ASSOCIATION FOR RADIATION RESEARCH

SOME 170 persons attended the seventh meeting of the Radiation Research Visiting Club held at the Medical Research Council Experimental Radiopathology Research Unit, Hammersmith Hospital, on May 9 and 10. About 100 were present at the open business meeting at which the need for a rather more formal organization was debated under the chairmanship of Prof. F. S. Dainton. This meeting brought to an end the first phase in the existence of the Club, which hitherto has had no rules, no committee, and no subscription, its only existence between meetings having been a list of 'member centres' with some names of individual radiation research workers. The whole responsibility for each meeting has rested on the hosts who have come forward with invitations, and they have been at liberty to arrange the meetings entirely as they wished. The informality of the meetings and the absence of organization appealed to most of those who attended, and many felt very reluctant to start a new scientific society or association. It was generally agreed, however, that the need had become pressing, for two main reasons: the numbers of research workers who had become interested had grown so large that membership on an individual basis was clearly necessary; also, some form of organization was needed to establish and maintain liaison nationally and internationally with bodies having similar or related interests. It was resolved, therefore, that an Association be formed.

The Visiting Club originally sprang from a desire on the part of scientists of different disciplines to meet together in each others' laboratories to discuss topics of mutual interest in the field of radiobiology in which they were working. The meetings of the Club have shown that the subject of radiobiology is broad enough to bring together a group of convenient size. It is probable that other branches of radiation research such as radiation chemistry could do the same. The issue most keenly debated at the recent meeting was whether the organization which the meeting proposed to bring into being should be an Association of people who were meeting primarily on the common ground of radiobiology—with the corollary that similar group organizations would be established for other branches of radiation research—or whether an attempt should be made to establish an organization which would meet the needs of all radiation research workers. As the name of the Association implies, the latter alternative was chosen, and one of the objects of the new Association was defined as being: "To bring together research workers of different disciplines, having a common interest in radiobiology, radiation chemistry and radiation physics".

It was the express wish of those present at this and previous meetings of the Visiting Club that the scientific business of the Association should be "conducted mainly according to the precedent set by meetings of the Radiation Research Visiting Club which have been held before the formation of the Association", and this proviso was incorporated in the constitutional rules which were agreed upon as a minimum operational requirement. From now on, however, the privilege of attending these meetings will be reserved for members of the Association.

Other constitutional rules were decided on which defined the conditions for eligibility to membership—"any person actively interested in the fields covered by the objects of the Association shall be eligible for election to membership"—and the composition of the committee, which everyone agreed should include radiation research workers from varied fields of interest. The first committee, elected for a two-year period, is as follows: chairman, Dr. L. H. Gray; honorary secretary, Miss T. Alper, Experimental Radiopathology Research Unit, Hammersmith Hospital, Ducane Road, London, W.12; honorary treasurer, Dr. C. L. Smith; ordinary members, Prof. A. Charlesby, Prof. F. S. Dainton, Dr. Alma Howard, Dr. J. F. Loutit, Prof. J. S. Mitchell, Dr. Edith Paterson.

The annual subscription was fixed at 10s., and it was agreed that anyone who has attended any of the seven meetings of the Radiation Research Visiting Club should qualify for membership without election. Any others wishing to join the Association should be proposed and seconded by members who know them personally. Forms for the purpose may be obtained from the honorary secretary and should be returned by the proposer with accompanying letter of recommendation. It is hoped that the first election of new members will take place at a business meeting which will be held in conjunction with the first scientific meeting of the Association. This will probably take place early in 1959, in Newcastle on Tyne, at the invitation of Prof. J. Weiss. Particulars will be circulated in due course to all who have become members of the Association by the appropriate time.

Most radiation research workers have affiliations with learned societies in their own specialty. The Visiting Club has never duplicated the activities of any learned society, but has set out to bridge the gaps between different disciplines. If, in its larger context, the Association can foster an exchange of knowledge and experience in the same friendly and intimate way as the Club has done, we feel that its future is assured.

L. H. GRAY
TIKVAH ALPER

FRITZ LONDON AWARD

THE fifth International Conference on Low Temperature Physics and Chemistry, held at the University of Wisconsin during August 26-31, 1957, was the occasion of the presentation of the first Fritz London Award. The Award is to be made biennially and carries an honorarium of 1,000 dollars, together with an expense allowance of 500 dollars. The recipient was Dr. N. Kurti, of the Clarendon

Laboratory, Oxford, and the texts of the introductory remarks made by Dean F. G. Brickwedde (Pennsylvania State University) and by Prof. J. G. Daunt (Ohio State University), who made the presentation, together with the address entitled "Nuclear Orientation and Nuclear Cooling" delivered by Dr. Kurti, are printed in the March 1958 issue of *Physics Today*. In a preceding article in the same issue,

Dr. J. Wilks (Clarendon Laboratory, Oxford) gives a report of the general proceedings of the conference.

