1913–14 was eighty-nine; the corresponding number for 1912–13 was 110, but this included institutions providing courses which in 1913–14 became junior technical schools. Up to and including 1914–15 there were forty-nine recognised junior technical schools, thirty-seven for boys and twelve for girls. The report contains also a survey of the influence of the war upon the work of universities and university colleges assisted by Treasury grants.

SCIENCE as "Cinderella" is the subject of an informing and suggestive article in a recent issue of the *Glasgow Herald*, and of a subsequent trenchant letter in the same journal by Prof. Soddy, F.R.S., which deals with the manner in which a certain large endowment intended for the promotion of scientific study and research is, and has been, diverted largely to other purposes of an entirely general educational character, which, however desirable to promote, were not the objects Mr. Carnegie had directly in view when making his generous gift of 1,000,000*l.* sterling in aid of the extension of the means of scientific investigation in the Universities of Scotland. It was perhaps too much to expect that a body of trustees, upon which there was, and is, only a very limited representation of men of distinction who were, or had been, actively engaged in scientific research, should regard that object as its first duty, but it is startling to learn how inadequately the interests of science have been served in the disposal of the income derived from the trust. The truth is that there is a lamentable lack of vital and intelligent interest in the sphere of science as an essential factor in the education of the nation, and as an indispensable instrument of its civilised progress. It is only by a thorough understanding of the phenomena of Nature and of man in all his activities and aspects, and through a firm grasp of the knowledge so gained, that humanity can rise to higher levels of well-being. The unfortunate attitude of the governing classes of the nation towards science is, as has been well said, largely "the result of the monastic traditions of the great public schools and universities in which most of our leading politicians have been trained." We need a genuine endowment of research, which shall have for its sole purpose the personal encouragement and support of the most gifted men of the time, who will give their whole energies to the pursuit of knowledge, assisted by men of proved competence. The teaching and training of the capable youth of the nation may well be left to the many able expounders of scientific theory and practice now available, who would draw their inspiration from the work of such men as are here indicated. We seek at this supreme crisis of our national history a man of clear vision and firm purpose who, taking all branches of knowledge for his province, will assign to each its true place and function in the education and training of all classes of the people. Such a man and such a purpose have yet to be achieved.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, June 30.—Prof. C. V. Boys, president, in the chair.—Dr. P. E. **Shaw** and C. **Hayes**: A sensitive magnetometer. A torsion balance of extreme delicacy carries a pair of purest silver balls, each 3 gm. weight. A solenoid, with horizontal axis passing through one of the silver balls, is brought close to the balance. On exciting the solenoid, divergent fields of known strength are obtained in the region of the ball. The resulting attraction of the ball to the solenoid is shown by a mirror reflecting a distant scale to a telescope. The couple on the torsion beam required to produce 1 mm. scale deflection is $4{\cdot}5\times10^{-7}$ dyne cm., and this torsion balance is 10^6 times as sensitive as any known to have been used previously in this kind of work. The results of these experiments are:—(1) The magnetic properties of the silver are ascertained even for weak fields of 1–10 gauss. (2) The silver has a pronounced retentivity, this effect being presumably due to the small trace of iron impurity. (3) The relation of susceptibility of the silver to the field used is found. The susceptibility of each of the constituent materials, (*a*) pure silver, (*b*) residual pure iron, appears to be greatly modified by the presence of the other material.—Dr. H. S. **Allen**: The latent heat of fusion of a metal, and the quantum-theory. A criticism is given of a theory of the process of fusion recently put forward by Ratnowsky. The author of the theory obtains an expression on certain assumptions for the entropy of a substance in the solid state. He then proceeds to deduce a simple formula suitable for use at high temperatures. It is shown that this formula is incorrect in consequence of the omission of a term in the expansion.—Prof. H. **Chatley**: Cohesion (part ii.).

MANCHESTER.

Literary and Philosophical Society, May 9.—Prof. W. W. Haldane Gee, vice-president, in the chair.—Dr. E. **Newbery**: The theory of over-voltage. The author gave an account of the history and reasons for the study of over-voltage. The following points were discussed:—(1) Methods of measuring over-voltage, including the direct potential difference method, the "knickpunkt" method, the bubble-angle method, the oscillograph method, and the rotating commutator method. (2) The most important phenomena connected with, and controlling factors of, over-voltage. (3) The chief theories put forward to account for over-voltage. (4) The following theory was suggested—over-voltage of an electrode is determined by four factors:—(*a*) Supersaturation of the electrode surface with non-electrified gas under very high pressure, due to the permeability of the metal to the ionised gas, but non-permeability to the molecular and also to the spontaneous decomposition of the alloys containing the same gas. (*b*) Formation of a series of alloys or solid solutions of gas (or compound of gas and electrode substance) with the electrode surface. (*c*) Deficiency or excess of non-hydrated ions, charged and discharged, in the immediate neighbourhood of the electrodes. (*d*) Inductive action of the escaping ionised gas on the electrode.—R. F. **Gwyther**: The specification of stress. Part iv. (continued). The paper contains the stress relations for the most usual co-ordinate systems which were previously withheld. The method originally used to obtain the equations is retained, as the fact of the elimination of the displacement is of importance. The stress relations are consequently not limited in their application to specifically elastic stresses; they apply with equal effect to stress having only the general character of elastic stresses.

PARIS.

