

CONFERENCE ON SCIENCE AND WORLD ORDER

WHILE the older sections of the British Association from A to M have been obliged to suspend their activities because of the exigencies of the War, the Division for the Social and International Relations of Science—the youngest and, one might say, the adopted child of that elderly yet virile organization—organized a Conference on Science and World Order at the Royal Institution, London, during September 26–28. On the day preceding its public sessions, at a luncheon arranged by the British Council and attended by many members of the Government and Diplomatic Corps, Mr. Anthony Eden, the Secretary for Foreign Affairs, expressed the growing appreciation by our higher statesmen of the value of scientific training, scientific research and the applications of science in the conduct of public affairs (see p. 403).

The six sessions of the Conference were well attended by a varied and representative gathering. At the opening session on Friday, September 26, a message of commendation was received from the Prime Minister (see p. 403); and a letter outlining the basis of the Conference was sent to H.M. the King, from whom a message was received later (p. 403). Sir Richard Gregory, president of the British Association, and chairman of the Division for the Social and International Relations of Science, then gave the inaugural address. He announced that sub-committees to deal with the main topics raised at the Conference would be appointed by the British Association.

The deliberations during the sessions covered the relations of science to government, human needs, world planning, technological advance, post-war relief and the world mind, respectively. The many valuable papers presented will be more amply noticed in a series of articles in forthcoming issues of NATURE. A perspective of the proceedings alone will be attempted here.

The discussion on "Science and Government", under the chairmanship of Sir Richard Gregory, was opened by Viscount Samuel, distinguished in the fields of both statesmanship and philosophy. He paid tribute to the scientific spirit, outlined the present organization of Government research departments (see Lord Hankey's speech in the House of Lords, NATURE, April 12, p. 432), and advocated the establishment of science attachés to the principal embassies. Prof. A. V. Hill, M.P., Foulerton research professor of the Royal Society, followed with a warning to scientific men to be continually aware of the dangers arising from interest, prejudice

and emotion, dangers which are certain to creep in when one attempts to deal with government and politics. He stressed the need to remove barriers between "government science" and "independent science" by the creation of more scientific advisory bodies attached to departments of State and the Cabinet.

Prof. L. Gulick, of the U.S. National Resources Planning Board, followed with a description of the New Deal's successful Tennessee Valley Authority and its achievements. Six main river dams have been completed and three more are under way on the Tennessee River itself, and several more on its tributaries for the multiple purpose of improved navigation, electrical power development and flood control. The present installed generating capacity now exceeds one million kilowatts, and by 1944 this will have been doubled. The revenue derived from the sale of electricity covers the operating expenses of all the Tennessee Valley Authority programme, which includes social work tending to improve housing, education, health and the standard of living generally.

Dr. P. W. Kuo, vice-minister of finance and former president of the South Eastern University of China, outlined the many ways in which a scientific approach to industrial problems has enabled China to strengthen its resistance to aggression, and how a reform of the currency system has contributed to China's ability to utilize to the utmost its resources. Prof. J. D. Bernal sketched five stages in the application of scientific method based on information, research, development, execution and control. Prof. J. B. S. Haldane gave a spirited address comparing the Academy of Sciences of the U.S.S.R. with the Bank of England in their relation to their respective Governments. Dr. A. Labarthe, editor of *France Libre*, formerly lecturer in technology and thermodynamics at the Sorbonne, speaking in French, pleaded for the establishment of a ministry of scientific research which would erect trial industrial plants for the investigation of new processes. Dr. J. Negrin, formerly professor of general physiology in the University of Madrid and lately head of the Spanish Republican Government, supplied the reflections of a professional man of science forced to take a leading part in the management of State affairs.

The second session of the Conference, which dealt with "Science and Human Needs", was under the chairmanship of H.E. the American Ambassador, Mr. J. G. Winant. He said in a speech which

directed attention to the need for eliminating both the threat of force and of poverty: "We must abolish both hunger and the sword as a means of forcing labour."

Prof. E. Abel, formerly of the University of Vienna, expressed the gratitude of his many Austrian colleagues who are working in Great Britain.

