

Proceedings of the Iowa Academy of Science

Volume 1 | Part 1, 1887-1889; (1887) -

Article 24

1888

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Recommended Citation

Call, R. Ellsworth (1888) "The Parvus Group of Unionidae," *Proceedings of the Iowa Academy of Science*, 1(Pt. 1), 45-51.

Available at: <https://scholarworks.uni.edu/pias/vol1/iss1/24>

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SOME ADDITIONAL OBSERVATIONS ON THE LÆSS IN AND ABOUT MUSCATINE.

BY. PROF. F. M. WITTER.

(Abstract.)

The unconsolidated material resting on the drift in and about Muscatine possesses many of the characters of the læss and since it passes by insensible gradations into the latter it seems rather to belong to the læss than to the drift.

The lower portion is generally most perfectly and beautifully stratified, the strata consisting of sand, clay, and occasionally some gravel, with small boulders of the granitic series, fragments of bituminous coal, etc. A very few calcareous concretions are found in the stratified basal beds and at one point good specimens of these concretions have imbedded pebbles. In the less evidently stratified portions abound several species of land shells and the eggs of one species are found. But little sand and this of the finest grain is found in the unstratified higher portions. In this have been found the teeth and largely the bones of two examples of *Rangifer caribou* and the greater portion of the antler of the same species most probably. Two or three species of fresh water mollusks have been found in what appears to be læss.

THE PARVUS GROUP OF UNIONIDÆ.

BY PROF. R. ELLSWORTH CALL.

(Abstract.)

This paper gave a resume of the known facts in the geographical distribution of these small *Unios* and proposed the reduction of a number of forms to synonymy. The relation of the assumed specific differences to conditions clearly connected with environment was pointed out and a somewhat close relationship of forms hitherto supposed to be very distinct was evidenced by the specimens exhibited. The dis-

tribution of the various forms was adduced as an argument in support of identity particularly of those species which occur in Texas and in Georgia.

The type of the group is the very small form described by Barnes from the waters of Ohio. This form with considerable variations occurs throughout the eastern half of the United States as far as the State of New York. To the south it ranges westward to Texas and has there been subjected to such environmental conditions as to become very much prolonged posteriorly. The sexual variations here are so marked that the two forms, male and female, have been described under at least two specific names. In Georgia occur two or three forms which have been called species mainly on the differences of color of the *nacre*. Some of these at least are but modifications of the common *Unio parvus* of the North.

The group includes the following species described by Dr. Isaac Lea, of which list those in italics are believed to be synonyms. In the list the forms which it is proposed to recognize as species are given in the order of the date of their description, so that, if for any reason the reader should wish to determine the chronologic arrangement of the species it will be possible to do so.

Unio glans Lea.

(Read May 7, 1830.)

"Observations on the *Genus Unio*," Vol. I, p. 92, Pl. VIII, Fig. 12.

Unio paulus Lea.

(Read October 2, 1840.)

"Observations on the *Genus Unio*," Vol. III, p. 51, Pl. XV, Fig. 29.

Unio minor Lea.

(Read August 18, 1843.)

"Observations on the *Genus Unio*," Vol. IV, p. 276, Pl. XXXIX, Fig. 3.

Unio texasensis Lea.

(Read March 24, 1857.)

“Observations on the *Genus Unio*,” Vol. VIII, p. 39, Pl. LXI, Fig. 181.

Unio bairdianus Lea.

(Read April 7, 1857.)

“Observations on the *Genus Unio*,” Vol. VIII, p. 42, Pl. LXI, Fig. 186.

Unio granulatus Lea.

(Read March 5, 1860.)

“Observations on the *Genus Unio*,” Vol. XI, p. 52, Pl. XVI, Fig. 46.

Unio germanus Lea.

(Read February 5, 1861.)

“Observations on the *Genus Unio*,” Vol. XI, p. 53, Pl. XIX, Fig. 54.

Unio bealii Lea.

(Read June 3, 1862.)

“Observations on the *Genus Unio*,” Vol. IX, p. 26, Pl. XXX, Fig. 273.

Unio marginis Lea.

(Read May 16, 1865.)

“Observations on the *Genus Unio*,” Vol. XII, p. 15, Pl. XXXI, Fig. 69.

Unio cromwellii Lea.

(Read May 16, 1865.)

“Observations on the *Genus Unio*,” Vol. XII, p. 18, Pl. XXXI, Fig. 54.

Unio cylindrellus Lea.

(Read June 2, 1868.)

“Observations on the *Genus Unio*,” Vol. XII, p. 68, Pl. XLVIII, Fig. 121.

Unio corvinus Lea.

(Read June 2, 1868.)

“Observations on the *Genus Unio*, Vol. XII, p. 70, Pl. XLVIII, Fig. 123.

Unio corvunculus Lea.

(Read June 2, 1868.)

“Observations on the *Genus Unio*, Vol. XII, p. 74, Pl. L, Fig. 127.

Unio vesicularis Lea.

(Read September 15, 1873.)

