dead and the living will, I do not doubt, hereafter throw more light on the appearance of organic beings on our earth, and their disappearance from it, than any other class of facts." The other discovery was the astonishing diversity between the species or local varieties of the Galapagos Islands and the evident deviation of the fauna from the nearest continent. As he exclaims: "Reviewing the facts here given, one is astonished at the amount of creative force—if such an expression be used—displayed on these small, barren and rocky islands; and still more so at its diverse and yet analogous action on points so near each other." This occurrence of extremely localized forms is a matter of special interest at the present day, because it is due largely to isolation, and the case of the Galapagos Islands appears to be paralleled by the distribution of the land shells of the Hawaiian Islands, and the extremely slightly marked local varieties of the fishes of certain lakes in Indiana, those of the *Littorina littorea*, and the flat fish of the New England coast; the problem as to the causes of their origin being still a matter of discussion.

In several very interesting chapters the author tells us about the relations between Darwin and Wallace; with the former originating the discovery of the principle of natural selection, and with the latter that of the survival of the fittest, both receiving their inspiration from a common source, Malthus' suggestive book on Population. As is well known, Darwin brooded over his work for twenty years, all this period observing and collecting facts, and experimenting and testing the truth of his views, while Wallace 'thought out almost the whole of his theory' in two hours, completing his essay in three evenings.

The publication of the joint article by Darwin and Wallace, in 1858, is memorable not only in the annals of science, but in the history of morals. For the nobility of spirit and generosity shown by both of the young ardent naturalists, the fact that, instead of leading to jealousy and bitterness, it formed the beginning of a life-long friendship, and of mutual confidence and esteem between the two, is most creditable to them as men and as scientists.

The historic meeting o the Linnean Society when the joint essay was read appeared to have produced but little immediate effect. The first one to accept, in October, 1859, and by his own wide experience extend to variation in birds the principle of selection, was Canon Tristram.

The doctrine of the origin of species, as well as the principle of evolution in general, were ably supported by those intellectual giants Lyell, Hooker, Herbert Spencer, Huxley and Asa Gray, and the chapters in which the influence of these men on the acceptance and spread of Darwin's doctrines is described are not the least interesting in the book.

While the author is most sympathetic and appreciative, he becomes a grain narrow and provincial in his reference to Lamarck and his work, stating on p. 99 that the causes of evolution proposed by Lamarck are 'seriously disputed and it is possible that they may be ultimately abandoned.' On the contrary, we are now hearing, after they had laid *perdu* for a generation, a great deal about Lamarck's views as to the causes of variation, involving the influence of environment, of use and disuse, of isolation; even if we throw out use-inheritance, now in question, from a broad and catholic standpoint, we must concede to Lamarck the discovery of the fundamental causes of variation, and to Darwin and Wallace the discovery of the principles of competition and of selection.

A. S. PACKARD.

La structure du protoplasma et les théories sur l'hérédité et les grands problèms de la biologie générale. Par YVES DELAGE, Professeur a la Sorbonne. Paris, C. Reinwald et Cie., Libraires-éditeurs. 1895. 8vo. Pp. 878.

Although Professor Delage's volume was published in 1895, it is perhaps not too late to say a few words to call the attention of the American scientific public to this valuable work. Professor Delage occupies quite a unique position through the series of elaborate critical compilations which he has made. These compilations have all been much more than a series of literary studies, having all been based to a considerable degree upon the examination by the author of the material involved in his subject. We need only refer here to the many-

volumed treatise upon zoology upon which Professor Delage is at present engaged, and which promises to become one of the monumental works of its kind. The present volume is divided into four principal parts. The first deals with the facts of observation, and discusses in a comprehensive manner the morphology and physiology of the cell, of the individual, of degeneration, sex, correlation of parts, death, etc., and, under the head of 'Race,' the phenomena of heredity, variation and the formation of species. The author has read very widely and understandingly, and his exposition of the facts which he has to present is extremely clear, so that this book easily occupies a first place among those that must be consulted upon the general phenomena of biology.

The second part discusses the special theories which have been advanced by various writers conerning the interpretation of the facts reported in the first part. We find under this head, for instance, the manifold views which have been advanced concerning the interpretation of the karyokinetic figures, of the isotropism of the ovum, of the germ plasm and of telogeny. The third part discusses the general theories, and here the author's industry is most advantageously revealed, although, as it was but natural to anticipate, the attention given to French writers preponderates somewhat over that accorded to the writers of other countries. Here we find a historical review of the theories which have been advanced concerning the soul, formative force and the vital force, and a review of the historic discussion between the Spermatists and the Ovatists. We would direct attention especially to the review of the various theories which have been put forward, beginning with Buffon and continued by Darwin and many others, according to which protoplasm is supposed to contain units of living matter of minute size, to which units the vital phenomena are ultimately to be referred. Those who are not familiar with the history of this subject will be perhaps surprised to find how many and varied these theories of the constitution of protoplasm have been, and how slight a basis of observation and fact any of them have had for a foundation. The method in which the author proceeds in these analyses is very excellent. He gives first a summary of the particular theory, and then presents his critical observations upon the evidence and character of the theory itself, keeping thus his repertorial and judicial functions entirely distinct. The fourth part, which is the briefest, gives a review of the entire series of conceptions which seem to the author best founded and most coherent among themselves with regard to the manifold problems of heredity and general biology. The work closes with a valuable and very extensive bibliography. The author has carried out his purpose very successfully, and has produced a work which ought to be available for consultation in every biological laboratory.

Charles S. Minot.

Inorganic Chemistry according to the Periodic Law. By F. P. Venable, University of North Carolina, and Jas. Lewis Howe, Washington and Lee University. Easton, Pa., The Chemical Publishing Co. 1898. Pp. 266. Price, $1.50.

The authors of this text-book say in their preface: "The claim made in behalf of this book is that it takes the periodic system for its guiding principle throughout; * * * some text-books give brief mention of the law; others introduce it partially while still clinging to the old systems." How far the authors have departed from the plan thus outlined is shown by the table of contents.

The introductory chapter occupies thirty one pages. Molecules and atoms are treated on the first page, the atomic theory on the second, the gas laws and Avogadro's hypothesis on the fifth and sixth; valency and electro-chemical phenomena on the sixteenth and seventeenth, the periodic law on the eighteenth, Mendelejeff's table and the reason for accepting it on the nineteenth. Absurd as it may seem to discuss these topics before the simplest chemical fact has been demonstrated, it is unavoidable if the general plan of the book is carried out. In the following chapters the elements (74 pp.), halides (11 pp.), oxides and sulphides (103 pp.), nitrides, carbides, silicides and alloys (5 pp.), are treated with reference to the periodic law.

It must be remembered that this is an elementary text-book for beginners. The begin-