ERRATA.

Page 12, lines 16 and 17, for *one* hundred read *three* hundred and for *one thousand* read *six hundred.*

Page 17, line 2, dele first letter in the line.

Page 168, line 12, page 177, lines 13 and 14, and page 271, line 10, for *Lemna trisulca* read *Spirodela polyrhiza.*

Page 209, line 2 of foot-note, after *but* insert *represents.*

Page 256, line 7, and page 266, line 19: *snowi* n. s. has been shown to be *hieroglyphica*, ♂.

Page 257, insert as line 8 as follows: -ken to the office produced young in ten days. The

Page 272, line 13, for *P. biguttatus* read *Pompilus biguttatus.*

Page 278, Plate V., 16, after *view* insert as follows: *a*, mentum; *b*, labial rudiment; *c*, maxillary palpi; *d*, maxilla; *e*, labrum; *f*, antenna; *g*, eye; *h*, mandible.

Page 286, line 11, drop initial *the* one line.

Page 386, line 1, for *Comstocki* read *Comstock.*

Page 399, line 17, for *specimens* read *specimen.*

Page 411, line 10, for *Michaelson* read *Michaelsen.*

Page 441, line 3 from bottom, for *66* read *68.*

Page 445, line 10 from bottom, for *57* read *58.*

Page 466, line 1 from bottom, for *Cypria* read *Cypris.*

ARTICLE XV.—*Contribution to a Knowledge of the North American Fresh-water Ostracoda included in the Families Cytheridæ and Cyprididæ.* By RICHARD W. SHARPE, B. S.

INTRODUCTION.

The present paper has been prepared in the course of work at the University of Illinois for the degree of master of science in zoölogy. In addition to extensive collections of Entomostraca made at the Biological Station of the University of Illinois, situated at Havana, on the Illinois River, I have been able, through the kindness of Dr. S. A. Forbes, to examine all the accumulations in this group made by the Illinois State Laboratory of Natural History during the last twenty years, and covering a territory little less than continental. The greater part of the material studied is from the rivers, ponds, and lakes of Illinois and immediately adjacent states, but at least a cursory examination has also been made of collections from the Yellowstone National Park and from the lakes of northwestern Montana.

Although the Ostracoda of Europe have now been extensively studied, but little work has been done upon this order in America. Prof. C. H. Turner, of Clark University, Atlanta, Ga., has, however, paved the way for American students in this field (**35**, **62**, **63**, and **64**), and scattered descriptions occur in the writings of some others. The earlier practice of distinguishing species by characters derived from the shell alone has had the effect to surround the study of this group with extraordinary difficulties and greatly to complicate the synonymy. More recently much use has been made of the structure of

the soft parts of these Crustacea, with the result to add several new genera, mostly described by Prof. G. O. Sars. For the convenience of students who follow me I have thought it best to embody synopses of all these genera in the text.

Of the twenty-two species herein mentioned fourteen are new to America, and twelve I believe to be undescribed. Two of these species belong to the genus Limnicythere and to the family Cytheridæ, itself new to America.

It is a pleasure to me to say that whatever value this work may have is due in great part to the kind encouragement I have received from Dr. Forbes, and to his generosity in providing both material and literature for my use.

LIFE HISTORY AND HABITS.*

Unlike the other groups of Entomostraca, most of which, independent of shores or bottom, swim easily and continuously throughout the waters they inhabit, the Ostracoda commonly occupy a more restricted range in small and shallow waters, or along the bottoms and margins of large lakes and streams. With them, the act of swimming is more laborious because of the structure of the animal and the weight of the shell. In collections of the limnetic plankton, therefore, they are either wanting, or present only in relatively insignificant numbers. In consequence of the temporary nature of the small bodies of water in which they are usually found, they are much more frequently observed during the spring months. At this time, in a little short-lived wayside pool or ditch vast numbers may make their appearance, soon to disappear with the drying up of the water. They may also be seen in such situations in the fall. They thrive in both clear and turbid waters, either in the midst of aquatic vegetation or on a bare mud bottom. Most of

* The text and tables under this head were prepared by Mr. C. A. Hart.

them are scavengers, though some species feed upon minute aquatic vegetation, such as diatoms and filamentous Algæ.

Ten of the species and both of the families herein treated were represented in collections of the Biological Station from the region covered by its operations in the vicinity of Havana. The collections examined were partly surface, bottom, and oblique tows taken with a fine towing net in the deeper and more open waters, and partly catches with the towing net or Birge net from among the vegetation along the gently-sloping shores.

In the first table following, the distribution of each species is shown with regard to the various collecting substations, which are grouped according to their general character. Full descriptions of these localities may be found in a previous article of this volume.* The total number of collections examined from each substation is given immediately beneath the letter designating the substation. The lower, larger number of each pair in the table indicates the relative abundance of the species, on the scale of 5, 1 meaning rare, and 5, excessively abundant. The smaller numbers above these show the number of collections in which the species appeared.

It will be seen that in the off-shore collections the first three genera (Limnicythere, Cyprinotus, and Candona) do not appear at all, while the last two (Cypria and Cypridopsis) appear a number of times. This indicates a difference in habits, and does in fact correspond to a decided difference in structure. The members of the second group possess well-developed swimming hairs or natatory setæ, and appear not only in the bottom tows but in the surface tows also, even in the river channel at station E.

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* Article VI., p. 151.

TABLE OF LOCAL DISTRIBUTION.

The upper figure of each pair shows the number of times the species was found, and the lower figure its relative abundance: 1, rare; 2, infrequent; 3, common; 4, abundant; 5, excessively abundant.

		Off-shore Collections.													Shore Collections.												Grand totals.
		Surface Tows.							Bottom Tows.						Sandy	Muddy.											
		River...	Lakes.				Mill-pond...	Totals.....	River...	Lakes.			Mill-pond...	Totals.....	Lake.	Lake.					River.			Miscellaneous.	Totals.....	
																Springy	Not springy.										
Substations.....		E.	C.	G.	L.	K.			E.	C.	G.	L.			G.	B.	C.e.	A.	C.w.	F.	D.	E.w.	E.e.				
Collections examined.....		52	5	8	8	1	1	75	45	7	8	9	1	70	12	7	32	6	10	5	14	12	1	6	105	250
Limnicythere illinoisensis..															1 1										1	1
Cyprinotus pellucida.....																								2 1 Roadside pool.	2	2
Candona..	simpsoni.....														1 2		4 3				3 2	1 3			9	9
	sigmoides.....														1 2			1 2			1 1				3	3
	reflexa.....																4 1								4	4
Cypria....	pustulosa.....						1 1	1	2 2	1 1				3		1 2	6 2				1 1	1 1			9	13
	obesa.....														1 2										1	1
	exsculpta.....								1 1					1	1 1		5 2					1 1		1 2 Johnson's L...	9	10
	ophthalmica....	1 2		1 1		1 1		9	2 2		1 2			3	1 3	1 2	4 3			1 1		1 1	1 3		9	21
Cypridopsis vidua.....		1 2		1 1	1 2	1 1		4		2 2	2 3	5 2		9	7 2	2 2	15 2	3 2	3 2		1 2	2 2		1 3 "Slough".....	37	50

TABLE OF SEASONAL DISTRIBUTION.

(For explanation see preceding table.)

			Feb.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Collections examined.	Off-shore Collections		1	0	0	3	29	33	41	20	8	10	145
	Shore Collections		2	3	28	6	12	23	14	5	6	6	105
	Total examined		3	3	28	9	41	56	55	25	14	16	250
Relative abundance; and number of times each species was collected.	Limnicythere illinoisensis				1 **1**								1
	Cyprinotus pellucida								2 **4**				2
	Candona...	simpsoni		1 **4**	5 **3**					2 **1**	1 **1**		9
		sigmoides			2 **2**					1 **1**			3
		reflexa		1 **1**	2 **1**						1 **1**		4
	Cypria.....	pustulosa			6 **2**		3 **1**	3 **1**	1 **2**				13
		obesa			1 **3**								1
		exsculpta		1 **1**	6 **3**		1 **2**			2 **1**			10
		ophthalmica	1 **1**	1 **1**	5 **3**	1 **2**	1 **1**	2 **3**	9 **2**	1 **1**			21
	Cypridopsis vidua		1 **2**	1 **2**	8 **3**	1 **2**	4 **2**	12 **3**	9 **3**	8 **3**	3 **2**	3 **3**	50
	Totals		2	5	36	2	9	17	21	14	5	3	

In the second table, the same data are grouped with regard to the time of year, the figures having the same meaning as in the preceding table. The rise in abundance in spring is quite evident, and probably would be more so if the earlier months were better represented. The first three genera (Limnicythere, Cyprinotus, and Candona) are absent during the summer months, reappearing in fall in lesser numbers. The remaining species (Cypria and Cypridopsis) are more uniformly distributed through the year. As they seem more at home in larger bodies of water, while those of the preceding group are accustomed to live in small ponds and streams which often dry up in midsummer, this difference would naturally be expected.

A full list of the species treated in the following pages, accompanied by biological data, is next given for comparison. Unless otherwise specified, the data given are from the records and collections of the State Laboratory. The relative abundance is indicated by a figure, as in the preceding tables.

The entire absence of species of Cypris from the Biological Station list is doubtless due to their occurrence in small ponds in preference to larger bodies of water, such as the lakes and streams of the Havana region.

Family Cytheridæ.

Limnicythere reticulata n. sp. Pond, Urbana, April, (2).

illinoisensis n. sp. Lake shore, Havana, May, (1). These species are evidently crawlers or burrowers rather than swimmers.

Family Cyprididæ.

Cyclocypris forbesi n. sp. Pond, Bloomington, April.

Cyprinotus pellucida n. sp. In water from creek, Urbana, April; roadside pool, Havana, Sept., (4); creek near Quincy.

burlingtonensis Turner. Jan. and March (Turner); Normal, May.

incongruens Ramd. Abundant in pools in spring (Vávra); Pt. Pinellas, Fla., May.

Cypris reticulata Zadd. Ponds, Normal, Feb., (2), and April, (5); Cypress swamp, Ky., Sept., (1).

fuscata Jurine. Pond, Urbana, April.

testudinaria n. sp. Pond in woods, Bloomington, April.

Candona acuminata Fischer. Pond, Clifton, May, (2).

recticauda n. sp. Pond, Clifton, Feb.

simpsoni n. sp. Lake and river shores, Havana, April, (4), May, (3), Oct., (1), and Nov., (1); pond, Urbana, April, (3).

fabæformis Fischer. Abundant in March and April in small pools (Vávra); pools, Normal, March; August (Turner).

sigmoides, n. sp. Lake and river shores, Havana, May, (2), and Oct., (1).

reflexa n. sp. Lake shore, Havana, April, May, and Nov., (1).

Cypria pustulosa n. sp. Bottom tows in river channel, surface and bottom tows in lakes, and lake and river shores, Havana, May, (2), July, (1), Aug., (1), and Sept., (2).

obesa n. sp. Lake shore, Havana, May, (3).

dentifera n. sp. Zoölogical Gardens, Cincinnati, O., Aug.

exsculpta Fischer. Common in most running streams. Bottom tow in river channel, lake and river shores, Havana, April, (1), May, (3), July, (2), and Oct., (1); ponds, Clifton, Feb. and May, (3); Normal, May; shore of L. Minnetonka, July, (1); Fourth Lake, Aug., (1).

ophthalmica Jurine. Surface and bottom tows in river channel, (2), surface and bottom tows in lakes, and lake and river shores, Havana, Feb., (1), Apr., (1), May, (3), June, (2), July, (1), Aug., (3), Sept., (2), and Oct., (1). A scavenger and active swimmer (Vávra). Common in ponds and ditches where there is little or no vegetation (Brady). Pools, Normal, March, (4); shore of L. Minnetonka, July, (1).

Cypridopsis vidua O. F. Müller. This cosmopolite seems to occur quite uniformly in all kinds of waters and at all seasons.

smaragdina Vávra. Ditch entering Calumet R., Aug., (2); found in July and August (Vávra).

SYNOPSIS OF FAMILIES TREATED IN THIS PAPER.*

1 (4). Second antennæ simple, subpediform, geniculate, clawed at the apex, not very unlike the upper antennæ; both pairs of antennæ bearing long setæ and adapted for swimming, or shortly setose and not used for swimming. Mandibles distinct, mostly strongly toothed at the lower extremity; palp of moderate size, bearing a more or less developed branchial appendage. First pair of maxillæ bearing a large branchial plate. Mostly fresh-water forms.

Tribe PODOCOPA.

2 (3). Three nearly similar pairs of feet, all directed downwards and used for locomotion. Caudal rami obsolete, forming two rounded setiferous lobes. Antennæ very little adapted for swimming.

CYTHERIDÆ.

3 (2). Two dissimilar pairs of feet; the anterior pair ambulatory, the posterior pair not used for locomotion, bent backwards within the valves. Caudal rami commonly well developed, mobile, and bearing two terminal claws. Antennæ commonly with natatory setæ. CYPRIDIDÆ.

