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postnotum darkened. Pleura dark brown, with a broad longitudinal silvery stripe. Halteres with stem whitened, knob dark brown. Legs with the coxae and trochanters obscure yellow; femora brownish black to black, with a narrow yellow ring at near three-fifths the length, the bases restrictedly obscure yellow; remainder of legs light yellow. Wings with the ground color brown, more saturated along the costal border, variegated by numerous white spots and dots, including a series of about seven along the anterior border, the second not reaching costa; fourth pale area continued across wing as a narrow, only slightly broken band that extends to vein *Cu*; all longitudinal veins behind and excepting *R*₅ with a white marginal spot; remaining cells of wings with scattered white spots; in brief, the pattern is dark with a much more restricted pale pattern; veins pale brown, pale in the white areas. Venation: Cell *M*₂ open by the atrophy of the basal section of *M*₃.

Abdomen chiefly dark brown.

Habitat.—GEORGIA. *Holotype*: ♀, Valdosta, Lowndes County, May 28, 1946 (P. W. Fattig). *Paratopotypes*: 2 ♀♀.

Although the present fly is generally similar to *Erioptera* (*Mesocyphona*) *caloptera* Say, it seems certainly to be distinct in the pattern of the legs and wings, as described. All three type specimens are virtually identical in the points indicated.

Notes on Some Aquatic Insects of the Brandywine Creek Drainage, Chester County, Pennsylvania

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During 1948 a biological survey of the Conestoga Basin, Lancaster County, Pennsylvania, was carried on by the Academy of Natural Sciences of Philadelphia for the Sanitary Water Board of the Commonwealth of Pennsylvania. At this time a limited number of similar collections was made in the Brandywine Creek Drainage. As a result of the interest shown in stream pollution in the state, particularly in the Brandywine Drainage, it has

been thought advisable to present the small amount of information assembled during that season's work. In addition it is believed that some of the distributional records may be of interest to those working on the various groups of aquatic insects.

A basic report has recently been published on the survey of the Conestoga Basin,¹ but due to the limited character of that undertaken in the Brandywine Drainage none has been presented. The method of survey on this drainage was essentially the same as that utilized on the major survey, with the same technics, methods of sampling and recording.

It is desired to thank all of those that participated in the survey for their help in the accumulation of the material here presented.

All of the material listed represents immature individuals except in the Hemiptera and Coleoptera where the material is adult unless otherwise noted. Incomplete identifications are listed only as a help in establishing the various ecological associations present.

A listing of the various localities examined and the conditions encountered is given below. The densities at the stations are listed, as in the other stream survey report: (1) rare, (2) few, (3) frequent, (4) common, (5) very abundant.

Station A. Brandywine Creek, 2½ miles north of Coatesville. Average width 5 feet. Average depth 15 inches. Shores wooded lowland. Bed of stream some boulders, mainly gravel or sand and a little mud.

This station was first examined 23 July 1948 (A1) and a second time 13 August 1948 (A2). This is station 129 of the State Stream Survey.

Superficially this appeared to be a healthy station.

Station B. Brandywine Creek south of bridge at Coatesville. Average depth 19 inches. Shores weeds and industrial wastes. Bed of stream mainly rubble, some clay.

This station was first examined 21 July 1948 (B1) and a second time 11 August 1948 (B2). This is station 126 of the State Stream Survey.

¹ PATRICK, RUTH, A proposed biological measure of stream conditions, based on a survey of the Conestoga Basin, Lancaster County, Pennsylvania. Proceedings Academy of Natural Sciences of Philadelphia, CI, pp. 277-341, map, (1949).

This station was heavily contaminated with oil and at the time of the first examination no insects could be found.

Station C. Brandywine Creek at Modena. Average width 50 feet. Average depth 12 inches. Shores low vegetation. Bed of stream mainly gravel, with mud near the shores.

This station was first examined 21 July 1948 (C1) and a second time 13 August 1948 (C2). This is station 127 of the State Stream Survey.

This station was heavily contaminated with oil, but not as much so as B. In addition garbage and other wastes were also present.

Station D. Brandywine Creek at Embreeville State Hospital. Average depth 20 inches. Shores pasture, with cut banks. Bed of stream about one-half rubble and sand, remainder rock with a fine mud covering.

This station was first examined 21 July 1948 (D1) and a second time 16 August 1948 (D2). This is station 128 of the State Stream Survey.

Superficially this appeared to be a healthy station.

Station E. Brandywine Creek above Lenape. Average depth 13 inches. Shores mixed second growth. Bed of stream mainly rocks and rubble, a little mud near the banks.

This station was examined 13 August 1948 and is station 141 of the State Stream Survey.

This appeared to be a healthy station.

Station F. Brandywine Creek near Lenape. Average depth 19 inches. Shores mixed vegetation, banks cut. Bed of stream rubble to rocks except for mud near the shores.

This station was examined 13 August 1948 and is station 142 of the State Stream Survey.

At this station there was some traces of oil contamination.

ODONATA

Agrionidae

Agrion sp. A2 3, D2 2.

Hetaerina sp. D1 2, D2 2, E 1.5, F 2.

Coenagrionidae

- Argia moesta* (Hagen) A2 2.
Argia sedula (Hagen) A2 2.
Argia violacea (Hagen) A2 4, E 3.
Argia maculata? A1 2.5.
Enallagma sp. C1 2, C2 3.
Enallagma civile (Hagen) C1 3, D2 4.

