THESIS
FOR DEGREE OF M.E.
College of Natural Science,
University of Illinois
E. G. Rule, Class of 1889.
Notes on The Eutamostracea of Champaign County, Ill.

Although the Eutamostracea are a very important part of the invertebrate fauna when considered from an economic standpoint, yet not very much work has been done upon them in this state. In the Bulletin of the Illinois State Laboratory of Natural History Vol. II, Article V, List of the described species of fresh water crustacea from America, north of Mexico, by Lucien M. Underwood, Ph.D., only ten species are described as having been found in Illinois. Of the ten species given in the report as belonging to this state, six belong to the order Copepoda, namely: Diaoptoma leptopus Forbes, D. hauguioides Forbes, and D. stagnalis Forbes; Aphroditicun labrocinctum Forbes; Cyclops agilis Koch; E. inexpectus Forbes; E. antirrhopus illinoiensis Forbes.
Belonging to the order Cladocera are Daphnia pellucida, P. E. Müller, and D. retrocurva, Forbes. Of the order Phyllopoda are Limnetic gouldii, Baird, and Branchipus serratus, Forbes.

Of these ten species, I found five near Champaign, namely: D. stagnalis, D. sanguineus, Branchipus illinoensis, Branchipus serratus, and Limnetic gouldii. Besides these I found eleven species not given in Underwood's list, namely: Simocephalus vetulus, Daphnia pulex, Bosmina cornuta, B. compressa, macrurum, Pleuroxus denticulatus, Keridophania dentata, Lepidurus polyhemus, and two undetermined species of keridophania, one Alosa and Lepisira, and one Chione.

Article 144. On the food relations of freshwater fishes: a summary and discussion, by S. A. Forbes. Vol 7. of the Bulletin Ill. State Lab. of Nat. Hist. gives other species as having been found in the state. The species given are as follows: Daphnia pulex, D. hyalina, D. retrocurva, Simocephalus vetulus, S. americanus, Keridophania dentata.
Scapholeberis nummaturus; Macrothrix laticornis; Bondina longirostris; Clydorus dilutus; Leptodora delicata; Pterygidae; Aceropyne leucocephalus; Lamptocera macrurus; Eurycreta laevissima; Leptodora hyalina; all three of the Cladocera. Cypria vidua and O. bifasciata of the Exopoda. Cyclopida thomasi; Epicure lacustris, and Buonavolenta of the Aegidae. This makes the total number that have been reported to be thirty-one. I identified twelve species from the neighborhood of Champaign, and found four others which I did not determine. One species of cyclops is in all probability new, for I did not succeed in finding a description of it. It is certain that more species may yet be found by a careful observer in a series of collecting lasting through an entire year, for some are more abundant at one season than at another. Although so very insignificant in size the Eutainoustra are a very close relative to all of the chief food supplies of man, as it shown by the
careful studies published in the Bulletin of the Illinois State Laboratory of Natural History. Volume I and II. The collection of which the present paper is a report were begun Sept. 28, 1887, and continued at intervals up to May 1, 1890. Specimens were found much more abundant in stagnant waters with a profuse growth of vegetation than in clearer running water. However one species was found as plentiful in an old well as in any other place, but the well is situated in the edge of a pond that was overgrown with vegetation but was dry at the time the specimens were taken. Some specimens were taken from clear running water, others from ditches by the Illinois Central R.R., and yet others from the sides of tile drains.

Order, Copepoda.

Anterior segments of the body covered with a carapace, the biramous feet few in number, not exceeding five
pair; single eye present; segments of body well marked, without shell forming reduplication of the skin; abdomen without appendages. Five species were found belonging to this order; two species of Diaptonurus, two of cyclops, and one of leuchothoeaupetra.

Culis Diaptonurus, Westw. Body elongated, six-jointed, first joint a cephalothorax formed by the fusion of the head with one joint of the thorax. Abdomen five-jointed, in female apparently three-jointed; antennae twenty-five-jointed.

