as are embodied in the Statement from the Council of Association printed in *Nature* earlier this year (159, 47; 1947) come with the greater weight of authority in that the full membership of the Association is limited to men of science with first-hand and specialized knowledge of atomic energy. The Association can thus speak as a body of experts, and this considerably facilitates the furtherance of its aims of investigating and making proposals for the international control of atomic energy in order to assist in the solution of this most pressing problem, and of helping to shape the policy of Britain in all matters relating to atomic energy. For implementing that second aim, and still more that of bringing before the public of Great Britain the true facts about atomic energy and its implications, the necessarily small body of experts requires, however, the support of the much larger body of informed public opinion. This can be provided by enlarging the membership of the Association by the institution of 'associate members', consisting of scientific workers and others who may not have special knowledge of atomic physics but wish to be associated with policy in this field. An appeal for associate members has now been issued over the signature of Prof. N. F. Mott, president of the Association.

The letter in which this appeal is made points out that men of science believe themselves to be fitted to take the lead in these matters because, on the technical aspects of atomic energy, they are the best-