Meetings

Gaseous Electronics

Annual Conference at Princeton

Princeton University and the Radio Corporation of America Laboratories jointly played host to this year's annual conference on gaseous electronics, held in Princeton, New Jersey, September 4, 5, and 6. Thirty-six papers were presented under the general session titles of Plasma and Space Charge, Radiation and Spectra, Fundamental Processes, Mechanisms of Gas Discharges, and Surface Phenomena.

As has been true in the past, the subject matter of the conference emphasized studies of the fundamental physical behavior of gas discharge phenomena, which is well illustrated by citing some of the outstanding papers. The behavior of free electrons and ions was reported on by W. P. Allis and D. J. Rose in a paper on ambipolar diffusion, by M. A. Biondi in a discussion of electron attachment to iodine molecules, by R. N. Varney's results on ion drift velocity in molecular gases, and in a paper presented by L. M. Chanin on ion mobilities in noble gases. Closely allied to these studies were those of B. T. Barnes on electron velocity distributions in Hg-A discharges.

A number of spectral studies of gas discharges were high-lighted by three papers, one by H. N. Olsen and W. S. Huxford, another by H. Fischer, and the third by W. A. Bostick, M. A. Levine, and L. S. Combes. The first of these reported the use of hydrogen atoms as a spectroscopic probe for measuring high ion concentrations by measuring spectral line broadenings due to the interionic Stark effect. The second described a high-energy hydrogen spark spectrum demonstrating self reversal of the Balmer lines. The third presented spectroscopic evidence of the pinch effect by self-magnetic fields in high current discharges.

The use of microwave techniques in gas discharge studies was discussed in many papers. Of these, mention should be made of measurements of collision parameters by O. T. Fundingsland, A. C. Faire, and A. J. Penico, the effect of a high-frequency signal on a dc discharge by M. A. Lampert and A. D. White, and a continuation of the studies of H. B. Williams and A. J. Hatch of the high-frequency breakdown at very low pressures.

Further light was shed on the details of ionization processes by two experimental papers, one by R. E. Fox, W. M. Hickam, and T. Kjeldaas, Jr. and another by W. H. Bennett and B. W. Harned. The problem was discussed theoretically in a paper presented by G. H. Wannier. The effect of adsorbed gases on the ejection of electrons from metal surfaces was treated by H. D. Hagstrum.

Not all the business of the conference was restricted to technical sessions. The RCA Laboratories held an open house for interested visitors one afternoon, and cocktails and a banquet were the center of attraction on Friday evening. The guest speaker at the banquet was Professor Gordon C. Craig of the History Department of Princeton University, whose able discussion of the role of the diplomats in the modern world led to lively discussions in the social evening which followed.

The conference, which had a registered attendance of 225, was sponsored by the Division of Electron Physics of the American Physical Society. The program was arranged by a committee under the chairmanship of W. P. Allis and included D. Alpert, J. D. Cobine, R. Gruner, D. R. Hamilton, R. A. Varney, and L. Malter, secretary. A few bound copies of the abstracts of papers presented at the conference may still be available and requests for these should be addressed to Dr. Malter at the RCA Laboratories, Princeton, New Jersey.

The committee elected to arrange next year's meeting, to be held in Washington with the Office of Naval Research acting as host, consists of W. P. Allis, chairman; R. Gruner, secretary; L. Malter; R. A. Varney; M. A. Biondi and H. D. Hagstrum.

Sanborn C. Brown
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Physics Research Techniques

International Conference in Brazil

The rise of physics in Latin American countries, particularly in Brazil, has repeatedly been the subject of comments in the pages of this journal (see K. K. Darrow, November 1950; B. Gross, January 1951; G. L. Brownell, July 1952; and News and Views, p. 24, October 1952). Another testimonial to South American physics was the symposium on "New Techniques of Research in Physics" that was held last July in Brazil by the Brazilian Academy of Sciences, sponsored by the United Nations Educational, Scientific, and Cultural Organization and by the Brazilian National Research Council, assisted by the University of São Paulo. This multifold fatherhood proved to be a very useful feature. Each organization took care of a certain group of people and a series of meetings. Unesco brought physicists from other Latin American countries, the Academy invited a selected group of scientists from the States, and the Research Council invited physicists both from the States and from Europe. Attendance was further swollen by a number of European and American physicists working under Unesco fellowships or under contract at various Brazilian institutions, and last, but not least, by Brazilian research workers, who contributed as much as forty percent of the sixty-one papers presented at the symposium.

The organization committee was run by Dr. A. Moses

with the same efficiency with which he has handled the sometimes intricate problems of the Brazilian Academy of Sciences, over which he presides. His responsibilities were in some measure lightened by the fact that in any emergency situation he was able to enlist the support of the president of the National Research Council, Admiral Alvaro Alberto, well-known for his former activities in the United Nations Atomic Energy Commission. Nobel laureate I. I. Rabi of Columbia University was the guest of honor at the symposium, having received a special invitation from the National Research Council of Brazil. Also invited by the Council were Professors K. Bonhoeffer from Göttingen and Paul Harteck from Hamburg, who attended the meetings and took part in the discussions.

