

wind. This represents a type of the Ascomycetes adapted to wind dissemination of the spores. Another type is represented by *Ascobolus immersus* with broad elliptical asci, and large spores which are held together by a broad gelatinous investment so that they remain in a group as a single projectile as they are shot from the ascus to a distance of 20-35 cm. This mass, which is 2,000 times the volume of a basidiospore, is too heavy for wind dispersal. It falls on the surrounding herbage where the spores may be devoured by herbivorous animals and gain dispersal after passing through their digestive tract.

The rate of fall of the spores of the Hymenomycetes was used to test the theory known as Stokes's law relating to the fall of microscopic spheres in air, and it was confirmed to within 46 per cent. For determining the velocity of spore fall under direct observation through the microscope the author employed an ingenious device of an automatic electric recorder, the position of a spore, as it successively passed by spaced horizontal threads in a Ramsden ocular, being registered by a tapping key controlled with the left hand.

The illustrations and press work of this book are good, and besides the very interesting and important discoveries, it is full of stimulating suggestions and possibilities for further investigation.

GEO. F. ATKINSON

Charles Darwin and the Origin of Species.

Addresses, etc., in America and England in the year of the two anniversaries. By EDWARD BAGNALL POULTON. New York, Longmans Green and Co.

It is fitting that upon November 14, 1909, the anniversary of the publication of the "Origin of Species," there should be published this memorial volume; fitting also that it should be written by a friend and advocate of Darwin's views in their entirety. Besides the addresses the volume contains some unpublished letters of Darwin and also a preface in which the author takes occasion to express his attitude toward the modern contributions to the study of evolution.

Nothing is more evident than that the younger generation of scientists has departed somewhat from the Darwinism of a generation ago. That fifty years' study of Darwin's great theories, by both friends and enemies, has established the general theories of which he was the most notable advocate upon an unshakable basis is very clear. But equally clear is it that this same half century has raised difficulties as to Darwin's special explanation of the method of evolution; difficulties so great that most of the younger generation of scientists are unable to accept Darwinism in its entirety as an all-sufficient theory. These difficulties have arisen not simply in the minds of Darwin's enemies, but in those of his friends also. That some solution of these difficulties is to be found is the belief of every admirer of Darwin, and moreover every admirer of Darwin must feel that this great master so fully exhausted the study of his great law of natural selection that little can be hoped for further study along the same lines. It is difficult to resist the belief that the removal of the difficulties that have arisen must come along new lines of study and not by the further exploitation of the old ones.

Poulton, however, apparently thinks otherwise and conveys the impression of holding that of the modern theories, that which is new is not true and that which is true is not new. The only real contribution to the discussion since Darwin that Poulton admits is Weismannism, and this he admits, seemingly, simply because it places the great theory of Darwin in a position "far higher than that ever assigned to it by Darwin himself." Of the mutation theory, which most thinkers today recognize as at all events decidedly stimulating, Poulton can only speak with a sneer, both at the theory and at its chief exponent. Some of Darwin's friends have been pleased to feel that Darwin really recognized mutations under the phrase "evolution per saltum" as a part of his theory. But Poulton is at pains to repudiate this idea entirely and to insist that Darwinism is a theory of evolution by minute steps and one of which any conception of mutation forms no part.

One can hardly fail to feel that this refusal to look with charity upon anything new only weakens Darwinism, and can but believe that Darwin himself would have been rather more broad minded. Darwin's position as the most stimulating mind of the nineteenth century stands secure, and he may well be ranked with Newton as one of the two great men that England has thus far produced. In this position he remains no less securely even if we do admit that the details of his great theory do not work out in all respects as he imagined them to do. We admire him not the less, but rather the more, as we learn that the descent theory, which must ever remain associated with Darwin's name, agrees with newly discovered facts as well as with those which Darwin himself knew.

But this volume of essays is written by an advocate, as eminently fitting for an anniversary volume, and it will form a necessary part of the Darwin bookshelf. Any light upon the personal life of the world's great men always has its interest and many a touch upon the life of Darwin given in these papers helps to render the great Englishman a live personality. The life of the man, his long struggle with ill health, his kindness and thoughtfulness for others amid his own suffering, his eagerness to give others even more than their share of credit for his discoveries and his own proverbial modesty, are anew impressed upon us as we read the unpublished letters and the newly given incidents in his life. The oft-quoted loss of appreciation of music and art, which Darwin admitted in his later life, are attributed by Poulton not to the result of scientific study, but to his constant suffering and ill health that made it impossible for him to have any comfort save in the, to him, one all-absorbing occupation of scientific study.

One new contribution of scientific knowledge is found in this volume in an essay upon "Mimicry in the Butterflies of North America," originally read in Baltimore in 1908. Complete mastery of this interesting subject is shown with a wealth of illustrative material. The historical development of mimicry in the western continent is traced in ingenious

detail. But Poulton adds nothing, and admits that he can add nothing, to the puzzling question of the *cause* of mimicry. This still remains as great a puzzle as it has ever been, although it is enriched with an abundance of illustrative material by means of which Poulton is enabled to follow the migrations into North America of the successive types of butterflies.

H. W. CONN

SPECIAL ARTICLES

THE EARLIEST DESCRIPTION OF *OENOTHERA* *LAMARCKIANA*

IN working over the early records of *Oenothera Lamarckiana* I have recently discovered in the Sturtevant collection of the library of the Missouri Botanical Garden, a remarkable manuscript which proves that this plant was originally a species growing wild in Virginia, and that it was the first *Oenothera* introduced into European gardens, about 1614. There has been so much obscurity and doubt regarding the origin and early history of *O. Lamarckiana*, the plant upon which the weight of DeVries's mutation theory largely rests, that a document which proves definitely the facts just stated must be regarded as of prime interest and importance. The frequent claim that *O. Lamarckiana* probably originated in cultivation, either through hybridization or otherwise, is here shown to be without sufficient foundation.

The record in question is a long marginal note in a copy of Bauhin's "Pinax," published at Basil in 1623. The note is written in Latin, in archaic English script, and gives an accurate description of *O. Lamarckiana* as we now know it, though differing somewhat in one or two minor characters. The plants were grown from seeds obtained from Padua in 1619, and the description is evidently written from the living plants. It is remarkable for its accuracy, considering the time it was written, equaling in this respect descriptions which were published much later. The author of the marginal note is apparently one Joannis Snippendale, whose name, in similar handwriting, appears on the title page of the