

PENNSYLVANIAN INSECTS OF ILLINOIS

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The 139 described species of Pennsylvanian insects known from Illinois have come from three rather widely separated areas. One species is known from Colchester, McDonough County; five from Vermilion County, south of Danville; and the rest from Grundy and Will counties, near Braidwood and Coal City, including the famous Mazon Creek locality.

The Francis Creek shale, lying above the Colchester (Wilmington) coal, is exposed naturally on the banks of Mazon Creek in Grundy County and artificially in excavations for coal in adjacent Will County. In both exposures the shale contains nodules formed around fossils. As almost every nodule broken open contains a well-preserved fossil, collecting has been extensive for nearly a century, and the locality has become world-famous for its rich Pennsylvanian flora.

The number of fossil invertebrates associated with the fossil plants is relatively small; few of these are insects. Thus, a season's collecting of fossil plants for the Chicago Natural History Museum usually produces one to three fossil insects; probably as many more disappear into the private collections of a host of enthusiastic amateurs, where they are occasionally examined by members of the Museum staff. As a result of many years of collecting, a small but rather good collection of Pennsylvanian insects now awaits descrip-

tion at the Museum. The present note is intended as an introduction to the work now being done on that collection, and as a brief review of past studies.

The first two species of Pennsylvanian insects to be described from the Mazon Creek nodules were made known in 1864 by James Dwight Dana, the great Yale naturalist. Samuel H. Scudder, of the Boston Society of Natural History and the United States Geological Survey, described 36 more, including the one from Colchester and one from the Danville area. Dana and Scudder may be thought of as representing a "Primitive Period" of fossil insect work in Illinois, which closed about 1905. The extinct orders were not then understood; fossils were assigned to broadly conceived modern orders and were compared with modern genera, or were placed in artificial groups in the belief that insect orders had not become differentiated by Pennsylvanian time.*

The "Middle Period" of Illinois paleoentomology, to pursue the figure, is dominated by Anton Handlirsch, of the Royal Imperial Museum of Vienna. From 1906 to 1920, Handlirsch described 77 species, almost all from Mazon Creek. Being

* "There existed among these ancient forms no ordinal distinctions, such as obtain today, but . . . they formed a single homogeneous group of generalized hexapods, which should be separated from later types more by the lack of those special characteristics which are the property of existing orders than by any definite peculiarities of its own."—Scudder, U. S. Geol. Survey, Bull. 31, p. 104, 1886.

familiar with insects of similar age from Europe, Handlirsch had a better insight than had Dana or Scudder into the problem of a natural classification. He named five new orders for the Pennsylvanian insects and redefined others, giving the classification of paleozoic insects a position of equal stature with that of modern insects. His observations and his taxonomy have not withstood all later tests, but his papers are still a necessary starting point for anyone working with Mazon Creek insects.

Balancing the Primitive and the Middle Periods there is inevitably a Modern Period, in which we hope that all problems will be solved. After Handlirsch's major work, the study of paleozoic insects received a great impetus from the work done by R. J. Tillyard, A. V. Martynov, and F. M. Carpenter on the Permian insects of Australia, Russia, and Kansas. Attention was for a time turned away from Illinois fossils, partly because Handlirsch had studied all the accumulated specimens and new finds were scarce, and partly because of preoccupation with the Permian faunas. Illinois paleontology blossomed again in 1938 and 1943 with two papers by Professor F. M. Carpenter, of Harvard University, in which six species are described in terms of the current understanding of venational homologies.

The size of the Pennsylvanian insect fauna of Illinois cannot at present be estimated. Of the 139 known species, some have already been rejected as unrecognizable; others, particularly in the well-stocked genera, may very well sink into syn-

onymy as intermediate forms are found and morphologic variability becomes better understood. The new specimens discovered in current collecting very rarely include representatives of described species, and seldom of described genera; thus the available sample is not yet of significant size.

