

## CONFERENCE ON NUCLEAR PHYSICS HELD AT OXFORD

The Conference on Nuclear Physics, organized by the British Atomic Energy Research Establishment (Harwell) and held at Oxford from September 7th to 13th, 1950, was a very good conference. The field discussed is best indicated by referring to the titles of the various half-day sessions: High Energy Machines; High Energy Physics—Experimental and Theoretical; Light Nuclei—Energy Levels and Transmutations; Angular Distribution; Photo-disintegration; Pile Physics; Spectroscopy—Alphas, Betas, and Neutrons; Theoretical Physics; Techniques; and Field Theory. There were about two hundred delegates in all; about thirty from the USA and Canada, representatives from practically all of the West European countries, and of course a large number from the United Kingdom.

In spite of the fact that the field covered was only a fraction of physics, there were five full days of meetings and some of the sessions were run in parallel. If, before the programme was established, it had been possible for a sagacious chairman to meet with the chief participants of each session, they could have been shortened somewhat; but it would necessarily require about the same time to cover the subject matter if one were (as here) to attempt to have contributions from a representative selection of the places where important work is proceeding. The organization of conferences on physics with a reasonably widespread attendance and to cover a field as wide as this presents a real problem, to which the organization of the present conference was a good answer (in the sense of a good approximation) but not a final answer. The number of pictures of details of the large machines that may usefully be viewed in the course of an afternoon, in particular, by a collector of cloud chamber photographs (and vice versa) is quite small; and a person who is involved in neither of these necessary pursuits is very soon likely to give up trying to distinguish between them at all. In spite of some minor difficulties of this sort at this conference it must have been so that most of the American delegates obtained a clearer and fuller picture of the work proceeding in the United States than would be possible at recent large meetings of the American Physical Society.

The session on high energy machines and, where possible, the work done with, rather than on, these was, of course, a preponderantly American affair. But none of the other sessions gave the same impression. Much sound work is being done on the Continent despite enormous difficulties, and a very great deal is being done in Britain. It seems likely that they are obtaining more per man-hour than we do in the States (they might, for example, easily have less red tape than we do and be more skillful in unravelling it) and much more per dollar. It would certainly be difficult to document this impression; but at least no easy conclusion should be drawn that by spending  $x$  times as much on physics the States will thereby be  $x$  times as effective.

The value of the conference has been greatly enhanced by the fact that within a month after the meeting the people of Harwell got out a really excellent set of detailed reports

on the papers. This was an impressive achievement and great credit is due the group, headed by Titterton, that carried it through so rapidly.

Most of the sessions were held in the lecture theatre of the School of Geography at Oxford, as being the only room available that was large enough. In this particular room, however, it was necessary to prohibit smoking. No doubt there were many delegates who were grateful for this circumstance, and in addition according to Sir John Cockcroft it seems that this no smoking rule was responsible for establishing some sort of a record. Niels Bohr attended some of the sessions and it is believed that he had never previously confronted so much physics without the aid of his pipe.

Carson Mark

## OPERATION FROSTBITE

### APS DIVISION OF HIGH POLYMER PHYSICS

The Division of High Polymer Physics of the American Physical Society held its eighth meeting November 24–25, 1950 in conjunction with the Chicago Meeting of the parent society. The first session took place Friday afternoon in the auditorium of the Museum of Science and Industry. Those who braved the chill Lake Michigan breezes sweeping 57th Street and who were not lured aside by the museum's fascinating radio and television exhibit which had to be negotiated to reach the auditorium, were treated to an interesting session of eight contributed papers. The status of Notre Dame as a center of high polymer research in the Middle West was pointed up at this session since half of the papers were authored or coauthored by representatives of that institution. The statistical theory of rubber was the central theme of several theoretical papers. Experimental contributions dealt with the properties of high polymers as determined by procedures ranging from classical dynamic measurements and stress-temperature plots, to light scattering, ultrasonic, and nuclear magnetic induction techniques. The information presented evoked much stimulating discussion which terminated only when the museum authorities warned that closing time was fast approaching and all the lights would then be extinguished.

"Operation Frostbite" continued next morning in Kent Theater. A breakdown in the steam heating system proved most inopportune. As far as could be ascertained the only source of thermal energy present was a single hot plate valiantly striving to heat a beaker of water for use in a demonstration of the wet tensile of stressed polyvinyl alcohol monofil. The audience, clad in overcoat and muffler, took it all good naturedly and were rewarded with a series of four excellent papers constituting a symposium on the subject "Solidification and Crystallization in Polymers". This symposium complemented one held the previous day under sponsorship of the Division of Solid-State Physics which considered in some detail "Formation of the Solid State by Crystallization". After some general remarks by the moderator, J. D. Ferry, on the physical changes attending polymerization, J. R. Van Wazer gave a lucid paper on the formation of solids by vitrification, using as his examples the behavior of glasses. H. Mark then presented a critical discussion of the several experimental methods available for determining the extent of crystallization in polymers and compared results obtained on various forms of cellulose. The symposium was concluded by T. Alfrey who emphasized that changes in polymer structures can occur at two distinct levels, one being reversible in nature and corresponding to a succession of changes in molecular configuration,



whereas the other is irreversible and represents a change in polycrystalline texture. Using the formation of crystal nuclei in rubber as an example of the latter type he drew on his arguments to explain why the melting range of rubber crystallites should be independent of the extent of crystallization.

