

on the attainment of high resolution from thin tissue sections, and suggested that, to attain a resolution of 10 Å., the section must be 100 Å. or less in thickness. A short discussion followed in which Mr. Haime (Associated Electrical Industries, Aldermaston) stated that, to avoid graininess in the final photographic print due to random fluctuations in the electron beam, a 10-Å. resolution micrograph must be recorded on the photographic plate at a magnification of not less than $\times 50,000$. R. C. Valentine and Dr. J. R. G. Bradfield (University of Cambridge) then presented two papers, in the first of which they described how, by draining the suspending fluid from a drop of suspension on a collodion-covered grid, damage to bacterial cells can be minimized. In their second paper they described preliminary observations on 0.035- μ sections of *Staphylococcus aureus* and *Paracolon bacillus*. Bodies described as resembling chromosomes were shown in the nucleus, which was demonstrated to contain deoxyribonucleic acid by use of a modified Feulgen stain.

Dr. T. H. Flewett and Dr. G. Eaves (School of Medicine, Leeds) showed sections of egg membranes infected with vaccinia virus, ultra-thin sections of the vaccinia virus being demonstrated. Dr. E. M. Brieger and Dr. A. M. Glauert (Strangeways Laboratory, Cambridge) showed some sections of lung and spleen of mice infected with bovine tubercle bacillus.

Mrs. B. E. Williams reported that the National Physical Laboratory, Teddington, has developed a cheap method of producing gelatin copies of diffraction gratings, from which it is possible to make 'Formvar' replicas for the electron microscope for use in magnification calibration. The Laboratory is prepared to supply these copies at a nominal charge to cover postage and packing.

C. E. CHALLICE

¹ Hillier, J., and Ramberg, E. G., *J. App. Phys.*, 18, 48 (1947).

NORTHERN SECTION OF THE PHILOSOPHY OF SCIENCE GROUP INAUGURAL MEETING

AN inaugural meeting to constitute the Northern Section of the Philosophy of Science Group of the British Society for the History of Science was held in the Staff House, University of Manchester, on January 30, at 2.30 p.m. Despite the cold weather, which made travel difficult, it was attended by representatives from the Universities of Leeds and Liverpool and the University College of North Staffordshire. Of those from the University of Manchester, eleven departments were concerned—botany, child health, classics, chemistry, extra-mural, mathematics, philosophy, psychology, radio astronomy, theoretical physics and zoology. From Leeds the departments represented were mathematics, medical physics and philosophy; from Liverpool, philosophy and zoology; and from North Staffordshire, philosophy and physics.

After Prof. L. Rosenfeld (professor of theoretical physics, University of Manchester) had been elected chairman of the business meeting, Dr. W. Mays (University of Manchester) gave an account of how the proposal for a Northern Section arose. He pointed out that for a number of years it had been felt by some members of the Philosophy of Science Group

who were living in the North of England that they were missing a good deal by not being able to attend its meetings, and it was therefore considered appropriate to have a Section of the Group in their part of the country. Such a Section would help to bring together people interested in the philosophy of science and encourage discussion and research. Inquiries made at Leeds, Liverpool, Sheffield and North Staffordshire as well as Manchester showed that there was considerable interest in the proposal. The members promoting the scheme therefore decided to ask the Philosophy of Science Group for permission to form a Northern Section, and this was readily granted. As far as future activities are concerned, it is hoped to hold meetings at regular intervals at the various university centres taking part in the scheme. There will obviously have to be a good deal of flexibility and decentralization, and, wherever possible, local centres will be encouraged to organize their own activities.

The resolution to form the Section was then put to the meeting and carried, and it was decided to elect a provisional committee to take charge of affairs until October, when there will be a general meeting and officers will be elected for the year 1954-55. Prof. D. M. Emmet (professor of philosophy, University of Manchester) was elected provisional chairman of the Section, and Dr. Mays provisional honorary secretary and treasurer. It was resolved that the committee be composed of two representatives from each University, and that members should be elected by the Philosophy of Science Group on the recommendation of the Section. Twenty-eight applications for membership were made at the meeting.

Prof. L. Rosenfeld then gave a lecture on "Rationalism in Antiquity". The topic, he said, has philosophical as well as scientific implications. If one examines the atomic theory of Democritus, one is struck by the modernness of his approach as he seriously attempts to give a rational explanation of the universe devoid of theological or mythological content. The view has been advocated that the growth of rational thinking in Ancient Greece, which led to the birth of Ionian natural philosophy, was to some extent conditioned by the social and economic changes occurring at the time. During the Pre-Socratic period the Greeks had the East opened up to them for trading purposes. In some ways one is reminded of the growth of scientific ideas during the sixteenth century as a result of navigational discoveries.

With the breakdown of Athenian democracy and its subsequent domination by Alexander, Greek philosophy lost its flexibility and became rapidly systematized. A new type of literature developed, the writing of Utopias with their veiled criticism of the authorities. The seeds sown by free discussion among the earlier Greek thinkers became, in Alexandrian times, Stoicism and Epicurianism; but whereas Democritus represented an optimistic and constructive philosophy, Epicurus and Lucretius represented a philosophy of pessimism fighting against a decaying civilization.

