the proper mathematical formulation of these sundry conditions so as to obtain a system of equations which can be readily solved. The paper is illustrated by diagrams which put the problems discussed in a clear light.—" Ueber systeme von differentialgleichungen dessen vierfach periodische functionen genüge leisten," by M. Krause, was presented at the Chicago (April) meeting of the present year. References are given to Hermite ("Sur quelques applications de la théorie des fonctions elliptiques," 1885), and to a paper by Picard (*Comptes rendus*, Band 89), and to previous work by the author.—E. B. van Vleck follows with a paper on linear criteria for the determination of the radius of convergence of a power series. Its object is to establish criteria for the convergence of a power series when the $(n+1)$th coefficient A_n is connected with the preceding coefficients by a linear relation which tends to take a limiting form as n increases indefinitely. The criteria include Cauchy's ratio-test as a special case, and may be looked upon as an extension of the test, and are applicable in cases in which the simple ratio-test fails. The paper closes with two theorems which are an extension for the case of two variables, criteria for the convergence of power series in such a case are stated to be very rare.—On the existence of the Green's function for the most general simply connected plane region, by W. F. Osgood.—A short but suggestive note—" D " lines on quadrics, by A. Pell. These lines, so named by Cosserat, were originally considered by Darboux. They are the lines drawn upon a surface in such a way that the osculating sphere at every point is tangent to the surface at that point. In addition to the above, the lines have been studied by Enneper and Ribaucour (for surfaces in general). In the present paper the author applies the theory of elliptic functions to the integration of Darboux's differential equation, and obtains an idea of the appearance of the lines and also some of their properties.—Starting from an article, by Prof. F. Morley, in the previous number of the *Transactions*, F. H. Loud gives sundry metric theorems concerning n lines in a plane. By giving a different interpretation to formulæ got by Prof. Morley, Mr. Loud obtains a new series of theorems and other results of some interest.—An application of group theory to hydrodynamics, by E. J. Wilczynski. It was observed by Sophus Lie that the stationary motion of a fluid can serve as a perfect picture of a one-parameter group in three variables. Apparently this fact has not been utilised for the purposes of hydrodynamics. This paper does this. Amongst other advantages, the treatment, from the new standpoint, leads to special cases of exceptional interest and importance, which otherwise appear to be difficult and unpromising.—Dr. L E. Dickson, following up work recently published in the *Proceedings* of the London Mathematical Society (vol. xxxi. pp. 30, 351), contributes an article on the determination of an abstract simple group of order $2^7 \cdot 3^6 \cdot 5 \cdot 7$, holohedrically isomorphic with a certain orthogonal group and with a certain hyperabelian group (contributed to the Chicago [April] meeting of the society).

In the *Journal* of the Royal Microscopical Society for August, Mr. E. M. Nelson has one of his useful technical articles on the "lag" in microscopic vision, as well as a historical account of the improvements in the structure of the microscope introduced by the firm of Ross. Mr. E. B. Stringer describes a new form of fine adjustment. Miss A. Lorrain Smith gives a description of some new microscopic fungi, including a new species of Entomophthora, not parasitic, but saprophytic on dead animal tissues. There is, in addition, the usual summary of current researches relating to zoology, botany and microscopy.

In the *Journal of Botany* for August, Messrs. W. and G. S. West have a second instalment of their notes on freshwater algæ, in which some new species and varieties are described. The remaining papers are descriptive or geographical.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 10.—M. Maurice Lévy in the chair.—Occultation of Saturn by the moon on September 3 observed at the Observatory of Lyons, by MM. J. Guillaume, G. Le Cadet and M. Luizet.—On differential systems with a general uniform integral, by M. Paul Painlevé. Four types of systems are examined, problems in mechanics such as the movement of a heavy body fixed by a point, the inversion of total differentials, the case where the general integral of a differential system does not admit of transcendental singularities, and the

study of the integrals of a differential system in a real field.—On the liquefaction of air by expansion with production of external work, by M. Georges Claude.—On the dielectric cohesion of gases and vapours, by M. E. Bouty. The experiments previously described upon the relation existing between the distance at which insulation breaks down and the pressure of the gas have been extended to vapours of liquids. Results of measurements for water, and eleven organic liquids, are given in the present paper. —On the modification of the electrical and organic properties of cables under the prolonged action of currents, by M. Georges Rheins. When a cable is submitted to the action of an alternating current it preserves its electrical and organic properties intact. With a continuous current in one direction the cable gradually loses its electrical properties, this effect being produced by the slow penetration of the copper from the wire into the sheath. The effect is similar with both gutta and paper coatings.—New researches on the absorptive power of hæmoglobin for oxygen and carbonic acid, by M. L. G. de Saint-Martin. As the result of numerous experiments quoted, the author is of opinion that, contrary to the views generally held, it is impossible, especially in pathological cases, to estimate hæmoglobin by means of the absorbing power of the blood.—On the nitrocelluloses, by M. Léo Vignon. Both the nitrocelluloses and the nitro-oxycelluloses energetically reduce Fehling's solution, their reducing power being apparently independent of the degree of nitration. The reducing powers of the nitration products of cellulose and oxycellulose are of the same order, about one-fifth that of inverted sugar.—On the wood of the Conifers of peat bogs, by M. L. Géneau de Lamarlière. In the wood of Conifers taken from a peat bog, the intercellular layer formed of lignin and pectic compounds is intact, whilst the internal portion has been strongly attacked by microbial action. The lignin and cellulose have disappeared, an amorphous substance remaining behind which is soluble in potash after the action of chlorine. The material resembles callose.— Influence of a dry or moist medium upon the structure of plants, by M. Eberhardt. Compared with normal air, the effect of dry air is to increase the thickness of the epidermal cuticle and the number of stomata, to make the cork layer form earlier, to increase the production of ligneous tissue, and to cause an increase in the amount of pallisade tissue in the leaf.

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