Maryland geological survey
Baltimore, The Johns Hopkins Press, 1901-1923
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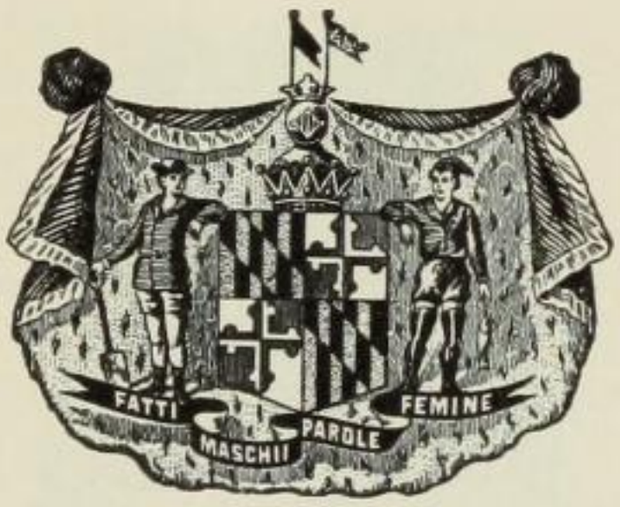
MARYLAND

GEOLOGICAL SURVEY



UPPER CRETACEOUS

TEXT

BALTIMORE
THE JOHNS HOPKINS PRESS
1916

general evenly convex. Basal surface convex, swelling to median longitudinal axis moderately. Transverse median sutures curve at first slightly convex back till posterior are quite convex. Vertical diameter of median teeth about five in horizontal diameter, their surfaces with usually distinct transverse or vertical wrinkles or nearly smooth. Length (width) 59 mm."—Fowler, 1911.

This species is recorded from the Monmouth and later Upper Cretaceous formations in the New Jersey area. Only uncertainly-determined fragments represent it in the Maryland Cretaceous.

Occurrence.—MONMOUTH FORMATION. Brooks estate near Seat Pleasant, Prince George's County.

Collection.—Maryland Geological Survey.

ARTHROPODA

CLASS CRUSTACEA[1]

Order DECAPODA

Family ASTACIDAE

Genus HOLOPARIA McCoy

The following species are referred to this genus with due reserve, as until the cephalothorax is known their exact position in the Astacoid series must remain doubtful. The *specific* characters of the fossils, however, may be readily appreciated; and the definition of the species may call attention to the matter and lead someone to search for the missing parts.

HOLOPARIA GABBI Pilsbry

Plate X, Figs. 1-4, 8, 9

Holoparia gabbi Pilsbry, 1901, Proc. Acad. Nat. Sci., Phila., p. 115, pl. i, figs. 11-14.

Holoparia gabbi Pilsbry, 1907, in Weller, Geol. Survey of New Jersey, Pal., vol. iv, p. 846, pl. cx, figs. 12-15.

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[1] Former descriptions by the author have been revised in terminology and slightly changed in phrasing for this report, but only type material has been used in such revision. Information upon additional specimens is given in separate paragraphs.

Description.—Left manus robust, evenly convex on both sides, but slightly more convex externally than within, the surface slightly roughened everywhere by small flattened, separated, scale-like asperities; lower margin bluntly angular and marked by a slight groove; upper margin narrowly rounded, bearing two short conic spines on the portion preserved. These are inserted slightly below the edge on the inner side, and directed upward and forward; and on each side there is a half-round tubercle at the base of the dactylus. Pollex rather slender, with a series of coarse tubercles (worn flat) along its grasping edge. Dactylus armed with a short conic spine near its base (continuing the row of similar spines on the upper margin of the palm), its grasping face with a series of coarse tubercles worn flat. Abdominal somites with highly arched tergum, the surface punctate.