Diaptonurus staqualis, Forber. Large and robust, red color. Cephalothorax much larger and longer than either joint of the thorax; body tapers slightly toward abdomen; anterior segment rounded in front; posterior margin of last thoracic segment with a process upon either side bearing a spine; segment ends abruptly. Antennae slender in female; long, but little shorter than cephalothorax, twenty-five-jointed, furnished with short scattered setae; in the male the
the right antenna is modified and has a development of a hooked spine upon the antepenultimate segment. The fifth foot is large, inner ramus in female slender, two-jointed; the terminal joint with two plumose setae longer than ramus; terminal segment twice as long as basal, the two reaching to end of basal segment of outer ramus. Outer ramus three-jointed, basal segment longest, second segment short, bearing one plumose and two subdeltoid spines; first smooth spine is attached to the segment just above the process bearing the other two spines; the plumose spine is twice as long as the other two. Terminal claw of ramus almost straight, biserate. Abdomen very small as compared with the body, short, slender, stylets short sub-elliptical, almost as broad as long.

The measurements of one specimen are as follows:

- length of body 2.8mm
- length of abdomen 1.94mm
- total length 3.94mm
- length antennae 2.4mm
- length cephalothorax
1.2 mm.; depth of same 1 mm.; anal setae female. 3 mm.; length fifth foot 2.5 mm.; greatest width body first segment 1.8 mm.; width last thoracic segment at posterior margin 1.5 mm.; width abdomen 4 mm.; length caudal styles 1.8 mm. Found in pond southeast of Urbana in early spring and at the same time with *D. sanguineus*; also taken from ditch by I. C. R. R. north of Champaign in company with *Cyclophor*, *Dinosephalus*, etc. April 7, 1870.

*Oxycoterus sanguineus*, Forbes. Body largest in front of the middle, tapering slightly towards abdomen, much larger and longer than abdomen; head rounded in front; margin of last thoracic segment with process bearing a large spine and a smaller one; body terminates abruptly. Antennae twenty-five-jointed reaching beyond the body, slender in female; the right antennae in male modified to form a clamping organ by the modification of some of the segments and the development of others with the addition of spines. Abdomen five-jointed, but only three
joints apparent in female because some are fused
together, much smaller than body; caudal setae long,
blender; setae long. Fifth foot large, binocular; inferior
ruman in female one jointed, with short setae at tip,
replaced near end of first segment of outer ruman, length
0.8 mm; outer ruman three jointed, basal segment as
long as other two segments, 0.74 mm; terminal segment
with two short and one long spine on outer side of ruman;
terminal claw slightly curved, very finely bicornate.
The following measurements are given to show the
proportion of the various parts:—Length body 1.34 mm;
abdomen 0.74 mm; total body and abdomen 1.57 mm; antenneae
1.43 mm; stylet 0.12 mm; caudal setae 0.37 mm; fifth foot 0.22 mm;
first segment of body 0.24 mm. Specimens were taken
in early spring with D. stagnalis, and from a ditch
by the I.C.R.R. April 7, 1873. They are very much like
D. stagnalis in shape, color, and general appearance; the
principal difference are in the smaller size and greater
the greater length of the antennae of _O. sanguinolentum_,
and the shape of the process on the last thoracic segment; the styli of the
ancus _Cyclops_, Müll. Body ovate more robust
than abdomen, composed of basal cephalothorax and
four segments; abdomen four-jointed. Without a heart,
mostly fresh-water animals. First pair of antennae
many-jointed, seldom longer than cephalothorax; second
pair of antennae four-jointed.

