

Sir George Greenhill: The Rankine trochoidal wave. The Rankine trochoidal wave (Phil. Trans., 1863), either as rollers or as a starting wave, can be divided up by vertical planes perpendicular to the wave crest into compartments, and the compartments sheared along each other. The investigation is made of the extra field of force in addition to gravity when the shear is made continuous and the planes removed in order that the continuity of pressure should be preserved in the interior of the water, and for the new wave motion to persist. Also when the planes stand over to the vertical and the circular orbits in the roller are in parallel planes. A geometrical investigation is added of the molecular rotation in the interior of the Rankine wave.—Dr. P. E. Shaw: The tribo-electric series. (1) The tribo-electric series, in which solid materials are arranged in order according to the charge they acquire when rubbed together, is trustworthy with due precautions. (2) Most solids are found to alter their place in the series if heated above a certain temperature which is specific for each material. This temperature is called the critical temperature. The surface in its new condition is termed abnormal. (3) The series may be divided into an upper Group A and a lower Group B. It is found that these groups have tendencies contrary to one another as the surfaces of the materials are rendered (a) matte, or (b) abnormal, or (c) pressed, or (d) flexed. If under any of these agencies Group A becomes more + forming, Group B becomes more - forming, and *vice versa*. (4) Anomalous effects are observed when liquid mercury is used as one of the materials, its behaviour being quite unlike that of solid surfaces. (5) As to theory, it is suggested that the prevalent idea that the electric double-layer existing at the surface of solids has the - layer outermost in all cases is incorrect. Normally the materials in Group A would have - outermost, those in Group B having + outermost. Orientation of surface atoms would give rise to changes in the disposition of the two electric layers and so account for observed effects. (6) Tribo-electricity undoubtedly affords a means, of extraordinary delicacy, of discriminating between materials apparently alike. Two instances are seen in the group of furs and the group of woods.—J. J. Nolan: The nature of the ions produced by the spraying of water. Part i. gives an account of the determination of the mobilities of the very mobile ions produced by the spraying of water. Groups of ions are found, positive and negative, some of very high mobility. In part ii. the less mobile ions described in a previous paper are discussed. Treating the ions as minute spheres of water, it is shown that their sizes as deduced from an empirical modification of Stokes's law would agree with the sizes calculated from the ordinary theoretical mobility formulæ. Certain evidence, however, tends to show that the larger of these ions are not simple spheres of water, but that they consist of loose groupings of various numbers of some smaller water-globules. In part iii. it is shown that the very mobile ions can be accounted for by supposing that they consist of aggregates of various numbers of water-molecules, the numbers of molecules in the various ions being related to one another in a regular way. Some of these ions have the same mobility as ions produced in air by X-rays, etc. It is suggested that the ordinary gaseous ion consists of a group of water-molecules, the size of the group depending on the degree of moisture of the gas.—Prof. J. C. McLennan: The absorption spectra and the ionisation potentials of calcium, strontium, and barium.—J. Small: Geotropism and the Weber-Fecaner law.—Prof. W. B. Bottomley: The isolation from peat of certain nucleic acid derivatives.

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## BOOKS RECEIVED.

Spiritualism and Sir Oliver Lodge. By Dr. C. A. Mercier. Pp. xi+132. (London: Mental Culture Enterprise.) 4s. 6d. net.

A Manual of Field Astronomy. By A. H. Holt. Pp. x+128. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 6s. net.

Laboratory Manual of Bituminous Materials for the Use of Students in Highway Engineering. By Prévost Hubbard. Pp. xi+153. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 6s. net.

The Fundus Oculi of Birds, especially as Viewed by the Ophthalmoscope. By Casey Albert Wood. Pp. 180+plates lxi. (Chicago: The Lakeside Press.)

Fifty-fifth Annual Report of the Secretary of the State Board of Agriculture of the State of Michigan and Twenty-ninth Annual Report of the Experiment Station from June 1, 1915-June 30, 1916. Pp. 896. (Lansing, Mich.: Wynkoop Hallenbeck Crawford Co.)

Critique des Propulseurs. Par Paul Popovatz. Pp. 131. (Paris: Gauthier-Villars et Cie.)

Science and Industry. The Place of Cambridge in any Scheme for their Combination. The Rede Lecture, 1917. By Sir R. T. Glazebrook. Pp. 51. (Cambridge: At the University Press.) 1s. 6d. net.

The National University of Ireland. Calendar for the Year 1917. Pp. viii+579. (Dublin: A. Thom and Co., Ltd.)

The Biology of Waterworks. By R. Kirkpatrick. (Economic Series, No. 7.) Pp. vi+58. (London: British Museum, Natural History.)

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