

formizing automorphic function $\varphi(t)$, a proof which he has treated in the second edition of his *Funktionentheorie* with detail. The prime function is defined in Lecture V as a limit

$$\Omega(t, \tau) = \lim_{\Delta t=0, \Delta \tau=0} \sqrt{\Delta t \Delta \tau e^{-\Pi_{t\tau}^{t+\Delta t, \tau+\Delta \tau}}},$$

where $\Pi_{t\tau}^{t\tau}$ is a function analogous to the difference

$$P_{\xi\eta}^{xy} = P_{\xi\eta}(x) - P_{\xi\eta}(y)$$

formed for a suitably chosen integral $P_{\xi\eta}(x)$ of the third kind on the Riemann surface. It is seen that the definition involves a function of four arguments, and it is on account of this circumstance that the fifth lecture is a natural continuation of the preceding four. For the theorems of Lecture II, in particular, describing the analytic character of a function of several simultaneous variables resulting from known properties of the function when all but one variable are considered as parameters, play an important and apparently indispensable rôle in establishing the existence and properties of the functions II and Ω .

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SHORTER NOTICE.

Mathematiker-Anekdoten. By W. AHRENS. Band XVIII of the *Mathematische Bibliothek* edited by Lietzmann and Witting. Leipzig, B. G. Teubner, 1916. Pp. 56. Price 80 pfennige.

ANYTHING from the pen of Dr. Ahrens is always sure to be interesting. His *Mathematische Unterhaltungen und Spiele*, his *Mathematische Spiele*, and his *Scherz und Ernst in der Mathematik* are all well known and are everywhere appreciated. He is one of those rare writers on the bizarre in mathematics who keep their balance and turn out works which have the stamp of dignity and learning, while at the same time revealing the lighter side of the science. In other words, he is a man who evidently combines in his own soul the *Scherz*

und Ernst, as he combines these elements in the title of one of his best known works.

On this account the reader is justified in expecting something worth his attention in a book of *Mathematiker-Anekdoten* compiled by such a writer; and if, by chance, he is a little disappointed in the diminutive size of the work under review, he may well ask himself what he expects for 80 pfennige. Surely, one cannot look for a seven-course intellectual dinner for 20 cents.

To American and English readers the chief interest in the anecdotes lies in the fact that most of them are not to be found in works in our language. The anecdotes in themselves are not numerous, nor are they, on the whole, as interesting as those to be found in some of Rebière's curious collections, but they are not of the stereotyped variety and hence they are welcome.

The first in Dr. Ahrens's list is Adam Riese, known to most Germans from the phrase "nach Adam Riese," which led, no doubt, to "according to Cocker" in England and "according to Daboll" in this country. The story is not of particular interest, but it lightens up, in a way, the general impression of Riese which comes to one from reading his works. The next one in the list is Gauss, concerning whose school days a couple of interesting stories are told; how he, at the age of nine, saw at a glance how to sum an arithmetic series, and how, at fifteen, he was reading Newton, Euler, and Lagrange.

Among others concerning whom Dr. Ahrens relates various anecdotes are the mathematical prodigy Henri Mondeux, with his examination by Cauchy; Riemann, "einer der genialsten und tiefstinnigsten Mathematiker aller Zeiten;" Grassmann, whom the vocational-guidance extremists would quite certainly have turned from the paths of mathematics in his younger days; Schellbach, whose nature the poet Novalis described, to the mind of Dr. Ahrens, in the statement that "Das Leben der Götter ist Mathematik. Alle göttlichen Gesandten müssen Mathematiker sein. Reine Mathematik ist Religion. Die Mathematiker sind die einzig Glücklichen. Der echte Mathematiker ist Enthusiast per se. Ohne Enthusiasmus keine Mathematik;" Ohm the physicist; August; Lasswitz the poet, who was professor of mathematics in the Gymnasium at Gotha; Euler; and Arago, with his interesting examination by Monge and Legendre. There are also notes

on certain interesting newspaper problems, a problem of exchange under war conditions, an incident in connection with Kästner's epigram on logarithms, and, finally, the Fermat problem.

All this is told in a style that is in harmony with the nature of the work and that would repay the reader even if the anecdotes themselves did not seem worth his time, which is far from being the case.

DAVID EUGENE SMITH.

NOTES.

THE July number (volume 17, number 3) of the *Transactions of the American Mathematical Society* contains the following papers: "On a general class of series of the form $\sum c_n g(x+n)$," by R. D. CARMICHAEL; "The geometries associated with a certain system of Cremona groups," by J. W. YOUNG and F. M. MORGAN; "A reduction of certain analytic differential equations to differential equations of an algebraic type," by W. D. MACMILLAN; "A new canonical form of the elliptic integral," by BESSIE I. MILLER; "On the notion of summability for the limit of a function of a continuous variable," by L. L. SILVERMAN; "On the factorization of Cremona plane transformations," by J. W. ALEXANDER; "Weierstrass's non-differentiable function," by G. H. HARDY; "Finite groups represented by special matrices," by G. A. MILLER; "On infinite regions," by W. F. OSGOOD; "Point sets and allied Cremona groups (Part II)," by A. B. COBLE; "Infinite products of analytic matrices," by G. D. BIRKHOFF.

THE July number (volume 38, number 3) of the *American Journal of Mathematics* contains the following papers: "A class of asymptotic orbits in the problem of three bodies," by L. A. H. WARREN; "Some invariants of the ternary quartic," by H. I. THOMSEN; "Functions of surfaces with exceptional points or curves," by C. A. FISCHER; "Dupin's cyclide as a self-dual surface," by MABEL M. YOUNG; "Projective differential geometry of one-parameter families of space curves, and conjugate nets on a curved surface. Second memoir," by G. M. GREEN; "The asymptotic equation and satellite conic of the plane quartic," by TERESA COHEN.