

associated with changes in the ionosphere. It is suggested that the magnetic variations are due largely to plasma oscillations in the lower levels of the ionosphere.

Subsequent 24-hr. recordings taken with a paper-speed of 1 in. per hr. have shown the existence of a marked diurnal effect, together with a curious major disturbance about an hour before sunset. It is planned to extend the work to include the vertical component of the field and to make continuous ionospheric recordings over the more significant times, and a full report will be published elsewhere. [April 27.]

RESEARCH COUNCIL OF ISRAEL

ANNUAL REPORT FOR 1950-51

THE second annual report of the Research Council of Israel, covering the year ended March 31, 1951, has recently been published*. In place of the original five advisory committees, committees have now been established for fundamental research (including the utilization of the natural resources of Israel), chemical industry, textile industry, agriculture, nutrition, food industry, and building (including roads). The membership of these committees is given, with lists of publications and research papers issued during the year.

The work of the Geological Survey has been facilitated by the establishment of a palaeontological laboratory. The search for additional sources of water has continued, deposits of peat have been discovered and the search for petroleum reserves continued. The Citrus Concentrates Producers Association completed successful pilot-plant trials on a process for the preparation of dry pectin of high jelly units from orange peel without the use of organic solvents, and has used ion-exchange resins to obtain a completely demineralized sugar syrup from limed citrus-peel juice. Research on pectolytic enzymes is a major activity in this laboratory, while the Ceramics Research Association has overcome difficulties experienced in slip casting due to the poor quality of the plaster by changing the conditions of fixing. The Textile Research Association has continued work on the shrink-proofing of wool with acid bromates. Medical research has included studies of the mechanical fragility of erythrocytes in the presence of sulphadiazine and of the intestinal flora of the newly born. Biological research has covered ticks and tick-borne diseases, vole research and the mode of action of germination inhibitors. The hydrochemistry of the Sea of Galilee was studied to determine the origin of the salts in the Dead Sea, and satisfactory yields of naphthenic acids have been obtained by oxidation of kerosene containing 18 per cent of aromatic acids after removal of the latter with sulphuric acid. A survey of the source of raw materials for the manufacture of cellulose has been undertaken, and a study made of micro-organisms responsible for the retting of flax.

Building research has been done on a number of topics which include: a study of the influence of all types of roof structures and of the effect of the design, finish and material of wall structures on the internal climate; the efficiency of housing schemes for immigrants; solar heating of domestic water

* Research Council of Israel. Second Annual Report for the Year ending 31 March, 1951. Pp. 32. (Jerusalem: Research Council of Israel, 1952.)

supplies; and the ageing of bitumen. Dew and water condensation in upper layers of soil and evaporation from open surfaces have also been investigated, solar radiation in the visible and infra-red regions was being measured, and field trials made of a number of fibre-yielding plants. A study of the population dynamics of the Mediterranean fruit fly, *Ceratitis capitata*, was initiated and also of the biological factors affecting the yield of legumes, while investigations of weeds and a study of the nutritional deficiencies of fruit trees were continued.

AMERICAN PHILOSOPHICAL SOCIETY

REPORT FOR 1951

THE year book for 1951 of the American Philosophical Society covers the year ended December 31, 1951*, and, besides a brief history of the Society by E. G. Conklin, biographical memoirs, lists of members and the auditor's report, includes the customary reports of the standing committees on finance, the library, meetings, publications and research. The report on research, which occupies most of the year book, details the ninety-six grants, totalling 85,305 dollars, which were awarded from the Penrose Fund during the year and gives an analysis of the distribution of grants from this Fund by subjects during 1949-51. Also detailed are five grants, totalling 9,950 dollars, from the E. R. Johnson Fund, two, totalling 4,750 dollars, from the J. Daland Fund for Research in Clinical Medicine, two from the Miclaux Fund, and twenty-eight, totalling 30,245 dollars, from the Reserve Fund for Post-war Expenditures, all of which were for research.

Among the more detailed of the reports from recipients of grants which are included (arranged alphabetically under subjects) in the report, mention may be made of that by H. Friedmann on the life-histories of the honey-guides (*Indicatoridae*) and the parasitic weaver-birds (*Ploceidae*) of Africa; S. M. Rose's study of induction of regeneration in limbs of lizards; C. A. G. Wiersma's investigation of the patterns of innervation of the legs in the higher crustacea, with special emphasis on the inhibitory innervation; H. E. Evans's taxonomic and biological study of the spider wasps of Mexico belonging to the sub-family Pompilinae (*Hymenoptera*, *Pompilidae*); W. Hovanitz's ampho-Atlantic study of *Colias hecta*, *Colias nastes* and *Colias palæno* and J. A. G. Rehn's detailed field study of the Orthoptera of the United States.

G. L. Kreezer reports on the development of methods for the determination of the components of biological systems on the basis of the mathematical analysis of transient response curves; D. C. Smith on studies in Bermuda on the thyroid glands of the parrot fish; C. L. Markert on the biochemical basis of cell differentiation; H. N. Andrews on the anatomy of *Botryopteris*; W. R. Taylor on his survey of the marine algæ of Bermuda; L. M. Langdon on a comparative survey of inflorescence characteristics in the *Castanæe*; and H. P. Hansen on the study of post-glacial forest migrations and climate in Western Canada and Alaska by means of pollen analysis of

* American Philosophical Society. Year Book 1951; January 1, 1951-December 31, 1951. Pp. 452. (Philadelphia, Pa.: American Philosophical Society, 1952.)

peat sections. Reports are also included of W. H. Camp's study of the relative virulence of beech bark disease on the several types of forest beech in eastern Canada and Maine; of B. Howe's investigation of caves, shelters and other sites where it is expected that Neolithic, Mesolithic and Palaeolithic remains are to be found in stratigraphic relation; of E. Murray's case study of colour-vision deficiency; and R. B. Singer's clinical and physiological investigation of disturbances of the acid-base balance of the blood, with particular reference to the effects of intravenous alkalinizing or acidifying solutions.

