

Such a superiority is less obvious than usual in Dr. Spengel's production. Either Dr. Spengel was generously unwilling that the difference should be too striking, or Prof. Huxley's malign influence has extended to the German engraver and printer.

Considering the view which the translator appears to take of Huxley's "Manual," we were rather surprised that he should jeopardise his great reputation by undertaking the translation of so inferior a work. Our astonishment may easily be imagined on finding on the back of the work that the *authorship is attributed to Spengel as well as to Huxley*. The outside of the book, as seen on the book-shelf, reads thus:—

HUXLEY-SPENDEL
ANATOMIE
DER
WIRBELLOSEN THIERE.

The only explanation which occurs to us of this unusual blending of the names of author and translator is that Dr. Spengel felt that the prominence of his name was necessary in order to ensure, for the production of so feeble an anatomist and so imperfect a writer as Prof. Huxley, a circulation large enough to bring about the pecuniary result for which the translation was made. Men have been known to make translations for the sake of a sort of parasitic, or rather "commensal" reputation; but in this case, since Dr. Spengel seems to be the superior of Prof. Huxley, some other object must have been foremost in view.

Seriously speaking, we hardly think Dr. Spengel can have fully realised the effect which such a preface would have upon the ordinary reader. Had he done so his behaviour towards Prof. Huxley would have been of a kind for which we should hesitate to use adjectives adequately descriptive.

F. M. B.

MERRIMAN'S "METHOD OF LEAST SQUARES"

Elements of the Method of Least Squares. By Mansfield Merriman, Ph.D., Instructor in Civil Engineering in the Sheffield Scientific School of Yale College. (London: Macmillan.)

THE method of least squares has an extensive literature of its own. Our author, in a sketch appended to his work, gives the titles of forty-seven of the most important memoirs and books which treat of this subject and of the law of errors of observation. He further "takes the wind out of the sails" of his reviewers by saying: "It would be easy to greatly extend the limits of this list. The titles have, in fact, been selected from a list of about four hundred, which I hope some time to publish, accompanied by historical and critical notes." Though this is an unkind cut, inasmuch as a reviewer will hardly care to bring forward any references of his own, we yet trust Dr. Merriman will be sufficiently encouraged to bring out this promised contribution to the history of a particular branch of mathematics. The writer's objects are "to present the fundamental principles and processes of the method in so plain a manner and to illustrate their application by such simple and practical examples as to render it accessible to civil engineers who have not had the benefit of extended mathematical training; and secondly,

to give an elementary exposition of the theory which should be adapted to the needs of a large and constantly-increasing class of students." Hence the book is both a practical and a theoretical one. The first part is concerned with the adjustment and comparison of engineering observations in which, after giving an introduction on the principles of probability and the method of least squares, he treats of direct observations upon a single quantity and independent observations upon several quantities, conditioned observations, and the discussions of physical observations.

The second part is devoted to the theory of least squares and probable errors; in this, after a deduction of the fundamental principles, he proceeds to the development of practical methods and formulæ.

In an Appendix he gives Gauss's method of solving normal equations, a list of literature (referred to above), remarks on the theory of least squares, and a few other short notes. A full index is given at the end. There is frequent evidence that the writer has carefully consulted the memoirs he cites in his list, so that while there is nothing of novelty in his treatment that treatment is founded upon the best authorities.

"As I have not written for mathematical experts, they will doubtless find considerable (*sic*) in the book at which to grumble." He points out what may be considered blots in his book. One is that he has adopted Gauss's development of the law of probability of error as the best adapted to an elementary presentation; "If this be objected to as defective, I claim at least the credit of knowing and of pointing out just what and where those defects are."

A consequence, perhaps, of having the work printed in this country is the list of errata. We would suggest in the event of the publication of the historical list, that the dates of reading of the memoirs should be given rather than (or at any rate in addition to) the dates of their publication.

We welcome this work as an evidence of the increasing attention that is being given to mathematics by the author's fellow-countrymen, and hope he will be encouraged by its reception here to follow up its publication with a promised work containing extended applications of the method to higher geodetic surveying and the other problems to which it can be and has been applied.

OUR BOOK SHELF

Holmes' Botanical Note-Book, or Practical Guide to a Knowledge of Botany. By E. M. Holmes, F.L.S., Curator of the Museum of the Pharmaceutical Society of Great Britain, late Lecturer on Botany at Westminster Hospital. (London: Christy and Co., 1878.)

FROM the author's experience at the Pharmaceutical Society, together with that gained during the time he held the lectureship at Westminster Hospital, he is likely to know pretty well the requirements of the students at the pharmaceutical and medical schools. It is not always, however, that a teacher, well acquainted though he may be with what is wanted by the students, is capable of providing the best material to supply those wants. In this note-book we think Mr. Holmes has succeeded in smoothing the path of the botanical course, often so uninteresting and consequently amounting to drudgery to many a student. The plan adopted of