However, he has chosen a title for his book which permits considerable freedom both as to the matter presented and as to the order of presentation.

PETER FIELD.

Neuere Darstellungen der Grundprobleme der reinen Mathematik im Bereiche der Mittelschule. By ALOIS LANNER. Berlin, Otto Salle, 1907. viii + 192 pp. Price, 3 Marks.

ONE of the distinctive features of the teaching of elementary mathematics in the latter part of the nineteenth century was the influx of a large body of new theory relating to the fundamental laws underlying the common processes. Perhaps the best evidence of this is found in the lectures of Weierstrass, and among the best exponents of the movement is Stolz's "Allgemeine Arithmetik." It was natural to expect, however, that Weierstrass would never directly reach the teaching body of Germany, and that works as elaborate as those of Stolz would have but little practical influence in the schools.

The opening of the twentieth century is seeing an effort to bring the results of such labors as these to the attention of those who teach the elements. Naturally this involves a great deal of experiment. The college professor, with little knowledge of the powers and interests and immediate needs of preparatory students, is liable to insist upon secure foundations for every process, while the teacher in the classroom is equally likely to err the other way. For those who try to see the argument of each of these types, and to weigh them judicially, any effort to simplify the labors of the theorists and to present them in concise form, is very welcome.

Dr. Lanner has attempted exactly the work. He has not written a textbook, nor a work on the theory of teaching, but he has prepared a simple treatise that seeks to supplement each. In brief, it may be described as a handbook, giving in simple form the principles underlying each of the chapters of arithmetic and algebra as taken up in the elementary courses, and offering material for supplementing the theory of the textbook.

The general nature of the work can best be judged by a few of the chapter heads: Gleicheit und Grösse; Die natürlichen Zahlen, followed by the various operations; Erweiterung des Zahlengebietes durch die Subtraktion, introducing negative numbers; Die Teilbarkeit der ganzen Zahlen, both absolute

and relative; Die systematische Darstellung der ganzen Zahlen, with the operations; Erweiterung des Zahlengebietes durch die Division, followed by the various forms of fractions; Das Rechnen mit endlichen Grenzwerten, with the relation between the decimal and common fraction; Irrationale Zahlen und Grenzwerte, unfortunately little more than a title; Das Rechnen mit algebraischen Funktionen; Die Veränderlichkeit der Funktionen, with a brief treatment of the differential coefficient and with a hint at maxima and minima; Die Integration, a mere introduction of four pages; Die Verhältnisse, followed by proportion; Die Teilregel, Mischungs- und Gesellschaftsrechnung, a subject that seems never to lose its fascination with the German arithmetician; Prozentrechnung, Rabatt, Diskonto, und Terminrechnung; Regeldetri und Kettensatz; Die Gleichung ersten Grades mit einer Unbekannten, followed by two unknowns; Rechnungsoperationen dritter Stufe, *i. e.*, powers, roots, and irrational equations; Die Logarithmen, with exponential equations; Die Ableitung von Funktionen aus ihren Eigenschaften; Imaginäre und komplexe Zahlen; Quadratische Gleichungen, followed by indeterminate equations, series, and interest computation; Kombinatorik, followed by the binomial theorem; Politische Arithmetik, including probabilities and insurance. Doubtless under the influence of that annoying parsimony which frequently characterizes the German publisher, the book has neither table of contents nor index, and hence it loses much of the value that it might possess as a handy tool.

From the list given above it will be seen that, while the theory of arithmetic is fairly covered, with the exception of the irrational number, the supplementary material in algebra is less satisfactory. Indeed, in spite of the fact that the author seeks to establish solid foundations for algebra, the result at once strikes the reader as incomplete. Possibly this is necessary, considering the purpose he had in mind, but it raises the question as to whether the work is worth the doing in this manner.

In his numerous historical notes Dr. Lanner is not altogether fortunate. Harriot, for instance, was not a professor at Oxford, nor did he die in 1622; it is not known that Recorde was born in 1510, nor that Paciuolo died in 1514; Newton was not born in 1643; Lagrange was not working in Turin in any of the years when he is said to have been there, and Jordanus Nemorarius probably did not die in Rome. The prac-

tice of placing a date after a man's name is helpful when it has any definite significance, but with Dr. Lanner it has none. Sometimes he gives the date of death, as of Stevin (1620); sometimes the date of a book, as in the case of Vieta (1591); but quite as often the date has no particular significance, as in the cases of Tartaglia (1557) and Riese (1550). Usually, however, the important date is omitted entirely, as with Stevin's work on decimals (1585). There are also several unfortunate errors in technical and proper names, as in the cases of Ouchtred, Boëthius and Boethius, Goss (for Coss), and Wimburgh (for Edinburgh).

Altogether, therefore, the work may be said to have been written with a laudable purpose, but to leave the field open for a carefully prepared treatise on the same subject.

DAVID EUGENE SMITH.

Reformvorschläge für den mathematischen und naturwissenschaftlichen Unterricht; entworfen von der Unterrichtskommission der Gesellschaft deutscher Naturforscher und Aerzte. Zweiter Teil: *Vorschläge überreicht der 78 Naturforscherversammlung in Stuttgart, 1906.* Herausgegeben von A. GUTZMER, Leipzig, Teubner, 1906. Pp. 73.

THE work of the commission appointed by the German society of natural scientists and physicians, as summarized in this second annual report, has been carried on during the past year along the lines laid down in its first report which has already been reviewed in the BULLETIN * So far as mathematics is concerned, the present report consists of a discussion of the way in which the principles laid down in the first report would work out in practice in certain special types of German schools not there considered, and brings little of general significance beyond the boundaries of Germany.

The section on instruction in mathematics in the higher schools for girls is of some interest to us in America, where thousands of girls and young women annually carry through successfully work of a grade as advanced and as difficult as any that is given to the young men in the German gymnasia. The commission urges that more work in mathematics be given in the schools for girls, and, indeed, that those who complete the full course should end with substantially the same attainments

* Vol. 12, (1906), pp. 347–351.