METROLOGY LABORATORY OF THE COLLEGE OF TECHNOLOGY, BIRMINGHAM

IN the College of Technology, Birmingham, the Production Engineering Section of the Department of Mechanical Engineering for the past five years has been developing the teaching of production techniques, particularly in the fields of machine tools, jigs and tool design, and fine measurement. In the last-named case, the new Metrology Laboratory of the College, which has been equipped at a cost of nearly £5,000, is now complete.

The functions of this Laboratory are threefold. First, it provides students with an opportunity for undertaking experimental work, and determining fine measurements using modern general and specialized equipment, the laboratory work being closely related to the lecture course. Secondly, the Laboratory is intended to provide local industry with an approved centre in which specified gauges may be measured. This project should be of particular interest to small engineering firms with only limited measuring equipment. In order to achieve this aim, the layout of the Laboratory has been supervised by the Metrology Division of the National Physical Laboratory, which has certified the equipment provided as satisfactory for an approved gauge testing centre. Further, a member of the staff who has maintained contact with the National Physical Laboratory during the development stage has qualified to act as the authorized supervisor. The gauge testing scheme is an arrangement whereby an educational establishment possessing specified measuring equipment may undertake the inspection of certain classes of gauges on behalf of the National Physical Laboratory. Inaugurated by the Ministry of Education, the scheme has the support of the Ministry of Supply, and as a result it covers the same classes of work for the Aeronautical Inspection Department. The Metrology Laboratory is authorized to undertake the inspection of parallel plain plug and parallel ring gauges; taper plain ring gauges; parallel plain gap gauges; taper plain gap gauges, and simple plain length, height, depth and thickness gauges; parallel screw plug gauges up to 4 in. diameter, of Whitworth, metric and B.A. forms of thread; and profile gauges; and simple angle gauges.

The third function of the Laboratory is that its equipment, which is in excess of the requirements of the National Physical Laboratory scheme, has been designed to promote additional facilities for research—a relatively new venture, upon which staff members are now engaged. These investigations are concerned with the study of the characteristics of fine metallic surface-finishes with reference to mechanical methods

of production, which has led to further studies of the influence of surface finish on friction and wear.

The Metrology Laboratory is electrically heated and thermostatically controlled at 68° F. (20° C.). Fluorescent lighting is installed. The majority of the equipment, which is almost exclusively of British design and manufacture, has generally been purchased; but certain firms have presented apparatus to the College. Apart from the essential standard gauges and measuring tools, the equipment includes measuring machines for the determination of errors in screw threads, including optical projection apparatus; a 7-36 in. end-measuring machine with accessories; and a taper diameter-measuring machine, all of which are based on National Physical Laboratory designs. Comparator-type measuring equipment representing mechanical, electrical, pneumatic and optical forms of operation are available. The issue of "Acceptance Test Charts for Machine Tools", prepared by the Institution of Production Engineers, and published in collaboration with the Institution of Mechanical Engineers, has led to the provision of equipment necessary for machine-tool alignment-tests. This includes optical instruments such as the 18-in. 'Microptic' auto-collimator, reading directly to 0.5" of arc, and an alignment telescope and target, reading to 0.0005 in., both manufactured by Messrs. Hilger-Watts, Ltd. A standard 'Angle-Dekkor', reading to 1' of arc, is also available. Experimental apparatus for preliminary surface-alignment tests has been constructed in the Laboratory, but work of an advanced nature is carried out on standard machines in the various machine-tool laboratories. A tool-room microscope with accessories, by Messrs. Cooke, Troughton and Simms, Ltd., has been provided for the measurement of angles, thread forms, linear displacements, and for the comparison of enlarged projected images.

Surface-texture measurements may be carried out using the latest Taylor Hobson 'Talysurf' Model 3. This machine measures the roughness of surfaces by traversing a stylus across the surface and electrically amplifying its movements. The result of the examination may be shown in the form of a graph indicating the nature of the surface undulations. Alternatively, an average number may be recorded indicative of the degree of roughness. A model of the well-known 'Tomlinson' mechanical surface-recorder, in which a trace is made on a smoked glass, provides an alternative method of surface measurement.

As the Laboratory is for the use of senior students taking the craftsman's course, as well as for students in advanced professional courses, apparatus in the form of gauges in common use has been constructed for examination. All experimental work is based on instruction sheets giving details of the equipment to be used and the procedure to be followed. The theory underlying the particular experiment is also shown. Students prepare full records of all work done and are expected to develop logical conclusions. In the case of direct measurement, particular emphasis is laid on the errors of determination. The application of British Standard specifications is an important aspect of the lecture work. Copies of pertinent specifications, and other relevant publications, are available in the Laboratory, and students are urged to study them with reference to the apparatus being used. In conclusion, it is not suggested that the development of metrological studies in the College is now complete; on the contrary, it is hoped that future developments will allow the work to expand considerably.