Pennsylvanian insects are rare fossils. It is desirable that anyone having a specimen in a private collection should lend it to a responsible institution for study, and should arrange for it to go ultimately to a permanent collection. Plaster or Parlodion replicas may be made of these rare specimens, and photographs taken; these can be studied even though the actual specimens remain in personal custody of the collector.

CHECKLIST OF PENNSYLVANIAN
INSECTS DESCRIBED TO 1953
FROM ILLINOIS

In the following list, no attempt is made at reforming the classification, except in combining Handlirsch's order Protoblattoidea with his order Protorthoptera.

ORDER PALAEODICTYOPTERA

Family Aenigmatodidae Handlirsch 1906

Aenigmatodes Handlirsch 1906

A. danielsi Handlirsch 1906,
Mazon Creek

Family Dictyoneuridae Handlirsch 1906

Athymodictya Handlirsch 1911

A. parva Handlirsch 1911, Mazon
Creek

Mammia Handlirsch 1906

M. alutacea Handlirsch 1906,
Mazon Creek

Family Eubleptidae Handlirsch 1906

Eubleptus Handlirsch 1906

E. danielsi Handlirsch 1906,
Mazon Creek

Family Hypermegethidae Handlirsch 1906

- Hypermegethes* Handlirsch 1906
H. schucherti Handlirsch 1906, Mazon Creek
 Family Syntonopteridae Handlirsch 1911
Lithoneura Carpenter 1938
L. lameerei Carpenter 1938, Braidwood, Will Co.
L. mirifica Carpenter 1943, Braidwood, Will Co.
 Syntonoptera Handlirsch 1911
S. schucherti Handlirsch 1911, Mazon Creek & Braidwood, Will Co.
 Family Thesoneuridae Carpenter 1943
Thesoneura Carpenter 1943
T. americana Carpenter 1943, Braidwood, Will Co.
 Family uncertain
Ametretus Handlirsch 1911
A. laevis Handlirsch 1911, Mazon Creek
Amousus Handlirsch 1911
A. mazonus Handlirsch 1911, Mazon Creek
Dixodus Handlirsch 1911
D. debilis Handlirsch 1911, Mazon Creek
Palaiotaptus Handlirsch 1906
P. mazonus Handlirsch 1906, Mazon Creek
Parapaolia Handlirsch 1906
P. superba (Scudder 1885, as *Paolia*), Mazon Creek
Scepasma Handlirsch 1911
S. gigas Handlirsch 1911, Mazon Creek
 (supposed larval forms), Mazon Creek & Braidwood, Will Co.
- ORDER HADENTOMOIDEA Handlirsch 1906
 Family Hadentomidae Handlirsch 1906
Hadentomum Handlirsch 1906
H. americanum Handlirsch 1906, Mazon Creek
- ORDER PROTORTHOPTERA Handlirsch 1906
 Family Adeloneuridae Carpenter 1938
Adeloneura Carpenter 1938
A. thompsoni Carpenter 1938, Mazon Creek
 Family Adiphlebiidae Handlirsch 1906
Adiphlebia Scudder 1885
A. lacoana Scudder 1885, Mazon Creek
A. longitudinalis (Scudder 1885, as *Termes*), Mazon Creek
 Family Aethophlebiidae Handlirsch 1906
Aethophlebia Scudder 1885
A. singularis Scudder 1885, Mazon Creek
 Family Anthracothremmidae Handlirsch 1906
Anthracothremma Scudder 1885
A. robusta Scudder 1885, Mazon Creek
Pericalyphe Handlirsch 1911
P. longa Handlirsch 1911, Mazon Creek
Melinophlebia Handlirsch 1911
M. analis Handlirsch 1911, Mazon Creek
Silphion Handlirsch 1911
S. latipenne Handlirsch 1911, Mazon Creek
 Family Apithanidae Handlirsch 1911
Apithanus Handlirsch 1911
A. jocularis Handlirsch 1911, Mazon Creek
 Family Asyncritidae Handlirsch 1911
Asyncritus Handlirsch 1911
A. reticulatus Handlirsch 1911, Mazon Creek
 Family Cacurgidae Handlirsch 1911
Archaeologus Handlirsch 1906
A. falcatus Handlirsch 1906, Mazon Creek
Cacurgus Handlirsch 1911
C. spilopterus Handlirsch 1911, Mazon Creek
Heterologus Carpenter 1943
H. langfordorum Carpenter 1943, Braidwood, Will Co.
Spitomastax Handlirsch 1911
S. oligoneurus Handlirsch 1911, Mazon Creek
 Family Cheliphlebiidae Handlirsch 1906
Cheliphlebia Scudder 1885
C. carbonaria Scudder 1885, Mazon Creek
C? mazona Handlirsch 1911, Mazon Creek
Megalometer Handlirsch 1906 (family doubtful)
M. lata Handlirsch 1906, Mazon Creek
 Family Epideigmatidae Handlirsch 1911
Epideigma Handlirsch 1911
E. elegans Handlirsch 1911, Mazon Creek
 Family Eoblattidae Handlirsch 1906
Anegertus Handlirsch 1911
A. cubitalis Handlirsch 1911, Mazon Creek
 Family Eucanidae Handlirsch 1906
Eucanus Scudder 1885
E. attenuatus Melander 1903, Mazon Creek
E. mazonus Melander 1903, Mazon Creek