The official program included meetings in Rio de Janeiro and São Paulo and extended over precisely two weeks. Unofficially there were a number of sightseeing trips to the beauty spots of the country, scientific and technical institutions, and private seminars. In Rio de Janeiro, for instance, one could always be sure to find a group of people assembled at Professor Lattes' Center of Physical Research, discussing the properties of some new particle or the most convenient methods of discovering one. The social part of the program included a visit to President Vargas, who, in addressing the guests, stressed the importance of science in the modern world and the national policy of developing scientific research in Brazil. A lunch was offered by the Ministry of Foreign Affairs at the Itamaraty. Cocktail parties were given by the president of the National Research Council at the picturesque Poraquê Island, by the Municipality of Rio in the forest of Tijuca up in the hills, and by the Rector of the University of São Paulo.

Altogether this unofficial part of the program was aimed at allowing the guests to acquire first hand knowledge of the possibilities and working conditions in Brazilian physics and of the economic environment in which it develops. When progress in a field is measured, not only by the absolute value of achievement, but by the slope of a curve, the findings can be startling; and nobody could fail to be strongly impressed by the tremendous energy and progress that manifests itself in the development of physics at São Paulo and Rio de Janeiro. A bus ride from Rio to São Paulo cut the meeting into two slightly asymmetrical parts, just as a branch line intersects the complex plane. Riding along this branch line proved interesting, and a stop was made at São José dos Campos where the Technical Center of Aeronautics of the Ministry of the Air is situated. There was just enough time for a rapid inspection of the Center, which is at the same time a technical establishment and an engineering school, and which now has on its staff roster some of the most famous names in the field of aeronautics.

Fourteen invited papers and forty-seven papers limited to twenty minutes each were listed in the scientific program. The themes, which were selected on the basis of their special interest for Latin American physicists, included topics in theoretical and nuclear physics, cosmic radiation and counter techniques, dielectrics, accelerators, and electrical circuits.

Discussion of theoretical physics was introduced with an exposition by David Bohm, formerly of Princeton and now at the University of São Paulo, on his causal interpretation of quantum mechanics, which seemed to stir up the minds of his listeners in a way which the writer remembers seeing only in a presidential election. The discussion on the subject was led by E. P. Wigner of Princeton, who also discussed spin-orbit coupling in nuclei. M. Moshinsky, from Mexico, discussed transient effects in scattering processes; pseudoscalar meson theory of the deuteron was treated by J. Leite Lopes from Rio de Janeiro and by Richard P. Feynman of the California Institute of Technology. The connection of the scattering matrix with causality and a dynamical theory of scattering were treated, respectively, by J. Tiomno and W. Schuetzer of the University of São Paulo, and by M. Moshinsky. Professor Wigner discussed the kinematic and dynamic laws of symmetry and presented a very interesting interpretation of the Racah coefficients. G. E. A. Fialho, from Rio, studied the low energy mu-mesons from pi-meson decays, and A. Medina, from Mexico, discussed the elimination of divergencies in the field theory and some investigations on the theory of nuclear reactors. The shell model of the nucleus appeared in communications by R. Oehme and W. Macke from the São Paulo Theoretical Physics Institute. The statistical theory of nonlocal fields and the production of fundamental particles were the subject treated by Gleb Wataghin, from Torino, Italy.

The discussion on cosmic rays started with a paper by M. S. Vallarta, of Mexico, on the relation between the cosmic radiation and the electromagnetic radiation emitted by the sun, measurements on the east-west symmetry of positive and negative mesons at zero latitude were reported by I. Escobar (La Paz), and the properties of mixed showers were discussed by G. Schwachheim and Andrea Wataghin, from São Paulo, who continue the studies on penetrating showers, discovered by Professors Gleb Wataghin, Santos, and Pompeia when the first-named of these three was head of the physics department at the São Paulo University. A theoretical paper by Professors Moliere and Budini from Göttingen gave the theory of the correlation of the various components of cosmic rays. Interesting techniques of Cerenkov counters were shown by J. Marshall from the University of Chicago, and high speed counting technique was discussed by S. de Benedetti of the Carnegie Institute. G. P. S. Occhialini, visiting professor at the Brazilian Center of Physical Research, gave a seminar on nuclear emulsion techniques. Then the discussion embarked on properties of Maze counters (with external cathode) which are very much in vogue in South America and which show at times a somewhat puzzling behavior, as, for instance, a photoelectric effect even though there is no metal in the discharge space. Papers were given by H. Schwarz, also from the Center, and by B. Gross and A. Aron,

from the National Institute of Technology in Rio. A very interesting high voltage device, usable for portable monitors, was shown by G. Hepp of Eindhoven, who is now working under contract at the Brazilian Center of Physical Research. Meson research with the synchrocyclotron, experimental results on proton-proton scattering, and recent experiments on the annihilation of positrons and on the effusive positronium were discussed respectively by H. L. Anderson, R. G. Herb, S. de Benedetti, and Martin Deutsch. An incidental remark concerning meson radiochemistry, far short of satisfying the curiosity of those attending, only stimulated our desire to know how far reaching may be the technical consequences of the fundamental work by Lattes and Gardner on artificial meson production.