Sir John Orr, director of the Rowett Research Institute, Aberdeen, implemented the chairman's appeal with fact and figures. He spoke with his usual vigour and clarity in favour of a food policy that would raise the health and intellectual standard of the masses, and advocated the appointment of an international convention to prepare the plans for a post-war food policy.

Sir Harold Hartley, chairman of the Fuel Research Board, gave a well-documented address on the world's heat and power requirements.

The Right Hon. Herbert Morrison, Home Secretary and Minister of Home Security, without committing the Government, agreed that a maximum and not minimum standard of living should be aimed at, and said that a scientifically defined welfare standard creates a principle for international collaboration. He ended upon a challenging note: "Shall man's mind become the master of material needs or shall it be tossed hither and thither by surging and misdirected economic forces?"

Dr. Wilder Penfield, president of the Royal College of Physicians and Surgeons of Canada, mentioned the action of official methods and stressed the necessity of making full use of suggestions given by men of science outside the official machine. He made a strong appeal for an airborne ambulance service, in which a beginning might well be made in the Near and Middle East, and he read a manifesto from McGill University asking that research workers should reconsider their work in relation to the urgent requirements of war.

Prof. W. G. Holford, professor of civic design in the University of Liverpool, discussed in a paper the correct use of land in the country and the opportunities and limitations of planning. Mrs. Mary Agnes Hamilton, of the London County Council, spoke as a representative of consumers, and made an appeal to men of science to help the poorer housewife do away with the drudgery associated with house-work.

The last speaker of the Friday session, Prof. A. C. G. Egerton, professor of chemical technology in the Imperial College of Science and Technology, pointed out the problems of food and power, both of which are derived from the sun's radiation, and pictured diagrammatically a scheme of human activities illustrating the interconnexions.

Saturday morning's session on "Science and World Planning" was under the chairmanship of H.E. the Soviet Ambassador, M. Maisky. He pointed out that in the U.S.S.R., a country with unified and strong administration, which has accepted the principles of planning, twenty years has been necessary to reach the present state of planning. One must not expect that the necessary requisites of world planning can be crowded into a day or two. M. Maisky said that Soviet men of science were unable to attend the Conference owing to difficulties of communication, and their speeches that were to have been relayed by radio had been jammed by German interference. He read a message from the U.S.S.R. Academy of Sciences in which Soviet men of science expressed their solidarity with their colleagues in allied countries in their combined effort to achieve final victory over barbarity and tyranny.

A message from General Smuts sent by radio and reproduced by gramophone was also heard by the Conference. "Science", said the voice from the other hemisphere, "is the greatest torch which the spirit of man has kindled in the modern world, and nothing—not even in the dark hour of our civilization—should be allowed to interrupt its kindly light. With our victory, science will not merely be reinstated to her honoured status, but a new era will open for her. Our aim is not only more knowledge and ever-new discovery of truth, but also the promotion of social welfare and the building of a great society of free people."

The session began with a paper by Lord Hailey discussing the colonial problems of the British Empire. He showed how the changed conception of the function of the State, namely, its intention to deal with the welfare of the individual, is bound to have a beneficial repercussion upon colonial policy. From his wide experience in Africa he illustrated the type of problems which have to be solved. A collaborator of Lord Hailey, Prof. G. Findlay Shirras, professor of economics in University College, Exeter, directed attention to some of the problems confronting India, with its large and ever-increasing population.

Prof. Alvin Hansen (political economist, Harvard University, and special economic adviser, Federal Research Board) outlined the current programme of research in the United States relating to post-war reconstruction, such as soil conservation, agriculture, nutrition, urban development and international relations. "It is my conviction", he said, "that internal prosperity in my country could be very much promoted by continued economic collaboration between Great Britain and the United States of America—collaboration to pursue parallel and co-ordinated policies of internal expansion."

Prof. P. Sargant Florence, professor of commerce in the University of Birmingham, analysed the problems of distribution of industry and advocated greater dispersion of "foot-loose" industries to ensure the blending of town and country amenities and outlook.