- E. minor* Handlirsch 1911, Mazon Creek
E. ovalis Scudder 1885, Mazon Creek
E. pusillus Handlirsch 1911, Mazon Creek
E. rotundatus Handlirsch 1906, Mazon Creek
 Family Gerapompidae Handlirsch 1906
Gerapompus Scudder 1885
G. blattinoides Scudder 1885, Mazon Creek
G. extensus Scudder 1885, Mazon Creek
G. schucherti Handlirsch 1906, Mazon Creek
 Family Geraridae Handlirsch 1906
Gerarus Scudder 1885
G. angustus Handlirsch 1906, Mazon Creek
G. collaris Handlirsch 1911, Mazon Creek
G. danielsi Handlirsch 1906, Mazon Creek
G. latus Handlirsch 1911, Mazon Creek
G. longicollis Handlirsch 1911, Mazon Creek
G. longus Handlirsch 1906, Mazon Creek
G. mazonus Scudder 1885, Mazon Creek
G? reductus Handlirsch 1911, Mazon Creek
G. vetus Scudder 1885, Mazon Creek
Genopteryx Scudder 1885
G. constricta Scudder 1885, Mazon Creek
Gerarulus Handlirsch 1911
G. radialis Handlirsch 1911, Mazon Creek
Aneptedius Handlirsch 1911 (family doubtful)
A. giraffa Handlirsch 1911, Mazon Creek
 Family Narkemidae Handlirsch 1911
Narkema Handlirsch 1911
N. taeniatum Handlirsch 1911, Mazon Creek
 Family Oedischiidae Handlirsch 1906
Genentomum Scudder 1885
G. validum Scudder 1885, Mazon Creek
G. carri Cockerell 1917, Mazon Creek
Progenentomum Handlirsch 1906
P. carbonis Handlirsch 1906, Mazon Creek
 Family Oryctoblattinidae Handlirsch 1906
Glaphyrophlebia Handlirsch 1906
G. pusilla Handlirsch 1906, Braceville, Grundy Co.
 Family Pachytylopsidae Handlirsch 1906
Palaeocarris Cockerell 1917
P. ornata Cockerell 1917, Mazon Creek
 Family Schuchertiellidae Handlirsch 1911
Schuchertiella Handlirsch 1911
S. gracilis Handlirsch 1911, Mazon Creek
 Family Spanioderidae Handlirsch 1906
Spaniodera Handlirsch 1906
S. acutipennis Handlirsch 1911, Mazon Creek
S. ambulans Handlirsch 1906, Mazon Creek
S. angusta Handlirsch 1911, Mazon Creek
S. elatior Handlirsch 1911, Mazon Creek
S. lata Handlirsch 1911, Mazon Creek
S. longicollis Handlirsch 1911, Mazon Creek
S. parvula Handlirsch 1911, Mazon Creek
S. schucherti Handlirsch 1911, Mazon Creek
Danielsiella Cockerell 1916 (*Spaniodera?*)
D. piscicula Cockerell 1916, Mazon Creek
Propteticus Scudder 1885
P. infernus Scudder 1885, Vermillion Co.
Camptophlebia Handlirsch 1906
C. clarinervis (Melander 1903, as *Dictyoneura*), Vermillion Co.
Paracheliphlebia Handlirsch 1906
P. extensa (Melander 1903, as *Cheliphlebia*), Mazon Creek
Petromartus Melander 1903 (family doubtful)
P. indistinctus Melander 1903, Vermillion Co.
Miamia Dana 1864 (family doubtful)
M. bronsoni Dana 1864, Mazon Creek
Gyrophlebia Handlirsch 1906
G. longicollis Handlirsch 1906, Mazon Creek
Metacheliphlebia Handlirsch 1906 (family doubtful)
M. elongata (Scudder 1885 as *Cheliphlebia*), Mazon Creek
Dieconeura Scudder 1885
D. arcuata Scudder 1885, Mazon Creek

