

## BUTTERFLIES

*Butterflies: their Structure, Changes, and Life-Histories, with Special Reference to American Forms.* Being an Application of the "Doctrine of Descent" to the Study of Butterflies. With an Appendix of Practical Instructions. By Samuel H. Scudder. (New York: Henry Holt and Company, 1881.)

MR. SCUDDER'S great reputation as an entomologist will cause many readers to turn to this beautifully got up volume with eager curiosity. They will expect to find a tolerably full account of all those interesting and complex phenomena of metamorphosis, variation, dimorphism and polymorphism, protective colouration, mimicry, and distribution, for the elucidation of which no class of organisms offers such abundant and striking materials; while they might not unreasonably anticipate that the bearing of the whole series of these phenomena on the "Doctrine of Descent" would be clearly indicated and the necessary conclusions to be drawn from them strongly insisted upon. The first separate work ever published on the general history of butterflies, as distinguished from their classification or specific description, would naturally excite some such expectations as these; but those who have entertained such ideas will be disappointed, and may perhaps be inclined to give the book less credit than it really deserves. We will therefore briefly indicate its contents and point out a few of its merits and deficiencies.

The first four chapters—"The Egg," "The Caterpillar," "The Chrysalis," and "The Butterfly"—respectively, give a very good general account of the form and structure of the insect during the stages of its existence, and they are illustrated by a large number of very excellent woodcuts, many of which seem to be original. Then follow descriptions of the internal organs, and their transformations during development, and a good chapter on habits, illustrated almost exclusively from North American species. We now come to the more important and interesting part of the volume, and find chapters on "Seasonal Changes and Histories," "The Colouring of Butterflies," "Diversity of the Sexes in Colouring and Structure," "The Origin and Development of Ornamentation," "Ancestry and Classification," and "Geographical Distribution," the titles of which cover a wide range, and seem to include all the chief points required for a full exposition of the subject. The treatment however is by no means satisfactory, since it is a rare thing to find any fact even alluded to beyond the range of North American species; and though the valuable observations of Edwards and Riley are frequently referred to, the important researches of Weismann and Fritz Müller are hardly mentioned. Far more important however is the almost total silence on the whole question of protective and warning colouration in larva and perfect insects and the wonderful phenomena of mimicry, which play so large a part in determining both the forms and colours of insects all over the world, and which are so marvellously developed in butterflies. The absence of all these considerations renders the chapter on "The Origin and Development of Ornamentation" most unsatisfactory, since it is almost wholly devoted to suggestions as to the probable lines which have been followed in the development of the ornamentation, while we are left without any clue to the

reasons for such special and wonderfully diversified results, or the laws by which they have been produced. Equally meagre is the chapter on "Geographical Distribution," which is treated solely from the point of view of the North American collector.

A more important fault than these deficiencies, in a work presumably intended for popular reading and to excite young American entomologists to a more complete study of their subject, is the very peculiar system of nomenclature adopted by the author, which, by the needless difficulties it will cause, must tend to disgust beginners with the whole study of natural history. The writer who has done more than any other person to facilitate the study of North American butterflies is Mr. William H. Edwards, who, besides a great work on "The Butterflies of North America," illustrated by fine coloured plates, has published, so recently as 1877, a complete "Catalogue" of the species. He is in fact the authority on North American butterflies, to the conscientious study of which he has devoted his life. When any such standard systematic work exists in a country, it seems to us the obvious duty of all who write popular books to follow its classification and nomenclature, not as endorsing their correctness, but simply to facilitate reference to works which every student *must* constantly refer to. Instead of doing so Mr. Scudder follows a quite different order in his systematic list of species, adopts a complex system of families, sub-families, tribes, and genera, mostly with unfamiliar names; and uses a generic nomenclature so totally unlike that of the above-named standard work, that out of a list of fifty-eight genera referred to in his volume only ten have the same names as those adopted by Mr. Edwards. As an example of the difficulty and confusion this must cause to a beginner we may mention that the North American species of the old genus *Papilio* are here given under five distinct generic names; *Lycæna* under the same number, and *Argynnis* under four. The family *Papilionides*, which Mr. Scudder retains, no longer contains the genus *Papilio*, after which it is named, because he transfers this name to our old friend the Camberwell Beauty, which he styles *Papilio Antiopa*. The old *Satyridæ*, or Meadow Browns, are now named *Creades*, and they are placed at the head of all the butterflies instead of near the end, as in the works of Edwards and of all the old writers. This must be all the more puzzling, because throughout the body of the work these names are everywhere given without the least indication that they are not in universal use. Thus at pages 100-102 we have *Basilarchia Archippus* many times mentioned, with a reference to Riley. But that author always uses the old name *Limenitis disippus*, and in the copious index to his Missouri Entomological Report, just issued, the name *Basilarchia* is not to be found, neither does it appear, even as a synonym, in Mr. Edwards' "Catalogue"! No one will object to differences of opinion on questions of nomenclature, when kept to their proper place in strictly scientific treatises; but every one who has at heart the extension of a taste for natural history has a right to protest against such totally unnecessary difficulties being thrown in the path of beginners.

We regret having to speak so strongly in animadversion of a book which contains much interesting matter and much valuable information, which is written in a pleasant

style and is illustrated in a very attractive manner. But we feel that an opportunity has been missed of producing a volume which should open up one of the most marvellous pages in the book of nature, in a manner to interest a wide class of readers and attract many new votaries to the study of these most beautiful and in many respects most instructive members of the great class of insects.

#### OUR BOOK SHELF

*The Quarterly Journal of Microscopical Science.* (London: Churchill.)

