British Boiler Availability Committee. Contacts with other countries were sought by this Committee, for the exchange of information and experience, and it was suggested that the structure of the Committee was worthy of emulation in many countries.

Four papers were submitted to the session concerned with the character of national fuel reserves, from Great Britain, Canada, the United States and France. The British contribution explained how the Coal Survey Section of the Fuel Research Organisation (Department of Scientific and Industrial Research) had helped in the production and preparation of coal, and in its storage, distribution and utilization.

Great interest was shown in the session concerned with atomic energy, although few members were able to offer contributions. It was thought possible that two kinds of fission furnace may be developed, one to use uranium 238, involving the preliminary conversion of this substance into fissile material such as plutonium, the other to use directly fissile material, such as plutonium, uranium 235 and 233. The second type of furnace would be much smaller than the first, but the material used by the first would be much more plentiful. Only 1/139 of the uranium in the earth's crust is directly fissile. If it became possible to use natural uranium, 170 tons per annum would satisfy the energy requirements of the world. Dr. W. Lulofs considered that as the world's supply of uranium would not be inexhaustible, it might be necessary to look for further sources of energy. For example, he wondered if it would be possible to build up helium from hydrogen, setting free a considerable amount of energy. Dr. J. D. Cockcroft replied that physicists had given such matters considerable thought, but with regard to the example cited, the necessary extremely high temperature is, as yet, prohibitive of progress. Several speakers considered that there had been over-optimistic views all over the world regarding the early development of atomic energy for industrial use. It is clear that many difficult problems have still to be solved before that hope can be realized; and at this stage the prospect is that atomic fission will have little, if any, financial advantage over present methods for the production of energy. It would, of course, set free very large amounts of fuels for other uses.

Other sessions considered developments in coal mining and coal preparation, economy measures in the production of gaseous fuels, the transport of gas, the transmission of electricity, and space heating. Several papers directed attention to the advantages arising from district heating in suitable towns.

The Netherlands National Committee, and an associated Committee of Ladies, arranged various technical and non-technical excursions. Facilities were provided for visits to the refineries and laboratories of the Bataafse Petroleum Maatschappij at Pernis, Delft and Amsterdam, the Philips works at Eindhoven, and the various works associated with the Netherlands State Coal Mines near Lutterade. Appreciation was expressed by all the members for the excellent organisation of the Conference and the arrangements made for the visits to works, laboratories, and places of general interest. The exchange of views and experience on the urgent question of fuel economy was felt to be most valuable and a real contribution towards the goal of economic recovery. The Conference had an even greater value in showing the benefits that can arise from a meeting of representatives of the countries of the world in a friendly spirit.

OBITUARY

Sir Albert Howard, C.I.E.

BOTANISTS, agriculturists and many others will learn with regret that Sir Albert Howard died in London on October 20. He was born in 1873 and educated at the Royal College of Science and at St. John's College, Cambridge, where he was a foundation scholar. Here he worked under Marshall Ward, who was then attracting a brilliant group of students to some of the newer aspects of botanical science, and after taking first-class honours in the Natural Science Tripos in 1898, he proceeded in 1899 to the Imperial Agricultural Department for the West Indies, then newly established with the purpose of applying science to the difficult problems raised by the threatened collapse of the sugar-growing industry there. In 1903 he returned to England to succeed F. Escombe as head of the Botanical Department of the South Eastern Agricultural College, Wye, Kent. He was not, however, entirely happy at Wye, and left in 1905 to become Imperial Economic Botanist to the Government of India, where for the first time he found full scope.

In the same year Howard married Gabrielle Louise Caroline Matthaei, of Newnham College, who was already well known for her investigations on vegetable respiration and assimilation, and they worked together for nearly twenty years at Pusa in so close a collaboration that no one knew which part was hers and which was his. Their first work was on wheat, and they were fortunate in having available an important collection of varieties brought together by W. H. Moreland and grown continuously on the Cawnpore Experimental Farm by J. Haymon, the first deputy director of agriculture, and by Bryce Burt. At that time there was a considerable export of wheat from India to England, and the Howards sought varieties giving better yields than those commonly grown, and possessing more 'strength' as defined by the English millers. Fortunately, one or both of the Howards had the artist's eye for picking out the varieties likely to do well and those that would not, and their final selections and crosses proved remarkably successful, particularly Pusa 4 and Pusa 12 in the United Provinces and the North West Frontier Province. An account of this work was given in "Wheat in India, its Production, Varieties and Improvement" (1909), and a general summary of all their work up to 1929 in "Crop Production in India" (Oxford University Press).

While at Pusa the Howards in 1912 started a Fruit Experiment Station at Quetta, a district long known for fruit-growing; it was, however, abandoned in 1919. It was re-started in 1933, but no records of the older work could be found, nor were the surviving varieties suitable for the new conditions.