_Cyclops sp._ Body oval; thorax large, abdomen slender;
body widest at posterior margin of cephalothorax. Antennae
eventen-jointed reaching to base of first segment.
Formula: ___________. Styli long, slender; setae
plumose, two inner long, outer of the two long setae about
two thirds the length of the inner; lateral setae not far
from end of styli. Fifth four two-jointed; basal joint
very broad bearing a long seta; terminal joint cylindrical.
bears one long seta, and a short spine near end of segment.
Fourth foot: - Terminal segment - two outer lateral spines, two terminal spines and setae, three inner lateral setae: - inner ramius, terminal segment - one outer lateral spine, two long and two short terminal spines, two inner setae. Third foot same as fourth except there are three inner setae on terminal segment of inner ramius.
Second foot: - outer ramius, terminal segment - two outer lateral spines, one short two long terminal spines and one ace terminal setae, three inner lateral setae: - inner ramius, terminal segment - one long one short outer lateral spine, two long two short terminal spines, three inner setae.
First foot: - outer ramius, terminal segment - two outer lateral spines, one terminal spine and two setae, two inner setae: - inner ramius, terminal segment - one lateral outer spine, three terminal spines, three inner setae.
Measurements of one specimen are as follows: length body 1.3 mm; first segment 0.2 mm; width body 0.43 mm; antennae
.52 mm; abdomen 5 mm; stylet 17 mm; caudal rētā 5 mm

This species corresponds in most respects to *Cyclops vivianii*, Fisher, but it is not so large. Whether it is a small variety of this species or not I do not know.

*Cyclops sp.?* Body robust, oval, 74 mm long; 37 mm wide; abdomen short, slender; last segment with minute teeth on margin; stylet long, slender; caudal rētā four, two long, two short; all but outer barbed; inner rētā short; second pair inner side a third larger than the others long rētā; long rētā not barbed toward base; outer rētā with very short spine at base; a short smooth spine a little distance from tip of stylet; short rētā on dorsal side of stylet near base of longest caudal rētā. Antennae eleven jointed; formula ————; five long one short rētā at tip of antennae; other pair of antennae four jointed with one short and five long rētā at tip.

Fifth foot two jointed, basal joint broad rounded, long rētā on terminal segment of outer ramus, one of equal
length of inner ramus; second segment of outer ramus little longer than broad, bearing setae on a short columnar process at end of segment.

Fourth foot; outer ramus is heavier and some shorter than inner ramus; first and second segments of outer ramus nearly equal in length and width; terminal segment two thirds length of other two, armed on outer side with two lateral spine, tip with two large spines, a very small spine and one seta. Seta slightly longer than longest spine; inner side with three setae; terminal segment of inner ramus slender, same length as terminal segment of outer ramus; one seta on outer side, two on inner, two long spines between two very short spines on tip.

Third foot; terminal segment of outer ramus with two outer lateral spines, three inner lateral setae, two long two short spines and one seta on tip. Outer ramus little shorter than inner, heavier. Terminal segment inner ramus same
length as terminal segment of outer rami, with a lateral seta having a very short spine at base; three inner lateral setae; two long spines between two short ones at tip.

Second foot: Outer rami very little shorter than inner; terminal segment of outer rami tapering from incision of first inner seta toward tip; armed with two outer lateral spines; three inner lateral plumose setae; three spines and one seta on tip, one short spine with a long bar on either side the inner being longer than the outer. Terminal segment of inner rami with one outer lateral spine; two long spines between two very short ones at tip; three inner lateral setae; lower margins of fifth two segments in both rami finely serrate.

First foot: Inner rami longer than outer; terminal segment stout; with one outer lateral seta; three inner lateral setae; one long and one short spine and one seta on tip. Terminal segment slightly longer than either of the other two.
Terminal segments of outer margin short, stout, outer side with one short and two long spines; two inner lateral setae; two setae, one long and one short apical on tip. Some measurements are as follows:

- Length body: 74 mm; width: 37 mm; length abdomen: 33 mm
- Width: 11 mm; length stylet: 12 mm; width: 0.37 mm
- Length caudal setae: 7.6 mm; second largest: 3.3 mm

I found no described species that appeared to be the same as this one; for this reason I believe it to be new. Although I believe this to be a new species, yet I am not sure enough to describe and name it as new. Specimens were taken in the spring of 1890 from Crystal Lake in Urbana.

Genus Xanthocephalites, Westwood.

Body five-jointed, first joint formed by the fusion of the head with the first joint of the thorax; each segment has at least one pair of appendages. First pair of
antennae short, six to nine jointed, second antenna two jointed. Abdomen not sharply marked off from body, five jointed, first two joints fused in female.

