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measurement in flames and hot gases, with particular emphasis on methods involving the measurement of radiant energy. W. Lochte-Holtgreven (Kiel University) described experiments performed in his laboratory on high current electric arcs in which temperatures as high as 50 000°K were determined from measurements on the degree of ionization in the arc.

Following the papers on the measurement of extreme temperatures, H. J. Hoge (Leeds and Northrup Company) described the procedures in use in industrial temperature measurement. The possibilities of using superconductors and semiconductors as thermometers were discussed by J. G. Daunt (Ohio State University) and S. A. Friedberg (Carnegie Institute of Technology). A new thermometer based on the temperature dependence of sound velocity in a gas was described by D. R. Pardue and A. L. Hedrich (Diamond Ordnance Fuze Laboratories).

The final session of the symposium was devoted to the discussion of a number of special topics including measurements of temperature in shock waves, A. R. Kantrowitz (Cornell University); in atomic explosions, F. G. Brickwedde (NBS); and in the upper atmosphere, H. E. Newell, Jr. (Naval Research Laboratory).

The success of the symposium was attested to not only by the large attendance, but also by the lively discussions on topics covering the range from millidegrees to megadeegrees. Publication of the symposium proceedings is being arranged by the American Institute of Physics. The book is expected to be published by the Reinhold Publishing Corporation by the fall of 1955, under the editorship of H. C. Wolfe of Cooper Union.

Arnold M. Bass

National Bureau of Standards

Ferrimagnetism

A Conference on Ferrimagnetism was held at the Naval Ordnance Laboratory, White Oak, Maryland, on the 11th and 12th of October, 1954. Ferrimagnetism is L. Néel's word for the type of ferromagnetism which occurs in certain oxides of the iron group elements, notably those of spinel structure—the "ferrites". In these substances the magnetic moments of the ions are not lined up parallel, as in iron, but have some kind of ordered antiparallel structure which, however, usually does not have equal numbers or sizes of moments pointing in the two directions, so that there is a net magnetic moment. In the special case where exact compensation of the moments occurs, we have the related phenomenon of antiferromagnetism.

The ferrites, of which a variety can be conveniently produced in ceramic form, have a large and growing practical importance, primarily based on their high resistance, which makes high-frequency applications possible. However, the emphasis at this conference was not on devices and materials for practical use but on the basic physics and chemistry of the materials.

If there was a central theme of the conference it was this: the broad outlines of Néel's theories of ferri-

and antiferromagnetism having been proven to everyone's satisfaction, attention is being concentrated on the complex but fascinating details and refinements necessary in many special cases. Some high lights in this area were E. W. Gorter's contribution from the Philips Laboratories which showed the great value of the combined use of careful chemistry, precise physical measurements, and detailed theory; the study of resonance near compensation points by the NOL group and Philips, particularly the NOL observation of the "exchange frequency" resonance which is an important new confirmation of theory; and the Brookhaven neutron diffraction results. These and other contributions nicely outlined the one greatest remaining problem, that of antiferromagnetic ordering on the B sites.

The problem of the origin of losses in ferrites continues to be important; Smit's contribution, also from Philips, and others reinforced recent indications that at least part of the losses have to do with the rearrangement of Fe^{++} valence states in the lattice. However, there remains a great deal of uncertainty in this whole area.

Finally, the neutron diffraction results of Roth on transition metal oxides of perovskite structure deserve special mention both as confirmation of Zener's hypothesis of ferromagnetic "double exchange" when valence states are mixed, and as further clarification of the relationship between ferrimagnetism and ordering of valence states. These are only some of the interesting and important papers, even on the subjects mentioned.

All who attended (185 from outside NOL) were grateful for this chance to catch up formally and in informal discussions with recent progress in our rapidly-growing field in the pleasant surroundings provided by our Naval Ordnance Laboratory hosts.

Philip W. Anderson
Bell Telephone Laboratories

Electrical Discharges in Gases

An international symposium on electrical discharges in gases will be held in the Netherlands (April 25-30) at the Technical University at Delft. It has been organized with the support of Unesco and with the help of the International Union of Pure and Applied Physics, the Technical University at Delft, and the Philips' Works at Eindhoven.

According to a preliminary announcement, the following main subjects will be discussed: (1) fundamental processes and new views on the mechanism of gas discharges; (2) instabilities and conditions of stability, oscillations, and noise phenomena; (3) breakdown potential; (4) new methods of measurement and application of gas discharges to other physical problems as a method of measurement; (5) arc discharges; (6) spark discharges; and (7) miscellaneous topics, including geiger counters and ion sources. In addition, invited papers are to be given by H. S. W. Massey (London), L. B. Loeb (Berkeley), C. van Geel (Delft),

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