tion on lithology, not from fault to be found with the treatment of the subject, but because lithology has now become too serious a study to be treated in so compressed a form. The student who uses this book without previous acquaintance with the rock-forming minerals that are here briefly described cannot obtain from the forty-six pages given to this section the knowledge that they are intended to give; unless, indeed, there is so liberal a supplement of personal instruction as to make the text practically unnecessary. We are familiar nowadays with the reaction against the mere verbal teaching of physics and chemistry, zoölogy and botany. The same spirit of reform should exclude brief treatment of lithology from an elementary book on physical geology. And, if the student protests that he wishes to gain at least a superficial knowledge of lithology, let the teacher confidently assure him that there is no such thing, but only a superficial ignorance. Better admit full ignorance than pretend to scanty knowledge, and use the space in the book and the time that would be given to it for fuller discussion of other subjects. The open admission of the author's own lack of expertness in modern lithology, by his acceptance of a chapter on the igneous rocks from Professor Bonney, is evidence enough that the section in question should not have been inserted in a book of this title.

The rest of the work is more satisfactory, because the elements of the subjects that it professes to teach can really be learned from it. It is characteristically British in fact and example, although some illustrations are taken from other countries. Its figures are hardly so good as they should be in this day of dry-plate photographs and easy reproduction of pen-and-ink diagrams. The chapter on earthquakes needs a good revision, and a terminology might be improved that allows such expressions as 'mass or weight,' 'ridge or mesa,' using these words apparently as synonymes. But, as a whole, the book gives brief, correct, and well-arranged mention of the more salient geological facts and theories, under the headings of 'change by internal causes;' 'surface agencies, destructive and constructive;' 'petrology and physiographic geology.' The description of the effects of faulting is exceptionally full; and unconformity, overlap, and overstep receive more than the usual share of attention. Under fluviatile agencies, Powell's expression, 'base level of erosion,' is accepted as the most fitting to describe this important and commonly neglected plane of reference; and, after definition and illustration, the author pertinently adds, that it is mainly because the early advocates of river-erosion neglected to insist on the control which elevation or depression exercised on river-action, that many observers have been unable to believe that rivers have had any significant share in the excavation of their valleys. There is to our mind an unnecessary scepticism as to the subglacial origin of bowlder-clay. The small and now old glaciers, which have long ago swept their beds so clean, afford only imperfect illustration of what went on beneath the ice-sheet just after its conquest of a land covered with the waste of secular disintegration; and there is nothing inconsistent in the belief that till was accumulated at one place, while moderate-sized lake-basins were excavated at another, as Geikie and Helland have fully shown. The localities selected for illustration are so largely English, that the book would require re-making to prepare it for American schools. We wish that some of our geologists who are broadly acquainted with the country east and west might undertake the task.

A TEXT-BOOK OF MICROSCOPICAL PETROGRAPHY.

AT this time, when the interest in microscopical petrography is so steadily on the increase, the need of a concise, accurate, and recent text-book on the subject is daily becoming more apparent. That such a one does not exist in English is to be much regretted; but this very fact will cause information regarding an admirable one, which has just appeared in Germany, to prove all the more acceptable to geological students. Dr. Hussak's book is short and elementary; but it contains the results, even the most recent, which have thus far been attained by the many workers in microscopical mineralogy and lithology, stated in a clear manner.

The first part treats of methods — optical, chemical, and mechanical — which are now applied to the study of rock-constituents, as well as the general morphological properties which characterize them. Part second consists of a tabular arrangement of all the rock-forming minerals, with their characteristic microscopic appearance, chemical reactions, associations, decomposition products, and all other peculiarities which might serve in their accurate diagnosis, arranged in parallel columns. This is all given in a very small space; but the copious and excellent references furnish

Anleitung zum bestimmen der gesteinbildenden mineralien. Von Dr. EUGEN HUSSAK. Leipzig, 1885. 196 p., 103 figs. 8°.

the student with the means of following up the literature of any subject as thoroughly as he may be inclined. The figures are numerous, new, and admirably fitted to illustrate the points for which they are intended. Altogether, the book is well suited for the wants of beginners, to whom the size and abstruseness of the larger works on petrography are often discouraging; and it will doubtless find many readers in this country as well as in Europe. It would abundantly repay translating into English.