**Canthocampius illinoensis**: Small without much difference between the size of body and abdomen; body and abdomen about equal length. Head and first thoracic segments fused into a cephalothorax; five segments in body and five in abdomen of male, four in abdomen of female; abdomen tapers toward end; first segment in female largest and longest; abdominal segments invaginate behind, sharply kerrate. Styles oval, each bearing two long retae and other short ones; the long retae unequal; the length of the larger being greater than that of the abdomen. Antennae short, seven jointed in six male eight jointed in female; processes from third joint in male bearing long appendage reaching as far as end of antennae; third joint long, fourth short; long retae at tips of antennae and bristled at various places.
Other pair of antennae two jointed with three long and two somewhat shorter setae on tip; secondary flagellum arising from basal segment, with its setal reach a little beyond end of said segment. Fifth foot two jointed, basal segment sub-elliptical. Measurement of one specimen gave the following results:— length 1 mm.; length of abdomen 45 mm.; caudal setae 7 mm.; antennae 22 mm.; antennae with setae 37 mm.; depth of body 24 mm.; length first segment 23 mm. Color bright red. Specimens were found in very great abundance among algae in a small stream in Urbana April 13, 1870. They were so abundant as to completely hide the algae in patches a foot in diameter giving it a brick dust red color.

Order Ostracoda

Generally very small animals with hard bivalve shells. Seven pairs of appendages which function as
antennae, jaws, creeping and swimming legs. Pediform mandibular palp present. Abdomen short."

Genus Cypria, Müller.

"Valves mostly subcylindrical or elongate oval, horny in texture. Upper antennae seven jointed; lower antennae five jointed. Second pair of jaws smaller than first, in the male prehensile. Postabdominal vacui long and slender bearing at the apex two long and unequal curved claws, and a short seta."

Two species were found but I did not identify either.

Order cladocera.

Body small, laterally compressed; with exception of head enclosed in a bivalve shell. Have two large antennae fitted for swimming, and four to six pairs of swimming feet.

Nine species were found belonging to this order.
are each of the following genera: *Moina*, *Lumaccephalus*,
*Lernoscephalus*, *Daphnia*, *Bosmina*, *Pleuroxus*, *Alona*, *kamp-
tocerus*, and *Cladocer.*

*Genus Moina*, Baird.

The following is very nearly the description given
by Weismann and Glocker: Head prone, separated from
the thorax by a depression; processes obscure; rostrum none;
pigment fleck absent; antennules of the female large,
movable; furnished with a sensitive seta near the
middle, flagelliform; antennules of the male very large,
hooked at the end. The setae of the antennae are all
hoeliate; the tri-articulate manus with five setae; posterior
margin of the valva thicker in the median line; caudal
setae very large, about twice in the length of the anal
arm above the claw, four of the first pair of the male
with a strong hook.

Only a single specimen of this genus was noticed
and it was lost, so that no description could be made.
Genus *Ceriodaphnia*, Dana.

"Resembles *Moina*, post-abdomen is shorter, and its habitus resembles that of *Daphnia*, antennae are smaller, and the shell thick and coarsely reticulated."

*Ceriodaphnia dentata*, Borr. Body rounded, little longer than deep. Shell with simple hexagonal sculpture; not very highly arched dorsally, much arched ventrally; contour irregular, slightly flattened dorsally; deep depression between head and body; no bead; antennules short; shell not spined behind but angled; head long angulated in front of antennules; antennae little over half length of body. Post-abdomen short, thick, truncate, armed with eight teeth. Claws long, with six to eight teeth varying in size, on outer side and also very fine teeth to tip of claw. Formulas broad, rounded.

**Measurements:**
- Length: 10.5 mm; depth: .88 mm; depth of head: .49 mm; length antennae: .65 mm; length of eye: .40 mm; length post-abdomen: .31 mm; width post-abdomen: .13 mm;
length claw 11 mm; length head 20 mm.

