

## Book Notices.

*The Story of Nineteenth-Century Science.*  
By HENRY SMITH WILLIAMS, M.D.  
Illustrated. New York and London :  
Harper & Brothers. Toronto : Wil-  
liam Briggs. 8vo, pp. viii-475. Price,  
\$2.50.

No feature of the nineteenth century is more marked than the great progress of physical science. Man has learned more of this wonderful world in which he lives during the last hundred years than in all the previous centuries of the world's history. The sciences of paleontology, geology, chemistry, biology, are almost entirely the creation of the last century. In this handsome volume, Dr. Williams passes under review the most noteworthy of the discoveries of these sciences.

Probably in no department has this progress been more marked than in that now known as physics, and probably to few are we more indebted for this progress than to Thomas Young, who, in the first year of the century, began to practise the profession of medicine in London. He was a precocious scholar who, in his fourteenth year, could write fourteen languages. In 1801 he presented the first convincing proofs of the undulatory theory of light, which has universally taken the place of Newton's corpuscular theory.

Our author describes Michael Faraday, "the man who added to the powers of his intellect all the graces of the human heart," as the "greatest experimental philosopher the world has ever seen." Nevertheless, he just missed the wonderful doctrine of the conservation of energy, which is described as "the greatest generalization ever conceived by the mind of man." This wonderful result was reached by different methods almost simultaneously, by Mohr, Mayer, Helmholtz and Joule. The doctrine of the dissipation of energy, as expounded by Professor Thomson (now Lord Kelvin), also leads to far-reaching results. The theory of an interstellar ether—as rigid as steel, more permeable than the ambient air, so perfectly elastic as to be absolutely frictionless—suggested by Young, has been practically demonstrated by Lord Kelvin and Professor Maxwell. But one of the most important hypotheses of the age is that of Lord Kelvin, namely, the vortex theory of atoms, "that profound and fascinating doctrine which suggests

that matter in all its multiform phases is nothing more or less than ether in motion."

Professor Maxwell's kinetic theory of gases throws a flood of light on molecular dynamics. According to this theory all the phenomena of gases are due to what our author calls "the helter-skelter fight of the showers of widely-separated molecules of which they are composed."

An interesting chapter is devoted to some unsolved scientific problems of the century. One of those is the destiny of the earth and solar system. Lord Kelvin shows that the system is like a clock which is running down, and which must eventually come to a standstill. But it is like a clock with its compensation pendulum. While the sun enormously dissipates its energy in radiation, its heat is in part maintained by its contraction, and in part by the rain of meteorites upon its surface. A comprehensive generalization is, that light, electricity, magnetism and gravitation are conditions of strain, torsion, or quiver of the universal ether which *ex hypothesi* rules the universe.

These sentences but indicate the absorbing interest and profound importance of the problems which are discussed in this book. Of course, in traversing the whole circle of the sciences, very great condensation is absolutely necessary. The progress of scientific medicine, for instance, which is treated in a couple of chapters, might alone fill a volume. The book is illustrated by a large number of portraits of the great scientists of the century and other important illustrations.

*Arabia: The Cradle of Islam.* Studies in the Geography, People and Politics of the Peninsula, with an account of Islam and Mission Work. By REV. S. M. ZWENER, F.R.G.S. Introduction by REV. JAMES S. DENNIS, D.D. New York, Chicago, Toronto: Fleming H. Revell Company. Pp. 434. Price, \$2.00.

It is a curious fact that Arabia, one of the oldest lands on earth, is one of the least known. We have better maps of the North Pole and of the moon than of large parts of this great peninsula. Much of it is "as utterly unknown as if it were an undiscovered continent in some polar sea." It has never been crossed by a European traveller nor entered by an explorer.