

reactions of B.A.L., and R. Spence and A. G. Maddack outlined the design of a radiochemical laboratory in relation to the protection of the health of the staff. Two further sessions, entitled "Endocrinology and Carcinogenesis" and "Drugs and Chemotherapy", included papers on doisylnolic acids (K. Miescher), oestrogens related to triphenylethylene (W. Tadros), carcinogenic agents of the *p*-aminostilbene type (G. A. R. Kon), the relation between physico-chemical properties and bacteriostatic properties of acridines (A. Albert) and the empirical and rational approach to chemotherapy, as exemplified by the work culminating in the discovery of the antimalarial paludrine (F. H. S. Curd and F. L. Rose).

In Section 9 (Chemistry in Relation to Fuel, Power and Transport) there were discussions on many aspects of the production of solid and liquid fuels, carbonization and gasification, and combustion. Among topics which attracted special attention were gas turbines and underground gasification. Sir Ernest Smith addressed a meeting on the training of chemists for the fuel industries. In Sections 10, 11 and 12 (Chemistry in Relation to Natural and Artificial Textiles, to Elastomers, Plastics, Glass and Ceramics, and to Metals) the predominant tendency was towards fundamental investigations as an aid to the solution of practical problems. The academic approach was typified by contributions on the properties of seaweed rayon (J. B. Speakman), deuterium exchange in cellulose (H. Mark), the theory of crystallization and plastic flow (Sir Lawrence Bragg), the intrinsic viscosity of polymer solutions (P. Debye), the effect of crystallization on the mechanical properties of high polymers (G. Gee), the network theory of rubber (W. Guth and H. M. James), sorption kinetics (R. M. Barrer), the thermodynamics of metallurgical extraction processes (H. J. T. Ellingham), and the electrochemical mechanism of corrosion (U. R. Evans). Section 13 (Chemical Engineering) held a symposium on educational aspects, as well as discussions on a variety of large-scale processes, including the production of hydrogen, oxygen, heavy water and toluene.

In addition to the section meetings, Congress lectures were delivered by L. Pauling on "Molecular Structure and Biological Specificity", Sir Henry Dale on "The Part of Chemistry in the New Therapeutics", P. Karrer on "Recent Advances in Organic Chemistry", A. Tiselius on "Recent Developments in Electrophoresis", L. Hackspill on "Calcium Carbide and its Reducing Properties", and by B. C. P. Jansen, who took as his subject "*Simplex non veri sigillum*".

The second, equally important function of the Congress, namely, to promote and extend the invaluable personal contacts between chemists of different countries, was well provided for. Delegates and members were entertained by the Government, the Royal Society, the Royal Institution, the Chemical Society, the Royal Institute of Chemistry, the University of London, Imperial Chemical Industries, the English Speaking Union and other bodies. There were two Congress dinners, one of which was attended by the Prime Minister and Mrs. Attlee. In proposing the toast of chemistry, Mr. Attlee said that the problem of the modern world was not how to make more advances in science, to which it owed so much, but rather, how to secure a world in which those advances could be made with safety. This indeed must have been the predominant thought of all those who took part in this Congress.

## SEVENTEENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS

THE Seventeenth International Physiological Congress was held in Oxford during July 21-25 under the presidency of Sir Henry Dale. It was attended by about 1,200 physiologists, including welcome delegates from the U.S.S.R. and China. The official programme was very heavy, for 350 communications, about seventy demonstrations and a number of films had to be compressed into three working days.

There were a number of excellent films, including one of hypothalamic stimulation by W. R. Hess, the isolation of a single nerve fibre by A. von Muralt, perfusion of the whole animal by I. de Burgh Daly, and colour films for teaching made with the help of Imperial Chemical Industries, Ltd., by J. H. Burn and F. R. Winton.

In earlier international congresses, it was intended that communications should be demonstrative and experimental, and memorable demonstrations have included one by Sherrington on the reciprocal innervations of antagonists, and another by Mering and Minkowski on the experimental production of diabetes. This year the demonstrations were interesting and competent, but not, perhaps, of the first importance.

For the communications, nine lecture theatres were in use simultaneously during the six sessions. This permitted the programme to be completed without trespassing on the time available for the all-important social activities, and their opportunities for personal contact.

A considerable number of communications arose from work undertaken with official encouragement in the War. Studies on respiration at high altitude, at high pressures of oxygen and carbon dioxide, explosive decompression, resistance to centrifugal force, resistance to high environmental temperature, all demonstrated the practical usefulness of physiological analysis.

Studies which were made possible by the development of new substances during the War, or which arose out of the care of war casualties, were on the whole of greater scientific importance. The application of diisopropyl-fluorophosphonate to a variety of systems involving acetylcholine, and further controversy over the part played by acetylcholine in the transmission of the nerve impulse, the application of B.A.L. to the treatment of poisoning by arsenic and other metals, are good examples. Work on patients suffering from starvation, traumatic arterio-venous aneurysms and traumatic paraplegia has also been not unprofitable.

Perhaps the most important work reported, however, has been in independent research, in which, in Prof. E. G. T. Liddell's phrase, after seven years, members were showing an active post-inhibitory rebound. An outstanding paper was given by A. L. Hodgkin and A. F. Huxley, who suggested that during the rising phase of the action potential in nerve, the membrane becomes highly permeable to sodium ions which then enter the cell. Potassium ions leave the cell during the falling phase and later restorative processes occur linked with energy-producing mechanisms. There was considerable indirect evidence in favour of this view. A theoretical treat-



ment of the principal events in muscular contraction was put forward by A. Szent Györgyi, and provoked a vigorous discussion (see also p. 262).