The final session was held Saturday afternoon in the more comfortable surroundings of Cobb Hall and comprised a group of six contributed papers. This meeting was featured by continuing reports of the Wisconsin group on the mechanical properties of high polymers, emphasizing the relaxation time distributions in polystyrene and polyisobutylene as derived from dynamic rigidity and viscosity data. Also included were papers on the molecular weight of polymer precipitated from solution, proof of sedimentation equilibrium for high polymer solutions in the ultracentrifuge, electrical measurements on carbon blacks dispersed in oil and subjected to shear, and a biophysical paper which attempted to explain the pairing up of kindred chromosomes in cells by a resonance interaction of identical oscillators.

At the business meeting it was announced that the next meeting of the Division will be held in Washington at the National Bureau of Standards on April 26-28, 1951 as a part of the Bureau's Semicentennial celebration. A committee headed by L. A. Wood has been appointed to organize a program for this meeting.

In conclusion the writer wishes to express the appreciation of the entire Division to J. D. Ferry, Chairman, R. L. Anthony, J. E. Field, and L. A. Matheson who constituted the program committee and were largely responsible for the success of the Chicago meeting.

W. L. Davidson

## GASEOUS ELECTRONICS

### THIRD ANNUAL CONFERENCE

The third annual Conference on Gaseous Electronics was held at the Barbizon Plaza Hotel in New York City, October 19-21, 1950. Among the 221 people registered were representatives of 113 industrial organizations, 64 educational institutions, and 33 government organizations. Members came from 20 states, and 4 came from foreign countries. The participation at this Conference by such a large number of scientists working in the field of gaseous electronics indicates the need of holding such meetings on an annual basis.

A total of 47 contributed papers and one invited paper, covering a wide range of gaseous conduction phenomena, made a very full and instructive program. The invited paper was presented by Dr. F. M. Penning of the Philips Research Laboratories, Eindhoven, Netherlands, who discussed the factors affecting the reproducibility of gas discharges.

Only a few of the many interesting contributed papers can be mentioned in this brief summary. Researches of fundamental importance in connection with ionization and deionization were presented in papers by R. B. Holt and M. Richardson, R. B. Bryan, M. A. Biondi, and A. V. Phelps. The discrepancy between the theoretical and experimental values of ion mobilities in the rare gases was clarified by the papers presented by J. P. Molnar and J. A. Hornbeck. Studies of mercury band fluorescence and the decay time of imprisoned radiation were reported by D. Alpert, A. O. McCoubrey and T. Holstein. L. B. Loeb summarized the work of the Berkeley group engaged in studying corona and related phenomena.

A paper on the energy distribution of electrons in elec-

trodeless discharges by W. P. Allis presented the basic relations for microwave breakdown and related phenomena. This served as an introduction to a series of experimental papers on microwave gas discharge phenomena. S. C. Brown discussed the extension of the microwave breakdown theory to frequencies of the order of 100 mc and reported good agreement with experiment. D. J. Rose compared theory with experiment for the electric field required to maintain a discharge at microwave frequencies. The electron recombination and probability of collision measurements made in a decaying plasma in  $H_2$  by means of microwave techniques were reported on by L. J. Varnerine, Jr. and by O. T. Fundingsland.

The sessions on arcs and on glow discharges presented the customary amount of new, interesting and unexplained phenomena, among which were oscillations, moving striations, and retrograde motion. L. Malter and E. O. Johnson, by means of a notably successful demonstration, presented some of the characteristics of the non-oscillating hot-cathode discharge, including the "ball-of-fire" effect. Some characteristics of heavy current arcs were presented by W. Finkelnburg.

The lively discussions of many of the papers contributed much to the value of the Conference.

The Conference committee for this year's meeting was W. P. Allis, D. Alpert, J. A. Hornbeck and J. D. Cobine. The success of the Conference was due in large measure to Dr. John A. Hornbeck who, with assistance from the Bell Telephone Laboratories, the unofficial host, made all the arrangements and attended to the many details involved. The Conference was temporarily affiliated for this year, as an experiment, with the Division of Electron Physics of The American Physical Society. This arrangement proved very satisfactory and permanent affiliation was voted at the business session. At the annual dinner, the Conference was duly welcomed into the D.E.P. fold with appropriate remarks by K. K. Darrow. The dinner followed the social hour at the Yacht Lounge where the view, etc. were thoroughly enjoyed. After the dinner, Mr. T. R. Burnight, head of the Ionosphere Section of the Naval Research Laboratory, presented a short sound film in color showing the launching of V2 rockets at White Sands and discussed some of the interesting problems involved in upper atmosphere research. Dr. Allis announced at the dinner that the executive committee for the 1951 conference agreed on by the nominating committee was as follows: W. P. Allis, J. A. Hornbeck, R. B. Holt, A. O. McCoubrey and J. D. Cobine. It was also announced that the committee had accepted the invitation of the General Electric Company to hold the next conference at the new Research Laboratory in Schenectady, New York, October 4, 5, 6, 1951.

Bound copies of abstracts of the papers presented at the Conference may be obtained, while the supply lasts, from Dr. J. A. Hornbeck, Bell Telephone Laboratories, Murray Hill, New Jersey.

J. D. Cobine

## MEETINGS TO BE HELD

### TERRESTRIAL MAGNETISM AND ELECTRICITY

The thirty-second annual meeting of the American Geophysical Union will be held in Washington April 30-May 2, 1951. The Union's Section on Terrestrial Magnetism and Electricity has announced plans for its technical session at this meeting, with papers to be presented on such topics as the ionosphere, cosmic rays, earth currents, studies of the