

remarks, for expeditious tests on the applicability of Cauchy's multiplication rule to powers of semi-convergent series higher than the second power, has given rise to the present investigation, which begins with alternating semi-convergent series, and ends with certain trigonometric series.—Analytic functions suitable to represent substitutions, is an interesting following-up of a theorem due to Hermite (*Comptes rendus*, vol. lvii. p. 750), by L. E. Dickson. Further generalisations are promised in a dissertation by the author.—S. Kantor contributes an elaborate memoir, "Theorie der Transformationen im R_n , welche sich aus quadratischen zusammensetzen lassen," which has as heading, "Boldness is caution in these circumstances."—Tactical Memoranda, i.-iii., by E. H. Moore, is the opening one of a series of papers which the author proposes to publish, on certain more or less closely connected topics of tactic. He starts from Cayley's division of algebra into tactic and logistic. This instalment bears upon the work of Reze (*Geometrie der Lage*), S. Kantor, Klein, and many others; it also gives a generalisation of the *fifteen-schoolgirls* arrangement, and considers whist tournament arrangements, which are in ultimate formulation purely tactical.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 17.—M. Marey in the chair.—On the copper mines of Sinai, worked by the ancient Egyptians, by M. Berthelot. These mines are near the coast of the Gulf of Suez, and are undoubtedly the most ancient known to history, having been worked at least 5000 years before the Christian era. They were abandoned about 3000 years ago, on account of the small amount of copper present in the ores. The reduction appears to have been carried out by methods not differing essentially from those in use at the present day, wood being used as the reducing agent, together with fusible silicates.—On the subject of a preceding communication, relating to some properties of primitive roots and secondary roots of prime numbers, by M. de Jonquières.—On an apparatus for aerial navigation, by M. Honoré.—Abstract of solar observations made at the Royal Observatory of the Roman College during the first half of 1896, by M. P. Tacchini.—Combination of argon with water, by M. P. Villard. When argon is compressed to 150 atmospheres in the presence of water cooled to 0° , local cooling at a point in the tube causes the separation of crystals, probably a hydrate, the dissociation tension of which at 0° is 105 atmospheres. Nitrogen and oxygen also combine with water under similar conditions, but at much higher pressures.—On the reticular structure of central nervous cells, by Mdlle. Wanda Sczawinska.—Contribution to the study of the coagulation of the blood, by MM. J. Athanasiu and J. Carvallo. It is concluded that in the normal state the blood and lymph contain elements, perhaps leucocytes, which supply the fibrin ferment necessary for the coagulation of these liquids, and that when these elements are prevented by any means, such as peptone, from fulfilling this function, the tissues are capable of replacing them.—Influence of certain substances upon the bactericidal properties of the blood, by M. London. The bactericidal power of the blood is markedly reduced by want of food, but increased by small repeated doses of sodium bicarbonate.—On the extraordinary refractions observed in the neighbourhood of lakes, and known under the name of *Fata Morgana*, by M. André Delebecque. The apparent enlargement of objects on the opposite bank of the lake is really due to the superposition of a number of images which, although not distinguishable by the unaided eye, are clearly separable by the aid of a telescope.—On the resolution of the general equation of the fifth degree, by M. L. Mirinny.

August 24.—M. A. Cornu in the chair.—M. Tisserand gave an account of the results of the observations made of the total eclipse of August 9. The results obtained by M. Deslandres at Yeso, and by Mdlle. Klumpke, at Vadsö, were unfavourable, but M. Backlund, of the Observatory of Pulkowa, was able to make some good observations at Novaya Zemlya.—On the transformations of the equations in dynamics, by M. Paul Painlevé.—On a proposition in mechanics, by M. F. Siacci.—On a doubly recurring series of points always homocyclic, by M. P. Serret.—On the electric convection following the lines of force produced by the Röntgen rays, by M. Aug. Righi. Experiments are described which tend to show the existence of a

convection following the lines of force.—The utility in radiography of a screen coated with phosphorescent sulphide of zinc, by M. C. Henry. The zinc sulphide screen, wrapped in carbon paper, is covered with the object to be examined and exposed to the radiation of a Crookes' tube for some minutes. On removal to a darkened room the image shines for at least a quarter of an hour, so that the smallest details of the image can be made out. The light emitted by glow-worms was found to be capable of penetrating blackened paper, and affecting a sensitive plate underneath.—The quaternary beds of the Micoque, by MM. G. Chauvet and E. Rivière.—Note on magnesium sulphide, by M. N. Bignan.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—British Association, Liverpool, 1896: Handbook to Liverpool, &c. (Philip).—An Archæological Survey of the United Kingdom: Dr. D. Murray (Glasgow, MacLehose).—On the Adjustment and Testing of Telescopic Objectives, 2nd edition (York, T. Cooke).—The Principles of the Transformer: Dr. F. Bedell (Macmillan).—"Made in Germany": E. E. Williams, 3rd edition (Heinemann).—Entomological Notes for the Young Collector: W. A. Morley (E. Stock).—British Butterflies: J. W. Tutt (Gill).—Elements of Astronomy: Sir R. S. Ball, new edition (Longmans). PAMPHLETS.—Les Applications de l'Électrolyse à la Métallurgie: M. U. Le Verrier (Paris, Gauthier-Villars).—Vierter Jahres-Bericht des Somblick-Vereines, 1895 (Wien).—Arithmetic for Promotion, Scheme B: Lock and Macdonald, Part 5 (Macmillan). SERIALS.—Science Progress, August (Scientific Press).—Royal Natural History, Part 34 (Warne).—Strand Magazine, August (Newnes).—Journal of the Royal Microscopical Society, August (Williams and Norgate).—Quarterly Journal of Microscopical Science, August (Churchill).—Longman's Magazine, September (Longmans).—Good Words, September (Isbister).—Sunday Magazine, September (Isbister).—Lloyd's Natural History. British Birds: Dr. R. B. Sharpe, Parts 3 and 4 (Lloyd).—Humanitarian, September (Hutchinson).—Chambers's Journal, September (Chambers).—Scribner's Magazine, September (Low).—Natural Science, September (Page).—Journal of the Royal Horticultural Society, Vol. xx. Part 1 (Victoria Street).—History of Mankind: F. Ratzel, translated, Part xi. (Macmillan).—Modern Astrology, September (Bouverie Street).

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