“Observations on the *Genus Unio*,” Vol. XIII, p. 41, Pl. XII, Fig. 34.

The synonymy of this group, therefore, will stand as in the subjoined lists and even here there is some doubt that the Texas forms should be held to be distinct.

Unio parvus Barnes.

- U. paulus* Lea.
- U. minor* Lea.
- U. marginis* Lea.
- U. corvinus* Lea.
- U. vesicularis* Lea.

Unio texasensis Lea.

- U. bairdianus* Lea.
- U. bealii* Lea.

Unio glans Lea.

- U. pullus* Conrad.
- U. granulatus* Lea.
- U. germanus* Lea.
- U. cromwellii* Lea.
- U. cylindrellus* Lea.
- U. corvunculus* Lea.

The type of the group is the form described by Dr. Barnes to which both in anatomy, habits and general characters all

the shells herein named show most marked resemblances. If the Texas forms be excluded as synonyms, then they will fall under the division headed by *U. parvus*.

The main facts on which this species reduction is based are set forth in the subjoined tabular synopsis. The various species have been studied in such detail as large series of shells from all sections of the south and the west would enable. In some cases authors' types have been available.

UNIO.	PARVUS.	CORVINUS.	MARGINIS.	PAULUS.	GLANS.	CYLINDRELLUS.	CROMWELLII.	GRANULATUS.
Outline.....	Elliptical, somewhat compressed.	Elliptical, inflated.	Elliptical, inflated.	Elliptical, inflated.	Ovate-elliptical, inflated.	Widely elliptical, somewhat cylindrical.	Elliptical, somewhat inflated.	Elliptical, somewhat inflated.
Substance of shell...	Thin, slightly thicker before.	Somewhat thick, thicker before.	Somewhat thick, thicker before.	Thick, thinner behind.	Rather thick.	Thick, thicker before.	Rather thin, thicker before.	Rather thin, slightly thicker before.
Beaks.....	Slightly prominent, coarsely and concentrically wrinkled.	A little prominent.	Somewhat prominent.	Somewhat prominent.	Somewhat prominent.	Slightly prominent.	Somewhat prominent; concentrically folded.	A little prominent, undulate, granulate.
Ligament.....	Small, thin, light straw-colored.	Short, thin, very dark brown.	Small, thin, light brown.	Short, thin.	Small.	Rather long, thin.	Small, thin, rather light brown.	Small, thin, light brown.
Epidermis.....	Yellowish green, lighter on beaks, striated, lines of growth distant, black.	Black, radiate, subsquamose, growth lines close.	Dark olive striate, obscurely rayed, margin greenish-yellow.	Nearly black.	Black or dark brown sometimes rayed.	Yellowish, radiate; lines of growth distant.	Striate, brownish or greenish rayed, growth lines distant, broad.	Dark olive, radiate, striate, lines of growth distant.
Cardinal teeth.....	Small, elevated, acuminate, crenulate, double in the left, single in the right valve.	Small, decussate.	Small, sulcate, crenulate.	Small, disposed to be double in both valves.	Rather large, elevated, double in left, single in right valve.	Small, sub-conical, corrugate.	Small, compressed, corrugate, double in both valves.	Small, compressed, crenulate, oblique, double in both valves.
Lateral teeth.....	Slightly curved, long, lamellar.	Long, somewhat straight.	Rather short, straight.	Long, curved.	Straight, lamelliform	Long, somewhat curved.	Rather long, somewhat curved.	Long, acicular, nearly straight.
Anterior cicatrices..	Distinct, moderately impressed.	Distinct, small, well-impressed.	Confluent, small, deeply impressed.	Distinct.	Distinct.	Distinct, small, well impressed.	Scarcely distinct, large, well impressed.	Distinct, rather large well impressed.
Posterior cicatrices..	Confluent, slightly impressed.	Confluent, slightly impressed.	Confluent, small, slightly impressed.	Confluent.	Confluent.	Distinct, small, slightly impressed.	Confluent, rather large slightly impressed.	Confluent, rather large slightly impressed.
Dorsal cicatrices....	Center of cavity of the beaks.	Center of cavity of the beaks.	Center of cavity of shell [beaks?]	On inferior part of tooth.	Center of cavity of the beaks.	Center of the cavity of the shell.	Center of cavity of the beaks.	Center of cavity of the beaks.
Cavity of shell.....	Shallow, white.	Deep, wide.	Rather shallow.	Deep.	* * * *	Deep, wide.	Deep, wide.	Deep, wide.
Cavity of beak.....	Shallow, rounded.	Shallow, obtusely angular.	Shallow, rounded.	Very small.	Wide, subangulated.	Rather deep sub-angular.	Small, obtusely angular.	Shallow, sub-angular.
Nacre.....	White, inclined to salmon in cavity of beaks.	White, iridescent.	White, iridescent.	White, iridescent.	Purple.	Purple, iridescent.	Purple, iridescent.	Purplish, iridescent.
Habitat.....	Ohio river.	Flint River, Ga. Neuse River, N. C.	Dougherty Co., Ga.	Chattahoochee River, Ga.	Ohio River.	E. Tennessee, N. Ga., N. Ala.	Kiokee Creek, Albany, Ga.	Big Prairie Creek, Ala.
Diameter.....	.6 inch.	.7 inch.	.5 inch.	.4 inch.	.7 inch.	.7 inch.	.4 inch.	.45 inch.
Length.....	.6 inch.	.8 inch.	.6 inch.	.6 inch.	.8 inch.	.8 inch.	.7 inch.	.62 inch.
Breadth.....	1.6 inch.	1.3 inch.	1.1 inch.	.9 inch.	1.3 inch.	1.5 inch.	1.1 inch.	1.10 inch.

