

SCIENTIFIC SERIALS.

American Journal of Mathematics, vol. xviii. No. 2, April.—The intermediary orbit, *i.e.* the Moon's periodic orbit relatively to the Sun obtained from the variation terms when all terms but those depending on the ratio of the mean motions only are omitted, has been considered in vol. i. by Dr. Hill, and subsequently in the *Acta Mathematica* (vol. viii.) the same writer obtained an expression for the motion of the Moon's perigee, so far as it depends on the ratio of the mean motions. These papers have been followed by others by Prof. E. W. Brown, in which the terms depending on the solar parallax and the lunar eccentricity are computed.—The object of the opening paper of the present number, on the inclinational terms in the Moon's coordinates, by P. H. Cowell, is to take into account, according to Dr. Hill's method, the inclination of the orbit, considering it as being the manifestation of a small oscillation about Dr. Hill's distorted circular orbit, which relatively to the Sun is a closed curve. The terms multiplied by the first power of the inclination have been calculated to the sixth order, and an expression for the part of the motion of the Moon's node, that depends upon the mean motions only, has been found as far as the eighth order, *i.e.* one term further than in Delaunay's series. The terms multiplied by the square of the inclination have been calculated to the fifth order, and the terms multiplied by the third power of the inclination to the fourth order in *m*. The notation adopted is that of the paper by Prof. Brown (*Am. Journ. Math.*, vol. xvii.).—A short note by A. S. Chessin, on non-uniform convergence of infinite series, brings out more clearly a point in a previous note (vol. xviii. No. 1), which the writer says has been misunderstood.—On a certain class of equipotential surfaces, by B. O. Peirce, discusses the nature of such systems of plane curves as are at once the right sections of possible systems of equipotential cylindrical surfaces belonging to distributions of matter which attract, according to the law of nature, and the generating curves of possible systems of equipotential surfaces of revolution.—M. Petrovitch contributes "Remarques sur les équations de dynamique et sur le mouvement tauchrone."—A note on C. S. Peirce's paper on a quincuncial projection of the sphere, by J. Pierpont, corrects an inaccuracy in that paper (vol. ii. p. 394). Mr. Pierpont, in a note on the invariance of the factors of composition of a substitution-group, gives a much simplified proof of this important theorem.—H. Maschke, in a long article (pp. 156-188) on the representation of finite groups, especially of the rotation-groups of the regular bodies of three- and four-dimensional space, by Cayley's colour diagrams, shows that Cayley's method (the theory of groups, graphical representation, *Am. Journ.*, vol. i., and on the theory of groups, *Am. Journ.*, vol. xi.) can be readily applied to the construction and investigation of numerous groups of higher orders. In particular, the writer says, the colour diagrams for the rotation groups of the regular bodies can be arranged in such a way that they lend themselves much easier, at least in some respects, to a study of the groups concerned, than even the models of the regular bodies. Numerous diagrams of interest accompany the paper.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, March 19.—Mr. A. G. V. Harcourt, President, in the chair.—The following papers were read:—The constitution of a new organic acid resulting from the oxidation of tartaric acid, by H. J. H. Fenton. The acid obtained by the oxidation of tartaric acid in presence of iron seems to be a dihydroxymaleic acid of the constitution $C(OH)(COOH):C(OH)(COOH)$; an isomeric acid has also been prepared, which is possibly the corresponding dihydroxyfumaric acid.—The volume and optical relationships of the potassium, rubidium and cesium salts of the monoclinic series, $R_2M(SO_4)_2 \cdot 6H_2O$, by A. E. Tutton. A detailed investigation of the physical properties and volume relationships of the twenty-two salts of this series, of which the author has previously determined the morphological constants, leads to a number of important conclusions; the alkali metal R in salts of this series, exerts a predominating influence on the crystallographical characters of the substances.—Comparison of the results of the investigations of the simple and double sulphates containing potassium, rubidium and cesium, by A. E. Tutton.—The bearing of the results of the investigations