4 (1). Second antennæ two-branched; one branch rudimentary, immobile, the other elongate, flexible, with long natatory setæ (Myodocopa); or both branches well developed, movable, and natatory (Cladocopa); or both branches flattened, similar to the feet of the Copepoda (Platycopa). *Marine tribes.*

* Modification of a key prepared by Brady (6).

Family CYTHERIDÆ.

"Shell mostly hard, calcareous, usually with an uneven surface either sparingly clothed with hairs or altogether bare; hinge generally toothed. Eyes more or less separated, sometimes wanting. Antennules subpediform, geniculate at the base; five- to seven-segmented; beset with short setæ which are partly spine like. Antennæ strong, pediform, curved, four- or five-segmented, with two terminal claws; basal segment bearing a long setiform biarticulate flagellum, which conveys a duct from a poison gland; second segment destitute of a setose brush.

"Mandibles usually strong, enlarged and toothed at the apex; palp well developed, directed forward, and bearing on the posterior margin strong curved setæ and a poorly developed branchial appendage. First pair of postoral appendages more or less maxilliform; the three following alike, pediform, directed downwards, adapted for walking. One pair of branchial laminæ attached to the maxillæ. Caudal rami obsolete, forming two rounded setiferous lobes. Copulatory organs of the male large and complex; in addition to which there is a curious bifurcate appendage between the feet of the first pair; ovaria and testes not produced between the valves; no mucous gland. Animal incapable of swimming."—G. O. Sars.

I am not aware that representatives of this family have heretofore been reported for America. Of the dozen or more genera belonging to this family, but one (Limnicythere) seems to be purely a fresh-water genus.

I. Limnicythere Brady.

1850. *Cythere*, Baird (**2**, p. 163).
1868. *Limnicythere*, Brady (**6**, p. 419).
1878. *Acanthopus*, Vernet (**72**, p. 516).
1888. *Limnocythere*, Dahl (**20**, p. 615).
1889. *Limnicythere*, Brady & Norman (**9**, p. 170).
1891. *Limnicythere*, Vávra (**68**, p. 107).

Shell strong, irregularly tuberculate or spinous, rather thin and horny in texture; extremities yellowish or hyaline.

The first pair of antennæ five-segmented, provided with short bristles on their outer edge; second pair four-segmented, the "spinning claw" being either two-segmented or unsegmented. The branchial plate of the mandible strongly developed (commonly rudimentary in other genera of this group). Caudal rami rudimentary, commonly but two short bristles.

Males are rare. Previous to Vávra's monograph (**68**) but five species were known: *L. sancti-patricii* B. & R.; *L. monstrifica* Norman, from England; *L. inopinata* Baird, from England and Sweden; *L. relicta* Lillj., from Sweden; and *L. incisa* Dahl, from Germany. Vávra (**68**) adds *L. stationis* as new, and Zschokke (**76**) has recently described *L. neocomensis* from Switzerland. I have found two species which presumably are not yet described.

Limnicythere reticulata n. sp. (Pl. XXXIX., Fig. 1–7.)

A small form, .66 to .73 mm. in length, .35 mm. high, and .25 mm. broad; grayish white. Shell sparsely hairy at the anterior and posterior ends; conspicuously marked with a honeycomb-like network of polygonal reticulations (Fig. 1 and 2), which are somewhat similar to those of *L. sancti-patricii and L. illinoisensis*, but with lateral furrows which serve at once to distinguish it from these species. The upper anterior part, in the neighborhood of the eye, is nearly free from reticulations, marking the position of a lateral depression which is deepest near the middle of the shell, becoming shallower anteriorly.

Seen from the side (Fig. 2), the shell is evenly and gradually rounded at both ends; dorsal margin straight, the ventral sinuate, the deepest part slightly anterior to the middle; posterior part somewhat broader than the anterior.

Seen from above, the shell is sharply and narrowly pointed anteriorly, broadening quickly and then suddenly contracting to broaden again slightly, so that it is widest back of the middle, from which it slopes gradually to the somewhat bluntly pointed posterior part.

Seen ventrally (Fig. 1), the lateral depressions show to greater advantage, appearing as two constrictions; one just posterior to the middle, the other considerably anterior to it.

Muscle impressions (Fig. 2) four, elongate-oval, situated at the bottom of a circular lateral depression, their longest axes parallel to that of the shell and to one another.

As with *L. neocomensis* and *L. stationis*, the first antennæ (Fig. 5) have a long, narrow terminal segment about seven times as long as wide, armed apically with three equal setæ, one of which is cleft apically for about a third of its length, having the appearance of a "sense seta," the inner branch being about half the length of the outer. In other respects the antennæ are the same as in other described species.

The second antennæ seem armed in no especial way. The three terminal spines are strong, plain, and much curved, the two longer being equal in length and four times the length of the apical segment; the other, seta-like, and about an eighth shorter. "Urticating setæ" two-segmented, reaching to the middle of the terminal spines. All of the inner setæ blunt and spine-like.

The palp of the mandible is short and plump. Maxillæ not especially armed in any way; outer edge of the base smooth.

The first of the three pairs of feet is the shortest, the others increasing in length in regular order backwards. All are armed similarly, with a few slight exceptions. The terminal claw of the first foot is slightly longer than the last two segments taken together; the spine-like seta on the inner apical edge of the second segment

is two fifths longer than the third segment; third and fourth segments of equal length. Terminal claw of third pair as long as the united lengths of the last three and a half segments (Fig. 6); antepenultimate segment as long as the last two segments, the spine-like seta on its inner distal edge of the same length; width of basal segment one fourth its total length; two spine-like setæ on its lower inner edge, the distal seta twice the length of the other.

Rudimentary caudal rami (Fig. 3) cylindrical, thick, blunt, about three times as long as wide, with a small seta near base, not over two thirds as long as the width of the ramus, and a stouter one near the tip of the ramus, twice as long as the preceding one.

The posterior dorsal part of the carapace (Fig. 7) tapers to a spine-like point, and upon the dorsal aspect there are several rows of tooth-like notches.

Described from several specimens taken from a small pond (Hedges' Pond) south of Urbana, Ill., April 10, 1896. A number were raised from mud taken from the bed of the pond.

Limnicythere illinoisensis n. sp. (Pl. XXXIX., Fig. 8–13; and Pl. XL.)

A medium-sized species, .88 mm. long, .40 mm. high, and .29 mm. wide; dark grayish white. A few scattering hairs on the surface of the shell, which is rather inconspicuously marked on its entire surface with polygonal areas, which are, however, very faint compared with those of *L. reticulata*. With a high power these areas are found to be filled with small elongate-oval to quadrangular granules (Pl. XXXIX., Fig. 9).

Seen from the side (Pl. XXXIX., Fig. 8), the shell is evenly and gradually rounded at both ends, the dorsal margin straight, the ventral deeply sinuate, the deepest part at the anterior third, just below the muscle impressions. (In *L. reticulata* the deepest part is just pos-

terior to a vertical line passing through the muscle impressions.) The posterior part is considerably broader than the anterior.

Seen from above, the shell is sharply and concavely pointed anteriorly, then quickly broadens and remains of the same width nearly to the posterior end, which is convexly and bluntly pointed. There is a constriction or sinus (Pl. XXXIX., Fig. 13) just in front of the middle, which, in the position indicated in Fig. 1, Pl. XL., is seen to be double. The deeper sinus is just anterior to the middle and above the muscle impressions. Anterior to this is a small conical elevation separating it from another smaller sinus or constriction from which the surface slopes quite quickly to the anterior part.

The radiating hairs of the anterior and posterior parts are more abundant than in *L. reticulata*, and resemble those of *L. neocomensis*. The anterior hyaline flange is three times as wide as the posterior one. (Pl. XXXIX., Fig. 8.)

Muscle impressions four, elongate-oval, situated at the bottom of a circular depression just anterior to the middle of the shell and just above the deepest part of the ventral sinus, their long axes parallel to that of the shell. There are two or three similar depressions in the same vicinity.

Terminal segment of the first antennæ (Pl. XL., Fig. 6) four times (in female) or five times (in male) as long as wide, armed apically with three setæ, the terminal one of which is divided apically as a "sense seta" and is once and two thirds the length of the segment; the other two equal, and one fourth longer than the segment. The penultimate segment is a fourth longer than the last one, while the antepenultimate is but half as long as the penultimate. The one preceding this, and also the basal segment, are ciliated along their inner edges (Pl. XL., Fig. 6).

The second antenna of the male differs from that of

the female in that the terminal claw is armed with three or four strong teeth at tip (Pl. XL., Fig. 5). The basal part of the penultimate segment has two circles of hairs, as has also the antepenultimate segment, which is two sevenths the length of the penultimate. "Urticating seta" two-segmented, reaching to the middle of the terminal spine; all the inner setæ blunt and spine-like, as in *L. reticulata.*

Maxillæ and mandibles not especially different from those of other members of the genus.

Feet of first pair (Pl. XXXIX., Fig. 11) shortest, armed like those of the second.

Basal segment of second pair faintly ciliated exteriorly near the base; penultimate segment slightly longer than the last, both together equaling the antepenultimate; terminal claw nearly equal to three preceding segments, and in male with two or three accessory teeth near the tip (Pl. XL., Fig. 3).

Feet of third pair (Pl. XL., Fig. 4) in the male with an unusually long terminal seta,—as long as the united segments of the foot,—faintly cross-striated on its distal half, its place of attachment surrounded by a circle of cilia, as is also the joint between the last and penultimate segments; the last two segments together equal to the antepenultimate, which has on its inner distal edge a plumose seta as long as the segment; basal segment somewhat triangular in shape, three times as long as wide.

Rudimentary caudal rami (Pl. XXXIX., Fig. 12) cylindrical, six to seven times as long as wide, gradually tapering to a seta-like extremity which is five sevenths as long as the main part of the ramus. Two dorsal setæ: one situated about the width of ramus from base and as long as the width of the ramus; the other just anterior to the seta-like termination, and about the same length as the first. The male sexual grasping organs are unusually well developed and as shown in Pl. XL., Fig. 2.

Described from specimens found at the Biological Station in a shore collection made at Thompson's Lake (Station G), Havana, Ill., May 26, 1895.

Family CYPRIDIDÆ.

"Shell generally thin and horny; valves equal or but slightly unequal in size, surface usually smooth or simply punctated; ventral margins more or less sinuated; hinge margins edentulous. Eyes simple, usually confluent, sometimes wanting. Antennules (first antennæ) slender, usually seven-jointed, very flexile, usually provided with a number of long hairs forming a dense brush. Antennæ (second antennæ) pediform, geniculated, four- or five-jointed, clawed at the apex, second joint mostly bearing an apical brush of hairs.

"Mandibles strong, apex strongly toothed, palp four-jointed, with a setiferous branchial plate at the base. Two pairs of maxillæ, the first pair four-digitate, its external branch distinctly two-jointed, bearing a large setiferous branchial plate; second pair small, composed of a single prehensile lobe and a palp which in the female is generally simple, rarely pediform, and in the male prehensile. Two pairs of feet dissimilar in structure, the anterior pair strong, ambulatory, directed downwards and having a long curved apical claw; posterior pair bent backwards within the shell, and not used for motion. Caudal rami usually well developed, elongated, very mobile, and bearing two or three apical claws. Intestine forming two dilatations, of which the anterior is provided with cœcal appendages. Generative organs large, and of complex structure, and partly extended within the valves; in the male frequently a complex whorled sac connected with the testis; copulatory organs symmetrical, and of moderate size."—Brady and Norman.

I have thought it well to insert all the genera of good workers in the following key, knowing that further usage will best determine their validity

ANALYTICAL KEY TO THE GENERA OF CYPRIDIDÆ.*

1 (13). Second pair of feet ending in a cylindrical segment with two backwardly directed setæ.

2 (3). Second pair of feet in both male and female six-segmented. Second pair of maxillæ without a branchial plate. I. NOTODROMAS.

3 (2). Second pair of feet in female five-segmented, in male six-segmented.

4 (7, 8) Branchial plate of second pair of maxillæ rudimentary, in the form of two feathered setæ.

5 (6). Eye present. VIII. CANDONA.

6 (5). Eye absent. IX. TYPHLOCYPRIS.

7 (4, 8). Branchial plate of second pair of maxillæ developed, in the form of three feathered setæ. X. CANDONOPSIS.

8 (4, 7). Branchial plate of second maxillæ with six feathered setæ.

9 (10). Palp of second maxillæ rudimentary. XI. ILYOCYPRIS.

10 (9). Palp of second maxillæ normally developed.

11 (12). Terminal segment of second pair of feet one fourth as long as fourth segment. XII. CYPRIA.

12 (11). Terminal segment of second pair of feet two thirds as long as fourth segment. II. CYCLOCYPRIS.

13 (1). Second pair of feet ending in a beak-shaped segment with one backwardly directed claw.

14 (15, 16). Caudal rami rudimentary, flagellum-like. XIII. CYPRIDOPSIS.

15 (14, 16). Caudal rami somewhat rudimentary, small, lamellar, terminating in a long seta, and having a much shorter one, placed dorsally at some distance from the tip. XIV. POTAMOCYPRIS.