Genus *Sinosephalus*, Schödl.

Form quadrate with the lower posterior margin sinuate; head with projection at eye, separated from body by a depression. Post-abdominal truncate, excavated below, broad; and teeth few, large, curved.

*Sinosephalus vetulus*, Schödl. Head rather small, separated from body by a depression, depressed, about two and two thirds in total length, longer than deep, does not extend far beyond eye, arched evenly to point in front of eye where the curve is sharp; the central margin is concave to the short base just at or below the pigment flesh and between the anterior margins of the shell. Pigment flesh very irregular, rhomboidal, generally with an elongation from one angle much smaller than eye. Shell reticulated, lines extending transversely to long axis of body; not very highly arched dorsally, arched ventrally. Short teeth on posterior third of dorsal
arch to lower posterior angle of shell; central margin with hairs. Heavy blunt process instead of spine near middle of posterior margin. Antennae with setae fully two thirds total length of body; maxillae three jointed, four filaments on upper and five filaments on lower maxilla.
Post-abdomen short, broad, widest at ten gradually tapering toward claw, with ten or twelve strong anal teeth. Claw long curved, not spined, with lateral row of five teeth to near middle of claw.
Measurements of one specimen: Length 2.86 mm; greatest depth 1.86; antennae 1.1 mm; proboscis 1.7 mm; total length antennae 1.7 mm; depth of head 1.1 mm; length head 0.71 mm; length claw 2.5 mm.

Very abundant in a pond north of Champaign, with Campiterocerus, Kauthocampitius, Platypteryx, etc. Epilipid females were taken in abundance from a pond south east of Urbana May 15, 1890.
Genui Daphnia, Müller.

"Five pairs of feet. Superior antennae two branched, one branch divided into four, the other into three articulations. Head produced downwards into a more or less pointed beak. Superior antennae exceedingly small, one-jointed, and situated under the beak."

Daphnia pully, Leclerc. Head more strongly arched than body not separated from body by a depression unevenly curved, extending beyond eye a distance equaling width of eye, ventral margin deeply concave, beak long, lying close to anterior margin of body shell and extending ventrally nearly to a line with the ventral margin of the shell, head deeper than long, pigment fleck present, small. Antennae strong, bipartite, each ramus three-jointed, undivided part long and strong, extending to anterior margin of head; outer ramus has four long jointed plumose setae, inner ramus five. Body oval, somewhat deeper in front in old.
Specimens: finely reticulated, lower posterior and ventral margins serrated, unevenly arched, more convex toward the rear than in front in old individuals.

Dorsal spine of various lengths and may be attached to the dorsal posterior angle or as far down as the middle of the posterior margin, finely toothed, anal claw strongly curved, spine at base; has five or six teeth in a row beginning very small at base and gradually increasing in length and size for one third length of claw, beyond which the claw is smooth. Post-abdomen short, slender, wider at top, tapering gradually toward claw, armed with ten or eleven uneven teeth which are larger toward the claws than toward the middle of the post-abdomen.

Measurements of one specimen: total length 2.0 mm; length head 0.34 mm; depth head 0.17 mm; length antennae 0.8 mm; setae of antennae 0.05 mm; total of antennae 1.21 mm.
length post-abdomen .43 mm; anal claw .14 mm; dorsal spine .25 mm; This species was found in great abundance in an old well in the edges of a dry pond southwest of Urbana Sep. 28, 1886.

Genus *Bournaments*, Baird.

"Five pairs of feet; inferior antennae two branched, one branch divided into four the other into three articulations. Head terminating anteriorly in a sharp beak directed straight forwards. Superior antennae long many jointed and projecting from the extremity of the beak."