Aeshnidae

- Cordulegaster diastatops* (Selys) D2 1.5.
 Gomphinae E 1.5.
Hagenius brevistylus Selys A1 1.5, A2 1.5.
Gomphus descriptus Banks A2 3.5, F 2.5.
Gomphus exilis Selys A2 2.
Gomphus spiniceps (Walsh) or possibly *G. villosipes* Selys A1 2, D1 2, F 2.
Gomphus villosipes Selys D2 1.5.
Boyeria vinosa (Say) A1 2.5, A2 4, D1 2, D2 2.5, E 3, F 2.
 Aeshninae E 2.
Aeshna umbrosa Walker C1 2, D2 2.

Libellulidae

- Macromia* sp. A1 3.
Macromia illinoiensis Walsh A2 1.5, D1 2, D2 2, F 2.
Macromia probably *illinoiensis* B2 3.
Somatochlora sp. C1 2, C2 3.
Plathemis lydia (Drury) C1 2.

EPHEMEROPTERA

Ephemeridae

- Ephoron* sp. A1 1.
Ephoron leukon Williamson A2 2.
Hexagenia atrocaudata McDunnough A1 4, A2 3.5.

Heptageniidae

- Stenonema annexum* Traver A1 4, F 3.2.
Stenonema candidum Traver A1 3.
Stenonema gildersleevei Traver A2 1.
Stenonema ithaca (Clemens & Leonard) A2 4.
Stenonema probably *ithaca* E 3.
Stenonema ohioense Traver A1 2, D1 2.
Stenonema pudicum (Hagen) A1 2.5, A2 2, D1 2.
Heptagenia sp. A1 1.5.
Heptagenia marginalis Banks A1 2, A2 2.
Iron humeralis (Morgan) A1 3, A2 4.

Baetidae

Baetidae A1 1.5.

Isonychia albomanicata (Needham) A1 4, A2 4.

Isonychia matilda Traver A1 3.

Ephemerella lata Morgan A1 2.5, A2 2, F 2.

Baetis sp. A1 2.

Baetis pygmaeus (Hagen) A2 2.

Pseudocloeon cingulatum McDunnough A1 3, A2 3.

PLECOPTERA

Perlidae

Perlesta placida (Hagen) A1 2.

Acroneuria arida (Hagen) A1 3.5, A2 3.

Acroneura internata (Walker) A2 2, F 2.

Acroneura ruralis (Hagen) A1 3.

Togoperla sp. A1 1.5, A2 3.5.

HEMIPTERA

Veliidae

Veliidae (sight records) A2 5, F 4.

Nepidae

Ranatra sp. A2 3.

Corixidae

Corixidae (sight records) A2 2.

NEUROPTERA

Corydalidae

Corydalus cornutus Linnaeus A1 3, A2 4, C1 2, D1 3, D2 2, E 4, F 2.

Nigronia sp. A2 2, D1 2.

COLEOPTERA

Haliplidae

Haliplidae (sight records) A2 2.

Dytiscidae

Dytiscidae (sight records) A2 2.5.

Gyrinidae

Gyrinidae (sight records) A2 3.

Parnidae s.l.

Larval water pennies A1 2, A2 2.5, D1 1.5.

TRICHOPTERA

Rhyacophilidae

Rhyacophila fuscula (Walker) A1 2.

Philopotamidae

Chimarra aterrima Hagen A2 1.

Psychomyiidae

Neuroclipsis sp. A1 2, A2 1.

Psychomyia sp. A1 1.5.

Hydropsychidae

Hydropsyche sp. A2 1.5.

Hydropsyche bifida complex A1 3, A2 4.

Hydropsyche simulans Ross A2 2, F 2.5.

Hydropsyche betteni Ross A2 1.5.

Cheumatopsyche sp. A1 3, A2 1.5, F 2.5.

Macronemum sp. A1 1.5.

Limnephilidae

Neophylax sp. A1 2.5.

Leptoceridae

Athripsodes sp. A of Ross A1 1.5.

DIPTERA

Tipulidae

Tipula sp. D1 2.

Simuliidae

Black flies F 2.

Chironomidae

Chironomidae—A1 1.5, A2 3.5, B2 3.5, C1 1.7, C2 2.5, D1 2.8,
D2 3.2, E 2.5, F 2.5.

Tabanidae

Tabanidae D2 1.5.

Empididae

Roederiodes Coquillett? E 1, F 1.5.

LEPIDOPTERA

Pyralididae

Elophila sp. A1 1.5, D1 1.

The diversity of forms at the various stations appears to be of some interest. It should be noted that Chironomids are treated as a single entity. At station A, 58 different forms were found, 40 on the first and 41 on the second examinations. At station B, only two forms were found, both on the second examination, there being no insect life present at the time of the first examination. At station C, seven different forms were found, seven at the time of the first examination and only three at the second sampling. At station D, 18 different forms were found, with 13 types present at each sampling. At station E, 10 forms were found and at station F, 17.

When one examines the information for the various major groups as distributed from the headwaters, through pollution and downstream, the following conclusions can be made. The Odonata were well represented at A, practically absent from B, and then show a gradual increase in diversity and numbers downstream. The Ephemeroptera showed a good mixed fauna at A, and were absent from B. Downstream the families other than the Ephemeridae reappeared but in reduced variety and number. In the Plecoptera only the Perlidae were found at A, and members of this family were again encountered at F. Of the Neuroptera, *Corydalus* was the only common form and this soon returned following the heavy pollution. Of the Trichoptera five families, represented by six species, were found only at A, while the Hydropsychidae, which were moderately well developed at A, reappeared at station F. Neither the Hemiptera nor Coleoptera were sufficiently collected to warrant the drawing of any conclusions. Of the Diptera either insufficient material, as in most families, or incomplete determinations do not allow the forming of conclusions. It is interesting to note that the single aquatic lepidopteron, *Elophila*, was present in both stations A and D.