16 (14, 15). Caudal rami cylindrical, ending in two claws.

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*A modification of Vávra's Key (68, p. 31).

17 (18). Natatory setæ of the second antennæ well developed, plumose, reaching considerably beyond the terminal claws. Anterior and posterior ventral margins of right valve generally armed with a row of tuberculiform teeth. III. Cyprinotus.

18 (17). Natatory setæ of the second antennæ not well developed, commonly simple, and not reaching beyond terminal claws. Margins of right valve not armed with a row of tuberculiform teeth.

19 (20). Natatory setæ small or rudimentary, not adapted for swimming. VI. Erpetocypris.

20 (19). Natatory setæ reaching to, or barely beyond, the tips of the terminal claws.

21 (22). Dorsal setæ of caudal ramus rudimentary or absent. Claws denticulate. VII. Stenocypris.

22 (21). Dorsal setæ of caudal ramus developed as usual, and near claws.

23 (24). Caudal rami exceedingly large and elongate. V. Cypricercus.

24 (23). Caudal rami, as usual, not disproportionately developed. IV. Cypris.

Descriptions of each of the above genera are inserted throughout the text for the convenience of workers, although but eight of the fourteen have been found in America.

The keys inserted are intended to be little more than an analysis of the species mentioned in this paper.

I. Notodromas Lilljeborg.

1792. *Cypris*, O. F. Müller (**49**, p. 48).
1853. *Notodromas*, Lilljeborg (**39**, p. 94).
1854. *Cyprois*, Zenker (**75**, p. 80).

The second pair of antennæ are six-segmented in both male and female. The second maxilla lacks a branchial plate. The palp of the female is two-segmented, the terminal segment ending in two short setæ. In the male this terminal segment is modified into a hook-shaped

appendage. The second foot is five-segmented, terminating in three setæ, of which two are directed backward. The two eyes are separate. The abdominal rami are long and slender.

Males are common. This genus numbers but one species, which has been reported from Minnesota by Herrick (1885). I have never examined specimens.

II. Cyclocypris Brady & Norman.

1787–1854. *Cypris*, Auctorum.
1820. *Monoculus*, Jurine (**36**, p. 179).
1854. *Cypria*, Zenker (**75**, p. 79).
1889. *Cypria*, Brady & Norman (**9**, p. 68).
1889. *Cyclocypris*, Brady & Norman (**9**, p. 70).

I give below the description of this genus, partially as amended by Vávra (**68**).

The second pair of antennæ are five-segmented in the female, six-segmented in the male, the fourth segment having no sense organ. Natatory setæ very long, reaching far beyond the tips of the terminal claws. The palp of the mandible and of the first maxilla are but normally developed. The second maxilla bears a branchial plate and palp. In the male the right and left palps are dissimilar, terminating as hooked prehensile organs.

The last segment of the second foot is unusually long, being two thirds the length of the fourth segment. The caudal rami are strong, terminating in unusually strong claws and a delicate seta. The dorsal seta is situated at some distance from the subterminal claw.

Males are numerous. The copulatory organ is quadrangular.

This genus differs from Cypria in the much more plump sheil, in the character of the second feet, in the different form of the copulatory organs, and in the absence of the two special sense organs on the second pair of antennæ of the male.

There are five species in this genus: *C. globosa* Sars, *C. lævis* O. F. M., *C. modesta* Herrick, *C. pusilla* Sars,

and *C. forbesi* n. sp., of this paper. Of these *C. lævis*, *C. modesta*, and *C. forbesi* are known to occur in America.

COMPARISON OF SPECIES.

1 (2). Caudal ramus twice as long as its terminal claw (measured on front edge). C. LÆVIS O. F. M.

2 (1). Caudal ramus clearly more than twice the length of its terminal claw (measured on front edge).

3 (4). Ramus nearly two and a half times the length of its terminal claw; claws strong, much bent, nearly smooth. C. FORBESI n. sp.

4 (3). Ramus three times the length of its terminal claw; claws strong, nearly straight, weakly bent near end, finely toothed; ramus toothed on hind edge, also with comb of teeth on its side. C. GLOBOSA Sars.

Cyclocypris forbesi n. sp. (Pl. XLI., Figs. 1–7.)

A very small form, scarcely larger than *Cyclocypris lævis*, .55 mm. long, .39 mm. high, and .36 mm. wide.

The shell is plump, with equal valves, translucent, of a muddy sepia-brown color in alcohol, sparsely covered both anteriorly and posteriorly with conspicuous hairs, none evident on sides.

Seen from the side (Fig. 1), the shape of the shell approaches a subelliptical form, three fourths as high as long, the dorsal margin a trifle straighter than the ventral, which is very evenly and gently convex.

Seen from above (Fig. 2), the shape is a moderate oval, thickest behind the middle, rather bluntly pointed anteriorly and more so posteriorly.

Second antennæ of male, six-segmented; of the female, 5-segmented. In the female the terminal segment (Fig. 3) is as long as broad, the penultimate four times as long as this, while the antepenultimate is twice as long as the penultimate, two and a half times as long as broad, bearing an unusually long sense organ near its base, reaching beyond the end of the segment. Terminal claws nearly straight, curved at tip, faintly toothed. Natatory setæ four times as long as the terminal claws.

Palps (Fig. 4 and 5) of second maxillæ in the male hook-like, the right one larger than the left.

Terminal claw of first foot rather stout, toothed, much bent at tip, and as long as the last three segments.

Terminal segment of second foot (Fig. 6) three fifths as long as the preceding segment. The longer of the backwardly directed setæ is longer than the combined lengths of the last three segments, the shorter one being one fourth as long, or the length of the last segment; terminal claw half as long as the last segment. Penultimate segment three and a half times as long as broad and armed on the inner edge with but one seta, which is on the middle of the segment, and half its length. In *C. globosa* and *C. lævis* there are two such setæ.

Caudal rami (Fig. 7) rather short, stout, somewhat bent, the terminal claw half as long as the anterior edge, the subterminal claw four fifths as long as the terminal claw, both stout, lightly toothed, and strongly bent at tip. Terminal seta about as long as width of ramus; dorsal seta delicate, two and a half times width of ramus from subterminal claw, and two thirds as long as ramus is wide.

The "organ of Zenker" is about twice as long as wide, resembling that of *C. globosa*.

Described from several male and female specimens in the collection of the Illinois State Laboratory of Natural History, from a pond in the woods near Bloomington, Ill., April 5, 1879.

Named for Prof. S. A. Forbes.

III. Cyprinotus Brady.

1792. *Cypris*, O. F. Müller (**49**, p. 48).
1820. *Monoculus*, Jurine (**36**, p. 170).
1885. *Cyprinotus*, Brady (**8**, p. 301).

Natatory setæ of antennæ reaching considerably beyond the tips of the terminal claws; plumose. Seta of dorsal edge of caudal ramus close to subterminal claw; claws smooth. Margins of right valve of shell generally armed with tuberculiform teeth. Propagation sexual.

In other respects this genus does not differ materially from the genus Cypris.

The species thus far known in America are *C. incongruens* Ramd., *C. crena* Turner, *C. burlingtonensis* Turner, *C. grandis* (Chambers), and *C. pellucida* n. sp.

COMPARISON OF SPECIES.

1 (4). Dorsal seta of caudal ramus more than half as long as subterminal claw.

2 (3). Dorsal seta width of ramus from subterminal claw. C. PELLUCIDA n. sp.

3 (2). Dorsal seta two and a half times width of ramus from subterminal claw. C. INCONGRUENS Ramd.

4 (1). Dorsal seta of caudal ramus less than half as long as subterminal claw, and width of ramus from it; setæ of ramus about equal in length, the dorsal seta reaching beyond tip of ramus by half its own length; ramus faintly serrate.
C. BURLINGTONENSIS Turner.

Cyprinotus pellucida n. sp. (Pl. XLII., Fig. 1-6.)

A moderately large species, from 1.10 to 1.40 mm. long, .80 mm. high, and .51 mm. wide, color varying from transparent to brownish yellow, commonly showing the outline of the animal within, the contents of the stomach and intestines being unusually apparent. Shell sparsely covered with small papillar elevations from which short hairs arise, these being longest at each extremity; also commonly well marked with a regular arrangement of dotted lines (Fig. 3).

Seen from the side (Fig. 1), the shell is nearly elliptical, regularly arched dorsally, nearly straight ventrally, anterior and posterior ends convex.

Seen from above (Fig. 2), the shell resembles a pointed ellipse, bluntly pointed posteriorly and rather acutely so anteriorly.

The two longer of the natatory setæ of the second antennæ reach but slightly beyond the terminal claws. The

penultimate segment in the female is armed with three claws distally, the outer of which is but a third as long as the other two and a half longer than the last segment. Claws four times as long as the distal segment, which is half as wide as long.

The two-segmented spines on the first pair of maxillæ are toothed.

Terminal claw of first pair of feet (Fig. 4) strong, finely cross-toothed near the extremity, and slightly longer than the last three segments, of which the penultimate and antepenultimate are of the same length, both together just equaling the one preceding. This segment has five patches of fine hairs (Fig. 4) on the inner edge, and a moderately long seta at the inner distal angle. Outer edge slightly crenulate.

Terminal claw of second pair of feet (Fig. 5) nearly straight, finely cross-striated and finely toothed, scarcely longer than terminal segment of foot.

Caudal rami (Fig. 6) slightly bent, about twice as long as the terminal claw. Claws finely toothed, strong, slightly bent, the shorter three fourths the length of the longer. Dorsal seta of ramus width of ramus from subterminal claw, bent, somewhat coarsely plumose, and as long as the subterminal claw, which is situated at width of ramus from terminal claw; terminal seta three fifths the length of dorsal one.

Shaded roadside pool near Havana, Ill. (abundant); Cedar Creek, near Quincy, Ill. (Coll. Ill. State Lab. Nat. Hist.); April, 1896, in an aquarium started from a small creek flowing through the University arboretum at Urbana, Ill.

Cyprinotus burlingtonensis Turner. (Pl. XLII., Fig. 7.)

1894. *Cypris burlingtonensis*, Turner (**64**, p. 17, Pl. VII., Fig. 14–23).

1895. *Cyprinotus burlingtonensis*, Turner (**35**, p. 333, Pl. LXX., Fig. 14–23).

Length 1.40–1.65 mm., height .66–.90 mm., and width .70–.80 mm.

The shell is thin, covered with long hairs, and yellowish brown except some bluish black stripes on the dorsum and sides. The dorsal band begins just back of the eye-spot, from which place two bands extend directly downward, spreading laterally and covering quite an extended area near the center of the shell. After extending posteriorly a short distance, the dorsal band sends downward two more bands which curve forward near the ventral edge of the shell, and finally merge with the central patch.

Seen from the side, the shell is suboval, somewhat narrower posteriorly, highest just anterior to the middle. Ventral margin quite straight.

Seen from above, the shell is subelliptical, somewhat more pointed anteriorly than posteriorly, while the sides are nearly parallel at the middle for a short distance.

Seen from the end, the sides are very convex.

Second antennæ stout; terminal claws toothed near tip, and of approximately the same length; natatory setæ extending beyond the tips of the terminal claws from one third to one half the length of the claws.

The two-segmented spines on the first process of the first maxilla are toothed.

First foot five-segmented, third segment slightly shorter than the fourth, which is three times as long as the terminal segment.

Second foot slender; terminal claw twice as long as the terminal segment and slightly bent.

Caudal rami long, straight, and narrow, more than twenty times as long as wide, the dorsal edge finely pectinate to within a short distance of base (Fig. 7). Terminal claw slender, straight, finely pectinate, half as long as the ramus; subterminal claw five sevenths as long as terminal one. Terminal seta a fourth longer than the dorsal one, which is a third as long as the subterm-

inal claw and situated less than the width of the ramus from it.

This species greatly resembles *Cypris fuscata* Jurine in many respects, but is easily distinguished from it by the greater length of the natatory setæ, the markings on the shell, the character of the caudal ramus, and by other minor details.

Normal, Ill., May 20, 1881 (Coll. Ill. State Lab. Nat. Hist.); Burlington, Ohio, March, 1893 (Turner); Atlanta, Ga., January, 1894 (Turner); Kent county, Del., March 3, 1894 (Turner).

Cyprinotus incongruens Ramdohr. (Pl. XLIII., Fig. 1, 2.)

