

organisations concerned, the Association of British Chemical Manufacturers, has recently published a brief survey of its work since its formation in 1916.

THE Association of British Chemical Manufacturers, which now has a membership roll of 117 firms representing a capital of more than £200,000,000, originated from the proposals of a committee representing the Chemical Society, the Society of Dyers and Colourists, and the Society of Chemical Industry, called at the suggestion of the first-named to consider the best methods of promoting co-operation between British chemical manufacturers. Additional objects served by the Association are: to provide British chemical industry with a medium for the expression of its views; to further technical organisation and promote industrial research; to facilitate the development and extension of British industries by keeping in touch with progress in chemical knowledge and practice; and to encourage closer co-operation between chemical manufacturers and the various universities and technical colleges. These desirable objects have been steadily borne in mind by the Association, the annual reports of which show a long record of achievement, and it has been prominently associated with all movements of importance since its formation. From its early days, the Association has maintained a service to keep members informed of the import and other statistics essential to their work, to keep them apprised of all directions in which new manufactures are needed, and yet at the same time to prevent useless overlapping by unnecessary duplication of effort. The Association is closely concerned with questions of safety in chemical works, with matters arising out of the Import Duties Act, with negotiations leading to new commercial treaties with foreign countries, with the incidence of acts such as the Dyestuffs Act and the Patents and Designs Act, with transport and with exhibitions. The monthly summary of information on chemical trade can be purchased by non-members.

Jubilee Exhibition at the Science Museum

To mark the occasion of His Majesty's Silver Jubilee, a pictorial exhibit illustrating the more outstanding inventions and conspicuous developments of the past twenty-five years has been arranged at the Science Museum, South Kensington. This exhibition was opened to the public on May 1 and will remain on view during the whole of the month. The main advances in the pure sciences, astronomy, mathematics, physics, chemistry, meteorology and geophysics are illustrated, together with their more important applications; for example, photographs are shown of the planet Pluto (which was discovered in 1930), modern methods of upper air investigations, radio-gramophones, 'talking pictures' equipment, infra-red photography and modern methods of prospecting. Of special interest is the series of photographs showing the rapid advances which have recently been made in our knowledge of the constitution of the atom, and the structure of the atomic nucleus. Progress of chemical industry is shown to include many important developments such as the

low-temperature carbonisation of coal, the manufacture of insulin, artificial silk and plastic products; while in the case of glass manufacture, reference is made to the improvements resulting from the introduction of machine processes and the influence on the glass industry of the widespread use of the motor-car. Among other subjects represented may be mentioned the development of aircraft, ships, locomotives, motor-vehicles, steam turbines, oil and marine engines, while the advances in electrical power and communication are illustrated by modern electric power stations, automatic telephones, radio-communication and television.

Award of Kelvin Medal to Sir Ambrose Fleming

THE Kelvin Medal of the Institution of Civil Engineers, which is awarded triennially as a mark of distinction in engineering work or investigation of the kinds with which Lord Kelvin was especially identified, was presented to Sir Ambrose Fleming by Sir Kingsley Wood, Postmaster-General, on May 7. Referring to our dependence on the universities for the inception of new scientific methods and scientific knowledge, Sir Kingsley said that thanks are due to Sir Ambrose not only for his own contributions, but also for the inspiration he has given to generations of students, which have spread over the world in ever-widening circles like the wireless waves themselves. Sir Ambrose was one of those pioneers in the science of radio, who worked under both physical and financial difficulties, and yet succeeded in placing at our disposal a means of communication of thought, sound and vision. Broadcasting may well be one of the greatest factors in drawing together the nations of the world. Sir Kingsley said that mass production in research produces results, but at a relatively higher cost than the research of inspired and gifted individuals, which has hitherto characterised the majority of the investigations carried out in Great Britain.

Viruses and Heterogenesis

THE definition and nature of life have been favourite subjects for ancient and modern discussion. Sir Henry Dale, armed with many recent exact data, stated in the Huxley Memorial Lecture on "Viruses and Heterogenesis", delivered at the Imperial College of Science on May 2 (London: Macmillan and Co., Ltd. 1s. net), the dilemma which confronts those who attempt to decide whether all the viruses which cause disease are self-propagating micro-organisms or whether some of them do not originate from the tissues of the host. Admitting that their minute size is perhaps the most important obstacle to accepting the smallest viruses as frankly living, he pointed out that there is an unbroken series from a virus of about the same size as the smallest bacteria with a diameter of 750 μ to the virus of poliomyelitis estimated at 10 μ , which approaches the size of a protein molecule; the diameter of a molecule of egg-albumin has been calculated as 4.33 μ (1 μ = one millionth of a millimetre). The long category of viruses has several

characters in common, making it very difficult to draw an arbitrary line at a certain size as criterion for separating two classes of entirely different natures.