Prof. J. Métadier brought greetings from the Free French Forces and submitted a fairly detailed plan for the creation of an international society for promoting scientific research.

Mr. D. P. Riley, of the University of Oxford, who is known for his work on X-ray crystallography, spoke as one of the younger generation of British scientific workers. He pleaded for a greater share for the younger men of science in the councils of scientific planning, in the laboratory and in the factory. He advocated setting up sub-committees of the British Association to investigate further the problems raised at the Conference; also the formation of an international committee, including workers of all grades and, if possible, the setting up of a club in London which would serve as a meeting-place for scientific men of all nationalities. The president, Sir Richard Gregory, intervened at this point and expressed his sympathy with the younger scientific investigators. He pointed out that so far as the Division for the Social and International Relations of Science of the British Association is concerned, they have taken an important part in its development. As he had mentioned earlier, in his presidential address, the Council of the Association will be asked to set up special sub-committees to consider the problems brought to the notice of the Conference.

Mr. Hugh P. Vowles, in a forceful address on "Giant Power and World Planning", compared the Soviet electrification programme with that in other countries, and concluded that only under a non-profit system is it possible to develop the power resources in a co-ordinated scientific manner.

Captain H. Barnard, of the Free French Forces, brought greetings from General de Gaulle and was warmly received by the Conference. He discussed the steps necessary to render it impossible for Germany to wage another war, and stressed the point that men of science have means of helping to prevent economic crises, which are the major source of widespread unemployment leading to such movements as Nazism.

A communication from the Right Hon. Lord Onslow dealt with the conservation of wild life and advocated the establishment of national parks. Mr. O. N. Arup discussed the elimination of waste by planning and standardization. Dr. Othmar Ziegler outlined what a rationally extended international system could do to ease social tension.

Mr. Maurice Dobb, lecturer in economics in the University of Cambridge, pointed out that the

postulates of early economists no longer hold good owing to monopolist competition, and advocated socialist planning. "Unless there is a boldly conceived action by the State on an extensive scale," he declared, "we may face a post-war slump that will put 1920 and 1929 in the shade."

The fourth session of the Conference covered the field of technological advance and was reminiscent of the usual British Association gatherings. The President of Czechoslovakia, Dr. Beneš, took the chair. He recalled that the first president of his country, the late Prof. Masaryk, had been a distinguished man of science, and declared that science and technology have played a decisive part in the progress and prosperity of his country. After analysing the growth of technology and its danger when used as an instrument for nationalist and expansionist aims, he concluded: "This conference of scientists is the manifestation of the urgent and categorical needs of the free world to liberate subjugated science, to use science and technology in the post-war world for the work of real, social reconstruction. But it is also a manifestation of our definite and firm will not to permit in the future the misuse of great inventions and all kinds of technological progress for criminal and destructive purposes."

The first paper was by Prof. C. H. Desch, scientific adviser to the Iron and Steel Research Council. It covered the field of conservation of natural resources, showing that while agricultural products may be periodically renewed under rational cultivation, mineral ore deposits are not inexhaustible. Indeed, copper, tin, gold and phosphate deposits, at the present rate of production, are believed to have a life of less than a century. Commercial exploitation tends to "skim the cream", and the proposed international authority which will control the fair distribution of mineral resources will likewise have to deal with the question of conservation.

Dr. L. E. Howlett gave an account of the progress made by Canada's optical industry, greatly helped by Research Enterprises Ltd., a Government-owned company working in close co-operation with the National Research Council. Dr. G. Coumoulos (Greece) stated that Greek industry and technology have tended to be much influenced by outside considerations instead of developing organically from the needs of the country.

Mr. A. J. Couzens presented a paper, prepared by himself and Mr. M. Yarsley, upon the uses and advantages of plastics. He stated that the War has given a powerful impetus to the plastics industry and that plastic material can be developed to meet specific needs.

