subject, as contained in his memoir "Quelques applications d'une formule sommatoire générale" (*Acta Societatis Scientiarum Fennicae*, volume 31, number 3 (1902)). It must be admitted that this chapter is difficult reading, a feature which seems due in large measure to the involved character of the hypotheses placed upon $\phi(\nu)$. In this connection may we not question which course would here be preferable, to employ involved hypotheses like these and thus attain a degree of generality in the results as great as that obtained by all previous investigators, or to sacrifice generality in some measure for the sake of simplicity and attractiveness? In a treatise like this the reviewer believes the latter alternative preferable.

Finally, we will venture to make one general remark. Professor Lindelöf's work being confined merely to the applications of the calculus of residues to the theory of functions as such, it is not surprising that nowhere do we find mention of the profound application of this calculus which Dini has made in the study of the convergence of the important series developments of mathematical physics. As early as 1880 his work "Serie di Fourier e altre rappresentazioni analitiche delle funzioni di una variabile reale" appeared, containing rigorous convergence proofs based upon the calculus of residues for Fourier's series, series in terms of Bessel's functions, zonal harmonics and elliptic functions. Attention is especially directed to the portion of this work from page 139 to page 328. Any general treatise bearing the title used by our author should certainly dwell more at length upon this latter aspect of the subject. Let us therefore hope to see in the near future a similar treatise having a wider scope.

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Geschichte der Elementar-Mathematik in systematischer Darstellung. By Dr. JOHANNES TROPFKE, Oberlehrer am Friedrich-Realgymnasium zu Berlin. Bd. I. Rechnen und Algebra, Leipzig, 1902. viii + 332 pp. Bd. II. Geometrie, Logarithmen, Sphärik und Sphärische Trigonometrie, Reihen, Zinseszinsrechnung, Kombinatorik und Wahrscheinlichkeitsrechnung, Kettenbrüche, Stereometrie, Analytische Geometrie, Kegelschnitte, Maxima und Mimima. Leipzig, 1903. viii + 496 pp.

THIS work of 844 large pages is a most welcome addition to the few histories of elementary mathematics now easily accessible. For all but those actively engaged in historical research, Cantor's Geschichte der Mathematik has become the first refuge when in quest of information on points relative to the history of mathematics. But the use of Cantor's work is hampered by two grave restrictions; it stops short a century and a half before the present time, and its order of development is chronological, grouping together the work be it of a man, or of a school or of a period of time. This makes it quite laborious to get a connected view of the history of any subject or topic. But it is precisely this which any teacher must have who wishes to utilize the history of mathematics to lend additional interest to his instruction. Therefore, the best thing for one to do who wished a more extensive view than that of brief works like Fink's Geschichte der Elementar-Mathematik* has been to collect fragments from Cantor by following the clues given in the index, and weave them together for himself as best he might into a more or less coherent history of the development of the subject or topic in hand. This has been done, no doubt, by many a one on both sides of the Atlantic, among them our author, who in the course of years has gathered together a huge mass of material, in the first instance from Cantor, and then from other works on the history of mathematics and from journals, these in turn leading him to the original sources. The extent and thoroughness of the study of the sources is evidenced by the number and exactitude of the references in the footnotes. Of them there are 1233 in the first volume and 1836 in the second, a total of 3069. Every statement of consequence in the text is supported by such a reference either to the original sources, or to Cantor or other works on the history of mathematics, or to both. These references are always very specific and furnish most precious clews to those who wish to trace back historical statements to their ultimate sources. An excellent mode of beginning the careful study of the history of any particular topic would be to look up in the originals the references given by Tropfke. These in turn would in many instances suggest others and the student would soon find himself launched on a research of his own. We need to pay more attention to the history of mathematics in our universities and colleges, not only to the interesting and instructive material already accumulated, but to the active enrichment of the fund.

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* Translation by Beman and Smith, Open Court Publishing Co., Chicago.

In such undertakings, so far as related to elementary mathematics, Tropfke's work will prove a most valuable and suggestive help.

The work will prove no less helpful to the teacher of elementary mathematics. Every teacher recognizes the desirability of attention to the history of his subject, both as giving more complete understanding of it, and as enhancing interest; but, as already mentioned, the serious labor of collecting the data confronts him. Several excellent and well-known works, usually arranged chronologically, already exist, which can be drawn on for this purpose; the work under review, however, is larger, exceptionally well arranged, and, being restricted to a narrow field, covers that field more thoroughly. Its style is readable, though condensed; the typography is fairly clear, and some attempt has been made to aid the eye by the use of different styles of type. A somewhat more open page would be acceptable, but would, perhaps, increase unduly the bulk of a work which is already quite large.

The history of arithmetic is first taken up and occupies 120 pages of the first volume. In algebra, algebraic symbols, the number concept, algebraic operations, proportions, equations to the fourth degree inclusive are taken up, and a few pages are devoted to equations of degree higher than the fourth and diophantine equations.

The detailed title of the second volume given above indicates its scope sufficiently. The work includes the conic sections and the methods of analytic geometry, but does not include the calculus; its field is therefore substantially mathematics as taught from the beginning of the work in the grades to the close of the freshman year in college.

It would not be difficult to find instances in which different treatment might be advocated (the modern definitions of irrational number, for example, deserve more than the bare mention which they receive); and in such an enormous mass of facts and references, misprints and errors of various sorts are surely to be found for the seeking, but in view of the high excellence of the whole work it would be ungracious to lay stress on minor defects. Whether regarded from the point of view of thoroughness of treatment, of convenience of arrangement, of conscientiousness in citing authorities or of scholarly spirit, the work as a whole deserves only high praise and ranks as a most valuable contribution to the history of elementary mathematics.

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