

## 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-

viously director of operational research to the Admiralty, who was appointed to fill the new post of deputy director of the Laboratory, is expected to be of considerable assistance in connexion with the extension of the impact of the work and policy of the Laboratory on industry. Dr. J. A. Pople took up his post as superintendent of the Basic Physics Division on October 1; work on the application of magnetic resonance to the study of the structure and properties of materials, on the physics of high polymers, and on the study of free radicals, is to be commenced in that Division.

During 1958, sixteen scientific officers and twenty-three experimental officers were newly appointed, but although these represent record numbers there was no net gain in the total staff. The hope is expressed in the annual report that foreign scientists will be attracted to come and work at the Laboratory for a few years as Research Fellows, and that more firms will second staff for periods of work at the Laboratory. Contact with the universities was maintained, but no details of any extra-mural contracts with universities are given in the report. Six members of university staffs were appointed as vacation consultants during the summer months, and nineteen vacation students worked at the Laboratory.

Two open days were again held, and of the 7,900 people invited, 3,250 attended. Two international symposia were held during the year. The ninth in the series, which took place during June 4-6, dealt with the physical chemistry of metallic solutions and intermetallic compounds, and the tenth, on "The Mechanization of Thought Processes", during November 24-27, evoked such considerable interest that the attendance had to be limited to the two hundred who could be accommodated. The proceedings of the symposium on visual problems of colour, held in September 1957; No. 19 in the series of Notes on Applied Science entitled "Signal Generators, Attenuators, Voltmeters and Ammeters at Radio-Fre-

quencies"; and a second volume, "Tables of Everett Interpolation Coefficients", in the series of NPL Mathematical Tables, were published during the year. In addition to a full programme of lectures, talks and discussions, in which the staff have participated, there have been several sound and television programmes based on work and tests carried out at the Laboratory. A transportable NPL caesium atomic-clock was included in the exhibition "Pendulum to Atom", organized by the British Horological Institute, and the Laboratory provided items for display at the Physical Society Exhibition, the Gauge and Tool Exhibition, the Royal Society soirée, and an exhibition for freshmen at St. John's College, Oxford.

The Lord President of the Council, Lord Hailsham, visited the Laboratory on June 5, and the chairman of the Council for Scientific and Industrial Research, Sir Harry Jephcott, on July 17. On February 26, a sub-committee of the Select Committee on Estimates inspected the Laboratory and appeared generally satisfied with the work being done, but expressed concern at the possibility of overlap of work and facilities between the Ship Division of the Laboratory and the Admiralty in relation to research on hull and propeller design. There is formal liaison between the two establishments through the Froude Ship-Research Sub-committee, and informal liaison between the superintendent of the Division and senior officials in the Admiralty.

A building plan for the long-term development of the Laboratory site is being considered in consultation with the Ministry of Works, and a centre, with lecture, conference and restaurant facilities, has at long last been authorized. A new physics building and a building properly equipped for the mechanical working of difficult materials have been included in the 1959-64 proposals. Reference is also made to the Ship Hydrodynamics Laboratory at Feltham [which was opened by the Duke of Edinburgh on October 19, see p. 926 of this issue of *Nature*].

## YELLOWSTONE PARK EARTHQUAKE

ON August 18 an earthquake occurred at 06h. 37m. 13s. G.M.T. from an epicentre near the western boundaries of Yellowstone National Park (epicentre lat.  $44\frac{1}{2}^{\circ}$  N., long.  $111^{\circ}$  W.). The earthquake had a magnitude of 7.1 or rather greater on the Richter Scale. The shock appears to have had a normal depth of focus. Most damage appears to have been caused by the earthquake near the Hebgen dam in south-western Montana. The dam is built at an altitude of 6,000 ft. and holds up a lake some 37 miles long in a narrow canyon, through which flows the Madison River. The dam is 87 ft. high and 718 ft. long. In addition to cracking parts of the base of the floor of the lake and producing minor cracks in the earth and rock section of the dam, the earthquake started a huge wave in the lake, which threatened further damage. Fortunately, the wall held fast. The surge of water in the lake and canyon is reported to have caused an air blast which stripped the clothing from one person.

Some seven miles below the dam, landslides from an 8,000 ft. high mountain blocked the road and the river. The road and the surrounding countryside

were severely fissured. Roads leading into the western side of Yellowstone Park were closed. Perhaps two hundred people, including ranchers, campers, fishermen and tourists in about fifty cars, were trapped between the landslide and the lake. Ten people are reported to have been killed and sixty injured. Telephones and electric power installations were out of action. Buildings shifted on their foundations, chimneys fell and fuel pumps toppled over.

The elastic waves of the earthquake were recorded by seismographs at observatories throughout the world. At Kew Observatory the provisional readings are:

<i>eP</i>	06 hr.	48 min.	11 sec.	G.M.T.
<i>iS</i>	06 hr.	57 min.	13 sec.	G.M.T.
<i>MH</i>	07 hr.	18 min.	00 sec.	G.M.T.
<i>F</i>	12 hr.	00 min.	00 sec.	G.M.T.

amplitude  $570\mu$

In the past the regions most affected seismically in this part of the United States have been east of Helena, Montana (lat.  $46^{\circ}$  N., long.  $111.2^{\circ}$  W.), and north-east of the centre of Helena ( $46.6^{\circ}$  N.,  $112^{\circ}$  W.).