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Science and Armaments

NOTHING could demonstrate more completely what the Prime Minister recently termed the madness of re-armament than the fact that in the recent debate on defence in the House of Commons, Government spokesmen failed to reply to the two questions which are uppermost in everyone's mind: What is the limit of the expenditure involved, and against whom is the programme directed? The questions indeed cannot be answered. There is no limit; and to express one's fears in definite words might well be to start the conflagration universally dreaded. Unless intelligence once again takes control over passion and prejudice in the relations of nations, and force is relegated to its proper function of maintaining law and order, there can be no escape from a conflict which would involve ruin for all. Nor can we hope for peace among nations any more than among individuals if we encourage the view that wrongs cannot or will not be dealt with by reason or persuasion and can only be redressed by force.

Even the staunchest supporter of the present programme of re-armament and defence in Great Britain can scarcely avoid misgivings as to its eventual outcome. Unless at the same time we can ensure that some real attempt is made to eliminate the root causes of international friction and misunderstandings, to control the mischief wrought by economic nationalism, and to secure a settlement of difficult economic and racial questions on a basis of social justice and not of *force majeure*, the attempts to strengthen armaments, however sincerely aimed at national defence, can only bring conflict nearer. Collective security is in fact the only possible form of security to-day. All else is merely a matter of relative insecurity and how soon the crash will be.

The most serious feature of the recent debate was, however, the absence of reference to the imperfection of defence against modern methods of warfare. Responsible technical and scientific opinion is at one in agreeing that any protective measures for the general population against air attack by chemical means is at best imperfect and inadequate, and scientific workers cannot evade their responsibility for warning the population of the limitations of the measures now being considered by the Air Raid Precautions Department of the Home Office. There could be no greater calamity than for the population to be deluded into believing itself to be largely immune from the consequences of such attacks in the event of an outbreak of war. The proposals to transfer part of Woolwich Arsenal to western and northern districts of the country, and to duplicate the coal oil plant at Billingham in South Wales instead of on the same spot, indicate in themselves that the effective defence even of munition centres is problematic.

To this extent, therefore, scientific workers will be in general sympathy with a resolution which was submitted at the meeting of the British Medical Association at Oxford in July. The resolution, however, proceeded further, and recommended the Association to take the initiative with the object of securing the co-operation of the medical profession of all countries to prohibit the manufacture of poison gas. Scientific workers would undoubtedly join in condemning the use of poison gas in conjunction with other forms of warfare as inhuman and degrading to civilization, even though they may doubt whether it is worth while to endorse too hastily proposals to discriminate against one particular kind of warfare.

The impossibility of effective defence measures against chemical warfare for the civil population should not blind us to the difficulty of securing its prohibition if resort was once made to warfare. Events in Abyssinia have demonstrated afresh the impossibility of relying on the pledges to a particular form of warfare when once a nation has broken its general pledge, even under conditions when provocation or retaliation in kind are impossible. Despite this impracticability, which was emphasized by speakers in the discussion at the British Medical Association, an amended resolution was passed which, condemning gas warfare, called on the Council to do everything in its power to secure the co-operation of the medical profession in all countries to prohibit the use of poison gas.

Apart from the serious doubts entertained by authorities as to the practicability of chemical warfare being prohibited, it is even open to doubt whether the restriction of particular methods of warfare is desirable. The very ruthlessness with which war is prosecuted with modern weapons, and the cynical disregard of international obligations or of any standard of humanity or chivalry in the conduct of a campaign, may even prove a gain to mankind in the end if the lesson is learnt that the real problem is that of eliminating and not merely of mitigating warfare. As Sir Henry Thuillier, who during the Great War was Controller of Chemical Warfare, has suggested, the interests of humanity might be better served if the whole populace appreciated in advance that the direct effects of resort to warfare would not be confined to the combatant services.

The lecture to which we refer has now been published in the *Journal of the Royal United Services Institution* for May last, and it will well repay study by all those who are really concerned with constructive efforts to establish peace and co-operation, and to secure the surrender or abatement of these national claims or rights which most hinder the working of a system of collective security and constitute the gravest danger to peace. Sir Henry Thuillier does much to stimulate clear thinking on questions where side issues have so long diverted attention which should have been given to the major question of eliminating the use of war altogether.

Proposals to restrict methods of warfare have arisen from economic considerations, as in regard to the battleship, but much more commonly on humanitarian grounds. In regard to the latter, a clear answer has rarely been given to the funda-

mental questions: Will the proposed restrictions actually reduce the inhumanity of war, and will the agreement be effective? The voluminous discussions which have taken place on chemical warfare, the submarine, the use of tanks, have not led to any general agreement on the answers which should be given. On the contrary, there is abundant evidence of the muddled thinking which Sir Henry Thuillier warns us is a most serious danger to peace and security.

