THE PHYSICAL SOCIETY

THE contents of the 1958 Year Book of the Physical Society (pp. v+106. London: Physical Society, 1958. 12s. 6d.), the fourth in the annual series, follows the pattern of previous volumes. It contains the texts of the ninth Charles Chree Lecture, the thirteenth Holweck Lecture and the forty-second Guthrie Lecture; the addresses delivered by the recipients of the thirty-fifth Duddell Medal and the fourteenth Charles Vernon Boys Prize; the discourses given at the forty-second Physical Society exhibition of scientific instruments and apparatus; obituary notices of six fellows including Viscount Cherwell; and the report of the Council of the Society for 1957.

In his Guthrie Lecture, Prof. W. E. Lamb spoke about some experimental tests of quantum electrodynamics and explained how measurements of the fine structure of hydrogen and similar atoms by microwave methods have provided valuable information about the interactions between elementary particles and have stimulated theoretical calculations. The Holweck Lecture, which was delivered by Prof. A. Abragam (Centre d'Études Nucléaires de Saclay) on May 1 at Cambridge, was entitled "Spin Temperature", and in it he showed by various examples how the concept of spin temperatures, positive or negative, is not only valid but also most fruitful. The secular variation of the magnetic field of the Earth has been known for many years, but it is only recently that any reasonable theories for the variation have been developed. In his Charles Chree Lecture, Sir Edward Bullard surveyed the experimental knowledge on the subject, and indicated that the theory that the variation is due to motions in an electrical conducting fluid core has much to commend it and

is closely related to the dynamo theory of the origin of the main field.

The measurement of the thickness of the helium film was the subject of the Duddell Medal address given by Prof. L. C. Jackson. He described how, in experiments at Bristol, a polarized light method used for the determination of the thickness of thin films of transparent materials was adapted to the measurement of the thickness of the helium film and how by a steady improvement in technique consistent observations were made of the helium-2 film as a function of height and temperature. The Charles Vernon Boys Prize address, entitled "Development of Bubble Chambers and some recent Bubble Chamber Results in Elementary Particle Physics", is a verbatim account taken from a tape recording of Dr. D. A. Glaser's talk which he delivered at Harwell on July 10, 1958.

The lectures and addresses will interest all physicists, but they deal with specialist subjects. The general reader will perhaps be attracted mostly by the discourses, and in particular by Mr. M. H. Wilson's account of Goethe's colour experiments, which is illustrated by some coloured prints. The other two discourses deal with some uses of physics in archaeology (ultrasonic cleaning; proton magnetometry; optical, X-ray and gamma-ray spectrometry; and magnetic and radioactive dating), and some recent investigations with aircraft on the physics of clouds and rain.

The Year Book is now the only publication of the Physical Society which is issued free to members. It is a most valuable and well-produced volume, and it is hoped that it will continue to be issued, even when the proposed amalgamation of the Society with the Institute of Physics actually takes place. S. WEINTROUB

THE NATIONAL PHYSICAL LABORATORY

THE various changes in the work and organization of the National Physical Laboratory at Teddington, which have either taken place or are under active consideration, are outlined in the annual report (Report of the National Physical Laboratory for the year 1958. Pp. viii+134+8 plates. London: H.M. Stationery Office, 1959. 8s. net), which has recently been published. It contains the report of the Executive Committee, which was presented to the General Board at its meeting on May 28, one of the annual open-days of the Laboratory; detailed reports prepared by the respective superintendents, of the work of the nine divisions of the Laboratory; the names of members of the Board and its committees, and of the senior staff of the Laboratory; and lists of the various papers published by the director and members of staff during the year.

In accordance with the recommendations of the review committee set up in 1957 to consider the organization and research programme of the Laboratory, the Electricity, Metrology and Physics Divisions were replaced by the three new Divisions of Applied Physics, Basic Physics and Standards. Work on the

differential analyser in the Mathematics Division; on refractories in the Metallurgy Division; and on glass working in the Light Division, has been discontinued. In the Applied Physics Division the future of the high-voltage work has not yet been decided, but the testing of magnetic materials has been allowed to continue. New projects in this Division are radiocarbon dating and the development of a national centre for neutron source standardization. In the Mathematics Division increased emphasis is to be placed on theoretical physics, and with *Ace* now almost complete and in use by the Mathematics Division, the Control Mechanisms and Electronics Division has been re-orientated to new fields of research such as process control by computers that learn to make correct changes by trial and error methods, and the development of new components for very high-speed computers.

No marked changes are contemplated in the research programmes of the Light, Metallurgy or Standards Divisions. The principal change in the work of the Ship Division is that more attention will be given to problems connected with the sea-going qualities of ships in rough water. Dr. E. Lee, pre-