tically complete, which Mr. Henry Edwards[1] has recently published. Of course, in the nature of things, it is a simple compilation; but since our actual knowledge of the perfect insects in the lepidoptera is out of all relation to our knowledge of their earlier conditions and their life histories, every contribution which tends to lessen the disparity is a distinct gain. We therefore particularly welcome the present work as one likely to have a marked influence in that direction especially if followed up, as the author promises, by annual appendices.

The insects concerned are systematically arranged, following the lists of Edwards, Grote, Fernald and others; under each species the recorded transformations, whether given in description or figure are arranged (generally in a single line) chronologically, a form of exposition which has a definite value as showing in so many cases the advance of our knowledge and the sources of borrowed material; finally the food-plants are given, not always so fully or specifically as might have been done. Short descriptive words such as "condensed" or "quotes French" etc. often characterize a reference briefly to indicate its value, and we think a more liberal use of comments in this brief form would have added much to the usefulness of the catalogue, and would have required little more work if undertaken from the outset. The labor of such a bibliography, however, necessitating exactitude at every step can be appreciated only by those who have tried it; and the last straw may sometimes break the poor camel's back. Nearly nineteen hundred species are indexed, and sixty-five authors cited.

As our knowledge of the lepidoptera of North America may almost be said to have originated in the famous folios of Abbot and Smith which a century ago recorded and pictured the transformations of so many species, many indeed hardly ever bred since then, it is not surprising that the earlier stages of lepidoptera should always have had their devotees in this country, and that, all things considered, our country is as well known in this respect as we could expect. That, however, a wealth of material lies untouched at our very doors the pitifully meagre entries which have often to be made in this bibliography bear abundant proof, while a comparison of this list with those of the known species should make us rather ashamed than proud of the record which Mr. Edwards holds up before us. We commend this book to the American lepidopterist as the most important work of reference he can have in his library.

[1] Bibliographical catalogue of the described transformations of North American lepidoptera. By Henry Edwards. Bull. U. S. Nat. Mus., No. 35. 8vo. Washington, 1889, pp. 147.

Do Flies Migrate?—Some years ago, early in September, I saw a migration of butterflies, *Anosia plexippus*, at Little Boar's Head, N. H., which I have recorded in my Butterflies of the Eastern U. S., v. 1, 730. They were moving southward along the shore. One afternoon at the end of last July, July 27 to be exact, I was sitting on the shore itself, backed by a bank, within gunshot of the same spot at which I had seen the flight of *Anosia*, when my attention was directed to the constant southward movement of small flies. There was practically no wind, but the flies moved swiftly in one direction for the space of two hours, forming a stream such as might readily pass through an open barrel; their numbers varied; at times but 3 or 4 would pass a given point every second; at other times hundreds; but on the average they were as many in the given area as drops of rain in a smart shower; rarely one would be seen moving out of the stream, and then it was in a diametrically opposite direction, and just as swiftly. I should add that the direction was evidently influenced in part by the trend of the low bluff at the base of which I was sitting, and I did not go elsewhere to observe them. The stream was not more

than three feet distant and only a few inches above the ground. The flies appeared to belong to a single species as several were caught for identification, and prove to be a species of *Ilythea*, one of the *ephydridae*, and probably the European species *I. spilota*, as that is the only one recorded from this country. I shall be glad to know if such streams have before been observed among *ephydridae*.

Samuel H. Scudder.

The Supposed Bot-Fly Parasite of the Box-Turtle.—During the autumn of 1889 Mr. W. H. Ellsworth donated to the Milwaukee Public Museum a pair of box-turtles (*Cistudo carolina*), which were taken near Windsor, Ct. They were kept alive during the winter in a terrarium, but the female died 5 April 1890. My friend, the talented taxidermist, Mr. C. E. Akeley, while skeletonizing this specimen called my attention to a peculiar swelling in the animal's neck. Closer examination showed that the cutis close to the carapace and a little to the right of the median dorsal line, had been converted into a pocket about ¾ of an inch in diameter. This pocket opened on the surface by means of a very small aperture and contained besides a quantity of suppurative matter, eight maggots which I at first took to be bot-fly larvae. Both their shapes and positions with reference to the inner surface of the cavity which they had excavated reminded me of the *Gastrophilus* larvae so often exhibited in the shops of veterinary surgeons. Such of the larvae as had not been injured during the removal of the skin and flesh from the cervical vertebrae of the turtle, buried themselves in the earth 14-15 April and pupated. The imagines made their appearance 27 May and proved to be not bot-flies at all, but a species of *Sarcophaga*.

Prof. S. W. Williston has directed my attention to the following note by Packard (American naturalist, 1882, v. 16, p. 598):

"The museum of Brown University has received specimens of a bot-fly maggot, of which eight or ten were taken, according to Prof. J. W. P. Jenks, from under the skin of the back of the neck, close to the shell of the box-turtle (*Cistudo carolina*). The turtle was collected at Middleboro, Mass." * * * *

"It appears to be a genuine bot-fly, but quite unlike any genus figured by Brauer in his work on the *oestridae*.

The body is long and slender, cylindrical, tapering so that each end is much alike. The segments are provided with numerous fine spines, which are not entirely confined to the posterior half or two thirds of the segment. The body is slender and the spines much smaller than in *Gastrophilus equi*."

A comparison of this account with my observation given above leaves no doubt that the larvae seen by Packard and myself are specifically identical. I have also compared one of the maggots with Packard's figure and description and can detect no differences. The error into which he has fallen is pardonable, inasmuch as the *Sarcophaga* larvae are microscopically so similar to bot-fly maggots that any entomologist unaccustomed to the minute study of dipterous larvae would not hesitate to allocate them to the *oestridae*. Until the flies appeared, I was quite sure that I had found a bot-fly infesting a reptile. (See Proc. acad. nat. sci. Phil., 1887, p. 393-394; 1888, p. 128; Science, 5 December 1884, v. 4, p. 511.)

It would seem to be a regular habit with this fly to infest *Cistudo carolina*. That the eggs or young larvae are laid on the living turtle there can be no doubt, but whether they are deposited in a sore, or on the unabraded skin of the nucha, as being a region inaccessible to the turtle's beak and claws, remains to be seen.

The four imagines which I succeeded in rearing proved to be females and though the species appears not to have been described as yet, I would rather wait till male specimens can be secured, before attempting to add another member to the large and very difficult genus *Sarcophaga*.

W. M. Wheeler.