Academy of Sciences, July 10.—M. Camille Jordan in the chair.—E. **Perrier**: Remarks on the book, "Les Allemands et la Science."—M. Gonessiat was elected a correspondant for the section of astronomy in the place of the late G. H. Hill; M. Walden a correspondant in the section of chemistry in the place of Emil Fischer; M. Bataillon a correspondant for the section of anatomy and zoology in the place of the late J. H. Fabre; and M. Depage a correspondant for the section of medicine and surgery in the place of the late Guido Bacelli.—M. **Akimoff**: The transcendants of

Fourier-Bessel with several variables.—**F. Arago**: Contribution to the experimental study of waves.—**M. Dussaud**: New experiments on the separation of the luminous and calorific effects of a source of light. The two lenses forming the optical system are separated in such a manner that air can be circulated between them. The heat effects are thus reduced to a negligible quantity.—G. K. **Burgess** and H. **Scott**: The thermo-electric measurement of the critical points of iron. By the method described, which is a modification of that used by MM. Boudouard and Le Chatelier, both the A_2 and A_3 points are clearly shown by pure iron (99·968 per cent. iron).—J. M. **Lahy**: The psycho-physiology of the machine-gunner.—L. **Roule**: The migration of the tunny fish (*Orcynus thynuus*).—C. **Nicolle**: An attempt at preventive inoculation in exanthematic typhus.

July 17. — M. Ed. Perrier in the chair. — The president announced the death of Elias Metchnikoff, foreign associate, and gave an account of his life-work.—G. **Bigourdan**: The renaissance of astronomy at Paris, starting from the sixteenth century.—A. **Colson**: Demonstration of the rational character of the new solubility formulæ.—E. **Bourquelot** and A. **Aubry**: The biochemical synthesis of a galactobiose. The synthesis was effected by the action of emulsin upon an aqueous solution of galactose. Although the product could not be obtained in the crystallised state, it is shown that a galactobiose is formed.—E. **Teodoreşco**: The presence of a phycoerythrin in *Nostoc commune*.—J. **Pavillard**: Some new flagellæ, epiphytes of the pelagic diatoms.—G. **Bourguignon**: A method of determining chronaxy in man with the aid of condenser discharges. Classification of the muscles of the superior member by the chronaxy according to their radicular origins.—J. **Delphy**: Abdominal scoliosis in *Mugil auratus* and the presence of a parasitic myxosporidia in this fish.

BOOKS RECEIVED.

The Chemistry of the Garden. By H. H. Cousins. Revised edition. Pp. xviii+143. (London: Macmillan and Co., Ltd.) 1*s*.

Economical Dishes for Wartime. By F. A. George. Pp. 48. (Birmingham: Cornish Bros., Ltd.) 6*d*.

Memoirs of the Connecticut Academy of Arts and Sciences. Vol. v. The Collection of Osteological Material from Machu Picchu. By G. F. Eaton. Pp. 96+plates xxxix. (New Haven, Conn.)

Cours de Manipulations de Chimie Physique et d'Electrochimie. By M. Centnerszwer. Pp. vii+180. (Paris: Gauthier-Villars et Cie.) 6 francs.

Exercices et Leçons de Mécanique Analytique. By R. de Montessus. Pp. ii+334. (Paris: Gauthier-Villars et Cie.) 12 francs.

The Birds of Britain: their Distribution and Habits. By A. H. Evans. Pp. xii+275. (Cambridge: At the University Press.) 4*s*. net.

A Shilling Arithmetic. By J. W. Robertson. Pp. viii+191. (London: G. Bell and Sons, Ltd.) 1*s*.

Revision Papers in Arithmetic. By C. Pendlebury. Pp. xv+68+xviii. (London: G. Bell and Sons, Ltd.) 1*s*.

Department of Mines. Memoirs of the Geological Survey of New South Wales. Ethnological Series. No. 2: i., The Cylindro-Conical and Cornute Stone Implements of Western New South Wales and their Significance. ii., The Warrigal, or "Dingo," Introduced or Indigenous? By R. Etheridge, jun. Pp. vii+53+plates xii. (Sydney: W. A. Gullick.) 7*s*. 6*d*.

Les Allemands et la Science. By Prof. G. Petit and M. Leudet. Pp. xx+375. (Paris: F. Alcan.) 3.50 francs.

Fungoid and Insect Pests of the Farm. By F. R. Petherbridge. Pp. vii+174. (Cambridge: At the University Press.) 4*s*. net.

A Treatise on the Theory of Alternating Currents. By Dr. A. Russell. Vol. ii. Second edition. Pp. xiv+566. (Cambridge: At the University Press.) 15*s*. net.

Combinatory Analysis. By Major P. A. MacMahon. Vol. ii. Pp. xix+340. (Cambridge: At the University Press.) 18*s*. net.

A Bibliography of British Ornithology. By W. H. Mullens and H. K. Swann. Part ii. (London: Macmillan and Co., Ltd.) 6*s*. net.

Hyperacoustics. By J. L. Dunk. Division I. Simultaneous Tonality. Pp. vi+311. (London: J. M. Dent and Sons, Ltd.) 7*s*. 6*d*. net.

The Danish Ingolf-Expedition. Vol. iii., Nos. 3 and 5. Crustacea Malacostraca. By H. J Hansen. Pp. 145+12 plates+1 chart, and a list of the stations, and pp. 259+16 plates+1 chart, and a list of the stations. (Copenhagen: Bianco Luno.)

A Treatise on the Circle and the Sphere. By Dr. J. L. Coolidge. Pp. 602. (Oxford: At the Clarendon Press.) 21*s*. net.

Fermat's Last Theorem. By M. Cashmore. Pp. 63. (London: G. Bell and Sons, Ltd.) 2*s*. net.

City and Guilds of London Institute. Department of Technology. Programme for the Session 1916–17. Pp. viii+408. (London: John Murray.) 9*d*. net.

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