Certain questions have to be frankly faced in any discussion on restrictions if clear thinking is to be ensured. Since all war is indescribably inhumane, is it to the benefit of the human race to try to reduce its inhumanity in two or three minor directions only? Nothing can really lessen its horrors, and it may well be better that the peoples should realize this in order that they may make every effort to put an end to it altogether. If it were known in advance that the effects of warfare would fall as ruthlessly on all classes of civilians, whether on the statesmen who had bungled diplomacy, or financiers or manufacturers or others whose desire for trade expansion or profits had contributed to its outbreak, as on members of the fighting services, much more serious and constructive efforts to prevent it might be made. On the question whether the proposed restrictions could really reduce the inhumanity at all, not only is there need for a close sifting of opinion but also for a frank facing of facts. The desire to abolish submarines or poison gas is largely based on lack of knowledge, false sentimentality, conservatism, fear of unknown methods and perhaps especially the fear that our adversary may prove more efficient in these new methods than ourselves. To the third question, whether we could have a reasonable guarantee that agreements of this sort would not be evaded, or even openly repudiated under stress of defeat, events in Abyssinia suggest a very definite and depressing answer. The only hope seems to be to organize a society in which constructive effort will be used to eliminate war altogether and to make civilized peoples realize the horrors and inhumanity of any such conflict between nations.

It is well that scientific workers should, as was done in the recent discussion at the meeting of the British Medical Association, dissociate themselves from the prostitution of scientific results in warfare or for other nefarious purposes: it is equally their duty, however, to do all in their power to ensure clear thinking on such matters. The

pertinent remarks of Sir Henry Thuillier about the alleged inhumanity of gas warfare, or even of the use of the submarine, should be welcomed by all scientific workers, and they reveal the essential childishness of much of the discussion on this point.

All war is inhumane; and to fritter away effort discussing the relative inhumanity of different kinds of warfare is rapidly becoming intolerable. What has to be recognized is that war is not only inhumane but also under modern conditions its renunciation as an instrument of national policy, and as a means of dealing with international disputes, is absolutely essential if civilization is to survive.

The question really is whether there is yet time to carry out the constructive work involved both in developing adequate machinery for settling international disputes, and for removing the causes of international friction and misunderstanding, before the world is overwhelmed in another outbreak. Scientific workers owe it to themselves, no less than to their science and to their civic responsibilities, to strain every effort to ensure constructive thinking in these matters and to promote the formulation and execution of policies adequate to secure that the enormous powers now at our disposal are used for the advantage of mankind instead of its destruction.

A Sketch of World History

World History:

the Growth of Western Civilization. By R. Flenley and W. N. Weech. Pp. xix + 757. (London: J. M. Dent and Sons, Ltd., 1936.) 12s. 6d. net.

WORKS on general history have often been noticed in NATURE, especially from the point of view of the space and the position which they assign to science. There has undoubtedly been a marked improvement in the matter, and the very attractive book under notice is a good example, suggesting also one or two points of criticism in its presentation. It is certainly the best thing of the sort that we have seen in English—a sketch of world history in some seven hundred pages with abundant illustrations and excellent maps and diagrams and written throughout by both authors with full knowledge and an almost perfect impartiality.

The questions of how to present the vast mass of material, and for whom one is writing, are, in this kind of book, supremely difficult. In this one, the readers who will gain most from it are those who have a fairly good knowledge beforehand and are glad to have it revived in a well-ordered summary up to date. For students who are approaching the subject for the first time, the language, ideas and implications of the writers are probably too difficult. This is the case more especially with Mr. Flenley, who does the modern portion. One often feels that the essential points could be conveyed without such an array of long and abstract words and in shorter sentences. On the other hand, Mr. Flenley grapples valiantly with the problem of including all sides of history—music, art and literature as well as science—and his allowance for science is relatively generous. Yet even so, how

can one excuse in such a survey the complete omission of the marvels discovered in the heavens and presented so clearly in the Astronomer Royal's recent "Worlds Without End"?

Mr. Weech, who is an old schoolmaster, has a crisper and simpler style. Some of his short sayings are admirable; for example, "It was the spoken word, not the written, that counted with the Greek and made him the teacher of the western world. . . . He was an excitable, quarrelsome, kind-hearted creature. He was continually fighting his neighbour in the next valley, but when he had finished, he did not, like other conquerors, mutilate, crucify or scalp his captives, nor did he convert them into gladiators." On the other hand, Mr. Weech is much less adequate in his account of ancient science. The wonderful discoveries which have recently been made of the mathematics of Babylonia, and the medicine of ancient Egypt, find no place. The institution of the calendar is naturally mentioned, but not its connexion with the heliacal rising of Sirius. More should have been given of the sort of matter which Prof. Gordon Childe has just put out in his "Man Makes Himself"—the origins of civilization—even if further cuts had to be made in the political sections. It is also doubtful in the later portion whether the Impressionist and Post-Impressionist painters deserve the several pages which they get.

There is room, however, for wide difference of opinion as to such relative values, and the book is strongly to be commended in the sense mentioned above. The sober hopefulness of the "Conclusion"—after a summary of the successes and failures of the League of Nations—hits the mark very well.

F. S. MARVIN.