1808. *Cypris incongruens*, Ramdohr (**54**, p. 86, Taf. III., Fig. 1–12, 15, 16, 18–20).
1820. *Monoculus conchaceus*, Jurine (**36**, p. 171, Pl. XVII., Fig. 7, 8).
1820. *Monoculus ruber*, Jurine (**36**, p. 172, Pl. XVIII., Fig. 3, 4).
1820. *Monoculus aurantius*, Jurine (**36**, p. 173, Pl. XVIII., Fig. 5–12).
1821. *Cypris fusca*, Straus (**61**, p. 59, Tab. I., Fig. 1–16).
1844. *Cypris aurantia*, Zaddach (**74**, p. 37).
1850. *Cypris aurantia*, Baird (**2**, p. 159, Tab. XIX., Fig. 13).
1853. *Cypris incongruens*, Lilljeborg (**39**, p. 119, Tab. IX., Fig. 6, 7; XI., Fig. 1–4; XII., Fig. 6).
1855. *Cypris aurantia*, S. Fischer (**24**, p. 650, Taf. I., Fig. 29–31, 60, 61.
1868. *Cypris incongruens*, Brady (**6**, p. 362, Pl. XXIII., Fig. 16–22).
1868. *Cypris fusca*, Fric & Nekut (**27**, p. 47, Fig. 28).
1872. *Cypris fusca*, Fric (**26**, p. 227, Fig. 6).
1889. *Cypris incongruens*, Brady & Norman (**9**, p. 73, Pl. XII., Fig. 8, 9).
1891. *Cypris incongruens*, Vávra (**68**, p. 95, Fig. 32^{1}–32^{6}).
1893. *Cypris incongruens*, Turner (**63**, p. 8, Pl. I., Fig. 9–16; II., Fig. 17–21).
1895. *Cyprinotus incongruens*, Turner (**35**, p. 330, Pl. LXVIII., Fig. 9–16).

Length 1.30 mm., height .75 mm., width .60 mm.

The shell is orange to ochreous yellow, which is somewhat intensified in spots to an almost purple tint espe-

cially noticeable at the highest dorsal part just in front of the eye-spot. Its surface is covered with numerous papillar elevations and scattered hairs. It is also finely pitted over its entire surface (Fig. 2), these pits showing to better advantage should the specimen partially project from its medium and be examined with reflected light.

Seen from the side, the dorsal margin is arched, highest at its posterior third. Ventral margin very slightly sinuate.

Seen from above, the shell is broadly ovate, narrowed in front, the right valve being somewhat overlapped by the left. The anterior and posterior margins of the right valve are armed with a row of small tubercles (Fig. 2), which give it a serrated appearance.

Setæ of the mandibular palps plumose. Natatory setæ strongly plumose, extending as far beyond the terminal claws as the length of these claws. The spines on the first process of the first pair of maxillæ are strongly toothed.

Second foot moderately stout, the terminal claw much bent and but little longer than the terminal segment.

Caudal rami (Fig. 1) rather stout for members of this genus, about thirteen times as long as wide, broadened at the base. Terminal claw slender, curved, finely toothed near its tip, and four sevenths as long as the ramus; subterminal claw not quite three fifths as long as the terminal one. Terminal seta four fifths as long as subterminal claw; dorsal seta slightly longer than the terminal one and twice the width of the ramus from the subterminal claw.

Pt. Pinellas, Fla., May 12, 1885 (Coll. Ill. State Lab. Nat. Hist.); Cincinnati, O., 1893 (Turner).

IV. CYPRIS O. F. MÜLLER.

1792. *Cypris*, O. F. M. (**49**, p. 48).
1820. *Monoculus*, Jurine (**36**, p. 170).
1868. *Cypris*, Brady (**6**, p. 360).

Second pair of antennæ five-segmented; natatory setæ reaching to or barely beyond the tips of the terminal claws. Mandibular palp not extending beyond tips of mandibular teeth; first mandibular process armed with two biarticulate spines, which are commonly toothed. Branchial plate of first maxilla large, bearing stiff plumose setæ.

The second foot ends in a bill-shaped segment (as in Cypridopsis) and a strong chitinous claw.

Caudal rami stout, ending in two long slender claws and a terminal seta. Dorsal seta always near the subterminal claw.

The males are as yet unknown. At least eight species occur in America, of which two are herein added to the list for the first time: *C. reticulata* Zaddach, not previously reported from this country, and *C. testudinaria*, described as new.

KEY TO SPECIES OF CYPRIS. *

1 (6). Both spines on the first process of the first pair of maxillæ smooth.

2 (5). Terminal claw of the second foot as long as the last segment. Shell noticeably less than three times as long as high. Terminal seta of caudal ramus a third as long as the terminal claw and of same length as the dorsal one.

3 (4). Caudal ramus straight; subterminal claw two thirds the length of the terminal one. Shell four ninths as high as long. C. CLAVATA Baird.

4 (3). Caudal ramus bent, weakly S-shaped; subterminal claw half the length of the terminal one. Shell two thirds as high as long. C. VIRENS Jurine.

5 (2). Terminal claw of second foot twice as long as the terminal segment. Shell fully three times as long high. Subterminal claw of caudal ramus half as long as the terminal one; terminal seta three times as long as the dorsal one, which is set closely against

* Partly a modification of Vávra's key (68, p. 83).

the subterminal claw; ramus straight, stout, and from ten to twelve times as long as wide.
C. FASCIATA O. F. Müller.

6 (1). Both spines on the first maxillary process of the first pair of maxillæ toothed.

7 (14). Third and fourth segments of the first pair of feet not grown together.

8 (13). Shell not reticulated as in Fig. 3, Pl. XLIII.

9 (12). Dorsal seta of caudal ramus not reaching beyond tip of ramus, one and a half times width of ramus from subterminal claw; ramus more than twenty times as long as wide; terminal claw half the length of the ramus; subterminal claw two thirds the length of the terminal one. C. FUSCATA (Jurine).

10 (11). Shell less than twice as long as high (as 5 to 3). Terminal claw half as long as the ramus; subterminal claw three fourths as long as the terminal one. C. TESTUDINARIA n. sp.

11 (10). Shell more than twice as long as high (as 13 to 6). Terminal claw a third as long as the ramus; subterminal claw two thirds the length of the terminal one. C. FISCHERI Lilljeborg.

12 (9). Dorsal seta of caudal ramus reaching beyond tip of ramus, and width of ramus from subterminal claw; ramus less than twenty times as long as wide.

13 (8). Shell of most individuals reticulated as in Fig. 3, Pl. XLIII. (Reticulation occasionally almost obsolete in old adults.) Terminal claw nearly three fifths as long as ramus, straight; terminal seta not more than a fourth as long as the terminal claw; dorsal seta as long as the terminal one, reaching beyond tip of ramus, and width of ramus from subterminal claw; ramus twelve to fifteen times as long as wide. C. RETICULATA Zaddach.

14 (7). Third and fourth segments of the first pair of feet grown together. C. PUBERA O. F. Müller.

Cypris reticulata Zaddach. (Pl. XLIII., Fig. 3 and 4.)

1844. *Cypris reticulata*, Zaddach (**74**, p. 34).
1851. *Cypris affinis*, S. Fischer (**23**, p. 32, Tab. X., Fig. 9–11).
1853. *Cypris affinis*, Lilljeborg (**39**, p. 116, Taf. XI., Fig. 8–14).
1868. *Cypris tessellata*, Brady (**6**, p. 366, Pl. XXIII., Fig. 39–45).
1883. *Cypris affinis*, Lilljeborg (**41**, p. 146).
1889. *Cypris reticulata*, Brady & Norman (**9**, p. 76, Pl. VIII., Fig. 1–2; XII., Fig. 5–7).
1891. *Cypris reticulata*, Vávra (**68**, p. 99, Fig. 34^1–34^2).
1893. *Cypris reticulata*, Daday (**19**, p. 296).

Length 1.25 mm., height .72 mm., width .62 mm.

Shell translucent to clear yellowish, with a dark blue patch dorsally and just posterior to the eye-spot. The strikingly sculptured form of the shell (Fig. 3) is especially noticeable in the young stages. This sculpturing resembles striations at the center of the shell, changing to radially arranged patterns resembling filagree work. Occasionally, in old specimens, this characteristic surface-marking may be almost absent, but a collection could hardly be made which did not contain some specimens showing it clearly.

Seen from the side, the shell is much the broadest in front, highest at the anterior third, where there is a small gibbous elevation, below which is the eye-spot. The dorsal margin slopes rapidly back to the quite narrow posterior extremity; ventral margin nearly straight, slightly sinuate just posterior to the middle.

Seen from above, the shell is tumid, oval, widest in the middle, and tapering somewhat more rapidly anteriorly. The dark dorsal coloration appears in the form of a rough cross.

The longest of the natatory setæ reach but slightly beyond the terminal claws.

The first pair of maxillæ are slender, weakly developed the spines on its first process toothed in my specimens, which differ in this particular from Vávra's, in which these spines are described (**66**, p. 100) as smooth.

Second foot long, slender, the terminal claw covered, slender, and twice as long as the terminal segment.

Caudal rami (Fig. 4) straight, weakly bent near the end, from ten to twelve times as long as wide, and very faintly toothed on the dorsal margin. Terminal claw slender, straight, finely toothed at its extremity, and nearly three fifths as long as the ramus; subterminal claw five sevenths as long as the terminal claw, straight. Terminal seta slender, short, of the same length as the dorsal one, which is one third the length of the subterminal claw and distant from it the width of the ramus.

This species occurred in April, 1884, in great numbers in a small grassy pool on the grounds of the Normal University at Normal, Ill. (Collection Illinois State Laboratory of Natural History). According to Brady it seems to make its home only in such pools, and is yet to be found in lakes or large bodies of water. The species is also known to occur in Great Britain, Sweden, Germany, and Russia.

Cypris fuscata Jurine. (Pl. XLIII., Fig. 5.)

1820. *Monoculus fuscatus*, Jurine (**36**, p. 174, Pl. XIX., Fig. 1, 2).
1837. *Cypris adusta*, Koch (**38**, Heft. XI., p. 3, Fig. 3).
1838. *Cypris galbinia*, Koch (**38**, Heft. XXI., p. 19, Fig. 19).
1844. *Cypris fuscata*, Zaddach (**74**, p. 32).
1850. *Cypris fusca*, Baird (**2**, p. 154, Tab. XIX., Fig. 7).
1850. *Candona hispida*, Baird (**2**, p. 161, Tab. XIX., Fig. 4).
1853. *Cypris fuscata*, Lilljeborg (**39**, p. 114, Tab. X., Fig. 6–9; XII., Fig. 5).
1854. *Cypris fuscata*, Zenker (**75**, p. 73).
1868. *Cypris fusca*, Brady (**6**, p. 362, Pl. XXIII., Fig. 10–15).
1887. *Cypris dugesi*, Herrick (**34**, p. 26, Pl. IV., Fig. 7).
1888. *Cypris fusca*, Sostaric (**60**, p. 47).
1889. *Cypris fuscata*, Brady & Norman (**9**, p. 73, Pl. XII., Fig. 3, 4).
1891. *Cypris fuscata*, Vávra (**68**, p. 98, Fig. 33^1–33^3).
1893. *Cypris fuscata*, Daday (**19**, p. 292).
1894. *Cypris fuscata*, Turner (**64**, p. 16, Pl. VIII., Fig. 41–46.
1895. *Cypris fuscata*, Turner (**35**, p. 320, Pl. LXXI., Fig. 41–46; LXXII., Fig. 7, 7p; LXXVI., Fig. 9).

Length 1.46 mm., height .82 mm., width .76 mm.

Color yellowish brown with a bluish black patch on either side near the middle and just posterior to a

vertical line passing through the eye-spot. The anterior part also is tipped with a dark patch. The form and intensity of coloration of these patches seem to be variable, but in general they are as described above. The surface of the shell is quite rough, as though covered with a loose scaly epithelium, and rather thickly set with short hairs.

Seen from the side, the shell is oblong-ovate, highest at its anterior third, sloping rather quickly to the posterior extremity, which is somewhat narrower than the anterior.

Seen from above, the shell is elongate-oval, the anterior end somewhat more acutely pointed than the posterior; widest at the middle.

Maxilla stout, the spines on its first process toothed.

Terminal segment of second foot one thirteenth as long as the penultimate segment, which is seven ninths as long as the preceding one. Terminal claw much bent and twice as long as the terminal segment.

Caudal rami (Fig. 5) long, slender, straight, more than twenty times as long as wide, the dorsal edge finely toothed. Terminal claw slightly bent, slender, finely toothed, and one half as long as the ramus; subterminal claw two thirds the length of the terminal one, straight, finely toothed near the tip. Terminal seta slender, about half as long as terminal claw, and twice as long as the dorsal seta, which is one and a half times width of ramus from the subterminal claw.

The specimens studied by me were obtained from a pond south of Urbana, Ill., April 16, 1892, and are now in the collection of the Illinois State Laboratory of Natural History.

The species occurs in Great Britain, Germany, and Sweden; and, in America, in Mexico and New Mexico (Herrick), at Cincinnati, Ohio (Turner), and at Urbana, Ill. (Coll. Ill. State Lab. Nat. Hist.).

Cypris testudinaria n. sp. (Pl. XLIV., Fig. 1–4.)

This species is 1.15 mm. long, .74 mm. high, and .65 mm. wide. Shell very thin, dirty brown to ochreous, and in all the specimens seen of a leathery flexible consistency, as if composed mostly of animal matter. Indeed, the shell might be rolled like parchment—a peculiarity not known to me as belonging to any other species of Ostracoda. It is rather thickly covered with short hairs, and there is also a thick marginal row.

Seen from the side, the shell is rather narrower anteriorly than posteriorly, elongate-elliptical in outline, the ventral margin somewhat straighter than the dorsal.