SIMON'S MANUAL OF CHEMISTRY.

THIS book, as the preface informs us, is intended as a guide to lectures and laboratory work for beginners in chemistry, being especially adapted for the use of pharmaceutical and medical students. It is hard to see, however, in what respects pharmaceutical or medical students need special methods of treatment in their commencement of the study of chemistry before they enter upon a study of those particular branches of the science especially necessary to them in their profession.

A peculiar feature of the book is the presence of seven colored plates, showing the variously shaded colors of the more common chemicals, and their color-reactions; such as the red of mercuric iodide, the yellow of arsenious sulphide, the shades of color produced by the action of reducing-agents on a solution of potassium dichromate, etc., — a feature which can possess little value to a laboratory student, who must necessarily become familiar with these colored substances and their reactions by personal experience. The book, however, bears the appearance of being intended for students who are to have but little laboratory work; and, indeed, with the exception of the portion treating of metals and their combinations, it cannot be considered as a really good text-book for laboratory use.

There is noticeable, moreover, throughout the book, an apparent lack of connection between fact and theory. The facts are given, but the theory is lacking. When supplemented by lectures, this defect might not be so noticeable. It is, however, a point to which the student's attention needs to be constantly called. Chemistry is more than a collection of facts: it is a living science. Facts serve as a basis upon which to build theories; and the mutual connection of fact and theory needs to be constantly indicated, as well as the methods of reasoning by which the theoretical conclusions are reached.

The book, however, possesses some admirable features. As a whole, it is well written, is systematic, and contains much that is valuable. Its main defect as an elementary text-book consists in the attempt to cover too great a variety of subjects at the expense of thoroughness. Critical examination, moreover, reveals here and there an occasional incorrect or misleading statement. Thus, on p. 358 we are told that "ptyalin, the active principle of saliva, is a ferment which has the power of converting starch into glucose," whereas it has been known for the last five years that the main product of the amylolytic action of saliva is maltose. The method for the determination of nitrogen, given on p. 241, can hardly be considered as the method generally used for this purpose, as is claimed by the author; neither can the method, given on the same page, for the determination of carbon and hydrogen "by passing dry oxygen gas over the substance heated in a glass tube," be taken as a satisfactory statement of the method generally used for making a 'combustion' in oxygen gas. Again: we are told on p. 359 that pepsin, in the presence of free hydrochloric acid, does not prevent the continued action of saliva on starch, whereas it has been plainly demonstrated within the last three years that the ferment of saliva is completely destroyed by gastric juice, and even by dilute hydrochloric acid alone.

Manual of chemistry. By W. SIMON. Philadelphia, *Lea's son & Co.*, 1884. illustr. 8°.

NEW TEXT-BOOKS OF PHYSICS.

MR. GAGE states his aim to be, "to collate in this volume something of value to every teacher of physical science." The book is divided into five parts: laboratory exercises, manual of manipulation, general review of physics, test-questions, and key to solution of problems. The experiments given in the first part are mostly well enough, and some of them even of considerable ingenuity. They are, however, numbered in a minute fashion, which is likely to mislead one who reads in the announcement that there are two hundred and thirty-eight experiments. In the forty-five pages devoted to the 'manual of manipulation,' very few directions for manipulation

Physical technics, or, Teacher's manual of physical manipulation, etc. By ALFRED P. GAGE, A.M. Boston, *Author*, 1884. 200 p. 8°.

Problèmes de physique de mécanique, de cosmographie, de chimie. Par EDME JACQUIER. Paris, *Gauthier-Villars*, 1884. 6 + 271 p. 8°.