

Superior geology. To the class of formations later than the Keweenawan, he refers the fossiliferous Cambrian sandstone of the Mississippi valley, and the horizontal sandstones of the Superior basin, known in local geology as the 'eastern' and 'western' sandstones. To the series of older formations he refers the Animikie group, the original Huronian, and the Penokee, Marquette, and Menominee Huronian groups. The fossiliferous sandstone of the Mississippi valley (Potsdam) he confidently considers later than the Keweenaw series, because it unconformably overlies it, with evidence of great intervening erosion. The 'eastern' and 'western' sandstones also are held to be newer, because they adjoin the Keweenaw series by unconformable contacts associated with fault-lines. These three sandstones he refers to essentially the same horizon, — the Potsdam, or its immediate downward continuation. In support of these views, he cites a large array of specific evidence, and gives precision to his discussion by maps and diagrams. The older formations named are separated from the Keweenawan on the grounds of unconformable relations, and discordance of character.

The stratigraphical discussion is fittingly closed by a sketch of the Lake-Superior synclinal. The existence of a downward flexure embracing the western part of the basin was long since made known by Foster and Whitney. Professor Irving and his Wisconsin colleagues, a few years since, determined its south-westerly extension into the borders of the Mississippi basin. The author now makes an important extension eastward so as to embrace nearly all of the lake's area, the trough assuming a curved, rudely reniform contour.

The monograph is closed by a chapter on the copper deposits, which were, however, not special subjects of investigation.

The treatment throughout is candid and able. There is a close adherence to facts, and the conclusions that legitimately flow from them. The memoir is a valuable contribution to general geology. The horizon of which it treats has long lain under a cloud of obscurity, if not of actual chaos, in Europe as well as in America. The distinct differentiation of the formations of one important field cannot fail to aid in the study of all others. When equally explicit descriptions of other regions involving this horizon shall be at command, we shall doubtless be on the threshold of agreement as to its taxonomic place and value. Present disagreement is largely an expression of imperfect knowledge and provincial study.

WORLD-STUFF.

'WHENCE came this world?' and 'Whither is it going?' are questions of never-tiring interest to mankind, — questions upon which they have pondered for long ages, and which are still unsolved. Where is the man who, without a shudder, can turn from the beautiful life around him, and in fancy contemplate a cold, cheerless, dark, lifeless condition of the world towards which we have every reason to believe it is tending?

In the book before us we have an effort made to weave the various speculations of others, regarding the evolution of the universe, into a continuous and harmonious whole by an admixture of the author's own ideas. Professor Winchell is well known from his past efforts to popularize science, and for his speculative tendencies; and perhaps he, of all American writers, is best fitted to popularize a subject like the one he has chosen, and commend it to the interest and attention of the masses. The work is to be judged rather by its success or failure as a popular presentation of the subject, than as an original contribution to cosmical science. In either respect, the book is disappointing; for our author, instead of keeping in a field in which he has perhaps no superior in America, has attempted a middle ground. He has written so that his treatise occupies a higher plane as a scientific treatise than his previous books, although, as is the tendency of all speculative minds, the presentation of theories has been mistaken for the presentation of evidence and proof. Again: as a popular presentation of the subject, the work falls below the other books of the author, so far as we are acquainted with them, and doubtless many portions will be considered by its readers as dry and pedantic. On the other hand, the work shows in many parts a mode of presentation of certain difficult questions that is well worthy the careful study of the majority of our scientific writers who have any desire that their readers should understand what they are writing about.

The author holds that the dust and iron globules found in the depths of the sea and on the mountain-tops are of meteoric origin, — a veritable world-stuff, pervading all space, — and that by and from this stuff world-systems are evolved. He supposes that a tendency for immense amounts of these dust particles to associate about a common centre leads to the formation of nebulous clouds, which, from a

World-life; or, Comparative geology. By ALEXANDER WINCHELL, LL.D., professor of geology and paleontology in the University of Michigan. Chicago, Griggs, 1883. 21+642 p. 12°.

drawing-together of the scattered particles, become heated, according to the well-known law for gases.