Natatory setæ of the second antennæ (Fig. 4) short, simple, just reaching the tips of the terminal claws. The terminal claws are straight, moderately stout, hooked at tips, finely toothed, and as long as the last three segments. Terminal segment twice as long as wide, one fifth as long as the penultimate, which is seven eighths as long as the antepenultimate; antepenultimate segment a little more than three and a half times as long as wide, the sense club short, nearly straight, situated just below the middle of the segment. There is a crown of cilia at the base of the natatory setæ, extending to the inner apical edge of the segment. The spines of the first process of the second maxillæ are toothed.

Claw of first foot (Fig. 2) bent, rather stout, lightly toothed, and one sixth longer than the last three segments combined. The last segment is as wide as long, the outer of the two terminal setæ being twice as long as the segment. The fourth segment from the last commonly has a crown of setæ near its base, besides scattered marginal ones.

Terminal claw of second foot about a third the length of the terminal segment, which is one seventh as long as the penultimate segment. The reflexed seta of the terminal segment is half the length of the penultimate segment.

Caudal rami (Fig. 1) slender, slightly bent, the dorsal edge serrate for two thirds its length, sixteen to eighteen times as long as wide. Terminal claw nearly straight, lightly toothed, half as long as the ramus. Terminal seta half as long as the terminal claw, which is one and a third times as long as the subterminal one: dorsal seta two thirds the length of terminal one, and width of ramus from subterminal claw.

The "organ of Zenker" presents an unusually spiny appearance (Fig. 3), since the spines are thickly set over the entire surface of the cylinder instead of being in wreaths, as is commonly the case; organ fully five times as long as wide.

Described from a number of specimens in the collection of the Illinois State Laboratory of Natural History, which were taken from a pond in the woods near Bloomington, Ill., April 22, 1879.

V. Cypricercus Sars.

1895. *Cypricercus*, Sars (**58** p. 37).

Natatory setæ of both pairs of antennæ well developed; palp and masticatory lobe of the first maxillæ narrow. Feet as in the genus Cypris.

Caudal rami excessively developed and elongate, affording a ready means of recognition. Cœcal appendage of intestine unusually short; ovarial tubes much elongated.

This genus has but recently been established by Sars (**57**) to receive a South African form with excessively developed caudal rami. No species have been reported as yet from America.

VI. Erpetocypris Brady & Norman.

1792. *Cypris*, O. F. Müller (**49**, p. 48).
1820. *Monoculus*. Jurine (**36**, p. 170).
1889. *Erpetocypris*, Brady & Norman (**9**, p. 84).

Second pair of antennæ five-segmented. Natatory setæ of the third segment very short, not nearly reaching the tips of the terminal claws and not plumose. Having no

power of swimming, the animal creeps along the bottom—a very different habit from that of Cypris.

Twelve species are known, two of which were described from America. An analytical table of the species occurring or likely to occur in this country is inserted here for the convenience of workers. I have examined none but *E. barbatus* (Forbes).

KEY TO SPECIES OF ERPETOCYPRIS.

1 (7). Caudal rami with two terminal claws and a terminal and dorsal seta.

2 (3, 6). Claw on last segment of second foot as long as segment. Shell about twice as long as high. Caudal rami about ten times as long as wide, dorsal margin finely toothed; dorsal seta not more than once width of ramus from subterminal claw.

E. STRIGATA (O. F. Müller).

3 (2, 6). Claw on last segment of second foot three times as long as last segment.

4 (5). Dorsal seta of caudal ramus delicate, undeveloped, close to subterminal claw; dorsal edge of ramus armed with five combs of teeth; terminal seta fully as long as subterminal claw. Shell somewhat longer than twice its height, the upper and lower edges nearly parallel. E. REPTANS (Baird).

5 (4). Dorsal seta of caudal ramus transformed into a short spine or claw, close beside the subterminal claw; dorsal edge of ramus armed with an unbroken row of fine teeth; terminal seta three fourths as long as the subterminal claw. Shell seven thirteenths as high as long, the upper edge evenly convex, the under edge very weakly concave.

E. OLIVACEA Brady & Norman.

6 (2, 3). Claw on last segment of second foot seven eighths as long as last segment. Dorsal seta serrate and claw-like, close to subterminal claw; dorsal edge of ramus finely toothed; ramus twenty times as long as wide; terminal seta about a third as long

as subterminal claw. Shell twice as long as high, the upper and lower margins nearly parallel. (The largest known fresh-water ostracode.)

E. BARBATUS (Forbes).

7 (1). Caudal rami with only the terminal claws developed, lacking the terminal and dorsal seta. Shell two and a half to three times as long as high. Second foot slender, ending in a small hook and a single weak seta. E. MINNESOTENSIS (Herrick).

VII. STENOCYPRIS SARS.

1859. *Cypris*, Baird (**3**, p. 233).
1889. *Stenocypris*, Sars (**57**, p. 27).

Natatory setæ of the second antennæ not reaching beyond the tips of the terminal claws. Palp of the first maxillæ very narrow, cylindrical, the last segment small, masticatory lobes long and narrow.

Caudal rami rather large, more or less lamelliform, dorsal edges sometimes pectinate; claws very unequal, both coarsely denticulate; seta of dorsal edge absent or very small, apical seta rather elongate. Propagation exclusively parthenogenetic.

Shell very narrow and elongate, height not nearly attaining half the length. This peculiarity is indicated in the generic name.

But one member of this genus has thus far been described, and it has not been reported from America.

VIII. CANDONA BAIRD.

1792. *Cypris*, O. F. Müller (**49**, p. 48).
1850. *Candona*, Baird (**2**, p. 159).

The following general description of this genus is essentially that given by Vávra (**68**, p. 39).

Second antennæ of female five-segmented, becoming six-segmented in the male through division of the fourth segment. Male provided at this dividing place with two special and characteristic sense organs. Natatory setæ, so commonly present in Ostracoda, lacking in this

genus. Second pair of maxillæ provided with a rudimentary branchial plate, formed of two unequal pectinate setæ attached directly to the basal portion of the maxilla; palp two-segmented in the female, terminating with three unequal pectinate bristles; palps of the male unsegmented, different from those of the female and from each other.

Second pair of feet commonly five-segmented, becoming six-segmented occasionally through division of the fourth segment; terminal segment provided with two backwardly directed unequal setæ and one long forwardly directed seta.

Caudal rami strong, each ending in two strong claws and a short seta, dorsal seta of ramus commonly remote from these.

The males are commonly more abundant than the females. The shell of the male is ordinarily larger and of another form than that of the female. The members of this genus are not swimmers, being destitute of natatory setæ. They commonly crawl on the bottom or may burrow in the sand and mud.

This genus numbers twenty-five species, of which nine are known to occur in America.

KEY TO SPECIES OF CANDONA.

1 (7). Fourth segment of second foot divided (second foot therefore six-segmented).

2 (3, 6). Shorter seta on last segment as long as last segment. C. ROSTRATA Brady & Norman.

3 (2, 6). Shorter seta on last segment of second foot two to three times as long as last segment.

4 (5). Caudal rami approximately straight (Pl. XLVI., Fig. 11); dorsal seta two and a half times width of ramus from subterminal claw; claws evenly curved, weakly pectinate, the terminal one half the length of the ramus; the subterminal one nine elevenths the length of the terminal one. C. RECTICAUDA n. sp.

5 (4). Caudal rami curved (Pl. XLV., Fig. 1); dorsal seta about twice width of ramus from subterminal claw; claws approximately straight or curved, with a hook-like extremity: terminal claw one third length of ramus; both claws of nearly the same length, rather stout, moderately toothed.

C. FABÆFORMIS (S. Fischer).

6 (2, 3). Shorter seta on last segment of second foot three to four times as long as last segment. Dorsal seta of ramus situated at two thirds length of seta, or two and a half times width of ramus, from subterminal claw; ramus much broadened at base, a fourth as broad as long; terminal seta half as long as dorsal one. C. ACUMINATA (S. Fischer).

7 (1). Fourth segment of second foot undivided (second foot therefore five-segmented).

8 (11). One or both claws of ramus more or less S-shaped.

9 (10). Both claws slightly S-shaped; ramus more than twice as long as terminal claw; dorsal seta of ramus four times width of ramus from subterminal claw. C. SIGMOIDES n. sp.

10 (9). Only the subterminal claw S-shaped; terminal claw more than half as long as ramus, scimitar-shaped; dorsal seta two thirds as long as subterminal claw. C. SIMPSONI n. sp.

11 (8). Both claws of ramus as usual (with one backward curve); ramus stout, curved; terminal claw half as long as ramus, and five fourths as long as subterminal claw; dorsal seta one and a half times width of ramus from subterminal claw.

C. REFLEXA n. sp.

Candona acuminata S. FISCHER. (Pl. XLIV., Fig. 5–7.)

1851. *Cypris acuminata*, S. Fischer (**23**, p. 148, Pl. IV., Fig. 12–16).
1854. *Cypris acuminata*, Zenker (**75**, p. 74, Pl. II., Fig. D).
1889. *Candona acuminata*, Brady & Norman (**9**, p. 104, Pl. IX., Fig. 9, 10; X., Fig. 5, 6).

1894. *Candona acuminata*, Turner (**64**, p. 19, Pl. VIII., Fig. 34).
1895. *Candona acuminata*, Turner (**35**, p. 299, Pl. LXXI., Fig. 34).

Length 1.00 mm., height .44 mm., width .36 mm.

Alcoholic specimens in the collection of the State Laboratory of Natural History have the shell of a dirty brownish color, thus differing from the specimens found by Turner in Texas which were white (**35**, p. 300).

Seen from the side, the shell is elongate, pointed both posteriorly and anteriorly, the middle dorsal part much arched, sloping abruptly posteriorly so that it is concave for a short distance, then rising slightly to slope again and form the narrow rounded posterior part. The slope anteriorly is much more gradual, with a slight concave depression. Ventral margin concave, the greatest depression being at the center.

Seen from above, the shell is subelliptical, both extremities being bluntly pointed, widest at middle, and narrowing gradually to both ends.

Second antennæ stout, terminal claws not pectinate; terminal segment twice as long as wide. Spines of the first maxillary process smooth.

Feet of the first pair (Fig. 5) made up of long narrow segments, the terminal one conical and twice as long as wide, the preceding one twice as long, the antepenultimate of the same length, and the one preceding this as long as the last three combined; terminal claw not as long as the last three segments together, faintly serrate near tip.

Fourth segment of second foot (Fig. 6) divided, thus making the foot six-segmented; terminal segment as wide as long, the shorter backwardly directed seta three and a half to four times as long as the terminal segment, the longer seta being just twice as long as the shorter one.

Caudal rami (Fig. 7) much broadened at base, where the internal contents seem to be coagulated—a peculiar appearance I have noticed in no other species of the

Ostracoda. Terminal claw a fourth longer than the subterminal one, and nearly half the length of ramus; both faintly toothed, the subterminal one more prominently so along the middle. Dorsal seta plainly plumose, about as long as the shorter claw, situated at two thirds the length of seta, or two and a half times the width of ramus, from subterminal claw; terminal seta half the length of the dorsal one.

This species occurs in the San Antonio River, Texas (Turner), and the specimens belonging to the Illinois State Laboratory of Natural History, mentioned above, were collected from ponds at Clifton, Ill., May 12, 1882.

Candona recticauda n. sp. (Pl. XLVI., Fig. 7–11.)

Shell of male 1.18 mm. long and .70 mm. high, stout, covered with scattered papillar elevations, the spermatozoa, as is usual, showing through as four bands.

Second antennæ of male (Fig. 8) stout, six-segmented, terminal segment two thirds as wide as long, the preceding segment as wide as long. The longer of the two male "sense organs" on the antepenultimate segment reaches beyond the tip of the terminal segment by the length of the hyaline tip, the shorter one reaching to the tip of the segment. Terminal claws as long as the antepenultimate segment and faintly toothed near the middle.

Palp of left second maxilla of male (Fig. 10) elongate, round, bent at tip, ending in a sharp hyaline point; two rather long blunt setæ at point of curvature, reaching three fifths the distance to the end of the palp. Right palp of male (Fig. 9) round, thick, slightly bent, ending in a sharp hyaline point, with two short blunt setæ on its concave side reaching two thirds the distance to the tip of the palp.

Terminal claw of first foot one and a half times as long as the last three segments; terminal segment

conical, the penultimate three fifths as wide as long, the antepenultimate two thirds as long as the penultimate, and all three combined scarcely as long as the one preceding them.

Feet of the second pair (Fig. 7) six-segmented, the fourth segment being divided; terminal segment as long as wide, the shorter backwardly directed seta two and a half times as long as the segment, the longer one three and a half times as long as the shorter one.

Caudal rami (Fig. 11) well developed, long, straight. Terminal claw half as long as the ramus, evenly and gently curved, toothed at middle; subterminal claw similar but a tenth shorter. Dorsal seta three fifths the length of the subterminal claw and at two thirds its length from the claw; terminal seta a third the length of the dorsal one. The base of the ramus is broad. A short distance below the base is a small sinus or indentation (Fig. 11) which seems peculiar to the species.