of the simple and double sulphates containing potassium, rubidium and cesium, upon the nature of the structural unit, by A. E. Tutton. No considerable contraction occurs in the formation of the double salts of the series $R_2M(SO_4)_2 \cdot 6H_2O$ from its constituent salts, so that it is improbable that these constituents are in chemical combination in the solid state; this conclusion is supported by the fact that these salts do not exist in solution, and that many of them are very unstable. It is not necessary to assume that the structural units of crystals consist of more than one chemical molecule in the case of double salts or salts containing water of crystallisation.—The hydriodides of hydroxylamine, by W. R. Dunstan and E. Goulding. The only crystalline hydroxylamine hydriodides which the authors have been able to prepare have the compositions $3NH_3O, HI$ and $2NH_3O, HI$.—An analysis of water from the dropping well at Knaresborough in Yorkshire, by B. A. Burrell.—Contributions to the knowledge of ethylic acetoacetate. Part I. Acetonylmaleic acid, by S. Ruhemann and E. A. Tyler. Ethylic sodio-acetoacetate and ethylic chlorofumarate react with formation of ethylic methylidihydrofurfurantricarboxylate, which on hydrolysis with alcoholic potash yields acetonylmaleic acid $CMe(OH):CII.CH(COOH).CH(OH).COOH$.—The action of lead thiocyanate on the chlorocarbonic esters. Part I. Carboxyethylthiocarbimide and its derivatives, by R. E. Doran.—An auxiliary assay balance, by R. Law. The author describes a balance for assay work, which gives the weight of the gold "cornet" with such accuracy that on its transference to the ordinary assay balance, the observer can put the requisite weight on the balance pan at once; the remaining fraction can then be determined by the rider alone.—Charas: the resin of Indian hemp, by T. B. Wood, W. T. N. Spivey, and T. H. Easterfield. Charas, the resin of *Cannabis indica*, contains a terpene, a sesquiterpene, a paraffin, $C_{29}H_{60}$, and a red oil, $C_{18}H_{24}O_2$; the latter, in doses of 0.05 gram, produces intoxication and sleep.—Note on the decomposition of α -chloronitrocammphor, by A. Lapworth.—On heating α -chloronitrocammphor, camphorquinone is produced.— π -Bromocammphor, by C. Revis and F. S. Kipping.—Oxidation products of α -bromocammphorsulphonic acid, by A. Lapworth and F. S. Kipping. On oxidising ammonium α -bromocammphorsulphonate with nitric acid, products are obtained which seem to be a sulpholactone, $C_{10}H_{12}SO_4Br_2$, a hydroxydibromocammphorsulphonic acid and an ammonium dihydrogen π -sulphocammphoric acid.—On the xylic and xylidinic acids, by W. H. Bentley and W. H. Perkin, junr.

March 26.—Anniversary Meeting.—Mr. A. G. V. Harcourt, President, in the chair.—After the reading of the presidential address and the transaction of the usual business, a ballot was taken for the election of officers and Council for the ensuing year.

Geological Society, April 15.—Dr. Henry Hicks, F.R.S., President, in the chair.—The President announced that a portrait in sepia of Prof. Bonney, executed by Mr. Trevor Haddon, had been presented to the Society by thirty-four subscribers, Fellows of the Society.—The following communications were read:—The Junction-Beds of the Upper Lias and Inferior Oolite in Northamptonshire. Part I. Physical and Chemical, by Beeby Thompson. The author, while combating the view that a considerable unconformity existed between the Upper Lias and the Inferior Oolite of Northamptonshire, brought together much evidence to illustrate the effects of slipping, and to show that these effects may be mistaken for those of unconformity. He also applied the evidence which he had collected to illustrate certain points in the physics of valley-formation. After giving details as to the horizon of the springs of the district, the distribution of water in the Inferior Oolite, and the development of the springs, he argued that every valley of the district has been elongated in the direction which it now has by a stream originating in a spring always at its head, and that the development of channels towards particular points of discharge had been the chief agent in initiating the formation and guiding the direction of all the minor valleys of the river-system within the influence of the same set of beds. A description of the characters of the slopes followed, and their significance was discussed. The structure of the hills and valleys of the district occupied the next portion of the paper, and the author considered that corresponding to the deepening of a valley by denudation there was uplifting of the beds below it, and at the same time an outward and upward thrust along the hillside which lifted beds there; also, that hills were reduced in height by sinking as well as by denudation of their