A French man of science—who desired to remain

anonymous—attempted a mathematical analysis of technological progress. The development of aviation and other technical developments may be represented by an exponential law; that is, such factors as the amount of goods and passengers carried, if plotted with their logarithm against time, give a straight line (law of organic growth). The same speaker suggested that there should be organized a special team of research workers whose duty would be to foresee the problems likely to arise from new technological development, or from present trends solve them before they become acute. For example, the problem of new sources of energy must be solved before the reserves of fuel are exhausted.

Dr. C. H. Waddington, of the Strangeways Laboratory, Cambridge, predicted, among the likely technical advances in biology, more extended technique of vernalization, utilization of hybrid vigour, and the production of entirely novel crop plants by means of such drugs as colchicine. Animal productivity will be increased by artificial insemination, and the hormonal control of sex development may well play a part in the poultry and perhaps the dairy industries.

The next paper to be presented was by a group of three Czechoslovak investigators, Drs. G. Lewi, R. Eisler and J. Cisar, and dealt with the technology of insufficiently utilized raw materials or waste products. This was followed by an outline of the technical advance in the building industry by Mr. R. Fitzmaurice, principal scientific officer to the Building Research Station, and by a communication from Dr. J. H. de Boer on the need for closer collaboration between universities and industrial research laboratories.

A rather different note was struck by Dr. J. E. D. Swann of the Association of Scientific Workers in a paper on the "Organization of Science for War Production". In an incisive manner the speaker criticized the inefficient utilization of scientific workers in the war effort and the insufficient exchange of information between different manufacturing concerns.

Prof. Enrico Volterra returned to the purely technological aspect with a paper on some recent applications of the theory of elastic dislocations in civil engineering, and finally Mr. Ritchie Calder wound up the afternoon's proceedings by pointing out that a definite picture of a "second industrial revolution" resulted from the many papers presented to the Conference.

"Science and Post-War Relief" was the theme of the fifth session, under the chairmanship of H. E. the Chinese Ambassador, Dr. Wellington Koo. "The trying experience of relief workers at the end of the last world conflagration", Dr. Koo said, "shows

clearly that rationalization and co-ordination through the use of scientific methods are necessary to the accomplishment of efficient results free from delay and waste." Like the chairmen of previous sessions, Dr. Koo emphasized that only a successful issue to the present struggle will enable scientific people to build according to their plans a new edifice of world order.

Mr. Philip Noel Baker, M.P., formerly professor of international affairs in the University of London, suggested that Governments should agree to strive towards an international food standard on the lines set out by Sir John Orr, and outlined the relief work done after the War of 1914-18 by the Nansen organizations and other bodies connected with the League of Nations.

Mr. R. Allen, of the American Red Cross, gave some of his recent experiences of relief work in Unoccupied France, and stated that a reservoir of medical supplies is being accumulated at Geneva and elsewhere to be used in case of epidemics. Prof. J. Löwy, of the University of Prague, mentioned the curative resources of Europe—sea and mountain air, climatic factors and medicinal springs—which should be made more generally available, and suggested that a special body should investigate this subject. Dr. Kuo Zing-Yang expressed the desire of Chinese men of science to collaborate in solving post-war problems, and pleaded that China should be granted full partnership and not be treated from the point of view of diplomatic expediency.

Mr. W. L. Kelly, of the International Institute of Wool, speaking as an Australian farmer, asked that measures should be taken now towards the storage of foods in such countries as Australia. Mme. Priestman-Breal, of the Friends Relief Mission, gave an excellent address on the psychological approach of relief work, based upon her experience in Poland after the War of 1914-18.

Sir John Russell, director of the Rothamsted Experimental Station, whose original theme was to have been the "Impact of Science on Agriculture", substituted instead a talk on "Restoring the Scorched Earth". He appealed to the competent authorities in the United States and Canada to ensure that the numerous varieties of crops specially suited to their different regions, which have been produced by Russian plant breeders, should be given a temporary home under suitable conditions.

Dr. Anni Noll, of the Pioneer Health Centre, Peckham, London, gave some of the findings from that unique experiment in the promotion of healthy surroundings for the family as a unit. Dr. E. Kodicek, lecturer in psychology in the University of Prague, advocated an efficient organization of scientific experts and politicians. Dr.

