skin, it would appear that depilatories are bound to affect the skin keratin. For the purpose of depilation, Dr. Moynahan said that he prefers the method of electrolysis, although this method is impracticable for axillary hair removal in women. After briefly referring to cases of oil dermatitis caused by the use of 'brilliantines', he interpolated some comments on keratoplastics and then referred to the merits and defects of barrier (protective) creams. His concluding remarks dealt with the indiscriminate use of disinfectants, which can easily intensify skin irritation, and with the potential dermatitis-provoking action of highly rosined soaps.

COPENHAGEN BIOLOGICAL CONFERENCE

RECENT developments and present trends in cellular biology, physiology and chemistry formed the subject of a joint Danish–British conference held during April 30–May 2 at the Danmarks Farmaceutiske Hojskole in Copenhagen. At the invitation of Danish biologists and the University of Copenhagen, a group of research workers from Great Britain as well as several Danish scientific workers reported on the progress of their own researches, dealing with a variety of topics, which were chiefly, though not exclusively, concerned with the correlation of cell composition with specific cell functions such as growth, division and survival.

The opening session, at which the chair was taken by Dr. A. F. Hughes, began with Prof. H. G. Callan's account of his studies on the amphibian oocyte nuclei; he was followed by Dr. W. S. Bullough, who spoke on the effect of œstrogenic hormones on carbohydrate metabolism and mitosis in mouse ear epidermis; and Dr. M. Webb on the influence of certain extraneous agents, chiefly magnesium, on cell division in bacterial cultures. Dr. F. Buchthal presided at the next session, which was devoted to papers by Dr. J. M. Mitchison, on the mechanical properties of the cell surface, particularly in relation to cleavage; Dr. E. Zeuthen on nuclear growth and respiration in dividing marine eggs, in the light of his recent experiments with the refined Cartesian diver technique; and Dr. C. Waymouth on the problems of maintenance and growth of tissues *in vitro*, in a variety of media of chemically defined composition.

The chair at the next day's meeting was taken by Dr. G. H. Bourne and Prof. P. Brandt Rehberg. The proceedings were opened by Drs. E. C. Slater and K. W. Cleland, who discussed the respiratory and phosphorylative ability of heart muscle sarcosomes. Dr. S. R. Pelc and Dr. A. Howard followed with a communication on the effects of X-rays and neutrons on the synthesis of deoxyribonucleic acid in plant roots; Dr. H. Holter surveyed critically the existing methods by means of which different parts of the cell can be separated mechanically and used for studies on the localization of enzymes in the cytoplasm; Dr. R. Brown described the enzymatic changes which occur in the plant cell during growth. A much appreciated contribution was made by Prof. K. Linderstrøm-Lang, who analysed in a detailed manner the phenomena of diffusion and precipitation in Gomori's histochemical test for phosphatase. Dr. E. Hoff-Jørgensen spoke on the deoxyribonucleic acid content of some bacteria in relation to requirements for vitamin B_{12}.

Prof. J. N. Davidson took the chair on the last day of the meeting. Dr. H. Kalckar described recent experiments in which he used radioactive phosphorus for the demonstration of a pyrophosphorolysis of uridinediphosphoglucose to uridinetriphosphate and glucose-1-phosphate; Dr. R. Markham reported on some new structural characteristics of nucleic acids as revealed by the combined application of enzymic and chromatographic methods; Dr. J. A. V. Butler then spoke on the action of radiomimetic substances on nucleic acid; and Dr. C. Lutwak-Mann on the behaviour of nucleic acid in blood-forming tissues with special reference to X-ray injury.

The contributions were followed by stimulating comments and discussion, notably by Prof. C. H. Waddington, Drs. J. Ebling, J. A. Kitching, R. K. Morton and others. In conjunction with the conference three evening lectures were given. Dr. D. J. Bell reviewed the subject of "Transglycosidation: a Natural Method of Stored-energy Transfer" before the Danish Chemical Society; Dr. T. Mann spoke on "Sperm Survival and its Dependence on Metabolic Processes" to the Danish Biological Society; and Prof. J. Z. Young on "Experiments on Learning in the Octopus" to the Natural History Society.

The British party, who enjoyed initially the support of Dr. M. Swann and later of their efficient secretary, Dr. W. S. Bullough, were most cordially received and entertained by their Danish colleagues. Prof. H. V. Brønsted, Dr. H. Holter, Dr. H. Kalckar, Prof. K. Linderstrøm-Lang and Dr. E. Zeuthen spared no effort to assure for the conference the maximum of scientific and social success. A banquet at the ancient Munkekaelderen was honoured by the presence of the rector of the University of Copenhagen, Prof. H. M. Hansen.

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES

MEETING OF THE EXECUTIVE COMMITTEE

THE executive committee of the International Union of Biological Sciences met in London in the rooms of the Royal Society during March 4–5. This meeting was midway between the last General Assembly of the Union at Stockholm in 1950 and the next one to be held in the summer of 1953. Thirty members of the executive committee, from eight countries, were present, representing the nine Sections of the Union, namely, those of Biometry, Botany, Experimental Cytology, Embryology, Entomology, Genetics, Limnology, Microbiology and Zoology. Some of these Sections are identified with international bodies; thus the Section of Biometry is constituted by the Biometrical Society, the Section of Experimental Cytology by the Society of Cell Biology, the Section of Microbiology by the International Association of Microbiologists, and the Sub-Section of Zoological Nomenclature by the International Commission on Zoological Nomenclature. The executive committee expressed the desire that all Sections of the Union, some of which are already affiliated to the permanent committees of International Congresses, should as far as possible be identified with international organizations having

similar activities and aims. Another wish was formally expressed that substantial financial aid be sought from international foundations for scientific establishments of the Union, in particular for the two centres of systematics and of experimentation which have been created by the Commission of the Union for Research on the Biological Control of the Pests of Plants.