The discussion on dielectrics was opened with a paper by R. M. Fuoss of Yale University on polyelectrolytes, which showed the author's ability in managing not only macromolecular ions, but also the intricacies of the Portuguese language. J. Costa Ribeiro, from Rio, gave an interesting theoretical and experimental account of the recent progress made in research on the thermodielectric effect discovered by him in 1944, which is now gaining increased practical importance because of its connection with thunderstorm electricity and the effect discussed some years later by Workman and Reynolds. His paper proved that classical physics still contains many new and unexpected features which it may yield when the right methods are applied. The related problem of the electret was considered by B. Gross. The properties of a special kind of resistors very sensitive to external pressure (baristors) were discussed by H. Barbosa from São Paulo.

The 30 Mev betatron at the University of São Paulo, in the hands of M. D. S. Santos, gave rise to a series of interesting papers on cross section determination techniques and values by Professor Santos and his coworkers, J. Goldemberg, E. Silva, and R. R. Pieroni. Recent high energy work with the Illinois betatron was discussed by D. W. Kerst. Technical aspects of the work with electrostatic generators, one of which is now under construction at the University of São Paulo, were discussed by O. Sala, P. B. Smith, and H. M. Nussenzweig, from São Paulo, R. G. Herb, from Wisconsin, and Fernando Alba, from Mexico. A new ion source, which is being constructed in São Paulo by Drs. Smith and Sala, raised considerable interest.

A discussion on circuit theory ended the meetings. Interesting papers were given by K. Fraenz and by R. Gans and M. Bemporad, from Buenos Aires, on servomechanisms and the theory of aerials, respectively. A new type of circuit analysis was described by B. Gross, as was a representation of polynomials by artificial transmission lines by G. Kegel, also from the National Institute of Technology. R. Vieira de Camargo and L. Q. Orsini, from the Engineering School in São Paulo, discussed the theory of the electrolytic tank, and P. R. Arruda, from the same institution, presented two interesting papers, one concerning new applications of the poly-analyser (an electromechanical device adapted to cathode ray oscillographs) and the other on some impovements in the techniques of diffusion cloud chambers. L. Q. Orsini discussed also the application of the Routh-Hurwitz criterion to self-oscillators. G. Kegel described a special coincidence and anticoincidence multichannel circuit, and finally two papers were delivered by H. Schwarz, the first on the development of high vacuum gauges, and the second on methods of obtaining high vacuum.

Apart from their scientific interest for physicists, the meetings were followed with great interest by the general public, which is becoming increasingly aware of the important role of physics in Brazil's economic development. Most of the local newspapers carried page-long daily articles containing general comments and abstracts of all papers presented, usually prepared by one of the physicists. The general feeling was well expressed by Professor J. Costa Ribeiro. Asked by newspaper correspondents to give his impression of the symposium, he remarked that its success has shown that the physical reality of physical research in Brazil can no longer be ignored.

B. Gross
Rio de Janeiro

MEETINGS TO BE HELD

Neutron Cross Sections

An informal conference on neutron cross sections in the Mev region is to be held at Brookhaven, January 20 and 21, sponsored by the AEC Neutron Cross Section Advisory Group and the ONR. Primary purpose of the conference is to acquaint the active workers in this subject with the current status of the field, as regards both experiment and theory. Emphasis in the discussions of measurements is to be on techniques and plans, rather than on finished results. It is also desired to indicate the needs and interests of the AEC in measurements of neutron cross sections in this energy range. Further information on the conference can be obtained by those interested from Dr. D. J. Hughes, Physics Department, Brookhaven National Laboratory, Upton, Long Island, New York. Accommodations for visitors to the conference are limited. It is hoped to publish summary minutes of at least the principal talks as soon after the conference as possible.

Chemical and Spectrographic Analysis

The annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy is scheduled to take place March 2–6 at the William Penn Hotel in Pittsburgh. The conference, jointly sponsored by the Analytical Chemistry Group of the Pittsburgh Section of the American Chemical Society and the Spectroscopy Society of Pittsburgh, will include an exhibit of laboratory equipment and a program of contributed papers. Further information can be obtained by writing to P. R. Carr, General Chemical Division, Allied Chemical & Die Corp., 1022 Gulf Building, Pittsburgh 19, Pennsylvania.