- D. mazona* Handlirsch 1911,
Mazon Creek
Metryia Handlirsch 1906
M. analis Handlirsch 1906, Mazon
Creek
Family uncertain
Agogoblattina Handlirsch 1906
A. occidua (Scudder 1885,
Oryctoblattina), Mazon
Creek
Aziologus Handlirsch 1906
A. thoracicus Handlirsch 1906,
Mazon Creek
Chrestotella Handlirsch 1919
C. danæ (Scudder 1868, *Miamia*),
Mazon Creek
Chrestotes Scudder 1868
C. lapidea Scudder 1868, Mazon
Creek
Didymophleps Scudder 1885
D. contusa (Scudder 1878, as
Termes), Vermilion Co.
Endoiasmus Handlirsch 1906
E. reticulatus Handlirsch 1906,
Mazon Creek
Geraroides Handlirsch 1906
G. maximus (Melander 1903, as
Dieconeura), Mazon Creek
Hemeristia Dana 1864
H. occidentalis Dana 1864, Mazon
Creek
Polyernus Scudder 1885
P. complanatus Scudder 1885,
Mazon Creek
Polyetes Handlirsch 1906
P. furcifer Handlirsch 1906,
Mazon Creek
Pseudogerarus Handlirsch 1906
P. scudderi Handlirsch 1906,
Mazon Creek
(larval forms), Mazon Creek

ORDER BLATTARIA

- Family Archimylacridae Handlirsch
1906
Adeloblatta Handlirsch 1906
A. columbiana (Scudder 1895, as
Progonoblattina), Mazon
Creek
A. sellardsi (Handlirsch 1906, as
Phylloblatta), Mazon
Creek
Archoblattina Sellards 1904
A. beecheri (Sellards 1903, as
Megablattina), Mazon Creek
A. scudderi Handlirsch 1906
(syn. of *beecheri*?), Mazon
Creek
Asemoblatta Handlirsch 1906
A. danielsi Handlirsch 1906,
Mazon Creek
A. mazona (Scudder 1882, as
Etblattina), Mazon Creek