But the ideas of the Milesian thinkers were not entirely original. The first international carriers and merchants were the Phoenicians. If the philosophical thought of the Phoenicians was purely mythological in character, the hypothesis that there is a relationship between rationalism and commercial adventure becomes considerably weakened. The little that is

known of Phœnician cosmology would seem, however, to indicate that it too was rationalistic in character. Though this resemblance between Phœnician and Greek thought may have been solely due to their both being seafaring nations engaged in commerce, one cannot entirely rule out the possibility that the former had some influence on the latter.

W. MAYS

BRITISH GELATINE AND GLUE RESEARCH ASSOCIATION RESEARCH PANEL MEETING

THE seventh meeting of the Research Panel of the British Gelatine and Glue Research Association was held at Beale's Restaurant, London, N.7, on November 26, with the director of research, Mr. A. G. Ward, in the chair.

The meeting took the form of a symposium on soluble collagens, the salient points under discussion being outlined in a general introduction, given by Dr. R. H. Smith (Biophysics Unit of the Medical Research Council). The remaining speakers then gave more detailed accounts of the progress made and conclusions reached in studies made using specialized techniques. Dr. R. W. G. Wyckoff (science attaché to the American Embassy, London) reviewed the evidence for the conclusion that the fine structure of reconstituted collagen fibrils, as revealed by electron micrographs, depends upon the conditions for reprecipitation (for example, the pH and the precipitating agent). At present, four kinds of order may be produced, only two of which (with spacings of 640 Å. and 210 Å.) have been seen in native collagen. The remaining forms are fibrils with a spacing greater than 2000 Å. and segmented fibrils.

Dr. F. C. Kelly (Biophysics Unit of the Medical Research Council) described in some detail experiments on the production of segmented material by adding nucleotides (such as adenosine triphosphate) to solutions of alkali-soluble collagen, prepared by extracting rat skin with secondary sodium phosphate.

The preparation and properties of the materials obtained by the reconstitution of citrate-extracted calf skin, acid-extracted tendon and alkali-extracted calf skin were discussed by Dr. J. H. Bowes (British Leather Manufacturers' Research Association). Amino-acid compositions, determined by Moore and Stein's procedure, were compared with that of native ox-hide collagen. These results are of particular significance to the manufacturer of gelatine, who normally pre-treats the raw material under acid or alkaline conditions.

Dr. D. S. Jackson (Rheumatism Research Centre, Manchester) gave an account of recent work on the evaluation of the relative importance of ionic and hydrogen bonds in determining the stability of rat-tail tendon. About one-quarter of the stability appears to arise from ionic linkages between collagen and chondroitin sulphuric acid, the main mucopolysaccharide present in tendon.

An extensive investigation, using human abdominal subcutaneous connective tissue, has led to the conclusion that this tissue contains at least three acid polysaccharides, none of which is identical with chondroitin sulphate. Dr. R. Consden (Special Unit for Juvenile Rheumatism, Maidenhead) described the work leading to this conclusion, and Dr. J. E.

Eastoe (British Gelatine and Glue Research Association) mentioned that he had found similar complexity in the mucopolysaccharides in the ox-femur shaft.

The important question of how collagen fibres arise within living tissue was discussed by Dr. S. Fitton Jackson (Biophysics Unit of the Medical Research Council), who paid attention particularly to the evidence obtained from phase-contrast microscopy and electron microscopic studies on the ossification of embryonic cartilage in the chick.

The final topic for discussion was high-angle X-ray diffraction in collagen. Mr. A. C. T. North (Wheatstone Physics Laboratory, King's College, London), after indicating the difficulties associated with obtaining reconstituted collagen in a form suitable for X-ray diffraction work, discussed the information which has been obtained from diffraction diagrams of swollen rat-tail tendon. Such diagrams are typical of a helical rather than a sheath-like structure for collagen. Dr. P. M. Cowan (also of the Wheatstone Physics Laboratory) elaborated on this conclusion, mentioning the requirements of bulk density and the importance of proline residues in connexion with hydrogen-bonding and stereochemical considerations. The helical structures proposed by various authors for collagen have been examined by the optical diffraction pattern method, and none appears satisfactory.

ARAB NATIONS SCIENCE CONGRESS IN ALEXANDRIA

A SCIENCE congress for the Arab nations, arranged by the Arab Nations Organization, was held in Alexandria, for the most part in the Faculty of Commerce of the University of Alexandria, during September 1-8, 1953, under the presidency of Prof. Mostafa Nazif, vice-rector of Ibrahim University, Cairo. More than five hundred men of science attended, representing Egypt, Iraq, Jordan, Lebanon, Palestine, Saudi Arabia, Syria and Yemen. The congress was opened by the president of the Republic of Egypt, General Neguib, who, with the official delegates from the nations participating, gave short speeches in which they stressed the importance of scientific co-operation among the Arab nations.

The activities of the congress were grouped into three sections. The first section, on original researches, consisted of about sixty papers dealing with mathematics, astronomy, physics, meteorology, biology, geology and chemistry; these papers were read before three groups, each of which held four meetings. Full details of these researches will be published in a special book to be issued by the organizing committee of the congress. At the second section, on general scientific problems, the subjects discussed dealt with scientific terminology; editing, translating and publishing books; the training and equipment of science teachers for schools; and the importance of science to the national economy. The organizing committee for the congress had previously arranged for the discussion of these problems by forwarding questionnaires to members of the teaching staff in the universities and ministries of education in the participating nations, and the replies had been published in book-form and circulated to members of the congress before meeting. The Arabic language was strongly recommended for the teaching of science in universities, and encouragement of the publication