Described from a few specimens in the collections of the Illinois State Laboratory of Natural History, obtained from ponds at Clifton, Ill., Feb. 16, 1882.

Candona simpsoni n. sp. (Pl. XLVI., Fig. 1-6.)

A small elongate species .73 mm. long, .30 mm. high, and .29 mm. wide.

Left valve slightly overlapping the right (Fig. 4); surface of shell covered with a few conical papillar elevations. Color grayish to yellowish white or cinereous.

Seen laterally (Fig. 3), the shell is elongate-elliptical, two and a half times as long as high, evenly rounded anteriorly, somewhat more pointed posteriorly, where the dorsal margin slopes more rapidly than the ventral margin. The dorsal edge is very slightly sloping, nearly straight, the ventral edge being slightly sinuate in the middle.

Seen dorsally, its greatest thickness equals its greatest height; outline subelliptical, the anterior part somewhat more acutely pointed than the posterior, which

is bluntly pointed or arched; side contours almost parallel for half the length of the animal.

Second pair of antennæ of female (Fig. 1) shorter and thicker than usual, the second segment being as wide as long, the antepenultimate but slightly longer than broad, and the penultimate four fifths as wide as long and about three times as long as the terminal segment. Terminal claws smooth, about as long as the last two segments taken together.

First pair of feet (Fig. 5) five-segmented; terminal segment conical, approximately as long as the penultimate, which is about as wide as long: antepenultimate segment like the penultimate,—the three combined being but an eighth longer than the second segment. Terminal claw as long as the last three segments.

Second pair of feet (Fig. 2) five-segmented, the fourth segment being undivided as in the great majority of the species of Candona. Foot small; second, third, and fourth segments of the same size; constricted at the joints, and not especially armed in any way except for the presence of several minute spines on each segment (Fig. 2). Terminal segment as long as broad, the shorter terminal seta two and a half times as long as the terminal segment, while the similarly directed seta is two and two thirds times as long as the shorter one.

Caudal rami (Fig. 6) rather short, stout, bent; terminal claw little more than half as long, stout, finely toothed, scimitar-like. The subterminal claw is strongly S-shaped and prominently toothed on the upper curve, and as the caudal rami commonly project from the shell, this structure affords a ready means of distinguishing the species at a glance. Dorsal seta of ramus twice the width of the ramus from the subterminal claw, bent upward at tip, and two thirds the length of the subterminal claw; terminal seta very small, scarcely half as long as the subterminal claw.

This species may be readily distinguished from *C. sigmoides* by the character of the caudal claws and the

relative lengths of the terminal setæ of the second feet; also by the difference in the relative lengths of the terminal and penultimate segments of the first foot, which in *C. sigmoides* are as two to three (Pl. XLI., Fig. 11), while in the present species they are approximately equal in length.

Described from a number of specimens collected at the Biological Station of the University of Illinois at Havana, Ill., and from specimens collected by myself at Hedges' Pond, near Urbana, Ill., April 10, 1896.

Named for Chas. T. Simpson, of the United States National Museum.

Candona fabæformis S. Fischer. (Pl. XLV., Fig. 1–3.)

1851. *Cypris fabæformis*, S. Fischer (**23**, p. 146, Pl. III., Fig. 6–16).
1853. *Candona fabæformis*, Lilljeborg (**39**, p. 207).
1870. *Candona diaphana*, Brady & Robertson (**11**, p. 18, Pl. V., Fig. 1–3).
1889. *Candona fabæformis*, Brady & Norman (**9**, p. 103, Pl. IX., Fig. 1–4).
1891. *Candona fabæformis*, Vávra (**68**, p. 45, Fig. 6^2, 12^1–12^9).
1895. *Candona fabfœormis*, Turner (**35**, p. 299, Pl. LXXV., Fig. 10, 11; LXXVI., Fig. 6–8).

Length 1.00 mm., height .47 mm., width .49 mm.

Shell yellowish transparent, a few minute papillar elevations on its surface and a few short scattered hairs.

Seen from the side, it is slightly widest back of the middle, the upper and lower edges nearly parallel, both ends fully rounded, the ventral edge quite deeply sinuate near the middle.

Seen from above, the shell is long, ovate, the two ends suddenly and equally pointed, the two sides nearly parallel at the middle.

Second antennæ quite stout; terminal segment slightly longer than wide; terminal claws smooth, slender, and in the female scarcely longer than the last two segments.

Second foot (Fig. 3) short, slender, the fourth segment divided, making the foot six-segmented. Terminal segment as long as broad, one half as long as the pe-

nultimate segment, which is twice as long as broad. Shorter terminal seta twice as long as the terminal segment and a third as long as the longer similarly directed seta; reflexed seta but slightly longer than the longer terminal one.

Caudal rami (Fig. 1) short, stout, curved, much broadened at the base, and fully seven times as long as wide. Terminal claw faintly toothed, nearly straight, but hooked at its extremity, and a third as long as the ramus; subterminal claw nine tenths as long as the terminal one and similar to it. Terminal seta as long as ramus is wide; dorsal seta four fifths as long as the subterminal claw, and distant twice the width of ramus from it. Dorsal margin slightly indented at its proximal third.

Atlanta, Ga., 1895 (Turner); Pools, Normal, Ill., March 27, 1881 (Coll. Ill. State Lab. Nat. Hist). The species occurs also in Russia, Sweden, England, and France.

Candona sigmoides n. sp. (Pl. XLV., Fig. 4–11.)

A large elongate form, the male being 1.25 mm. long and .63 mm. high.

Surface of shell without any special markings; anterior and posterior extremities finely hairy. The testes show through the shell in the form of four curved bands which coalesce posteriorly. (Fig. 4.)

Seen from the side (Fig. 4), the shell of the male is much higher posteriorly, the greatest height being about half the length; anterior extremity evenly rounded, narrow; posterior sloping ventrally. Dorsal margin rather evenly rounded; ventral, deeply sinuate anterior to the middle of the shell.

Second foot (Fig. 7) five-segmented, its longer terminal seta one and three fifths times as long as the last three segments combined; shorter seta as long as the two segments preceding the last, or five times the length of the last segment.

Male antennæ (Fig. 5) six-segmented, the last two segments of the same length, together just equaling the antepenultimate segment; "sense organs" on the distal edge of the antepenultimate segment (Fig. 5), reaching beyond the last segment, the transparent tips funnel-shaped (Fig. 8). Palps of maxillæ as in Fig. 9 and 10.

Caudal rami (Fig. 6) long, straight, more than twice as long as the terminal claw. Subterminal claw three fourths the length of the terminal one, both being somewhat S-shaped, the shorter one quite noticeably so. Terminal seta small, one fifth the length of the terminal claw; dorsal seta reaching one half the distance to the subterminal claw, and situated four times the width of the ramus from it.

This species is somewhat closely related to *C. candida* (O. F. Müller), although easily distinguished by the form of the "sense organs" on the male antennæ; by the great length of the terminal setæ of the second feet (which more than equal the preceding three segments, while in *C. candida* they only equal the two preceding the last); by the relative lengths of the terminal and penultimate segments of the second feet, which in *C. sigmoides* are as 1 to 2 and in *C. candida* as 1 to 4; and by the comparative lengths of the terminal seta and terminal claw of the caudal ramus—in *C. sigmoides* as 1 to 5, in *C. candida* as less than 1 to 2.

It is also somewhat closely allied to *C. simpsoni*, especially in the form of the second feet and the caudal claws, but is easily distinguished from that species by the form of the shell, by the much greater length of the terminal setæ of the second feet, and by the fact that both caudal claws are slightly S-shaped in *C. sigmoides*, while in *C. simpsoni* only the subterminal one is S-shaped, and that very noticeably so.

Described from a few male specimens collected at Havana, Ill., May, 1895.

Candona reflexa n. sp. (Pl. XLVII., Fig. 1-3.)

Shell twice as long as high, thin, minutely granular or pitted, fragile, cinereous, somewhat thickly ciliated on both extremities, which are evenly rounded, the anterior more pointed than posterior. (Further notes on shell impossible from lack of specimens.)

Terminal segment of first foot as long as the penultimate segment is wide; sides of all the segments armed with clusters of small setæ (Fig. 1).

Second foot (Fig. 2) five-segmented, the fourth segment being undivided; terminal segment as wide as long and about a third as long as the penultimate segment. The shorter terminal seta, instead of pointing backward as usual, is somewhat reflexed; for about a third of its length it lies in the same line as the inner edge of the terminal segment; then it is flexed at an angle of about 60° and lies in nearly the same straight line as the penultimate segment. The longer of the two backwardly directed setæ is as long as the last two segments.

Caudal rami (Fig. 3) slightly curved, stout, eight times as long as wide. Terminal claw evenly curved, lightly toothed, strong, half as long as the ramus; subterminal claw three fourths as long as the terminal one and slightly bent near its base. Dorsal seta as long as the subterminal claw, and distant one and a half times the width of the ramus from it; terminal seta somewhat shorter than the width of the ramus, blunt, rather stout.

This is the only Candona I have thus far met with having the peculiar partly reflexed seta of the second foot. Whether this is a characteristic of a young stage or not, I am not prepared to say. The species is somewhat closely related to *C. candida*, but easily distinguished by the characters of the second feet, and the proportions of the segments of the first feet.

Collected at Havana, Ill., May, 1895.

IX. Typhlocypris Vejdovsky.

1880. *Cypris*, Vejdovsky (**70**, p. XLIX).
1882. *Cypris* (*Typhlocypris*), Vejdovsky (**71**, p. 64).
1891. *Typhlocypris*, Vávra (**68**, p. 51).

Second antennæ five-segmented in the female, and six-segmented in the male through the division of the fourth segment. Natatory setæ absent, eyes lacking. The second maxilla carries a rudimentary branchial plate formed of two unequal plumose setæ.

Second pair of feet five-segmented, terminal segment short, bearing two unequal backwardly directed setæ, and one long forwardly directed seta.

This genus differs from the genus Candona principally in the absence of eyes. On account of its haunting dark places the eyes have become rudimentary and, as a partial substitute, the "sense organs" have been excessively developed.

This genus contains but one species, which as yet has not been found in America.

X. Candonopsis Vávra.

1870. *Candona*, Brady & Robertson (**11**, Pl. IX., Fig. 9–12).
1891. *Candonopsis*, Vávra (**68**, p. 54).

Second antennæ similar to those of Candona. Mandible provided with an extraordinarily long palp. Second maxilla bearing a branchial plate formed of three plumose bristles. Caudal rami slender, without the usual dorsal seta.

The female is as yet unknown. No members of this genus have been found in America.

XI. Ilyocypris Brady & Norman.

1820. *Monoculus*, Jurine (**36**, p. 177).
1838–1868. *Cypris*, Koch (**38**); Zaddach (**74**); S. Fischer (**23**); Lilljeborg (**39**); Brady (**6**).
1889. *Ilyocypris*, Brady & Norman (**9**, p. 106).

Shell very strong, irregular, and spiny, somewhat resembling that of Limnicythere.

Second pair of antennæ five-segmented, natatory setæ reaching beyond the terminal claws (except in one variety). Second pair of maxillæ very characteristic; palp rudimentary, two-segmented; branchial plate formed of six plumose setæ.

Second foot five-segmented, terminal segment short, provided with two long, unequal, backwardly directed setæ and a rather short forwardly directed seta.

Caudal rami stout; dorsal seta distant from the subterminal claw.

This genus contains but one known species, which as yet has not been found in America.

XII. Cypria Zenker.

1785–1854. *Cypris, auctorum.*
1820. *Monoculus*, Jurine (**36**, p. 178).
1854. *Cypria*, Zenker ((**75**, p. 77).
1889. *Cypria*, Brady & Norman (**9**, p. 68).
1891. *Cypria*, Vávra (**68**, p. 62).

I give the following general description of the genus from Vávra's emendation (**68**).

Second pair of antennæ five-segmented in the female and six-segmented in the male; distal extremity of the fourth segment in the male provided with two special sense organs; natatory setæ, on the end of the third segment, extraordinarily long, reaching far beyond the tips of the terminal claws.

Mandibular palp, also that of the first maxilla, unusually well developed. Second maxilla with a well-developed branchial plate; palp unsegmented in the female, ending in three bristles; right and left palps of male different in shape, each forming a hooked prehensile organ.

Terminal segment of second foot small, about a third as long as the fourth segment, bearing two nearly equal backwardly directed setæ, which are comparatively short, and a long forwardly directed seta.

Caudal rami stout, ending in two strong claws and a seta; dorsal seta commonly situated about the middle of the dorsal margin. Copulative organ triangular.

The members of this genus are all small and rather compressed. There are eleven species, of which seven are found in America.

KEY TO SPECIES OF CYPRIA.

1 (8). Terminal setæ of second feet approximately equal.

2 (3). Terminal setæ of second feet twice as long as the terminal segment. Left valve with a dorsal flange; right valve with a row of tubercles anteriorly and ventrally. C. PUSTULOSA n. sp.

3 (2). Terminal setæ of second feet approximately as long as the terminal segment.