The refinement of physical methods applicable to living organisms has progressed rapidly. Methods of measuring tissue fluid flow by radioactive helium, recording the contour of the heart by a precise radiographic and photo-electric method, continuous records of blood pressure in man by a condenser manometer, all provide powerful tools for work on the circulation. The clinical physiologists, A. Cournand, J. V. Warren, E. A. Stead, J. McMichael and E. P. Sharpey Schafer, using cardiac catheterization, have demonstrated the similarities as well as the differences in the behaviour of the circulation in man and in anaesthetized animals.

The nature of the proteins of muscle and of the nucleus and its chromosomes has continued to occupy much attention. The central nervous system also was the subject of a large number of papers; but there were no outstanding advances in any of these fields.

The Congress accepted an invitation to Copenhagen for the Eighteenth International Congress, to be held in 1950, under the presidency of Prof. August Krogh.

On the last day, the University of Oxford conferred degrees of Doctor of Science on Profs. C. H. Best, H. S. Gasser, B. A. Houssay, August Krogh and A. Szent Györgyi.

## GRASSLAND AND ANIMAL PRODUCTION

**I**N July 1937 the International Grassland Conference was held in Great Britain, and the delegates examined closely the work and promise of the Aberystwyth nucleus, from which so much of the newer knowledge and philosophy of grassland management has spread. In the last week of June 1947, a further review of the activities of the Welsh Plant Breeding Station was made by members of the British Grassland Society and the Society of Animal Production at the first joint meeting of the two groups. This occasion, too, was given a minor international flavour by the representatives from countries overseas, who took the opportunity to refresh their contacts with workers in Britain; but, useful as this was, the greater significance of the meetings and visits lay in the interchanges of ideas and comments between those concerned on one hand with better grassland and, on the other, with better use of that grassland by the animal.

At first glance, there should be no divergence between the two aspects; clearly, however, there is. Moreover, there might appear to be a close parallel between the objectives of the animal husbandman and the agronomist: one aims to increase productivity by better nurture, better breeding, and a replacement of the less biologically efficient stock by those of greater and more reliable merit, the other at improving productivity of the plants by broadly similar means. Yet such a parallel would be deceptive as a representation of the past, and even present, courses of the two lines of endeavour.

During the last ten years great progress has been achieved in the development of plant-breeding methods and material. At all stages of the process, from the search for fresh material, its testing, experi-

mental breeding, progeny-testing, and multiplication, to the treatment of seed, and the certification of stocks, as well as in the maintenance of proved stock plants or strains and in the trials of material from other sources in pure cultures and in mixtures, the techniques have advanced even under the difficulties occasioned by war-time shortages of personnel and equipment. The gardens and trial grounds of the Plant Breeding Station at Penglais, with the larger plots and field trials at Frongoch and the multiplication fields at Morfa Mawr, provided the background for a spectacular display by Prof. T. J. Jenkin and his colleagues of the use and application of the old and new methods—to the envy of the animal breeders, who, restricted by the numerical smallness, but physical largeness, of their material, have also to think in terms of populations.

The years of war have accelerated the spread of the selected Aberystwyth strains of grasses and of clovers into practical conditions of grassland establishment. The urge to increased production of British agriculture has given encouragement to ley farming, and the demand for seed of known origin has had repercussions in the seed trade, as well as on the administrative and routine activities of the staff of the Station. At the same time, the principles and methods of improving the swards of the higher and inherently poorer grazing lands, as developed at Llety-Evan-Hen and the Cahn Hill Improvement Scheme, have been given a wider extension to other hill areas, to the enhancement of stock production, as was described by Mr. Moses Griffith and Prof. W. Ellison at the separate meeting of the Society of Animal Production. The prospect of the early discontinuation of the Cahn Hill work is regarded with concern by both Societies, the members of which recognize the important role of the hill farming areas in the maintenance of a healthy and balanced stock-raising industry in Great Britain.

Though somewhat envious of the technical opportunities and material advantages offered to the plant breeders, the stock men were none the less comforted. They found themselves, for example, on familiar though not so clearly signposted country in noting such matters as the variation among the progeny from selected parents and strains, the differential responses of varieties and strains under a common environment and changed behaviour in other environments, the range in maturity, the effects of length of day on reproductive organs, the handiness of 'indicator' characters (but not of necessity their feasibility as measures of performance), change or 'degeneration' in the later generations of stocks grown on in other areas, or even the different potentialities and performances of 'pedigree' and 'commercial' strains. There should be much common ground here for future co-operation in study and discovery of principles, for example, in wedding the ecological approach to the genetical, to enlighten the limits of selection in one environment to meet the demands and suitabilities in another.

The present divergence of views occurs with regard to purpose and method. The emphasis in the grassland work appears, to the animal husbandman, to be on the sward, and its management to the benefit of the sward. The increased productivity of swards, as swards, which can emerge from suitable seeds mixtures, sown under favourable conditions of soils and cultivations, with appropriate fertilizer treatments and apt grazing and cutting, is clearly demonstrable and has, in fact, been often and well demonstrated.