THE twenty-first volume of the second series of the above journal—published during the four quarters of this year—lies in its complete form before us, and it seems to merit more than a passing record at our hands. The volume contains over 650 pages of text, and, besides woodcuts, thirty-four plates, many coloured, and the majority of double size; but it is not the quantity of the material, gratifying though it be to see that the British school is not wanting in this respect, so much as the quality of the contributions that we would call attention to. In the importance of its Memoirs this journal, now in its majority, may fully claim to rank on the level of the highest of those comparable to it published in Germany, and its editor and his assistants are to be congratulated on seeing that all the subjects coming under their province are so fairly dealt with. It is not proposed to treat here of the individual memoirs from a critical point of view—no one individual could write such a criticism—but as a general *résumé* of the work done. Slightly classified, vegetable histology and physiology is enriched by the papers on *Welwitschia mirabilis* by F. Orpen Bower; on the development of starch grains, by F. W. Schimper; on the water glands in the leaf of *Saxifraga crustata*, by W. Gardiner. As contributions to zoology may be mentioned the memoir by G. Busk on Polyzoa; by H. B. Brady on Reticularian Rhizopods; a most important paper on *Limulus* an Arachnid, by the editor; to embryology the researches of Lan'ester on *Limnocoelium*, Scott on Lampreys, Wilson on Actinotrocha; to anatomy the memoirs, on the head cavities and nerves of Elasmobranchs, by Dr. Marshall; on the nasal mucous membrane, by Dr. Klein; on the Branchiate Echinoderms, by Herbert Carpenter; on the organ of Jacobson, by Dr. Klein; on the lymphatic system of the skin and mucous membrane, by Dr. Klein; on the Wolffian duct and body in the chick, by Adam Sedgwick; on the cranial nerves of Scyllium, by A. Milnes Marshall; and on the structure and significance of some aberrant forms of Lamellibranchiate gills, by Dr. K. Mitsuri. Nor must the papers by Mrs. Ernest Hart on the micrometric numeration of the blood corpuscles; by J. F. Dowdeswell on some appearances of the blood corpuscles; nor those by Dr. Cunningham on microscopic organisms in the intestinal canal, and Prof. Lister on the relations of micro-organisms to disease, be overlooked. The value of this volume will thus be apparent to the reader who knows of the subjects of which the above is a condensed list. One thing alone, to our mind, the volume needs, viz. a really efficient index to its valuable contents. The two pages and a half of index to these 650 pages of matter form an index only in name. Would it not be well to have an index volume published to the twenty-one volumes of this series, and then with volume xxii. commence a yearly index which would be both a help and a service to the student?

*Essays on the Floating-Matter of the Air in Relation to Putrefaction and Infection.* By John Tyndall, F.R.S., LL.D. (London: Longmans and Co., 1881.)

To reprint these essays in an easily-accessible form was a happy thought of the author's. It is of vast importance to the public at large that they should at least know what

views are being held by a large majority of working and thinking men on the subjects of putrefaction and infection. Quite apart from the question of how germs originate is the question of what evils arise from their presence; and although, with most of those who have investigated the matter, we regard it as well proven that, except from a pre-existing germ, no new germ arises, yet we would be prepared almost to overlook this part of the matter in our anxiety to see proper notions diffused as to the effects produced by these "floating matters of the air." The benefits that mankind has gained by the researches of the biologist, chemist, and physicist into this subject are already beyond calculation; nor is there yet any apparent limit to them. From the pages of this small volume some ideas may be gleaned of what the modern treatment of surgical cases has gained by a knowledge of this subject; nor do we think the day far distant when medicine may reach to the rank of surgery through an insight into the germ causation of febrile disease. The history of the silkworm disease in Italy and France bears witness to the enormous value, even if measured in a commercial sense, of the labours of Pasteur, Quatrefages, and others in working out from this point of view the parasitic diseases that caused at one time the almost total destruction of the silk industry in Europe; and the history of Pasteur's researches on fermentation, even when told in a few words, as in the fourth chapter of this volume, does it not tell of discoveries full of benefit to one portion at least of mankind? Prof. Tyndall well writes: "The antiseptic system of surgery is based on the recognition of living contagia as the agents of putrefaction." Keep these away, destroy them either by an excess of cold or heat, and the putrefaction is prevented. But this is true not of surgery only; it makes itself felt in the routine of every-day life. An account was laid before the Academy of Sciences of Paris, in May of this year, of an examination of the feeding-bottles in use at a *crèche* in Paris. The milk for the children put into these contracted a nauseous odour. Of thirty-one examined, twenty-eight contained in the eaoutchouc tubes or nipples germs (microscopical microbes), and even in some cases there were masses, more or less abundant, of fungoid vegetations. The milk found remaining in some was acid, with numerous bacteria; and this in spite of what was thought to be cleanliness. No wonder Prof. Tyndall writes of such material—such matter out of place—as dirt. We cannot all contrive to live in the grand, pure air to be found in such places as the Bel Alp; but all could help towards making the air of their dwellings freer from the contagion of dirt; and if right and accurate notions were held on such matters by all interested in them, prevention would soon be seen to be much better than cure. This little volume will be found exceedingly interesting reading, and its contents will furnish the reader with abundant material for thought, which perhaps may, in floating through his brain, take root there and bring forth a crop of good fruit.

E. P. W.

#### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

#### The Struggle of Parts in the Organism

MR. ROMANES, in his letter published in your number of Oct. 27 (vol. xxiv. p. 604) draws a distinction between the "Argument from Design as elaborated by the Natural Theologians of the past generation," and another argument from design which he