ON A SYSTEM OF DIFFERENTIAL EQUATIONS LEADING TO PERIODIC FUNCTIONS

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The present paper contains an elementary algebraic deduction of a system of differential equations satisfied by all the hyperelliptic sigma functions which, as is believed, were first stated, but without demonstration, in the Proceedings of the Cambridge Philosophical Society, Vol. IX, Part IX, 1898, p. 513. In that note will be found indications of a method of solution of the equations in connexion with the theory, considered by PICARD, of integrals of total differentials, and of a method of obtaining from them the expansion of any sigma function, and of their use, in case $p = 2$, for expressing the geometry of KUMMER's sixteen nodal quartic surface. The establishment of a theory of the sigma functions directly from these differential equations would appear likely to be of the greatest suggestiveness for the development of the theory of functions of several variables. It is from this general point of view that the equations appear to the present writer to be of peculiar interest; though their simplicity would also recommend them merely as a contribution to the theory of the hyperelliptic functions.

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