The Union organizes annually a limited number of discussion symposia. In 1951 three were held on, respectively, cytochemistry, symbiosis in insects, and biometry in relation to plant growth. This year four are to be held: on the bacteriophage, at Royaumont near Paris; on cytodifferentiation and histodifferentiation, in Stockholm; on the scientific organization of botanic gardens, in London; and on the biochemical and structural bases of morphology, in Utrecht.

The International Union of Biological Sciences, which has been in existence since 1919, is a member Union of the International Council of Scientific Unions, and from time to time, as the need for them arises, joint commissions which last a few years are established between it and other Unions of the Council; for example, a new Joint Commission on Electron Microscopy with the International Union of Pure and Applied Physics has just been set up. The International Union of Biological Sciences possesses limited funds furnished by the subscriptions of its thirty-one member countries, and it acts in an advisory capacity to Unesco for expenditure by that body on biological sciences. Further information can be obtained from the general secretary of the Union, Prof. P. Vayssière, 57 Rue Cuvier, Paris.

BRITISH GELATINE AND GLUE RESEARCH ASSOCIATION

FIFTH RESEARCH PANEL MEETING

THE fifth research panel meeting of the British Gelatine and Glue Research Association was held at Beale's Restaurant, Holloway Road, London, N.7, on Tuesday, April 29, at which the total attendance of about seventy included staff of member firms, and of other research associations and government departments. The chair was taken by Mr. S. G. Hudson, chairman of the Association.

The first paper was given by Dr. J. T. Edsall, professor of biological chemistry in Harvard University and Fulbright visiting lecturer in the University of Cambridge. In his paper, entitled "The Conversion of Fibrinogen to Fibrin", Prof. Edsall commenced by underlining the striking character of the gel-forming process in blood clotting, shown all the more clearly when the purified protein constituents, thrombin and fibrinogen, are mixed in solution and a firm rigid gel is formed in a short period of time. The gel-forming ability is so great that Dr. J. D. Ferry has obtained fibrin gels at a concentration of 0·004 per cent. The two main stages in blood clotting are the formation of thrombin from prothrombin and, secondly, the thrombin–fibrinogen interaction which leads to clotting. It has proved possible to obtain purified prothrombin from which thrombin can be prepared for studies of its action on fibrinogen. Thrombin clearly acts catalytically, since the amount required to convert a substantial quantity of fibrinogen into fibrin is very small (1 part per million of fibrin). Quantitative studies of its enzyme action are, however, difficult to perform owing to adsorption of thrombin on the fibrin formed. Fibrinogen represents some 4 per cent of human plasma proteins and up to 10 per cent in beef plasma and the plasma of other animals. It has been separated by salting out or by low-temperature alcohol precipitation.

Flow birefringence, ultracentrifuge studies, diffusion and light-scattering give evidence of a molecular weight for fibrinogen of 400,000–500,000, the molecule being markedly elongated. Approximate dimensions are, for a rod-like shape, length 700 A. and diameter 38 A. Electron microscope studies by C. Hall, while confirming these figures in the main, show a considerable variation in length from molecule to molecule, and the structure appears bead-like along the length of the molecule. The sub-units may be related to observations of the action of urea in breaking down the molecule to give units of molecular weight in the region of 100,000. The molecular weight of thrombin is not known definitely, but is probably less than 100,000.

The early stages of the action of thrombin on fibrinogen have been shown by Lorand, Bailey and co-workers to involve the release of end-groups which can be estimated by Sanger's fluoro dinitrobenzene technique, giving a frequency of roughly one group per 100,000 molecular weight. In addition, 3–4 per cent of the protein weight is split off as a peptide, the composition of which is being studied. At *p*H 5 there is no evidence of clot formation when fibrinogen and thrombin are mixed. It is clear that some action occurs even in these conditions, since on raising the *p*H instantaneous clotting occurs, whereas in a mixture freshly made at the higher *p*H there is a time delay before clotting. Light-scattering indicates the formation of intermediate aggregates 2500–4000 A. long prior to setting. These aggregates are formed by the modified fibrinogen after loss of the peptide.

By appropriate choice of conditions (*p*H, salt content) the type of clot obtained can vary from a clear transparent stable gel to a doughy opaque mass easily giving rise to syneresis. The difference depends on the size of the fibrillar units, as has been confirmed by electron microscopy. The coarse clots are the basis of the fibrin films developed by J. D. Ferry and P. R. Morrison for use in neuro-surgery. The effects of *p*H, salt concentration, urea, guanidine hydrochloride, etc., on rate of clot formation have all been studied.

Electron microscope studies of the fibrils in the coarse type of clot show a periodic structure with a spacing of 230 A. reminiscent of the collagen structure. There is no ready explanation of this periodicity. The type of bonding appears to vary according to whether calcium, and a plasma component, are present or not. In the absence of these two, urea suffices to cause dispersal of the clot, but with both present it appears likely that more permanent links involving —SH groups are formed.

The second paper was given by Mr. E. Bradbury, of the British Cotton Industry Research Association, Shirley Institute, Manchester, and bore the title "The Effect of the Temperature of Preparation on the Mechanical Properties and Structure of Gelatine Films". Mr. Bradbury explained the significance of this work as fundamental to the study of the use of gelatine for rayon sizing. Gelatine films prepared by