In 1924 the Howards left Pusa for the new Institute of Plant Industry, Indore, established to provide a farm for Bernard Coventry, agricultural adviser to the States in Central India. The general principle underlying their administration was that the crop was to be treated as a unit and studied in relation to the field and the village; there was to be no division of the scientific work into departments. A joint book, "The Application of Science to Crop Production", was published in 1929. Unfortunately, in 1930 Mrs. Howard died, and the long and fruitful partnership came to an end. Howard himself left India in 1931; he was knighted in 1934.

At Indore, Howard had worked with Y. D. Wad on composts. These have long been known in the East, and they have the double advantage of supplying much-needed organic matter to the soil, and of affording the means of keeping the villages cleaner than would otherwise happen. No new principle was involved in the work, but his enthusiastic, even passionate, advocacy served the valuable purpose of greatly extending the use of composts. Howard, however, went further and introduced ideas regarded by scientific workers as going beyond the experimental evidence. He embodied these in two books, "An Agricultural Testament" (1940) and "Farming and Gardening for Health or Disease" (1945), and they were ably and persuasively set out in "The Earth's Green Carpet" (1947) by his second wife, Louise E. Matthaei, an associate of Newnham College and formerly chief of the Agricultural Service of the International Labour Office, Geneva. Whatever the fate of these ideas, they have caused scientific workers in agriculture to re-examine the foundations on which their hypotheses are based—always a useful exercise.

Howard was active almost to the end. For a day or two he had been slightly unwell, then came a heart attack from which he did not recover. E. JOHN RUSSELL

NEWS and VIEWS

Scientific and Technological Man-Power in Great Britain

THE report of the Committee on Scientific Man-Power (Cmd. 6824), it will be remembered (see *Nature*, June 15, p. 794, 1946), was based on the work of the Barlow Committee; both reports emphasized the vital need for increasing the output of trained men of science and technologists in Great Britain. In order that the part which universities and technical colleges will be called upon to play in this connexion may be estimated with greater accuracy than has been possible hitherto, the Advisory Council on Scientific Policy has asked for the help of the Technical and Scientific Register of the Ministry of Labour and National Service in measuring the existing man-power in the scientific and technological fields; to do this a comprehensive questionnaire is being sent out. The purpose of the survey is solely to obtain as complete an analysis as possible of the existing scientific and technological man-power in the United Kingdom and overseas in respect of its distribution in age groups between Government, industry, university and school teaching, and to use this analysis for estimating in which of the sciences it will be necessary to take special steps for increasing the output of the universities and technical colleges because of exceptionally heavy demands for home and overseas posts, previous and continuing shortages, or the high average age of any particular group. In asking for the completion of the questionnaire, the Ministry states categorically that the information provided will in no circumstances be used as a basis for any form of administrative control or direction. It is not being sought as a means of revising the Technical and Scientific Register of the Ministry of Labour.

A complementary inquiry is being conducted by the Ministry of Labour by specially appointed subcommittees of the Technical Personnel Committee presided over by Lord Hankey. These inquiries are designed to establish as nearly as possible the demands likely to be made by industry, teaching and Government service, both at home and overseas, in the various branches of science and technology during the next five to ten years, and committees have been set up to deal with chemical engineering, architecture and surveying, engineering, microbiology, entomology, geology and physics. The Committee on Chemical Engineering completed its work last year; draft reports have been prepared for architecture, surveying, microbiology and entomology; the engineering inquiry is well under way; and those into physics and geology have been commenced. It is hoped to set up a further committee in the immediate future to inquire into the future demand for chemists and metallurgists.

Committee on Science and its Social Relations

THE Committee on Science and its Social Relations, instituted by the International Council of Scientific Unions in April 1937, held its first post-war meeting in London during September 11–12. The members from the United States and from China were unable to attend, but Dr. V. Weiskopf from Cambridge, Mass., was present. A considerable part of the meeting was devoted to a discussion of the dangers facing the world from the possibilities of misusing science for war. The failure thus far to establish a world control of atomic (nuclear) energy is extremely embarrassing. Every effort towards a better understanding of the issues and dangers ahead must be supported by all means. Equally menacing dangers are connected with the possibilities of using bacteriological infections or poisons, control of which is far more difficult than that of atomic energy. It is important that those responsible for the strategy governing the armed forces of the United Nations should bear fully in mind the implications of these new weapons and of the speed with which they can be brought into operation. Equally, it is important to develop throughout the world a public opinion fully informed of the danger and strongly supporting measures leading to peace and international understanding. The whole future of the world depends on this. Much attention was also devoted to the position in which science has arrived through the legal secrecy restrictions now introduced in a number of countries; and through the support of scientific research by grants from military authorities and from industry.

The Committee decided to resume the work started before the War of making surveys of the social position of science in various countries. For this purpose the organisations adhering to the International Council (national academies and the like) will be asked to set up committees in each country to collect a number of specified data. Such a national committee, consisting of private individuals, already exists in Denmark and has done extremely valuable work there. Help will also be asked of the United Nations Educational, Scientific and Cultural