Experimental Results

Experiments have been carried out with active cobalt, tantalum, and gold wires arranged to form letters of the alphabet, in order to form an estimate of the capabilities of the instrument. Difficulties increase rapidly with increasing penetration of gamma radiation, but even with cobalt-60 we have found it possible to make reasonable visual images of simple sources. Fig. 3 shows the results of experiments with active gold and tantalum wires and illustrates the increased resolution obtained with a 3-mm. as opposed to a 5-mm. diameter aperture. The figure also indicates the degree of resolution obtainable as two parallel line sources are gradually moved relative to each other. It will be noted that the matrix of one hundred spots is adequate for these early experiments, resolution being determined largely by aperture diameter. The photographs represent reasonably the visual image produced on the long-persistent screen oscillograph.

In spite of obvious limitations we have produced with this apparatus recognizable visual and photographic images of radioactive sources, and are continuing with experiments to design and construct apparatus of greater sensitivity and resolution. We are also carrying out experiments with X-ray sources, as it seems that in the X-ray field the apparatus may have considerable application as an image amplifier. Other possibilities include studies of movement of radioactive materials by serial exposure, the formation of stereoscopic images and the direct presentation of the variation of counting-rate over an extended source. [Aug. 2.

[1] Mayneord, W. V., and Belcher, E. H., Supp. No. 2, *Brit. J. Rad.*, 259 (1950).

THE AMERICAN CHEMICAL SOCIETY AND INTERNATIONAL CHEMISTRY

THOSE who associate the United States with operations carried out with clockwork precision on a gigantic scale would not have been disappointed with the activities of the chemists who attended the Diamond Jubilee of the American Chemical Society in New York during September 3–7 and the Twelfth International Union and International Congress of Pure and Applied Chemistry during September 8–12; the Union completing its activities in Washington, D.C., on September 14–15.

The total enrolment for these events was more than 18,300. Detailed accounts of the proceedings of all three organizations, the technical sessions, lectures, speeches and dinners have already been published in the appropriate journals; indeed, three issues of the American periodical *Chemical and Engineering News* are almost entirely devoted to this subject. There were many interesting features well worthy of comment about these meetings of the largest collection of chemists ever assembled in the world.

While the annual meeting of the American Chemical Society was naturally a domestic affair, yet on this, its seventy-fifth meeting, that Society extended invitations to colleagues overseas and to other kindred domestic societies. There were present forty-one delegates representing societies from thirty-eight nations and seventy-seven delegates from domestic societies. The presentation of scrolls of congratulation took place in the Armoury in New York, where the delegates in their academic costumes were introduced in turn by Prof. Herman Mark to President N. H. Furman, who accepted the scrolls which were then placed by Secretary Alden Emery in a box on the stage. The ceremony on this gigantic scale was extremely impressive. It may not be generally known, but no less than 265 of the younger chemists from forty-five different countries were invited to the United States through the instrumentality of the Economic Cooperation Administration and the Ford Foundation. These had the opportunity of attending the meetings, visiting industrial plants in various sections of the country and of staying a few days in the homes of American scientific men to enable them to get a better appreciation of the American way of life. They were officially welcomed to the meeting by President Furman, Donald Shank of the Institute of International Education, Alden Boyd of the Economic Cooperation Administration and the Ford Foundation, and Alden Emery, the general secretary of the American Chemical Society. This was in addition to the hospitality lavished on the delegates themselves.

The importance of chemistry in the national life is a topic which usually receives attention only from the chemists themselves, but it may be of some importance to other countries to note that at these meetings there was read a letter of welcome from President Truman; an official civic welcome by the City of New York on the steps of the General Post Office; an unveiling of a bronze plaque by Dr. C. Parsons, former secretary of the American Chemical Society, on the wall of the house where the Society was founded seventy-five years ago in Washington Square, the Chelsea of New York; an able address by Governor Driscoll of New Jersey on "Politics in an Age of Science"; a speech by Allan Berkley, the Vice President of the United States, on the "Chemical Problems of the Farmer", in which he reminded his audience of the fact that Thomas Jefferson had regarded chemistry as "the most useful of sciences, big with future discoveries for the utility and safety of the human race". Finally, in Washington an after-dinner speech was given to the delegates of the International Union by Charles Sawyer, U.S. Secretary of Commerce.

The U.S. post office issued ten million commemorative stamps, of which, I believe, more than 2½ million were sold within the first two days.

The formal meetings and dinners were diffused over the country both by radio and television; a number of the official delegates found several days exposure to 'Kleg' lights rather tiring. It was also significant that the three public speeches addressed to the American Chemical Society all dealt with the future rather than with past achievements; that of President Furman reviewing the present and indicating the future developments within the Society. Dr. J. B. Conant, president of Harvard, chose as his text "A Skeptical Chemist looks into the Crystal Ball", and Dr. Kenneth Mees, of the Kodak Co., dealt with "The View Ahead in Chemistry". These prophets were as optimistic as those who stood before Lars Porsenna.

Both English and American chemical journals and abstracts play a large and important part in world chemistry, and it is evidently desirable that such technical matters as symbols, nomenclature and

abbreviations should be as uniform as is possible. This meeting of the American Chemical Society provided a welcome opportunity for those responsible on both sides of the Atlantic to meet and discuss this important matter. Semantics give us no decision between 'sulphur' and 'sulfur' or 'aluminium' and 'aluminum', but the two countries have found it possible to adopt the same symbols and identical logical methods for the necessary chemical shorthand.

