

HEINRICH MARTIN WEBER.

Festschrift Heinrich Weber zu seinem siebenzigsten Geburtstag am 5 März 1912. Gewidmet von Freunden und Schülern. Mit dem Bildnis von H. WEBER in Heliogravüre und Figuren im Text. Leipzig und Berlin, B. G. Teubner, 1912. viii + 500 pages. Price 24 marks.

IT will not have been without a sharp pang that former pupils read of the death, at Strassburg on May 17, of Heinrich Martin* Weber. The breadth of his mathematical knowledge, the fascinating delivery of his lectures, the great modesty of his bearing, the charity and rich sympathy of his nature in association with young men, the charming hospitality of his home (at least before the death of Mrs. Weber a dozen years ago)—are all recalled by those so fortunate as to have been his pupils.

Professor Weber was the eldest son of the noted historian Georg Weber and was born at Heidelberg, March 5, 1842. He was educated at the Lyceum in Heidelberg and at the universities of Heidelberg, Leipzig, and Königsberg. His doctor's thesis (Heidelberg, 1866) dealt with a contribution to the "Theory of singular solutions of partial differential equations of the first order." In 1866 he became privat-docent, and in 1869, *ausserordentlicher* professor of mathematics in the University of Heidelberg. He married in 1870. In 1873 he was appointed *ordentlicher* professor in the University of Königsberg; in 1883 professor in the Polytechnische Hochschule, Berlin; in 1884 professor at the University of Marburg; in 1892 professor at the University of Göttingen; and finally in 1895 professor in Strassburg, where his only sister, wife of Heinrich Holtzmann, professor of theology in the University, was living. Here he remained till his death.

Professor Weber's scientific publications have been numerous, the papers appearing for the most part in *Crelle* and in the *Mathematische Annalen*. His first book, on the Theory of Abelian Functions of Deficiency Three, was published in 1876. In 1891 appeared his *Elliptic Functions and Algebraic Numbers*, afterwards incorporated into his classic *Lehrbuch*

* Cf. *Allgemeine Deutsche Biographie*, vol. 41, p. 302.

der Algebra (2 volumes, 1895–96; 2d edition, 3 volumes, 1898,* 1899,* 1908; abridgment, 1 volume, 1912; French translation of volume I, 2 volumes 1898). His article on “Complex multiplication” appeared in the *Encyklopädie der mathematischen Wissenschaften* in 1900. In this year and the following were published the two volumes of the so-called fourth edition of *The Partial Differential Equations of Mathematical Physics* based on Riemann’s lectures;† this was not a new edition however, but rather an entirely new work by Weber, with the same purposes in view. The fifth edition‡ was published 1910–12. The three volumes of the remarkably popular *Encyclopaedia of Elementary Mathematics*§ edited by Weber and Wellstein, first published 1903–1907, have already gone through three editions and have been expanded into four volumes.

Then, too, Weber was editor of Riemann’s *Collected Works* (1876; 2d edition 1892), of the German edition of Poincaré’s “Value of Science” (1906; 2d edition 1910||); of the first published (1911) volume of the great new edition of Euler’s *Works*, besides being joint editor of Franz Neumann’s *Works* (1906) and of the *Mathematische Annalen*.

Europeans have a pleasant way of taking time to celebrate anniversary occasions both within and without the family circle. Friends and former pupils of Moritz Cantor on his seventieth birthday (in 1899) presented him with a “Festschrift” of over 600 pages, containing in addition to an expression of appreciation and good wishes, some 30 original contributions to the history of mathematics by as many historians. In like manner those who held Professor Weber in high esteem prepared a similar memorial for his seventieth birthday, and this is the volume before us for review.

The heliogravure frontispiece portrait is singularly characteristic and life-like. Besides the memoirs, only the following introductory message is to be found in the volume:

“*Highly honoured Professor!* A number of your friends and

* Reviewed by J. Pierpont in this BULLETIN, vol. 4 (1898), pp. 200–234; vol. 5 (1899), pp. 480–482.

† Reviewed in this BULLETIN, vol. 8 (1901), pp. 81–85 (J. S. Ames).

‡ Reviewed in this BULLETIN, vol. 18 (1911), pp. 87–89 (O. D. Kellogg); vol. 19 (1913), pp. 482–483 (J. B. Shaw).