*Bournaments comuta*; *Baird*. Very much rounded, small; shell greatly arched dorsally, slightly flattened anteriorly, truncate posteriorly, with two short smooth blunt spines at posterior central angle of shell slightly curved upwards; shell not strongly arched ventrally, posterior two thirds of central margin
straight but not parallel with long axis of body; anterior third of ventral margin curved toward the anterior shell margin; body deepest in middle, head deep, short, not marked off from the body by a depression. Anterior pair of antennae large, long, curved outward and backward, with short setae above middle of anterior side. Posterior antennae bibranchi, outer ramus four jointed, bearing long setae at tip. Post abdomen short, broad, equal size whole length, truncate at end; claw long, strong, with three or four stout teeth near middle and very fine one from thence to the tip. In one female the length of the body was .37 mm; greatest depth .29 mm; depth at posterior end .24 mm; depth head .24 mm; length anterior antennae .09 mm; posterior antennae .09 mm; outer ramus posterior antennae .05 mm; length post abdomen .07 mm; anal claw .037 mm; width abdomen .05 mm; length of appendix at posterior ventral angle of shell .02 mm.
young Bovina in shell of parent. 17 mm; another
specimen 37 mm long had a young Bovina 3 mm long
yet in the shell. Specimens were taken from
Crystal Lake.

Genus Clydonia, Zeech.

Clydonia has a "globose form not obviously
truncate behind; head terminating in a sharp, long,
curved beak, which lies close upon the anterior margins
of the shell; antenna short; eye larger than the pigment
fleck; abdomen flattened, excavated in the male."

Clydonia sphacelosa, Baird. Body short, spherical,
flattened behind; form above appears oval, but much
broader anteriorly than posteriorly; shell hexagonally
reticulated on central, posterior, and posterior dorsal
surface; slightly longer than high. Shell very highly
and evenly arched dorso-ventrally, very full in middle of
Central margin somewhat flattened towards the ends more so toward posterior end than toward the anterior. Posterior margin short, nearly straight, greatest depth of shell in middle. Head small, short; neck long, sharp in female, curved inward; antennules moderate in female, large in male; antennae short, with two or three-jointed rami bearing long setae. Post-abdomen short, rather broad, wider in middle and tapers slightly, to the rounded end, is armed on the posterior margin with nine or ten short teeth; claw short, weak, with a basal spine. In male post-abdomen excavated instead of rounded at end.

Measurements of one female: length shell, 44 mm; depth, 40 mm; width anterior end, 34 mm; width middle, 31 mm; length neck, 33 mm; antennae, 12 mm; post-abdomen, 16 mm; width post-abdomen, 0.7 mm; length claw, 0.4 mm.

This species was found in great abundance among the slime and vegetation of a swamp by Crystal Lake.
Not many other specimens were found with them, these being only a few individuals of \textit{Cyclopy, Cleuroxus, Hypris,} and \textit{Simooxiphax}. Taken May 2, 1870, also in limited numbers Sep. 30, 1870.

\textbf{Genus \textit{Kampfoterus}, Baird.}

Shell elongated, longitudinally striate, armed behind with minute teeth; head and back keeled. Post-abdomen long, furnished with a lateral row of scales, narrowed toward end. Terminal claw with a simple basal spine serrate; antennae usually with seven setae.

\textbf{Kampfoterus madurensis, Baird.} Body nearly rectangular, shell striate; deeper in front than behind, dorsal margin involute, posterior slightly convex, finely toothed; central margin serrate, concave in middle, convex at edge. Head small, keeled; not extending the length of body, more strongly arched than body, depressed. Beck blunt, long, extending below nearly to
central line of shell, curved backward, emarginating posteriorly. Eye larger than pigment. Antennae four jointed, reaching below beard. Retract long; total length of antennae and retina about half length of body. Antennae short, reaching nearly to end of beard. Retract twice coiled. Postabdomen long, narrow, tapering toward end; narrow at tip, rapidly increasing to greater width, then gradually tapering to lend. Posterior margin finely toothed. Beak long, slender, nearly straight to near the tip where there is a slight curve; one spine at base; claw provided with wide or few teeth beginning very small near base of claw and becoming larger to a point a little beyond middle of claw beyond which it is smooth.