This species was based upon a left hand (figs. 8, 9) and group of four abdominal somites in the collection of the Academy of Natural Sciences of Philadelphia. A left (figs. 3, 4) and a right hand and other fragments are in the Wagner Free Institute. The pollex is broken in both specimens, and the proximal portion of the hand is wanting. In the Wagner Institute specimen the base of the dactylus remains. Breadth of hand of the type specimen 21.5 mm., thickness 13 mm.

The proximal part of a manus and a carpus are preserved in specimens from the Chesapeake and Delaware Canal. The carpus is somewhat like that of *Homarus* in shape, spinous on both sides. The surface of the manus is shown in the photograph, fig. 3.

Occurrence.—MATAWAN FORMATION. Deep cut of the Chesapeake and Delaware Canal, Delaware.

Collections.—Maryland Geological Survey, Academy of Natural Sciences, Wagner Free Institute of Science.

HOLOPARIA GLADIATOR Pilsbry

Plate X, Fig. 6

Holoparia gladiator Pilsbry, 1901, Proc. Acad. Nat. Sci., Phila., p. 116, pl. i, figs. 15, 16.

Holoparia gladiator Pilsbry, 1907, in Weller, Geol. Survey of New Jersey, Pal., vol. iv, p. 848, pl. cx, figs. 16,17.

Description.—Manus long and narrow, parallel-sided, its thickness more than half the width, about equally convex on the two sides, smoothish, showing scattered punctures and under a lens a very fine punctulation; on both sides of the hand a row of three or four small pointed tubercles run lengthwise along the median convexity; lower edge bluntly biangular. Pollex nearly double the width of the dactylus, pyriform in section, with a row of tubercles along the grasping edge. Dactylus oval in section, also bearing pointed tubercles opposed to those on the pollex.

Length of manus as broken 35.3 mm.; width 11.5 mm.; thickness 7 mm.

Types are No. 10,120 collection of Wagner Free Institute of Science, and consist of an imperfect manus with broken dactylus in place, a fragment of the pollex, apparently of the same specimen, and a fragment of another hand of larger size, width 14 mm., thickness 9 mm. They were exposed by breaking hard nodules which occur in the clay at Lenola, New Jersey. Another broken manus is in the collection of the Philadelphia Academy from the deep cut of the Chesapeake and Delaware Canal in Delaware.

The species is readily recognizable by the long, narrow shape of the hand and the minute punctulation of the surface, the biangular lower edge of the pollex and hand, etc.

Occurrence.—MATAWAN FORMATION. Deep cut of the Chesapeake and Delaware Canal, Delaware.

Collections.—Wagner Free Institute of Science, Academy of Natural Sciences of Philadelphia.

Family CALLIANASSIDAE

Genus CALLIANASSA Leach

CALLIANASSA MORTONI Pilsbry

Plate XI, Figs. 1-3

? Callianassa antiqua Otto, 1870, Credner, Zeitsch. d. deutsch. geologisch. Gesell., Bd. xxii, p. 241.

Callianassa mortoni Pilsbry, 1901, Proc. Acad. Nat. Sci., Phila., p. 112, pl. i, figs. 1-7.

Callianassa mortoni Pilsbry, 1907, in Weller, Geol. Survey of New Jersey, Pal., vol. iv, p. 849, pl. cxi, figs. 1-15.

Description.—Manus rhombic, its breadth about two-thirds the length, the surface nearly smooth. The outer face is very convex, the greatest convexity being posterior and near the upper or dactylus side; there is a series of four punctures extending backwards from the base of the pollex, and three punctures on the same convex side; *the posterior margin abruptly* falls near the joint, a prominence bearing a group of small tubercles at the summit before the deflection. Inner surface or palm (fig. 1) much less convex than the outer, becoming concave near the lateral margins, nearly smooth, the anterior margin slightly excavated between the bases of the pollex and dactylus, and bordered there with a short row of small tubercles. On the median portion of the palm there are two punctures, marking it off into thirds longitudinally. Lateral margins of the manus acute, closely, finely and regularly crenulate; the lower margin straight, with a row of punctures along the inner side but extremely near the edge, and another less close to the edge outwardly; upper margin deeply curved down posteriorly, produced into a deflexed lobe, and similarly margined with spaced punctures. Pollex about one-half the total length of the palm, curved at the tip, having a blunt median tooth and a crenulated ridge on the grasping face, the lateral edges of which are smooth except at their bases which are crenulated. The dactylus has two contiguous, crenulated ridges along the outer edge.