4 (5). Terminal claw of caudal ramus half the length of the ramus. C. OPHTHALMICA (Jurine).

5 (4). Terminal claw of caudal ramus three fifths the length of the ramus.

6 (7). Dorsal seta of caudal ramus rudimentary, shorter than width of ramus, situated at four times the width of the ramus from the subterminal claw, and above the center; subterminal claw with a comb of very long teeth beyond the center of the claw. C. DENTIFERA n. sp.

7 (6). Dorsal seta slender, two and a half times as long as ramus is wide, and two and a half times width of ramus from subterminal claw, which is almost smooth. Shell marked with closely set parallel and anastomosing lines. C. EXSCULPTA (S. Fischer).

8 (1). Terminal setæ of second feet plainly unequal, the shorter terminal seta being scarcely longer than the segment and but half the length of the other similarly directed seta. Dorsal seta of ramus three times width of ramus from subterminal claw. C. OBESA n. sp.

Cypria pustulosa n. sp. (Pl. XLVIII., Fig. 6–10.)

This species is .51 mm. long, .39 mm. high at the highest part, and .22 mm. wide; clear brownish in color, with a dark patch anteriorly, another just above and posterior to the eye-spot, and still another on the posterior part. Both extremities are hairy, the disc moderately so. Lucid spots (Fig. 6) six, four large and two small, the smaller ones situated ventrally. All are elongate and situated near the center of the shell.

Seen from the side (Fig. 7), the whole specimen seems to be highly arched, owing to the presence of a dorsal flange on the left valve, which is otherwise of the form of the right. Right valve (Fig. 6) regularly arched dorsally; both extremities fully rounded, the anterior sloping, however, somewhat more rapidly; ventral margin nearly straight, except a small sinuation at the middle. Anterior margin of right valve (Fig. 6) with a row of thirteen to sixteen small tubercles, and just posterior to the ventral sinuation are three or four others, which are not so conical but seemingly flattened out and pointed posteriorly.

The sense club on the third segment of the second antennæ reaches but to the upper quarter of the segment, the terminal part being bent outwardly; natatory setæ three times as long as the distance between their place of insertion and the tip of the claws; terminal segment twice as long as broad.

Palp of first maxilla very prominently developed, the first segment twice as long as broad, the terminal segment nearly circular, with two well-developed setæ and three or four shorter ones.

Terminal claw of first pair of feet (Fig. 8) smooth and as long as the two segments preceding the last; the segment preceding these two hairy.

Terminal segment of second foot (Fig. 10) small, carrying two equal, simple, distally directed setæ and a reflexed one, which is as long as the last three segments; penultimate segment provided with a row of cilia at its

distal end and several irregularly scattered plumose cilia on its inner edge, also with a stiff seta on its inner edge situated slightly below the middle and reaching to the distal end of the segment; antepenultimate segment as long as the penultimate, covered with scattered plumose cilia and bearing a seta at its inner distal angle which is slightly longer than the seta on the penultimate segment.

Caudal rami rather long and narrow (Fig. 9), nearly straight, two and two fifths times as long as the terminal claw, which is weakly bent and smooth; subterminal claw four fifths as long as the terminal one, provided with a comb of long teeth near the tip. Terminal seta two fifths as long as the terminal claw; dorsal seta situated at the middle of the ramus, scarcely as long as the ramus is wide.

This Cypria occurs quite abundantly in the collections of the Biological Station, made near Havana, Illinois.

Cypria obesa n. sp. (Pl. XLVIII., Fig. 1–5.)

Length .78 mm., height .48 mm., width .33 mm.

Shell plump, clear to brownish yellow, with a few scattered elevations on its surface, but not especially marked in any way. Muscle impressions quite small. Seen from the side, the shell is of a regular suboval form with a straight ventral edge, three fifths as high as long.

Second antennæ of male six-segmented; terminal segment twice as long as wide; inner terminal claw half the length of the outer; apical part of fourth segment with two "sense setæ" reaching to the tip of the terminal segment; sense club on the inner edge of the third segment rather short, extending slightly beyond the upper quarter of the segment; natatory setæ only twice as long as the distance between their place of insertion and tips of terminal claws.

Palp of right maxilla of male (Fig. 5) larger than that of the left maxilla (Fig. 4), and formed as shown in the figure.

Claw of last segment of first pair of feet (Fig. 1) smooth and slightly longer than the united lengths of the last three segments; terminal segment conical, about as long as wide; two segments preceding just equaling one another; seta at inner distal angle of antepenultimate segment as long as the penultimate segment.

Last segment of second foot (Fig. 3) seven tenths as wide as long and a fourth as long as the preceding segment; shorter backwardly directed seta half as long as the longer one, or just equal to the last segment in length; antepenultimate segment slightly shorter than the penultimate, the seta at its inner distal angle as long as that on the penultimate segment. The anterior distal part of the penultimate segment has a crown of cilia surrounding a short seta, and there are also several clusters of coarse cilia on this and the antepenultimate segments.

Caudal rami (Fig. 2) bent, somewhat stout, and nine times as long as wide, finely toothed along the inner margin. Claws evenly bent, finely toothed, but more coarsely so at middle; terminal claw three fifths as long as the ramus; subterminal one half as long as ramus. Terminal seta of ramus three sevenths as long as the subterminal claw; dorsal seta two thirds as long as the terminal one and situated three times the width of the ramus from the subterminal claw, or slightly beyond middle of ramus.

Described from a number of male and female specimens taken at Havana, Ill., August, 1895.

Cypria dentifera, n. sp. (Pl. XLVII., Fig. 6–11.)

Shell .69 mm. long, .38 mm. high, and .26 mm. wide. Entire surface smooth; sparsely hairy except at each end; brownish yellow, with dark brown markings as follows: an anterior, a ventral, and a dorso-ventral patch, and a vertical stripe dorsally just posterior to the eye-spot. Muscle impressions in the form of a rosette, closely clustered, six or seven in number (Fig. 6).

Seen from the side (Fig. 6), the shell is highest just posterior to the middle, quickly sloping posteriorly, more gradually anteriorly. The anterior margin of the right valve projects as a hyaline flange, receiving as in a pocket the anterior margin of the left valve, which is armed with a row of eighteen to twenty tuberculiform teeth. Ventral margin slightly sinuate at middle, the anterior and posterior parts sparsely hairy.

Seen from above (Fig. 7), the shell is widest back of the middle, blunt and evenly rounded, sides nearly parallel, then quickly narrowing anteriorly to a rather pointed end.

Natatory setæ of second antennæ long, slightly plumose, three of them reaching the entire length of the antennæ beyond the terminal claws. Terminal and penultimate segments in female three times as long as wide.

Mandibles and maxillæ not especially marked; palp of left second maxilla of male as in Fig. 8.

First pair of feet (Fig. 9) rather stout; terminal claw smooth, much bent, and as long as the last three segments; terminal segment subconical, a third as long as the penultimate, which is of the same length as the antepenultimate; latter with a few scattered setæ dorsally, and a short, slender seta at the inner apical angle, two thirds as long as the segment.

Two terminal setæ of the second feet (Fig. 10) approximately equal, as long as the last segment, faintly toothed; terminal segment sinuate on its inner edge, two thirds as wide as long; penultimate segment three and three fourths times as long as the terminal one, four times as long as wide, the dorso-basal edge somewhat crenulate, the inner finely ciliate, a plumose seta at its middle point and a comb of cilia at its inner apical angle; antepenultimate segment as long as the penultimate, finely setose on its inner margin and with a rather stout plumose seta at its inner apical angle, as long as the seta on the penultimate segment. The

long seta of the terminal segment is as long as the last three segments.

Caudal rami (Fig. 11) rather stout, about ten times as long as wide. Terminal claw stout, nearly smooth, curved beyond the middle, and three fifths as long as the ramus; subterminal claw two thirds as long as the terminal one, with a comb of remarkably long teeth near the tip. These teeth are longest distally, decreasing in length towards the base of the claw. Terminal caudal seta half as long as the subterminal claw; dorsal seta very slender, nearly four times width of ramus from subterminal claw, upwardly curved, not longer than ramus is wide, situated slightly above center of ramus.

This Cypria would attract attention from the manner in which the right valve overlaps the left, and it might be taken for *C. inequivalva* Turner (**63**, p. 6) except for differences in the second feet, in the markings of the shell, in the caudal rami, and some others.

Described from a number of specimens in the collection of the Illinois State Laboratory of Natural History, taken in the Zoölogical Gardens at Cincinnati, Ohio, Aug. 30, 1881. Not as yet known from any other locality.

Cypria exsculpta S. Fischer. (Pl. XLVII., Fig. 4).

1853. *Cypris elegans ula*, Lilljeborg (**39**, p. 206).
1855. *Cypris exsculpta*, S. Fischer (**24**, p. 652, Pl. XIX., Fig. 36–38).
1864. *Cypris striolata*, Brady (**4**, p. 60, Pl. III., Fig. 12–17).
1868. *Cypris striolata*, Brady (**6**, p. 372, Pl. XXIV., Fig. 6–10).
1880. *Cypris granulata*, Robertson (**55**, p. 18).
1887. *Cypris striolata*, Herrick (**34**, p. 29, Pl. IV., Fig. 3).
1889. *Cypria exsculpta*, Brady & Norman (**9**, p. 68, Pl. XI., Fig. 1–4).
1894. *Cypria exsculpta*, Turner (**64**, p. 13, Pl. VII., Fig. 2–8).
1895. *Cypria exsculpta*, Turner (**35**, p. 305, Pl. LXX., Fig., 1–8; LXXII., Fig. 3).

Length .58 mm., height .37 mm., width .25 mm. Shell thin; clear yellow to transparent.

Seen from the side, the shell is broadly subovate, highest in the middle, but of about the same width for two thirds its length; dorsal margin strongly arched, the eye-spot anterior to the highest point.

Seen from above, the shell is a narrow, much compressed ellipse.

Terminal segment of second foot a fourth as long as the preceding segment. The two short terminal setæ are of the same length as the segment, the longer one as long as the last three segments.

Caudal rami short, stout, and much curved. Terminal claw smooth, curved, and about half the length of ramus; subterminal claw five sixths the length of the terminal one, smooth, curved, twice the length of the terminal seta; dorsal seta somewhat longer than the terminal seta and situated slightly beyond the middle of the ramus.

This species may at once be recognized by the meshwork of anastomosing parallel longitudinal lines over the entire surface of the shell (Fig. 4). These may commonly be quite readily seen, thus settling its identity at once, as I am not aware of any other ostracode with shell markings of this character.

This species is quite common in most running streams, and was one of the commonest forms seen in my examination of the collections of the Illinois State Laboratory of Natural History from various localities, and of the Illinois Biological Station at Havana, Ill.

Cypria ophthalmica Jurine. (Pl. XLVII., Fig. 5.)

1820. *Monoculus ophthalmicus*, Jurine (**36**, p. 178, Pl. XIX., Fig. 16, 17).
1835. *Cypris compressa*, Baird (**1**, p. 100, Pl. III., Fig. 16).
1837. *Cypris tenera*, Koch (**38**, H. XII., p. 3, Fig. 3).
1838. *Cypris punctata*, Koch (**38**, H. XXI., p. 23, Fig. 23).
1850. *Cypris compressa*, Baird (**2**, p. 154, Taf. XIX., Fig. 14, 14*a–c*).
1851. *Cypris elegantula*, S. Fischer (**23**, p. 161, Pl. X., Fig. 12–14).
1853. *Cypris compressa*, Lilljeborg (**39**, p. 112, Tab. X., Fig. 16–18).
1854. *Cypria punctata*, Zenker (**75**, p. 77, Taf. III., Fig. A).

1868. *Cypris compressa*, Brady (**6**, p. 372, Pl. XXIV., Fig. 1–5; XXXVI., Fig. 6).
1868. *Cypris ovum*, Fric & Nekut (**27**, p. 48, Fig. 30).
1872. *Cypris ovum*, Fric. (**26**, p. 228, Fig. 28).
1874. *Cypris compressa*, Brady, Crosskey, & Robertson (**14**, p. 123; Pl. 1., Fig. 5, 6).
1885. *Cypris punctata*, Nordqvist (**50**, p. 150).
1888. *Cypris punctata*, Schwarz (**59** p. 18).
1888. *Cypris compressa*, Sostaric (**60**, p. 47).
1889. *Cypria ophthalmica*, Brady & Norman (**9**, p. 69, Pl. XI., Fig. 5–9).
1891. *Cypria ophthalmica*, Vávra (**68**, p. 63, Fig. 19^{1}–19^{6}, 20^{1}–20^{4}).

Length .56 mm., height .37 mm., width .32 mm. The American representative seems to be smaller than the European form, if one may judge from the descriptions of Vávra (**68**, p. 63) and of Brady (**6**, p. 372).

Shell much compressed, reniform, clear brown, except at the anterior and posterior ends and just back of the eye-spot where there are dark brown bands or patches, these three bands being perhaps a ready means of distinguishing the species.

Seen from the side, the dorsal margin is much arched, but hardly as much as in Vávra's specimens.