Measurements of one specimen:—Length, 6 mm. Depth of shell, claw, spine, post-abdomen. Spine, antennae, 6 mm. Total length of post-abdomen and claw equal to depth of body, and a little over one half its length.
The specimens were taken April 19, 1878, from a small pond north of Champaign, that contained much vegetation. They were found in company with Sinuopterus, kathoracipterus, beclops and bypris.

Hence Alnus, Baird.


Alnus epi 2. Body sub-rectangular, considerably arched above, concave ventrally, convex posteriorly, constricted at junction of values, nearly straight anteriorly, slanting on ventral margin. Could not distinguish whether shell is smooth or finely reticulated. Head large, rather flattened dorsally; beak blunt, nearly straight, reaching almost to a line with the ventral margin of shell.
Eye twice as large as the pigment fleck. Greatest depth of body near middle; arch even from central posterior angle to head. Antennae bidentate; same three-jointed, first segment length of other two; spine at base of second segment of inner ramulus, two thirds distance from base; spine and long jointed setae at tip of ramulus. Post abdominal about broad; posterior margin incurved with sharp angle one half distance from end; very fine teeth one angle to one third the distance from the end where the post abdominal is armed with large teeth about twice or ten in number, lateral row of six or eight hairs or weak spines; teeth some larger toward end of abdomen. End of post-abdomen truncate or rounded, claws not greatly curved, with one strong spine at base.

Measurements: Length 3.3 mm; depth 2.9 mm; antennae 0.8 mm; post-abdomen 1.3 mm; claw 0.8 mm; width 2 post-abdomen. On the ventral side of antennae, 1.5 mm; length head 1.2 mm. Only one species
was found.

*Helena Cleropis, Bivalv.
Shell strongly convex dorsally, striated or reticulated, break long, labiate, curved backward or forward;前侧内面窄, 后方后部的角状突起尖端, 前方角状突起前端尖端, 中央下侧角状突起前端尖端, 后方角状突起前端尖端。Shell hard, usually two spine and may be serrate.

*Plumaria deuterocline, Birge: Shell oval, dorsal margin highly arched, ventral margin very greatly arched toward the front but flattened from middle backward, posterior end truncate narrow, shell much deeper in middle than at end. Break long, sharp, pointed downward, slightly curved backward. Central margin of shell fringed with setae, anterior margin toothed, ventral posterior angle armed with
three or four short teeth. Postabdomen rather long, slender, broadest at middle, armed on posterior margin with teeth, truncate or concave at end. Audial claws long, slightly curved, with two spines at base. Antennae three jointed, pani short, setae long, total antennae and setae about one third length of body.

One specimen gave the following measurements:

- Length of shell: 32 mm
- Depth: 28 mm
- Depth at posterior end: 25 mm
- Length base: 12 mm
- Postabdomen: 22 mm
- Claws of...

Specimens were found in Crystal Lake creek in Urbana above and below the dam, among algae. They were taken Sep. 30, 1887.

Order Phyllopoda.

"Body usually six feet covered by a large carapace forming two valves in the lower form. Two pairs of antennae, a pair of mandibles, and two pairs of maxillae, and in Opodidae a pair of maxillipeda. Feet broad and
leaf-like. Abdomen not clearly differentiated from the thorax and the abdominal feet are not different in shape from the thoracic appendages. Body segments vary from seventeen in Zunuccites to sixty-three in Saphe. Eyes sessile or united in a single mass or stalked.

Lunae Zunuctites, Loren.

"Carapace bivalved, nearly spherical, oval, smooth; no beaks or umbones. Head large, the front bearing the head enormous, and produced into a very large rostrum. Eyes small. Antennae short."

Zunuctites gouldii Baird. Only a single specimen was taken; found in a pond south-east of Urbana.

Lunae Branchipurus Schäffer.

"Body large and very stout; head large; male claspers elbowed large and thick, complex, varying much in form. Head of male with a pair of frontal appendages hanging"
down between the male claspers, and varying much in form. Body soft without a carapace, head small, eyes stalked; eleven pairs of feet. A specialized abdomen with eight or nine segments, not bearing appendages."

Branchipus serratus Forbes. Only a single specimen of this species was taken, in the spring of 1870.