

house-flies and their allies, together with the sheeptick (*Pupipara*) as being the most highly modified, and the last to appear, of the dipterous series.

In the Hymenoptera there is nothing of this kind, we do not have entire groups of this order which have become so reduced, degenerate and modified, largely the result of parasitic life, as in the flies. The Hymenoptera are a normal blossoming or branching out of the topmost portion of the tree of insect life, while we should regard the Diptera as a degenerate, retrograde, downfallen branch.

If we look at the larvæ of Diptera we shall see that the most perfectly developed or highly differentiated forms are those of mosquitoes, black flies and the Tipulidæ, etc., (*Encephala*); then we pass on to a series in which the body becomes more and more maggot-like, the head being so reduced in the Muscidæ (in the old sense) that it is difficult to make out the homologies of the antennæ and parts of the mouth. The internal organs, as the tracheæ, share in this alteration and extreme modification of parts, adapting the maggot for its parasitic or otherwise peculiar mode of life and surroundings. Indeed, below the families embraced in the Orthorapha (*Culicidæ*, *Simulidæ*, etc.), the great group of Diptera now consists of very degenerate, highly modified forms.

Now under what canons of taxonomy are we to act in considering what forms are "high" and what are "low," unless we take into account the facts we have considered? It seems to us that the few entomologists and other naturalists who advocate placing the Diptera at the head of the insect series, disregard the fact that the processes of degeneration, reduction, with specialization in limited directions, and of adaptation to unusual modes of life, their habits being, in many groups, parasitic, or partially so, have brought about a modification of larval and adult structure, such as we do not find in any of the other larger orders of insects.

It seems to savor somewhat of a violation of the principles of classification, which in these days is based not only on comparative anatomy, but on morphology, paleontological history, and the facts of adaptation to changed conditions of existence, to give the highest rank to a group in which disuse of certain parts leading to degeneration, and the modification of other parts adapting them for quite peculiar uses, are so marked. And it is this wonderful amount and variety of modification and adaptation to this or that mode of life which makes the group one of such striking interest to the philosophic student. We see how much at the mercy of the environment the group has been exposed, and this is especially striking when we compare the Diptera with the great group of Lepidoptera, where there is a striking persistence and fixity of structural features, both in larva and imago, as well as in the modes of life, and the nature of the food.

BOOK-REVIEWS.

British Locomotives, their History, Construction and Modern Development. By C. J. COOKE. Whittaker & Co., London and New York, 1893. 376 p. 12mo. \$2.00.

AN interesting and very instructive account of the rise and progress of the locomotive, especially in Great Britain, including important details of construction and dimensions, as well as performance. It is written in a sufficiently popular style to be readable by any one having an interest in its subject, and is yet sufficiently technical to satisfy the specialist desiring information in relation to the proportions and the work, or even the general plans, of locomotives, old and new, including, of course, the now familiar "compound engine." The book is addressed, and most suitably, to all who take an intelligent

interest in the working of the locomotive and of railways, and to practical railway mechanics as well. It is written by an employe of the London and Northwestern Railway, and is therefore reliable and accurate; its illustrations are from working drawings, and are supplied by the great locomotive designers of the United Kingdom, and are, therefore, valuable to the professional, as well as useful to the casual, reader. The early history of the engine, of the struggles in which George Stephenson and his contemporaries engaged to make steam a successful railway motor, and the later account of the modern compound engine are likely to prove most interesting to the average reader; but no one should omit the careful perusal of the last chapter, on the duties of the locomotive engine-driver, in which he will find much to impress him with the wonderful combination of courage, skill, intelligence, foresight, knowledge and readiness, in times of emergency, which is demanded of that humble and rarely appreciated craftsman.

Negative Beneficence and Positive Beneficence: Being Parts V and VI of the Principles of Ethics. By HERBERT SPENCER. New York, D. Appleton & Co. 12mo. \$1.25.

THIS volume completes Mr. Spencer's ethical treatise, so that all who wish to know the final views of the philosopher of evolution on questions of conduct and duty are now enabled to do so. In the opening chapter Mr. Spencer draws a very sharp distinction between beneficence and justice, as he understands these terms, and then proceeds to show that beneficence has two forms, the positive and the negative. He then discusses various forms of negative beneficence, which consist in refraining from acts that would be injurious to others or to society at large, and afterwards those forms of positive beneficence which he deems most important. He confines himself almost entirely to private and industrial life, and we look in vain in these pages for any recognition of that beneficence that shows itself in advancing human knowledge and human virtue. Indeed, with the exception of certain passages in which the author's excessive individualism shows itself, the book is of a commonplace character; and whoever takes it up with the expectation of having his moral ideas clarified or his moral sentiments quickened and elevated, will be disappointed.

But what is more remarkable is that Mr. Spencer, as we learn from his preface, is himself disappointed; for, after congratulating himself on the completion of the work, he says:

"My satisfaction is somewhat dashed by the thought that these new parts fall short of expectation. The doctrine of evolution has not furnished guidance to the extent I had hoped. Most of the conclusions drawn empirically, are such as right feelings, enlightened by cultivated intelligence, have already sufficed to establish. Beyond certain general sanctions indirectly referred to in the verification, there are only here and there, and more especially in the closing chapters, conclusions evolutionary in origin that are additional to, or different from, those which are current." For our part, we can see no connection between the law of evolution as propounded by Mr. Spencer and the moral law; and we cannot perceive that he has shown the existence of such a connection. Both in this volume and in the preceding one on "Justice" evolutionary principles are brought in only occasionally and incidentally; and, when they are brought in, they are generally irrelevant to the discussion. Indeed, how can the study of a merely natural process like evolution teach us what we ought to do? How can we even know whether evolution itself makes for good or for ill unless we already have a moral ideal by which to judge its results? We fear that those who have been expecting evolutionism to furnish a guide of life will have to look in some other direction.