Seen from above, the shell is widest at the posterior third, narrow, somewhat acutely pointed anteriorly and rounded posteriorly.

Natatory setæ very long, reaching beyond the tips of the terminal claws by more than the total length of the antennæ, or three times as long as the distance between their point of insertion and the tips of the terminal claws.

Terminal segment of second foot somewhat longer than broad, a third as long as the preceding segment, and sinuate at its inner margin. The two terminal short setæ are about the same length and as long as the terminal segment.

Caudal rami (Fig. 5) short, rather stout, bent, and fully eight times as long as wide. Terminal claw simple,

curved, half as long as the ramus, subterminal claw two thirds as long as the terminal one, with a patch of teeth near its tip. Terminal seta half as long as subterminal claw; dorsal seta slender, as long as width of ramus, situated at middle of ramus. The inner edge of the ramus was smooth in the specimens examined, thus differing from Vávra's description (**68**, p. 63).

Minn., 1883 (Herrick); Baxley, Ga., 1895 (Turner); Havana, Ill. (Coll. Ill. State Lab. Nat. Hist.).

XIII. Cypridopsis Brady.

—— *Cypris*, *auctorum*.
1820. *Monoculus*, Jurine (**36**).
1868. *Cypridopsis*, Brady (**6**, p. 375).

Second pair of antennæ five-segmented. Natatory setæ at end of third segment long and plumose. The branchia of the second maxilla consists of a plate bearing five plumose setæ or else of two setæ which are inserted directly on the blade.

Second foot five-segmented, with a strong chitinous claw at its extremity.

Caudal rami rudimentary, flagelliform, base turgid, a short cilium on the dorsal edge.

The males of this genus are unknown. There are eleven species, of which three are known to occur in America.

KEY TO SPECIES OF CYPRIDOPSIS.

1 (2). Branchia of second maxilla with five setæ. Three dark bands on dorsal and lateral aspect of shell; very plump. Common.
C. vidua (O. F. Müller).

2 (1). Branchia of second maxilla formed of two setæ.

3 (4). Caudal rami cylindrical, turgid at base, suddenly narrowing to a bristle which is little longer than the basal part.
C. newtoni Brady & Robertson.

4 (3). Caudal rami broad, gradually narrowing to a bristle. Shell much compressed.

5 (6). Natatory setæ of second antennæ reaching to the end of the terminal claws. Shell pale green.

C. VILLOSA (Jurine).

6 (5). Natatory setæ of second antennæ reaching beyond the end of the terminal claws. Shell grass-green, at least dorsally.

C. SMARAGDINA Vávra.

Cypridopsis vidua (O. F. MÜLLER).

1792. *Cypris vidua*, O. F. Müller, (**49**, p. 55, Tab. IV., Fig. 7–9).
1820. *Monoculus vidua*, Jurine (**36**, p. 175, Pl. XIX., Fig. 5, 6).
1837. *Cypris maculata*, Koch (**38**, H. X., p. 2, Fig. 2).
1841. *Cypris strigata*, Koch (**38**, H. XXXVI., p. 19. Fig. 19).
1844. *Cypris vidua*, Zaddach (**74**, p. 35).
1850. *Cypris vidua*, Baird (**2**, p. 152, Pl. XIX., Fig. 10, 11).
1850. *Cypris sella*, Baird (**2**, p. 158, Pl. XIX., Fig. 5, 5*a*).
1851. *Cypris vidua*, S. Fischer (**23**, p. 162, Pl. XI., Fig. 1–2).
1853. *Cypris vidua*, Lilljeborg (**39**, p. 111, Tab. X., Fig. 10–12).
1854. *Cypris vidua*, Zenker (**75**, p. 79).
1868. *Cypridopsis vidua*, Brady (**6**, p. 375, Pl. XXIV., Fig. 27–30, 46).
1868. *Cypris vidua*, Claus (**17**, Pl. I., Fig. 6–8).
1868. *Cypris vidua*, Fric & Nekut (**27**, p. 48, Fig. 29).
1869. *Cypridopsis obesa*, Brady & Robertson (**10**, p. 364, Pl. XVIII., Fig. 5–7).
1870. *Cypridopsis obesa*, Brady & Robertson (**11**, p. 15).
1871. *Cypris vidua*, Heller (**31**, p. 90).
1872. *Cypris vidua*, Fric (**26**, p. 227, Fig. 27).
1874. *Cypridopsis obesa*, Brady, Crosskey & Robertson (**14**, p. 128, Pl. I., Fig. 1–4).
1879. *Cypris vidua*, Herrick (**32**, p. 112, Pl. XVII., Fig. 1).
1880. *Cypridopsis vidua*, Robertson (**55**, p. 20).
1887. *Cypridopsis vidua*, Herrick **34**, p. 31, Pl. IV., Fig. 1).
1888. *Cypris vidua*, Sostaric (**60**, p. 46).
1889. *Cypridopsis vidua*, Brady & Norman (**9**, p. 89).
1891. *Cypridopsis vidua*, Vávra (**68**, p. 75, Fig 23^1–23^4).
1892. *Cypridopsis vidua*, Turner (**62**, p. 73).
1893. *Cypridopsis vidua*, Daday (**19**, p. 300).
1894. *Cypridopsis vidua*, Turner (**64**, p. 19).
1895. *Cypridopsis vidua*, Turner (**35**, p. 312, Pl. LXXII., Fig. 1–1*g*: LXXV., Fig. 5, 6, 8, 9; LXXVI., Fig. 4, 7).

This well known species needs no extended notice in this paper.

Length, .60–.70 mm., height, .35 mm., width, .38–.45 mm.

Seen from above, the shell is broadly ovate, widest back of the middle. Three characteristic darker bands varying from dark brown to green extend down each side from a longitudinal dorsal band. These bands together with its oblong spheroidal form and plump appearance can hardly fail to identify the species.

The caudal rami are rudimentary, the terminal part being produced into a long slender stylet which is somewhat longer than the ramus.

This species is ubiquitous, and I have yet to know of a pond or stream which it has not made its home. It is seemingly always present in aquaria, and appears to play the rôle of scavenger, thriving in situations to which other Ostracoda seem to be totally unadapted. Viewed with a low power these creatures present a very pretty appearance as they rapidly swim about, the banded shell at once attracting attention.

It would seem that its great adaptability to adverse situations and its scavenging habits might account in part for its almost universal distribution throughout the temperate zones.

Cypridopsis smaragdina Vávra. (Pl. XLVIII., Fig. 11–12.)

1891. *Cypridopsis smaragdina*, Vávra (**68**, p. 80, Fig. 26^{1}–26^{3}).

Length .65 mm., height .45 mm., and breadth .34 mm.

This striking and interesting form appears at first glance, when seen from the side (Fig. 11), to be in the shape of a half-moon, except that the under edge is nearly straight. The shell is light to grass-green, especially on its dorsal aspect; alcoholic specimens, however, commonly show but a trace of this coloration. Surface thickly covered with long hairs, which are all parallel to one another, backwardly directed, and closely appressed to the shell (Fig. 11).

The eye-spot, instead of being at the highest point of the shell, as in the typical forms described by Vávra, is slightly below and anterior to this location. The natatory setæ of the second antennæ are long, reaching beyond the tips of the terminal claws by the length of the claws, thus differing from *C. villosa* (Jurine), its near relative, the natatory setæ of which reach but to the terminal claws.

The caudal rami (Fig. 12) are rudimentary, the basal part cylindrical, more than three times as long as wide, then suddenly narrowing into a long flagellum, fully twice as long as the basal part. The ramus also has a dorsal seta at the termination of the basal part, slightly longer than the ramus is wide.

South Chicago, August 24, 1881, from a ditch opening into the Calumet River (Coll. Ill. State Lab. Nat. Hist.).

XIV. Potamocypris Brady.

1868. *Bairdia*, Brady (**6**, p. 474).
1870. *Potamocypris*, Brady (**7**. p. 366).

Second antennæ four-segmented, third and fourth segments bearing numerous setæ, which are short, not reaching beyond the middle of the terminal claws; last segment with two strong terminal claws and two or three short, slender setæ. Mandible stout, palp three-segmented and bearing a single branchial seta near the base. Feet as in Cypris, caudal rami rudimentary, consisting of a long seta with a lamellar base, bearing a short dorsal one commonly at base of the lamellar part.

Shell compressed, outline when seen from the side similar to that of Cypridopsis.

I know of but two species of this genus,—*P. fulva* (Brady) and *P. gregaria* Sars,—neither of which is known to occur in America.

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EXPLANATION OF PLATES.

Plate XXXIX.

Fig. 1. *Limnicythere reticulata* n. sp.: ventral view.
Fig. 2. Inside view of left valve of shell.
Fig. 3. Rudimentary caudal ramus.
Fig. 4. Second foot.
Fig. 5. First antenna.
Fig. 6. Third foot.
Fig. 7. Posterior dorsal part of carapace.
Fig. 8. *Limnicythere illinoisensis* n. sp.: lateral view.
Fig. 9. Markings on shell.
Fig. 10. Part of anterior surface of shell.
Fig. 11. First foot.
Fig. 12. Rudimentary caudal ramus.
Fig. 13. Ventral view.

Plate XL.

Fig. 1. *Limnicythere illinoisensis* n. sp.: view of side from below.
Fig. 2. Male sexual clasping organs.
Fig. 3. Second foot.
Fig. 4. Third foot.
Fig. 5. Second antenna of male.
Fig. 6. First antenna of male.

Plate XLI.

Fig. 1. *Cyclocypris forbesi* n. sp.: lateral view.
Fig. 2. Dorsal view.
Fig. 3. Second antenna of female.
Fig. 4. Palp of left second maxilla of male.

Fig. 5. Palp of right second maxilla of male.
Fig. 6. Second foot.
Fig. 7. Caudal ramus.

Plate XLII.

Fig. 1. *Cyprinotus pellucida* n. sp.: lateral view.
Fig. 2. Dorsal view.
Fig. 3. Markings on shell.
Fig. 4. First foot.
Fig. 5. Second foot.
Fig. 6. Caudal ramus.
Fig. 7. *Cyprinotus burlingtonensis* Turner, caudal ramus.

Plate XLIII.

Fig. 1. *Cyprinotus incongruens* Ramd.: caudal ramus.
Fig. 2. Anterior end of right valve, pittings indicated at *x*.
Fig. 3. *Cypris reticulata* Zadd.: markings on shell.
Fig. 4. Caudal ramus.
Fig. 5. *Cypris fuscata* Jur.: caudal ramus.

Plate XLIV.

Fig. 1. *Cypris testudinaria* n. sp.: caudal ramus.
Fig. 2. First foot.
Fig. 3. End of organ of Zenker.
Fig. 4. Second antenna.
Fig. 5. *Candona acuminata* Fisch.: first foot.
Fig. 6. Second foot.
Fig. 7. Caudal ramus.

Plate XLV.

Fig. 1. *Candona fabæformis* Fisch.: caudal ramus.
Fig. 2. First foot.

Fig. 3. Second foot.

Fig. 4. *Candona sigmoides* n. sp., ♂: lateral outline view.

Fig. 5. Second antenna.

Fig. 6. Caudal ramus.

Fig. 7. Second foot.

Fig. 8. "Sense organ" of second antenna.

Fig. 9. Palp of left second maxilla.

Fig. 10. Palp of right second maxilla.

Fig. 11. First foot.

Plate XLVI.

Fig. 1. *Candona simpsoni* n. sp.: second antenna of female.

Fig. 2. Second foot.

Fig. 3. Lateral view.

Fig. 4. Ventral view.

Fig. 5. First foot.

Fig. 6. Caudal ramus.

Fig. 7. *Candona recticauda* n. sp.: second foot.

Fig. 8. Second antenna of male.

Fig. 9. Palp of right second maxilla of male.

Fig. 10. Palp of left second maxilla of male.

Fig. 11. Caudal ramus.

Plate XLVII.

Fig. 1. *Candona reflexa* n. sp.: first foot.

Fig. 2. Second foot.

Fig. 3. Caudal ramus.

Fig. 4. *Cypria exsculpta* Fisch.: reticulations on shell.

Fig. 5. *Cypria ophthalmica* Jur.: caudal ramus.

Fig. 6. *Cypria dentifera* n. sp.: inside view of left valve of shell.

Fig. 7. Dorsal view of shell.
Fig. 8. Palp of left second maxilla of male.
Fig. 9. First foot.
Fig. 10. Second foot.
Fig. 11. Caudal ramus.

Plate XLVIII.

Fig. 1. *Cypria obesa* n. sp.: first foot.
Fig. 2. Caudal ramus.
Fig. 3. Second foot.
Fig. 4. Palp of left second maxilla of male.
Fig. 5. Palp of right second maxilla of male.
Fig. 6. *Cypria pustulosa* n. sp.: inside view of right valve of shell.
Fig. 7. Lateral view of left valve of shell.
Fig. 8. First foot.
Fig. 9. Caudal ramus.
Fig. 10. Second foot.
Fig. 11. *Cypridopsis smaragdina* Vávra: lateral view.
Fig. 12. Rudimentary caudal ramus.