In his remarks, Dean Brickwedde paid tribute to Fritz London for his wide range of contributions to physics and for his philosophical approach to research. He thanked Arthur Little, Inc., for their generosity in sponsoring both the first and second Fritz London Awards, and mentioned that much of the great expansion in cryogenic research since the end of the Second World War was due to this firm because of its manufacture and improvement of the Collins helium cryostat. Prof. Daunt briefly outlined Dr. Kurti's accomplishments in the field of low-temperature physics, referring especially to his investigations at temperatures less than 1° K.

Dr. Kurti, in his address, explained first the essential connexion between nuclear orientation and cryogenics, and then summarized the four basic equilibrium methods of nuclear orientation—magnetic hyperfine structure alignment, magnetic hyperfine structure polarization, external field polarization, and electric hyperfine structure alignment. All four methods have been realized experimentally, the first both at Oxford and Leyden initially in 1951, the second in Oxford about a year later, and the third and fourth in Oak Ridge in 1955 and 1956, respectively. The nuclear orientation experiments had as their chief aim the study of the anisotropy of the gamma-ray emission in a variety of radioactive decay schemes, and by combination of the results with data obtained by conventional nuclear physics methods and by paramagnetic resonance, the decay schemes of some twenty nuclei have been established. Dr. Kurti particularly directed attention to the recent celebrated experiment on parity conservation carried out by E. Ambler, R. W. Haywood, D. D. Hoppes, R. P. Hudson and C. S. Wu at the National Bureau of Standards, pointing out that this had required considerable skill in cryogenics and had

brought nuclear orientation methods into the limelight.

Dr. Kurti then turned to consider how nuclear orientation could help in solid state physics, and gave two examples of how, if the decay scheme and hence the gamma-ray anisotropy to be expected is known, the oriented radioactive nuclei may be used as indicators for certain properties. Finally, he dealt in some detail with nuclear cooling, that is, the production of very low temperatures by isentropic demagnetization of polarized nuclei. The idea was first mentioned explicitly in 1933 by C. J. Gorter, and by N. Kurti and E. F. Simon, and the possibilities of attaining the very large values of H_i/T_i (initial magnetic field and temperature) required were discussed by Simon in 1939. The final successful experiments were performed in 1956 (see *Nature*, 178, 450; 1956), and Dr. Kurti described in his address the four steps in a magnetic cooling experiment; the construction of a suitable cryostat for nuclear cooling using magnetically cooled manganous ammonium sulphate, and the results of a series of nuclear demagnetizations all starting from $T_i = 0.012^\circ$ K. and from fields, H_i , ranging between 3.5 and 28 kilogauss. The lowest temperature measured was about 20 microdegrees. It should be possible, Dr. Kurti asserted, to increase the value of H_i/T_i four or five times, thus reducing the nuclear entropy by about 40 per cent from its ideal value. The demagnetization would then lead to a temperature below the nuclear Curie point and the nuclear ordering could be ascertained. Another worth-while problem would be the cooling of other substances into the microdegree temperature range, and it would seem that on theoretical grounds alone there should be no fundamental difficulty. Thus eventually, Dr. Kurti forecast, microdegrees would assume a similar place in cryogenics to that occupied by millidegrees to-day.

S. WEINTROUB

RESEARCH FOR INDUSTRY

UNDER the title "Research for Industry"*, the Department of Scientific and Industrial Research has published a useful summary of the work done by the industrial research associations which the Department assists with grants, covering the fifteen months ended December 30, 1957. "Research for Industry", which corresponds with the summary that formerly occupied about one-third of the Department's annual report, will in future be published separately for each calendar year and generally appears to follow the pattern of its predecessor. Although it gives an interesting picture of the many-sided contribution which the research associations are making to the national life, it does not—and a summary of this character could scarcely be expected to—facilitate assessment of the place of the movement in industry, or its strength or weakness in relation to other institutions, whether from the point of view of research, of education, or of the dissemination of information.

Although most of the research associations issue annual reports, a few points of general interest may

be noted to illustrate the wide scope of the movement. The British Baking Industries Research Association, for example, is examining a new milling technique which permits the alteration by mechanical means, to a greater extent than previously, of the protein/starch ratio in the several flour fractions produced, and promises to permit the production from relatively poor quality flour of fractions suited for specialized purposes. The British Boot, Shoe and Allied Trades Research Association has made good progress with new methods of training operatives whereby girls may be fully trained in six weeks. The British Cast Iron Research Association's work on de-phosphorizing foundry iron, which should permit greater use to be made of British ores high in phosphorus for making iron castings, has reached a promising stage.

The British Ceramic Research Association, which in the past few years has made a particular study of the control of dust in those processes in which the health of the operative is at hazard, and has succeeded in controlling dust in the towing and fettling of earthenware on an industrial scale, is now focusing attention on the corresponding problems in the sanitary earthenware and tile industries. The British Coal Utilization Research Association has developed

* Department of Scientific and Industrial Research. Research for Industry: a Summary of work done by the Industrial Research Associations in the Government Scheme, 1956-57. Pp. iv+159. (London: H.M. Stationery Office, 1958.) 7s. 6d. net; 1.35 dollars.