Eugen Wallach, formerly manager of the Hirsch-Kupfer Gesellschaft, discussed the post-war control of metal resources and the human aspects of industrial reconstruction. Mr. H. G. Norman, chairman of the British Federation of Social Workers, stated that in the new post-war world, human emotional needs must have a place, and trained social observers, experienced in the art of human understanding and social healing, will be needed. The session ended with an address by Mr. Hugh H. Smith, of the Rockefeller Health Foundation, on the role of epidemiology in the post-war world.

The last session of the Conference was devoted to "Science and the World Mind". The chairman, Mr. H. G. Wells, confronted with a much too limited time to do justice to the subject, arranged for his address to be duplicated and distributed; he requested the speakers to comment on several definite points: a federal world language, the problem of spelling and phonetics, the meaning of words and the storage and distribution of ideas. Unfortunately, Mr. Wells's suggestions did not reach the various contributors in time, and while some made a commendable attempt to rewrite their papers or adapt them to the chairman's suggestions, the majority spoke on their prepared subjects.

Prof. L. Hogben, professor of zoology in the University of Birmingham, had originally prepared a paper on education for government. In a brilliant improvisation he sketched the history of the idea of auxiliary international language, towards which some four hundred attempts have been made from the seventeenth century onwards.

Mr. J. G. Crowther, of the British Council, dealt with education of the public, and Prof. Max Born, professor of natural philosophy in the University of Edinburgh, with the teaching of science. "The human race", Prof. Born said, "is slowly awakening from a dream mind into a state of clearer consciousness." Dr. J. Needham, reader in biochemistry in the University of Cambridge, developed the theme that a principle of increasing organization is discernible in living beings and culminating in social organization counter to the principle of degradation of energy to a dead level.

Mr. J. A. Lauwerys, of the University of London Institute of Education, under the title the "Scientific Content of General Education", presented the views of a group the members of which are concerned with the training of science teachers. "Mere giving more time to science is not enough," he said; "the scientific method and the scientific attitude must be fostered and the material must be chose. from a wider field and treated in a modern manner."

Mrs. S. Neville-Rolfe, of the British Social Hygiene Council, in a well-delivered address, advocated an institute of social biology and stressed the need for a wider understanding of the emotional nature and the requirements of man. The causes of war, she stated, lie in the lack of ability, character and emotional development of man himself. A true democracy can only be created by the emotional and intellectual development inspired with a positive purpose in life. Youth can appreciate the opportunity and accept the responsibility of mustering the forces of evolution and directing them to the development of man.

Prof. Skalinska, of the University of Cracow, spoke on behalf of the Polish men of science, men and women who had to find refuge in other lands, and Count Zamoyski assured the Conference that no man-made creeds will in future obstruct the relations between Poland and the U.S.S.R.

Prof. Julian Huxley, like some of those who had preceded him, did not speak on his prepared subject, "The Scientific View of Education as a Social Function", but undertook the difficult task of summarizing the main points that had emerged during the proceedings of the Conference.

The meeting was then taken over by the president, Sir Richard Gregory, who repeated the promise that committees would be appointed by the Council of the British Association to prepare considered reports upon several main points that had been raised. He then presented the Charter of Scientific Fellowship (see p. 393), a concrete proof of the new spirit which the Division for the Social and International Relations of Science has been formed to foster.

Thus ended a memorable Conference, leaving a mixed impression of light and shade, of brilliant flashes of intellect and dark patches of unco-ordinated effort. Unfortunately, in practically every session the time allowed to the speakers became progressively shorter towards the end of the meeting, irrespective of the nature and the importance of the subject-matter. There was much lack of unity and proper relationship in the too numerous papers, insufficient drive towards results to be achieved, and lack of clear vision of the potentialities of the situation. Some would claim that the Conference was nothing but a sterile hybrid between the free-platform attitude of previous British Association meetings on one hand, and the purposeful drive which inspires many younger scientific workers on the other. Others hold that in spite of all imperfections, one can discern in these deliberations the amœbic beginning of a world mind, as yet halting and incoherent, but full of promise for the future.