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46. PRELIMINARY ACCOUNT OF THE EPHEMEROPTERA OF WICKEN FEN

BY

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THESE notes are based almost entirely on observations made during the autumn and particularly during August 1931; and for this reason are restricted in their nature. The imagines of many Ephemeridæ have rather a short season, and thus it is possible that several species occur in the Fen which have never been recorded. The nymphs of the majority of species should be present at all seasons of the year, since many Ephemeroptera appear to have a life cycle of at least two years. With the exception of *Cloëon* and *Ephemera* the nymphs are often more difficult to obtain than the imagines, and thus little fresh information can be got from them as to the species occurring in the Fen. In addition the specific determination of an ephemerid nymph is nearly always uncertain and often impossible on account of the small amount of information that has been published on the subject.

According to the most recent system of classification we have eight families of Ephemeroptera in England. Of these four families, viz. Potamanthidæ, Ephemerellidæ, Siphonuridæ and Ecdyonuridæ, appear to frequent very, or fairly, rapid water, and are thus unlikely to occur anywhere in the Fen area, which is characterised by the slow movement, or even stagnant nature, of most of the water in it. Commissioners' Drain, which is much the most rapid stream in the Fen, only flows at half a mile per hour, while the families mentioned above are found in streams of five miles an hour and more.

The other four families are: Ephemeridæ, Leptophlebiidæ, Cænidæ and Baëtidæ. Representatives of all these families are found in the Fen, but so far the total number of species known

is only eight. As these families contain altogether twenty-six species, many of which should find a suitable habitat in the Fen, it is probable that further work will raise the number of species without increasing the number of families.

The species so far recorded are as follows:

Ephemeridæ

Prof. Dr. Thallies

Ephemera vulgata Linn. This conspicuous species is common on some parts of the Fen in May and June, when it can be seen in large numbers from about 4 p.m. flying with the up-and-down movement that is characteristic of ephemerids. The nymph burrows to a depth of several inches in the mud, and is best obtained by scooping up large quantities of mud and allowing the nymphs to crawl out, when they become easily visible. The nymph was found most abundantly in New River (Monks' Lode), and to a lesser extent in Wicken Lode below its junction with New River; a careful search did not reveal its presence in the upper part of Wicken Lode. As the water in the Lode is stationary until joined by the stream from New River it is possible that this species, like *E. danica*, requires a stream for its existence. It does not appear to occur in Commissioners' Drain, which is the only other stream in the Fen, but this may be due to some difference in the nature of the bottom or in the composition of the water; this is quite possible, since Commissioners' Drain obtains all its water by fen drainage, while New River rises outside the Fen.

Leptophlebiidæ

Leptophlebia marginata Linn. Mr L. Eastham tells us that the nymph of this species is common in the larger ponds as well as in smaller water stretches which dry up in summer. The only imago known from Wicken apart from those bred by Mr Eastham is one in the Museum collection labelled "24.5.13. Wicken."

Paraleptophlebia. On November 8 four nymphs of this genus were obtained from the weed in New River near the lower bridge. They are probably *P. submarginata*, but it does not appear possible to be sure until they have been bred.

Cænidæ

Cænis horaria Linn. (= *dimidiata* Steph.). This species appears to be widely distributed in the Fen and has been seen in large numbers over New River and Wicken Lode. It has not been seen earlier than 7 p.m., when the subimagines begin to appear; from 7.30 p.m. onwards the imago was seen flying plentifully over the water up to a height of seven or eight feet. The flight probably continues well after dark, as three males were taken at light in the Main Drove between 10 and 10.30 p.m. on August 18, and Mr A. P. G. Michelmores records this insect as being common in the Fen at light in June; on this occasion the males were more numerous than the females. The observations of Mr L. Eastham and Mr Michelmores show that this species is most common in June, but it is still abundant on suitable evenings in the middle of August. The nymph is found in stagnant ponds and in the running water of New River, in both cases being found in the surface layer of fine mud. Mr K. G. Blair kindly verified our determination of the species.

Baëtidae

Centroptilum luteolum Müll. The males of this species were observed swarming along New River and Wicken Lode on several evenings in early August, but it was never as common as the next two species. On October 18 the males were swarming over New River at 3 p.m. and several females were also seen on the wing.

Cloëon dipterum Linn., *Cloëon simile* Eaton. These two species are extremely common in the Fen, and their nymphs appear to abound in water-weed in every part of it. They are perhaps not quite so common in the ponds as they are in the water forming part of the drainage system. As is the case with most Ephemeroptera the imagines are most numerous on the wing in the later afternoon and evening, although on one occasion a swarm of *C. simile* was observed over Burwell Lode at 9.40 a.m. The females of this genus can be swept from the herbage at any time and probably live for several days. These species appear to spend some time in the sub-imaginal instar and very often pass the night in this stage. In August *C. simile* was definitely the more common of the two species, and while it was still common in mid-October *C. dipterum* was not seen at this time. This suggests that *C. dipterum* has an earlier season than *C. simile*, since in late July the two appeared to be present in about equal numbers.

Baëtis tenax Eaton. On October 18 this species was flying over New River in quite large numbers at 3 p.m. As is usually the case on such occasions the majority of the insects were males, but one female was also taken.