

volume of such a solid be  $\leq 1 + \frac{1}{2^3} + \frac{1}{3^3} + \frac{1}{4^3} + \dots$ , it is always possible to indicate deformations of the solid for which the volume remains constant, the origin remains fixed and all straight lines of the solid remain straight while all points of the frame excepting the origin are found outside the solid after deformation.

17. Mr. FRITZ KÖTTER, of Berlin: *On the problem of rotation treated by Mrs. Kovalevsky.* The paper develops somewhat farther the formulæ given by Mrs. Kovalevsky in the 12th volume of the *Acta Mathematica* for a certain integrable case of the problem of rotation of a heavy body about a fixed point.

18. Mr. PILITZ, of Jena: *A question in the theory of numbers.* After an introductory discussion of the necessity for a new calculus, or at least of a new way of conceiving of the combination of elements in the problems of the theory of numbers and the theory of functions, the speaker gave a proof of the proposition announced by Riemann as probably true: that the complex 0-points of the function  $\zeta(s)$  all have  $\frac{1}{2}$  as their real part.

19. Mr. F. STÄCKEL, of Halle: *On the bending of curved surfaces under certain conditions.*

20. Mr. A. WANGERIN, of Halle: *On the development of surfaces of rotation with constant negative curvature on each other.*

21. Mr. WILTHEISS, of Halle: *On some differential equations of the theta functions of two variables.*

22. Mr. G. CANTOR, of Halle: *On an elementary question in the theory of manifoldnesses.*

23. Mr. GORDAN, of Erlangen: *Remarks on a proposition of Mr. Hilbert.*

ALEXANDER ZIWET.

## NOTES.

A REGULAR meeting of the NEW YORK MATHEMATICAL SOCIETY was held Saturday afternoon, December 5, at half-past three o'clock, the president in the chair. Mr. Wiley, Mr. Snook, and Dr. Pupin were appointed a committee to report at the annual meeting, on December 30, nominations for the officers and other members of the council for the calendar year 1892.

Dr. Pupin read an original paper entitled "On a peculiar family of complex harmonics," in which he deduced several

useful properties of certain complex harmonic curves, explaining briefly their application to polyphasal and continuous current generators. Mr. Steinmetz and Dr. Webster made remarks upon the physical side of the paper. Mr. Steinmetz said that he had actually obtained in experiments with dynamos, curves which very closely resembled those given in Dr. Pupin's paper.

T. S. F.

THE following courses of lectures, extending through the first half year, are being delivered at Clark University, Worcester, Mass. :

By Professor Story : (1) Enumerative geometry and the theory of coloring maps ; (2) Historic development of arithmetic and algebra.

By Dr. Bolza : (1) Klein's icosahedron theory ; (2) Definite integrals and calculus of variations.

By Dr. Taber : Modern higher algebra.

By Dr. White : (1) Theta-functions of three and four variables ; (2) Modern synthetic geometry and higher plane curves.

By Mr. de Perrott : Application of analysis and group theory to the theory of numbers.

By Professor Michelson : Optical theories.

By Dr. Webster : Dynamics.

At the weekly mathematical conferences conducted by Professor Story, non-euclidean geometry has been the subject of systematic discussion, together with less extended consideration of topics of interest from other departments of mathematics. At a recent meeting the new Amsler's planimeter which has been added to the mathematical apparatus of the University was exhibited and its theory explained by Professor Story. Careful measurements on known areas give results accurate to within one-twentieth of one per cent.

J. W. A. Y.