SYNOPSIS OF THE SPECIFIC CHARACTERS OF THE PARVUS GROUP.

Call: The Parvus Group of Unionidae

GERMANUS.	CORVUNCULUS.	PULLUS.	VESICULARIS.	TEXAENSIS.	BAIRDIANUS.	BEALII.	MINOR.
Elliptical, somewhat inflated.	Elliptical, somewhat inflated.	Elliptical, somewhat inflated.	Elliptical, inflated.	Elliptical, sub-compressed.	Elliptical, slightly inflated.	Elliptical, somewhat compressed.	Elliptical, rather inflated.
Somewhat thick, thicker before.	A little thick, thicker before.	* * * *	A little thick, thicker before.	Rather thin, thicker before.	Rather thin, thicker before.	Slightly thickened, thicker before.	Thick, thinner behind.
Rather prominent, concentrically undulate.	A little prominent, concentrically undulate.	Slightly prominent.	Slightly prominent.	Slightly prominent, sub-concentrically undulate.	Slightly prominent, concentrically undulate.	A little prominent.	Rather prominent.
Short, thin, lightish brown.	Short, thin, brown.	* * * *	Rather long and thin.	Small, thin, yellowish-brown.	Small, thin, yellowish-brown.	Short, thin, dark brown.	Short, thin.
Dark brown, eradiate, transversely striate.	Blackish, eradiate; lines of growth distant.	Dark, olivaceous, wrinkled.	Dark olive, obscurely rayed, growth marks distant.	Dark olive, shining, obsoletely rayed, marks of growth distant.	Dark brown, obsoletely radiate, growth lines distant.	Dark brown or blackish, obscurely radiate, marks of growth distant.	Striate, nearly black.
Small, erect, compressed, crenulate, acuminate.	Small, erect, compressed, crenulate.	Oblique, single in one, double in the other valve.	Small, sulcate, somewhat compressed, double in both valves.	Small, erect, crenulate.	Small, erect, acuminate, crenulate, double in both valves.	Small, compressed, crenulate, pointed, double in both valves.	Rather large.
Thin, somewhat curved.	Rather long, slightly curved.	* * * *	Rather long, lamellar, nearly straight.	Long, lamellar, somewhat curved.	Long, lamellar, somewhat curved.	Very long, slightly curved, lamellar.	Small, curved.
Distinct, small, well impressed.	Distinct, small, well impressed.	* * * *	Distinct, small, well impressed.	Distinct, small, well impressed.	Distinct, small, somewhat impressed.	Distinct, rather large, moderately impressed.	Distinct.
Confluent, slightly impressed.	* * * *	* * * *	Confluent, rather large, moderately impressed.	Confluent, slightly impressed.	Confluent, slightly impressed.	Confluent, slightly impressed.	Confluent.
Center of cavity of beaks.	Center of cavity of the beaks.	* * * *	Center of cavity of the beaks.	Across the cavity of the beaks.	Across the cavity of the beaks.	Across center of cavity of the beaks.	Center of cavity of the beaks.
Rather deep, wide.	Deep, wide.	Very capacious.	Deep, wide.	Somewhat deep, wide.	Small, wide.	Shallow, wide.	Deep.
Shallow, obtusely angular.	Shallow, obtusely angular.	Very capacious.	Shallow, obtusely angular.	Shallow, obtusely angular.	Shallow, obtusely angular.	Shallow, obtusely angular.	Rather deep, angular.
Purplish, iridescent.	Purple, iridescent.	Chocolate purple.	Whitish, iridescent.	Bluish, very iridescent.	White, very iridescent.	White or pale salmon, iridescent.	Pearly white, iridescent.
Coosa River, Ala.	Swamp Creek, Whitfield Co., Ga.	Waterree River, S. C., Warm Spa, N. C.	Lake Ocheechee, Fla.	DeWitt Co., Texas.	Devil's River, Texas.	Leon Co. and Rutersville, Texas.	Lakes Monroe and George, Fla.
.55 inch.	.5 inch.	* * * *	.5 inch.	.5 inch.	.4 inch.	.6 inch.	.4 inch.
.82 inch.	.7 inch.	* * * *	.7 inch.	.8 inch.	.7 inch.	1. inch.	.6 inch.
1.1 inch.	1.1 inch.	* * * *	1.3 inch.	1.4 inch.	1.2 inch.	1.7 inch.	.9 inch.