method that we owe the striking generalizations of Neumayr and the philosophical views of Suess. Probably this distrust with which comparative geology is regarded by some scientists is due to the confusion of comparative geology proper with the efforts made by some "pigeon hole" geologists to bring together the formations in different widely separated quarters of the globe, and to illustrate in convenient tabular form their relations and equivalence. Opinions differ so widely regarding these correlations that probably no such table of equivalence could ever be constructed which would satisfy more than its author. We do not mean that such attempts are wrong in principle, but that they fail of scientific treatment and are necessarily blind to all that would throw a doubt, or disturb their harmony or proportion.

Comparative geology, as a science, however, is far from drawing such definite lines; it rather seeks to indicate the possibility of such equivalence and discusses not only the facts relative to the important questions of fauna and flora, but also marshals into place the physical features of structure and of inorganic grouping as well as of geographical relations. Not that Dr. Kayser has omitted tables of stratigraphical divisions, but these have been composed with greatest care and with the best understanding of the difficulties as well as of the facts which make the tabulated statement at the same time both desirable and to a certain extent possible.

Dr. Kayser's "Lehrbuch"[1] appeared in 1891, and was immediately accepted by German geologists as a most important addition to their literature, and since that time has been universally regarded as the standard work upon the subject. The original work, which was intended for the use of German students, was naturally largely devoted to the study of the German formations, but even with this preference clearly marked there was yet more detail of extra German countries than had been usual in previous writings. Nor is this particular attention to Germany necessarily a fault, as in that country most detailed study has been given, and no special locality could have been better chosen as an illustration of continental Europe as a whole. Moreover, the author's intimate personal knowledge of the localities described gives additional satisfaction to the reader. Professor Lake, with a full realization of the peculiar insular seclusion of British geologists, has appreciated the value of this work to his fellows and in giving even a pure translation would have contributed a book of greatest value. He has done more than this, however, in his many additions descriptive of countries outside of Germany, particularly, of course, in treating of England, where, as in the former country, the geological series have been most carefully worked out. These additions are particularly numerous in the early portions of the work, becoming somewhat more limited in the discussion of the later formations, owing to the exigency of space. Doubtless in a second edition the writer will be permitted by his publisher to develop the work in proper proportion. As regards the American formations, the comparisons, though brief, are carefully drawn from our best authors, and the data are quite sufficient for their purpose. Further, as has been suggested in a recent review of this same work by Prof. R. D. Salisbury, data concerning American geology are more easily accessible to American students, thanks to the correlation essays of the United States Geological Survey, than data concerning European geology, which this volume supplies. Particularly is this true of the literature relating to the geology of the continent, which appears without exception in languages foreign to us and consequently difficult for reference.

[1] "Lehrbuch der Geologischen Formationskunde," Dr. Emanuel Kayser. Stuttgart, Ferdinand Enke, 1891.

Dr. Kayser is fortunate in his translator, Professor Lake, who has already attained a high position by original work in the same field, both at home and abroad, in connection with the Geological Survey of India. Mr. Lake has aimed to edit as well as to translate and together with the hearty coöperation of the author has brought the book fully up to date, at the same time introducing an extension of field, as has been indicated. In points of variance between continental and English teachings a review of the divergent tenets has in most cases been given, and where exceptionally unqualified statements have been made, though we may not be in full accord with the author, we must at least acknowledge that these statements represent the beliefs most widely accepted by the geologists of to-day.

We can give but a brief review of the contents of this volume, merely indicating the general treatment of the subject. An introduction defines the subject and its sub-divisions, the classification of the sedimentary strata, with a few words on the origin and early condition of the earth. Part I. treats of the Archæan or primitive rocks, their general character, mode of occurrence, origin, etc. The importance of this great group is fully recognized, though the space devoted to its discussion is rather limited. The Palæozoic or "Primary Group" is discussed in Part II., the order of discussion being that adopted throughout the work for each group and for each system, namely, after general remarks an historical summary, followed by a study in geographical grouping, of development and palæontology. It is in the treatment of the Palæozoic that the translator makes his greatest departure from the author, rejecting, here, the latter's division into the Cambrian and Silurian systems in favor of the English divisions of Cambrian, Ordovician, and Silurian. The Silurian of Lake, as is the custom of English writers, extends to the top of the Salina, or Waterlime, series, the Lower Helderberg and Oriskany being included in the second system of the Palæozoic, the Devonian.