Carpus is somewhat shorter than the palm, equally convex on both sides, with sharp, crenulated edges like the manus; more swollen distally. The lower distal angle is acute, and there is an oblique groove and a short keel bordered with small tubercles near it on the outer face. The upper proximal angle is produced backward. The inner face has a small distal group of tubercles and some scattered pustules, both usually almost effaced.

Merus subtriangular in section, the upper keel strongly arched, lower keel nearly straight and more strongly serrate, the middle of the very convex outer surface granulose, with two rounded tubercles at the anterior extremity; the opposite or inner face nearly flat. In all specimens preserved with the members in place, the merus is flexed at a right angle with the carpus.

Measurements of manus in millimeters:

	Length	Length exclusive of finger	Width in the middle	Thickness
(a)	—	29	19	9.5
(b)	25	18	11	6

The left cheliped of another specimen measures: Total length of manus, 27, palmar surface (without fingers) 20 mm.; width in middle 13 mm.; greatest length of carpus, measured obliquely 20, or from middle of distal to middle of proximal margin 14 mm.; width in middle 12 mm.; length of merus 13 mm. (No. 10,005 Wagner Free Institute of Science, Matawan formation of Crosswicks, N. J.)

The abrupt deflection of the hind margin of the more convex face of the manus and the downward bend, posteriorly, of its upper margin (as in fig. 1) are characteristic of the species.

Both chelæ of a Lenola individual preserved in one nodule show the right claw to be somewhat the larger. Otherwise the two claws seem to be counterparts. I can find no other difference.

It is an abundant species, known by remains of over one hundred individuals, chiefly the manus only, though sometimes all of the segments of the cheliped are preserved in place; when this is the case, it is usually due to their being imbedded in hard nodules. No remains of the other limbs or the body have been found.

Specimens of the manus and carpus from Bohemia Creek are entirely typical. One broad manus from Brooks estate and one from Post 218, Chesapeake and Delaware Canal, differ in being broader, length of palm 18.3 mm., breadth 14.5 mm. I have seen a few examples of this broad form from New Jersey and am uncertain about its status, whether it is racial or possibly sexual.

Two imperfect chelipeds, not very unlike in size, and in one nodule, were formerly recorded by me as belonging to one individual; but on renewed examination I think them remains of two individuals. The smaller cheliped of *C. mortoni* still remains unknown.

Occurrence.—MATAWAN FORMATION. Post 218, Chesapeake and Delaware Canal, Delaware; Ulmstead Point, Anne Arundel County, Maryland. MONMOUTH FORMATION. Head of Bohemia Creek, Delaware; Brooks estate near Seat Pleasant, Prince George's County, Maryland.

Collections.—Maryland Geological Survey, Academy of Natural Sciences of Philadelphia, Wagner Free Institute of Science.

CALLIANASSA MORTONI var. MARYLANDICA n. var.

Plate XI, Figs. 9, 10

Description.—The manus resembles that of *C. mortoni* by having the inner face (palm) much less convex than the outer. The outer face has a longitudinal series of four punctures running to the base of the pollex, and a series of five to the base of the dactylus; it is contracted near the proximal articulation and has a group of tubercles in the crest before the constriction. The lateral margins of the manus are sharp and crenulated, the margin behind the dactylus being nearly straight, not deflected near the proximal angle as in *C. mortoni.* The pollex is one-third the total length of the manus, and at its base nearly one-third of the width. It has a submedian crenulated ridge and an obtuse median tooth on the grasping margin. The dactylus is not fully exposed, but seems to be somewhat longer than the pollex. The carpus, merus, and ischium do not differ materially from those parts in *C. mortoni.*

Length of hand, exclusive of fingers, 17 mm.; breadth 12 mm.; thickness 6 mm.