SIR HENRY referred to Huxley's discussion of biogenesis and abiogenesis, and to the recurring claims for the origin of life from dead matter, including the 'spontaneous generation' of worms, maggots and bacteria, and the repeated victories of the advocates of biogenesis. He stated his personal opinion that the similar claim that viruses have their origin by heterogenesis in the tissues of the host would in the future be disproved and that the doctrine that like breeds like would triumph in this field also. Sir Henry emphasised the fact that viruses are obligatory parasites and suggested that the minute filterable particles are only a stage in the life of the infective agent, which might be able to reconstitute larger and more complete forms inhabiting the cells of the host where they cannot now be recognised or their size determined. He propounded the view that our theoretical problem is not to determine the lowest limit of size compatible with the minimum required for a living reproductive cellular unit, but to determine what is the minimal portion of such a unit which might be adequate for its reconstitution under favourable conditions.

Royal Institution: Annual Meeting

MAY 1 was the day of the annual meeting at the Royal Institution, when the members received the report of their committee of visitors on the state of the Institution during the year 1934, and when the election of officers took place in accordance with the time-honoured procedure. The three scrutineers were sent to watch the three balloting glasses during the half-hour that the ballot must remain open; at the end of the time they marched out to the private room appointed for the counting of the votes; and in due course they returned, to report to the meeting the names of the officers, managers and visitors elected for the year 1935-36. The president is to be the Right Hon. Lord Eustace Percy; the treasurer, Sir Robert Robertson; the secretary, Major Charles E. S. Phillips; new managers are Prof. E. N. da C. Andrade, Sir Frederick Berryman, Prof. A. Fowler, Sir Richard Paget, Prof. A. O. Rankine, Dr. G. C. Simpson, Mr. W. J. Tennant and Mr. James Whitehead. The visitors report testified to increased membership, to improved attendance at the lectures and to a year of varied activities in the Institution. The accounts show a financial position which cannot but be gratifying to the members and to their treasurer, Sir Robert Robertson, who has had charge of the finances since 1929, one of the most eventful and at times anxious periods in the Institution's history. The report of the Davy Faraday Research Laboratory records valuable progress during the year in the researches, largely on the structure of organic molecules, directed by Sir William Bragg. In the unavoidable absence of the president, Lord Eustace Percy, the meeting was conducted by the honorary secretary, Major Phillips; and it was remarkable for the felicitous terms of a speech in

which the thanks of the members were given to the president for his services during the past year by Sir James Crichton-Browne, of whom the evidence of *Who's Who*, that he is now in his ninety-fifth year, is difficult to credit.

Atomic Arrangement in Metals and Alloys

PROF. W. L. BRAGG, in the twenty-fifth annual May Lecture before the Institute of Metals on May 8, dealt with the inner structure, or atomic arrangement, of metals and alloys. In general, when one metal is alloyed into another a series of phases appears. Metal *A* dissolves a certain amount of metal *B* with a gradual alteration in properties as the proportion of *B* increases. At a certain composition, a limit is reached, and for greater amounts of metal *B* a new phase appears as separate crystals of quite different properties mixed with the first phase. Regions of single and double phase alternate as the composition varies from pure *A* to pure *B*. These phases are the nearest approach in an alloy system to the chemical compounds formed by combining elements. X-ray analysis has shown that each phase has its own definite pattern, such as a cubical array with atoms at corners and centres, or at corners and centres of faces. The pattern changes from phase to phase. One of the most striking generalisations about alloy patterns to which X-ray analysis has led us is the empirical Hume-Rothery rule, which states that the ratio of free electrons to atoms in a structure is the same for alloys with the same pattern. H. Jones has recently shown how the alloy pattern affects the binding energy of these free electrons, and so has given a reason for this rule. Another point brought out by the X-ray analysis is that the method of arrangement of the atom amongst the positions of the phase pattern can be varied widely. The phase pattern is an entity apart from the way the atoms are distributed, in marked contrast to ordinary chemical compounds. The study of the movements of the atoms amongst the positions, as affected by heat treatment, can be made the basis of a very interesting theory; at high temperatures the atoms are shuffled up in a random way, while at low temperatures they sort themselves out into a regular alternation. The importance of this work is that it provides a basis for the chemistry of compounds formed between metals.

A National Statistical Service

THE establishment in Great Britain of a special statistical council comprised of business men, bankers, economists and members of the general public charged with the task of instituting a National Statistical Service was recommended by Mr. Roy Glenday in opening a discussion on "The Use and Misuse of Economic Statistics" before the Royal Statistical Society on April 16. This new body would not itself collect statistics, but would devote its energies to co-ordinating the statistical work now being performed by Government departments, private bodies and individuals. Mr. Glenday pointed out that international trade has reached a crisis in its fortunes