As the oldest national chemical society, the president of that of Great Britain was asked to convey the congratulations of the chemical societies invited to this meeting to our hosts; and Arthur B. Lamb, professor emeritus of Harvard, past editor of the *Journal of the American Chemical Society*, was made an honorary life member of the Chemical Society in Great Britain.

In the proceedings of the International Congress, the world-wide ramifications of chemistry were most clearly revealed by the fact that the four official public lectures were given respectively by Prof. V. Deulofeu of Buenos Aires, Prof. K. U. Linderström-Lang of Copenhagen, Dr. E. W. R. Steacie of Ottawa, Canada, and Prof. A. R. Todd of Cambridge in England, while the various committees and commissions of the Union and sections of the Congress were naturally international in character.

In Washington, the Union members were looked after by Dr. E. U. Condon, of the Bureau of Standards, and Dr. D. W. Bronk, of the National Academy of Science. The most important international action completed by the Union consisted in the re-admission of Japan and the admission of Western Germany and New Zealand to the Union. This meeting of the Union terminated the period under the presidency of Prof. H. R. Kruyt. Chemists who have the world interests of chemistry at heart are deeply indebted to one whose wisdom and skill have steered the Union through the difficult post-war period to a position in which it finds itself a living entity and has a real purpose in the complex times in which we live. Prof. Arne Tiselius was unanimously elected as successor, and the next meeting of the Union will be held in Stockholm in 1953. While the sectional meetings, of which there were so many, were managed with the skill born of long practice by the American Chemical Society, it proved too much for the Union, which found that having a congress of pure and applied chemistry on its hands was no joke. Delegates to the Union who thought they had sufficient work to do in the Union itself found that they had, in addition, to participate in many Congress activities. This, indeed, may be the last of the Congresses devoted to all phases of chemical activity. In Stockholm the Congress activities will be restricted to physical chemistry and one or two special topics.

All visitors to the United States are always impressed by the kindness and hospitality of their hosts. Those who attended these conventions will never forget the attentions showered upon them by American individuals, civic authorities, societies and industrial organizations for fourteen memorable days.

ERIC K. RIDEAL

TWELTH INTERNATIONAL CONGRESS OF PURE AND APPLIED CHEMISTRY

THE Twelfth International Congress of Pure and Applied Chemistry was held in New York during September 9–13, immediately following the Diamond Jubilee celebrations of the American Chemical Society. Chemists attending the Congress came from forty-two countries and, of more than nine hundred papers presented, about one-third were by chemists from countries outside the United States. Through the help of the Economic Co-operation Administration and also the Ford Foundation, a number of young chemists from foreign countries were able to attend the Congress and, after its conclusion, were taken on tours of the principal industrial centres of the United States. The Congress was divided into sixteen general sections, but, due to the large number of papers presented, some of these had to be subdivided further. In addition, a general lecture was given each day by a leading chemist (two from Europe, one from North and one from South America) to a combined meeting of all sections.

The first of the general lectures was given by Dr. E. W. R. Steacie, Division of Chemistry, National Research Council of Canada, and was entitled "The Decomposition of Organic Compounds". Taking as examples the thermal decomposition of ethane and the reaction of a methyl radical with an aliphatic hydrocarbon, he reviewed the different approaches and trends over the past few years in the field of gas-phase reaction kinetics. He stressed that, though the original postulates and calculations about free-radical mechanisms have been useful in directing the investigations to date, much more experimental data are needed on a variety of simple reactions. The theoretical approach now involves too many assumptions and approximations, and can only be further advanced when reliable experimental data have been amassed.

Prof. K. U. Linderström-Lang, of the Carlsberg Laboratories, Copenhagen, discussed, in his lecture "Structure and Enzymatic Breakdown of Proteins", the chemistry involved in the conversion of ovalbumin to plakalbumin. He presented evidence showing that when the protein ovalbumin is attacked by a bacterial proteolytic enzyme, the formation of plakalbumin II may correspond to the loss of a hexapeptide unit from the ovalbumin molecule. A reaction also occurs in which plakalbumin I is first formed, corresponding to the removal of a dipeptide (alanyl-alanine) from the original molecule, and then a tetrapeptide is split off more slowly to yield plakalbumin II. It was pointed out that although this comparatively small change in composition, namely, the removal of a peptide of low molecular weight, produces a remarkable change in the crystal form and solubility of the protein, dilatometric studies now reveal that there are other more profound changes in the molecule.

In the third lecture of the series, Prof. A. R. Todd, University of Cambridge, discussed "The Chemistry of the Nucleotides". Reviewing recent work in this field, particularly that of the Cambridge group, Prof. Todd considered the approaches to nucleotide chemistry in relation to nucleic acid structure. Three chemical problems are involved: the structure and synthesis of nucleosides, the phosphorylation of these to give nucleotides, and the method of linkage of dissimilar bodies through the phosphoric acid group. In discussing these, the proof of the β-glycosidic linkage in the nucleosides was described, followed by an account of the use of dibenzyl-chlorophosphonate as a mild phosphorylating agent. The uncertainty of the location of the phosphate group on either the 2- or 3-position of ribose in the nucleotides was explained by the possible cyclization