It will not do, perhaps, to be critical here, any more than, one should be of a fairy-tale, for it would destroy the charm of the illusion; and there is no reason why this speculation is not as good as, or perhaps better than, any other cosmological theory.

The book, further, contains an additional part, giving a historical account of the evolution of cosmogonic doctrines; while, as a whole, it contains very full references to the literature of the subjects discussed.

HOVEY'S MIND-READING.

THE title of this book gives no adequate idea of its contents. It is a very full account, indeed in great part a reprint, of such of the Proceedings of the English Society for psychical research as refer to thought-transference, with a few pages of introductory and concluding matter. Why this fact should not be made apparent in the title, we fail to see, as it is distinctly stated in the body of the work, and is evident on every page. The title will naturally suggest to the reader an original discussion of the history or philosophy of the subject, which the book does not pretend to give him. None the less, however, must we thank the author for presenting to the American reader so complete an account of what is really important and interesting in the volumes issued by the society referred to. He has wisely omitted every thing not pertaining to the special subject of mind-reading and telepathy. The matter pertaining to this subject is presented so fully and so faithfully, that it leaves little for the reviewer to say of the general character of the contents of the book.

What are really original, are the author's own discussions in the first and last chapters. These discussions are, we regret to say, of a nature rather to cast discredit upon the whole subject, in the minds of the closest thinkers, than to throw light upon it. The author wholly mistakes the point at issue between the believers and unbelievers in psychic force. He joins the great army of hobby-riders by holding up to ridicule or disapprobation certain real or supposed men who in the past have opposed, on scientific grounds, views which afterward turned out to be correct. This is just what every man does who has an

engine to run without fuel, or a patent gun which is to destroy the largest armored ship. Mr. Hovey represents those who differ from him as men who pronounce untrue that which they cannot explain; and all the way through he imagines himself talking about people who deny his facts. Now, there are no such people worth talking about, and there is no question of fact at issue. The real state of the case is, that he has a theory for explaining admitted facts, and the only men he has to oppose are those who do not believe that he has established his theory. The admitted facts are certain phenomena known as mind-reading, and certain acts of copying drawings by a blind-folded person not in contact with any other person. The contested theory is that these facts prove the transfer of thought from mind to mind without the intervention of any physical agency. Those who refuse to accept this theory may or may not have a theory of their own: it is not at all incumbent on them to form one. They may say that they meet with phenomena which they cannot explain, every day of their lives, and that this is amongst them. The psychic societies were organized for the express purpose of investigating the subject, and finding out what theory, if any, was the correct one. If there were not some question as to how the phenomena should be explained, there would be little occasion for a psychical society.

TEXT-BOOKS IN CHEMISTRY AND MINERALOGY.

THE lecture-notes on general chemistry, by Dr. J. T. Stoddard, are, as the title indicates, merely an outline which should be the basis of a student's notes in a course of experimental lectures. A few general principles of the science are given briefly, and then follow statements of the properties, uses, history, method of preparation, and occurrence, of the commonest of the non-metals and their compounds. The appendix contains some tables and hints as to the methods of chemical calculation. From its briefness, the book can be of little value except as a suggestion of some elementary facts which the beginner should learn; and its use as an outline for the basis of a

Outlines of lecture-notes on general chemistry. Part i, The non-metals. By J. T. STODDARD. Northampton, *Gazette publishing company*, 1884. 84 p. 8°.

An outline of qualitative analysis for beginners. By J. T. STODDARD. Northampton, *Gazette printing company*, 1883. 4+54 p. 8°.

Systematic mineral record, with a synopsis of terms and chemical reactions used in describing minerals. By E. M. SHEPARD. New York, *Barnes*, 1884. 26 p. 8°.

Mind-reading and beyond. By WILLIAM A. HOVEY. Boston, *Lee & Shepard*, 1885.