

its reappearance is valuable both because it corrects certain errors in Murr's transcription, and because it now becomes generally accessible.

Regiomontanus was the leader of his generation in astronomy and mathematics, and his correspondence with Bianchini, who was court astronomer to the Duke of Ferrara, Speier, who was court astrologer to the Prince of Urbino, and Roder, the professor of mathematics at the University of Erfurt, throws much light upon the practical astronomical work of the fifteenth century. The correspondence is in Latin and no translation is given.

Altogether, this number of the *Abhandlungen* is one of the most valuable that have appeared, and the tendency to publish the sources for the history of mathematics is one that will meet the hearty commendation of scholars.

DAVID EUGENE SMITH.

Gauss' wissenschaftliches Tagebuch, 1796–1814. Mit Anmerkungen herausgegeben von FELIX KLEIN. Reprinted from the *Festschrift zur Feier des hundertfünfzigjährigen Bestehens der Königlichen Gesellschaft der Wissenschaften zu Göttingen*. Berlin, Weidmannsche Buchhandlung, 1901, 8vo., 44 pp.

As a youth not quite nineteen years old Gauss began jotting down in a copy-book memoranda, always, unfortunately, of the very briefest sort, of the great mathematical discoveries he was making. The entries in this Scientific Diary (*Catalogus*, Gauss calls it) are in Latin, and begin with a statement dated March 30, 1796, to the effect that Gauss had found a construction for the regular polygon of seventeen sides. From this date the entries follow each other in rapid succession, there being no less than 112 in the next four years and a quarter. From here on they become more irregular, and there are only 34 entries during the following fourteen years. Such a diary as this, written by any great mathematician, would be of the greatest interest, as illustrating, even with all its gaps and obscurities, the order in which the mathematical ideas developed in his mind and the form they first took; but there is probably no mathematician in whose case it could be even approximately as valuable as in the case of Gauss. For it is well known that ideas, many of them of the first importance, poured in on Gauss's mind in his early youth in such numbers that, as he himself

said, he was at times hardly able to master them ; and many of these ideas, especially those concerning elliptic functions, were never incorporated in memoirs.

This diary has now been given to the public by Professor Klein, who has enhanced its value very greatly by attaching to a large number of its entries explanatory notes pointing out their relation to other published or unpublished writings of Gauss. Professor Klein explains, however, that this publication is to be regarded as a preliminary one only, since the diary is to be printed, with a more extended commentary, in Volume X, of Gauss's Collected Works.

A portrait of Gauss at the age of twenty-six, which has never before been published, serves as frontispiece, and one of the pages of the diary is reproduced in facsimile.

MAXIME BÔCHER.

Zur Integration partieller Differentialgleichungen. DR. KARL BOEHM. Leipzig, Teubner, 1900. 8vo. 55 pp. Mk. 1.80.

THE above paper, printed in book form, deals exclusively with the formal solution of partial differential equations, and of systems of such equations, by means of series, the convergence of which is not investigated.

The author starts with a given equation, or set of equations, of any order, forms their successive derived equations, and counts the number of derivatives of highest order compared with the number of equations, at each stage. He then shows, for a single equation, that the given equation can be solved with respect to any exceptional* derivative, and finally that a power series expansion may be obtained for the solution, which will formally satisfy the given equation, when arbitrary constant values have been preassigned for certain suitable derivatives ; all this at a point where the equation is not "singular" with the respect to the exceptional derivative chosen. Similar results are obtained for a system of equations, under certain restrictions.

The work doubtless has real merit, but the reviewer does not feel justified in entering further into detail on account of the failure to discuss the convergence of the series in question : an omission which the author acknowledges in several places, and which renders the importance of the paper rather doubt-

* "Ausgezeichnet ;" the definition is too intricate to repeat here.