The illustrations, which have been drawn in all cases from the original work, include seventy-three plates and seventy figures in the text, or, in all, 596 illustrations, and these form an invaluable part of the volume. The majority of these, which are all well executed, are devoted to palæontological subjects, but we have also many illustrations of structural and physical conditions. The typographical work is excellent, the choice of type, following the German edition in plan, is such as to bring out at a glance the subject matter of each paragraph and thus to add greatly to the value of the volume as one of reference. This is a matter often either neglected by the author or unsatisfactorily accomplished by the publisher, and it is rare that we find so carefully executed a plan as is here observed.

Edward Livingston Youmans; a Sketch of His Life. By John Fiske. New York, D. Appleton and Co. $2.

This is a book which all who are interested in the diffusion of scientific knowledge among the people, and especially all who knew Youmans personally, will like to read. It is written in the clear, smooth style of which Mr. Fiske is master, and as he was one of Youmans's most intimate friends, the biography has the authority as well as the interest which personal acquaintance gives. The most interesting chapters to us have been the earlier ones, which relate the story of Youmans's early life, his work on the farm and his struggles to obtain an education. Then follows the pathetic account of his blindness, which, though most of the time only partial,

almost disabled him from intellectual work during a large part of his early manhood, and sometimes brought him to the verge of dispair. Nevertheless, it was while suffering from this great affliction that he succeeded with some help from his sister in preparing his text-book on chemistry, which at once made him known to the public, and gave him the means of support. This treatise was, in Mr. Fiske's opinion, Youmans's germinal book, all his subsequent work being foreshadowed in it. Next came his career as a scientific lecturer, in which he was successful not only in a pecuniary way but also in increasing the popular interest in the physical sciences.

The rest of the book before us is devoted to those wider enterprises in which Youmans engaged, beginning with his first acquaintance with Herbert Spencer and his agency in securing the publication of Spencer's works in this country. This part of the book is enriched by a large amount of correspondence between the two men, which not only shows their business relations to each other and to their publishers, but reveals many interesting traits of character. There are also letters from Huxley, Tyndall and other scientists, besides many that passed between Youmans and the members of his family. A full account is also given of the establishment of the *Popular Science Monthly*, which, it seems, was successful from the start, and also of the International Scientific Series, which was not started without some difficulty, but which, as our readers well know, proved both scientifically and commercially successful in the end.

The book closes with a series of extracts from Youmans's writings, giving his views on education, on the relations between religion and science and on other subjects; so that readers have before them as full an account of the life and work of the popular scientist as they are likely to need, and one that is worthy of its subject and of its author.

Elements of Chemistry, Descriptive and Qualitative, Briefer Course. By JAMES H. SHEPARD. Boston, D. C. Heath and Co. 1863, 240 p.

THE success of Shepard's Inorganic Chemistry, as exemplified by its use in over three hundred and fifty colleges and schools, and by the high words of praise which have already been accorded it, is sufficient warrant of Professor Shepard's understanding of the needs of a school text-book in chemistry. The present volume is prepared as a briefer course and is intended to meet the needs of secondary school instruction, particularly where chemistry as a study has been forced into a limited period. In addition to the elements of inorganic chemistry, the author has added to the completeness of the work by a chapter on organic chemistry, treating successfully in an elementary manner this rather difficult department. The book is clear, concise, and well adapted for young pupils. It is interesting to note that Professor Shepard's Inorganic Chemistry has been recommended by the Committee of Secondary School Studies, appointed at the meeting of the National Educational Association.

NOTES AND NEWS.

A CROWDED meeting of the members of the Victoria Institute and their friends took place recently at London, England, in the Theatre of the Society of