§ Reviewed in this BULLETIN, vol. 10 (1904), pp. 200–204 (D. E. Smith); vol. 14 (1908), pp. 499–501 (H. S. White); vol. 17 (1911), p. 546 (F. W. Owens); vol. 19 (1913), pp. 422–423 (J. B. Shaw).

|| Reviewed in this BULLETIN, vol. 19 (1913), pp. 252–253 (J. B. Shaw).

pupils have united to present to you, on your seventieth birthday, this book as a token, of abiding remembrance and of their sincere admiration and attachment. We have believed that we could not better express our regard and feeling of gratitude than by a joint original production which in many-sided content is a reflection of the richness of your own life work. For with rare versatility you have directed your ceaseless activity in different departments of science, in algebra, number theory, theory of functions, in mechanics and mathematical physics, you have created works of permanent value, you have opened up new fields of research, while at the same time, in comprehensive works which have become the common property of all mathematicians, you have fixed in panoramic fashion the scientific possessions of our time.

"But not alone as investigator and teacher do we honour you to-day; our good wishes are likewise a token of appreciation of the personality worthy of all honour, an offering to the true ever trusty friend, to the lofty-minded man, who even under severest trial has preserved his true goodness of heart and belief in ultimate triumph for high ideals.

"The firm of B. G. Teubner by the printing and publication of this work also wish to express their sincere esteem, and we conclude with heartiest good wishes."

The memoirs are arranged in alphabetical order according to authors:

J. Bauschinger (of Strassburg), "On the Laplace compared with the Gauss method for determining an orbit" (pages 1-10); O. Blumenthal (Aachen), "Remarks on the singularities of analytic functions of several variables" (11-22); R. Dedekind (Braunschweig), "On the Zeller proof of the quadratic reciprocity theorem" (23-36); A. Eichenwald (Moscow), "On the field of light waves in reflection and refraction" (37-56); P. Epstein (Strassburg), "The generalizations of Kronecker's boundary formula" (57-74); R. Gans (Strassburg), "Is gravitation of electromagnetic origin?" (75-94); H. Hahn (Czernowitz), "General proof of Osgood's theorem of the calculus of variations for simple integrals" (95-110); L. Henneberg (Darmstadt), "On the center of gravity of funicular nets and on special space reciprocal figures of graphical statics" (111-129); D. Hilbert (Göttingen), "On the notion of class of differential equations" (130-146); E. V. Huntington (Cambridge, Mass.), "A new

approach to the theory of relativity"* (147-169); A. Kneser (Breslau), "Remarks on the number of extremes of curvature of closed curves and on related questions in a non-euclidean geometry" (170-180); A. Krazer (Karlsruhe), "On the theory of multiple sums of Gauss" (181-197); A. Loewy (Freiburg), "On homomorphic groups and the influence by adjunctions on the rationality groups of linear homogeneous differential equations" (198-227); L. Mandelstam (Strassburg), "On an application of integral equations in the theory of optical images" (228-241); L. Maurer (Tübingen), "On transformation relations" (242-251); R. v. Mises (Strassburg), "Contribution to the oscillation problem" (252-282); T. Reye (Strassburg), "On the pencil congruence (2, 2) of Hirst" (283-290); F. Schur (Strassburg), "On the generation of surfaces of the second degree by correlative sheaves" (291-297); M. Simon (Strassburg), "Cusanus as mathematician" (298-337); A. Sommerfeld (Munich), "On propagation of light in dispersing media" (338-374); A. Speiser (Strassburg), "On the composition of binary quadratic forms" (375-395); P. Stäckel (Karlsruhe), "Periodic functions and systems of infinitely many equations" (396-409); E. Study (Bonn), "Groups of two-sided collineations" (410-413); H. E. Timmerding (Braunschweig), "On the molecular theory foundation for the theory of elasticity" (414-421); W. Voigt (Göttingen), "The electrostatic field in a stationary light-stream" (422-427); P. Volkmann (Königsberg), "Historical and critical studies on the notion of causation"† (428-442); R. H. Weber (Rostock), "On the proof of uniformity in the theory of the conduction of heat" (443-456); J. Wellstein (Strassburg), "Algebraic uniformization of algebraic functions" (457-479); C. Wirtz (Strassburg), "On the figure of the moon" (480-500).

R. C. ARCHIBALD.

BROWN UNIVERSITY,
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* Read before the American Mathematical Society, October 28, 1911. Also published in *Philosophical Magazine*, ser. 6, vol. 23, No. 4, pp. 494-513, April, 1912.

† Professor Weber delivered a Prorektor oration at the University of Königsberg entitled, "On Causation in Natural Science" (publ. at Leipzig, 1881). To the works mentioned above as edited by Weber should be added five volumes of Ostwald's *Klassiker* series: Rosenhain, 1895; Göpel, 1895; Jacobi, 1895; Lagrange, 1898, Gauss, 1903.