- Metachorus* Handlirsch 1920 (fam-
ily questionable)
M. testudo (Scudder 1890, as
Promylacris), Mazon Creek
Oxyoblatta Handlirsch 1906
O? triangularis (Scudder 1895, as
Paromylacris), Mazon Creek
Palaeoblatta Handlirsch 1906
P. paucinervis (Scudder 1890, as
Archimylacris), Mazon
Creek
Phylloblatta Handlirsch 1906 (often
spelled *Phylloblatta*)
P. diversipennis Handlirsch 1911,
Mazon Creek
P. hilliana (Scudder 1895, as
Etblattina), Mazon Creek
Archimylacrid larvae
Dipeltis (*Diplodiscus*) *carri*
Schuchert 1897, Mazon Creek
Etblattina mazonana Sellards
1904, Mazon Creek
... *larvalis* Handlirsch 1920,
Mazon Creek
... *paidium* Handlirsch 1920,
Mazon Creek
Family Mylacridae Scudder 1885
Mylacris Scudder 1868
M. anthracophila Scudder 1868,
Colchester, McDonough Co.
M. elongata Scudder 1895, Mazon
Creek
M. similis Handlirsch 1906,
Mazon Creek
M. sellardsii Handlirsch 1906,
Mazon Creek
M. ampla Scudder 1895, Mazon
Creek
Orthomylacris Handlirsch 1906
O. antiqua (Scudder 1884, as
Mylacris), Mazon Creek
O. contorta Handlirsch 1911,
Mazon Creek
O. gurleyi (Scudder 1895, as
Mylacris), Mazon Creek
O. rigida (Scudder 1890, as *Pro-
mylacris*), Mazon Creek
Paromylacris Scudder 1885
P. rotunda Scudder 1885, Mazon
Creek
Platymylacris Handlirsch 1911
P. paucinervis Handlirsch 1911,
Mazon Creek
Promylacris Scudder 1885
P. ovalis Scudder 1885, Mazon
Creek
Simplicius Handlirsch 1920
S. simplex (Scudder 1879, as *Lith-
omylacris*), Danville area,
Vermilion Co.
mylacrids of uncertain genus
... *ampla* Scudder 1890 (as
Paromylacris), Mazon Creek

- ... *amplipennis* Handlirsch 1920, Mazon Creek
 mylacrid larvae
- ... *sellardsii* Handlirsch 1906, Mazon Creek
- ... *melanderi* Handlirsch 1906, Mazon Creek
- ... *schuchertiana* Handlirsch 1906, Mazon Creek
- ... *sellardsiana* Handlirsch 1906, Mazon Creek
- ... *diplodiscus* Packard 1885 (as *Dipeltis*), Mazon Creek
- ... *anceps* Sellards 1904, Mazon Creek
- ORDER SYPHAROPTEROIDEA
 Handlirsch 1911
- Family Sypharopteridae Handlirsch 1911
- Sypharoptera* Handlirsch 1911
- S. pneuma* Handlirsch 1911, Mazon Creek
- ORDER PROTODONATA
- Family Paralogidae Handlirsch 1906
- Paralogopsis* Handlirsch 1911
- P. longipes* Handlirsch 1911, Mazon Creek
- ORDER MEGASECOPTERA
- Family Prochoropteridae Handlirsch 1911
- Prochoroptera* Handlirsch 1911
- P. calopteryx* Handlirsch 1911, Mazon Creek
- Family uncertain
- Adiaphtharsia* Handlirsch 1906
- A. ferrea* Handlirsch 1906, Mazon Creek
- Lameereites* Handlirsch 1911
- L. curvipennis* Handlirsch 1911 (doubtful form), Mazon Creek
- ORDER UNCERTAIN
- Teneopteron* Carpenter 1943
- T. mirabile* Carpenter 1943, Braidwood area, Will Co.
- Megathenthomum* Scudder 1868
- M. pustulatum* Scudder 1868, Mazon Creek
- M. scudderi* Handlirsch 1906, Mazon Creek
- Protodictyon* Melander 1903
- P. pulchripenne* Melander 1903, Mazon Creek
- Geraropsis* Handlirsch 1919
- G. scudderi* Handlirsch 1919, Mazon Creek

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