

GEOLOGICAL BIOLOGY, AN INTRODUCTION TO THE GEOLOGICAL HISTORY OF ORGANISMS.—By Henry S. Williams. Svo. pp. 395. Henry Holt & Co., New York, 1895.

Professor H. S. Williams, of Yale University, has written this book with the view of presenting to college students as well as to the general reader a clear and succinct account of the chief problems in the geological history of plants and animals and of pointing out what progress has been made in solving them by the investigations of Paleontologists in recent years.

The late Professor Huxley once said: "That the primary and direct evidence in favor of evolution can be furnished only by paleontology. The geological record, so soon as it approaches completeness, must, when properly questioned, yield either an affirmative or a negative answer: if evolution has taken place there will be its mark left; if it has not taken place, there will lie its refutation." Dr. Williams, in this book, points out how the study of the geological record shows that evolution has taken place and what the chief facts and factors of this evolution are.

The means of estimating the approximate length of time during which life has existed on the earth are first explained, and the way in which this great length of time may be divided into geological periods is referred to. The teaching of the fossil remains of animals which lived upon the earth during these enormously long periods, and its bearing upon the subject of evolution is then taken up, certain genera of fossils being selected for especial treatment, and the question: "What is a species?" considered and answered. Dr. Williams shows from these studies that the actual facts of the geological history of organisms points unmistakably to a course of evolution by descent in which the progress attained by each succeeding form was a paramount condition of the origin of the next member of the race. Dr. Williams' own investigations have added many important facts to the daily accumulating body of evidence going to establish this important conclusion. He is, however, a firm believer in the divine origin of things. "It has been supposed by many," he writes, "that evolution is intrinsically antagonistic to, and has, in fact, replaced the creational conception of the origin of things in the world. In one respect this is partly true; the new view has fundamentally changed the conception of creation. Evolution has given us another notion of God. In the old conception God was an artificer making organisms out of inorganic matter directly, as one might build up a vessel of clay and then vivify it. The new conception of God, as creator, finds its concrete empirical representation in the act of expressing a thought or purpose into the spoken word. Creation is the phenomenalizing of will, so sublimely described in that ancient formula—*In the beginning God spoke and it* (the whole phenomenal