care is taken with the applications. These are unusually numerous and excellent for the purpose intended, and very many of them are solved in detail in the text. This makes the book easy reading and adapts it to self-study for one who wants a modern and rigorous practical grounding in this most important branch.

As was suggested above, more might well have been left for the student to do; but with large classes and meager time allowance, of course, the German professor would feel this procedure very doubtful and dangerous. Then there is a liberal number of problems that are not worked out, distributed in well-chosen places, on which the student may develop "mental muscle." The treatments of continuity, limit, integration, the indeterminate forms, convergency and divergency, if not concise, are clear, strong, and practical. On the whole, fulness is a close concomitant of clearness, and soundness. Fulness is not in this case wordiness, but conscientious didactics. It is in the interest of guaranteeing insight. Bulkiness therefore, if a fault at all here, at least leans to the side of virtue. Every teacher of calculus to collegiate sophomores would do well to have this book at hand for problem material, for pedagogic suggestion, and for inspiration.

The few trivial errors that have appeared, all of them typographical, are not worth mentioning. The publisher might well be commended for the excellence of his work, if his name were not already a sufficient guarantee of typographical excellence. The binding is however decidedly frail for so heavy a book.

G. W. MYERS.

Wahrscheinlichkeitsrechnung. Von Prof. Dr. FRANZ HACK. Leipzig, Teubner, 1911. 122 pp.

THIS is a worthy sample of the Sammlung Göschen, covering in six parts the fundamentals of the calculus of probabilities. The treatment is rather too condensed for the very beginner, but is well adapted to the reader who has once learned the elements and, having grown a little rusty on reasons, wishes to recover enough of the theory to make rational use of it.

The first part is on the basic theory; the second, on applications of the theory to special problems; the third, on the laws of large numbers; the fourth, on a comparison of the theory of probability with experience; the fifth, on the theory

of errors of observation; and the sixth, on the application of the calculus of probabilities to statistical matters. An appendix contains a table of values of the probability integral and a brief mortality table.

Works on this subject seem just now to be attracting little interest in America. When American students of mathematics learn to take mathematical studies as seriously as do German students, American colleges and universities will hardly care to continue to slight the calculus of probabilities, as is now being too generally done. Still may it not be worth while to remark the duty of our college and university curricula to lead rather than to follow the trend of mathematical events?

The general slighting of this very practical field of mathematical theory is perhaps only a phase of the very prevalent neglect in America, both in universities and in the professions, of most mathematical interests beyond the rudiments and the demands of professional practice.

When we have become so many-sided in our mathematical appreciations and interests as to include the all-around utilities as well as the logical perfection of the science, we shall see less to jeer at in the appearance from the German press of one or more books every year dealing with probabilities, least squares, etc. The more or less empirical character of these subjects is no sufficient ground for our general neglect of them.

This little book will be a handy reference book to the actual user of least square adjustments. With a modicum of mathematical training even a beginner in this theory would find the little volume highly useful.

The typography and page arrangement are up to the standard of the Göschen collection, and no errors of significance in either form or substance have been found. Of course, no extended view of the subject can be given in a hundred and twenty-two small pages, but the standard literature of the subject is cited with discrimination and some fulness in a condensed bibliography on page six and in footnotes throughout the book. Of course European continental literature is regarded as sufficient by the author, though there is some cause for complaint that the applications of the theory by Galton and Pearson in England to statistical and inheritance questions have received not even the consideration of a footnote reference.

G. W. MYERS.