This race is separated from *C. mortoni* chiefly on account of the different shape of the outer margin of the hand. In over a hundred individuals seen of that species, the margin is always much more deflected near the proximal angle. The type is a complete cheliped. The example from Seat Pleasant is not fully identified, being imprefect.

Occurrence.—MONMOUTH FORMATION. Brightseat (type locality), Brooks estate near Seat Pleasant, Prince George's County, Maryland; head of Bohemia Creek, Delaware.

Collection.—Maryland Geological Survey.

CALLIANASSA CONRADI Pilsbry

Plate X, Fig. 5

Callianassa conradi Pilsbry, 1901, Proc. Acad. Nat. Sci., Phila., p. 114, pl. i, figs. 8-10.

Callianassa conradi Pilsbry, 1907, in Weller, Geol. Survey of New Jersey, Pal., vol. iv, p. 851, pl. cx, figs. 18-22.

Description.—Manus rhombic, the length of the palm not much exceeding the width, somewhat more convex on the outer than on the inner face, the outer surface neither abruptly nor deeply deflexed near the posterior margin. Surface smoothish, with some tubercles on each side of the slight excavations on both sides of the hand near the commissure between the bases of the fingers; the acute lateral edges of the hand crenulated, as in *C. mortoni,* but the lower edge is not deflexed posteriorly as in that species. Pollex triangular in section, the angles crenulated, the flat grasping face with a short smooth rib near the base, which joins the keel along the outer angle of the pollex. There is no tooth on the pollex.

Length of manus about 30 mm.; exclusive of pollex 18.5; width 16.5; thickness 7.6 mm.

In a few specimens of the paratypic lots the dactylus remains as a short stump only. No carpus or other part is known from the New Jersey localities. Thirteen hands, probably belonging to as many individuals, are before me, the most perfect being one of two in the collection of the Wagner Free Institute of Science.

The manus of *C. conradi* differs from that of *C. mortoni* in being much shorter and broader; more evenly convex on the two sides, the posterior margin of the outer side and the keel along the upper edge are not abruptly deflexed behind; the pollex of *C. conradi* has no median tooth on its grasping face, which is flat with a short smooth ridge and bounded by two crenulate angles, while in *C. mortoni* there is a median tooth, a crenulate ridge on the face, and no crenate angle along the lower inner part of the pollex.

The carpus in a specimen from Brooks estate near Seat Pleasant (pl. A, fig. 4) is more compressed than that of *C. mortoni,* with the proximal end more oblique, and the short, tuberculate carina near the distal angle is much less developed. There is a row of punctures along the distal border.

Two specimens from two localities in Maryland seem referable to this species. That from the Brooks estate consists of a hand, not quite perfect, and the natural mold, which shows also part of the impression of the dactylus, part of the carpus and part of the merus. The specimen from Seat Pleasant is small, a hand with broken fingers. It appears that the

dactylus is decidedly longer than the pollex. The natural mold is also preserved though not perfect. The description is from the type specimen.

Occurrence.—MATAWAN FORMATION. Ulmstead Point, Magothy River, Anne Arundel County. MONMOUTH FORMATION. Brooks estate near Seat Pleasant, and railroad cut west of Seat Pleasant, Prince George's County.

Collections.—Maryland Geological Survey, Academy of Natural Sciences of Philadelphia, New Jersey Geological Survey, Wagner Free Institute of Science.

CALLIANASSA CONRADI var. PUNCTIMANUS n. var.

Plate XI, Figs. 4, 5

Description.—The manus is about equally convex on both sides, as in *C. conradi;* sides acute and crenulated, the proximal margin outside very little contracted to the articulation. A longitudinal series of six punctures runs to the base of the dactylus, and another of fewer punctures to base of the pollex. The pollex is broken, but at the base it is triangular in section and found like that of *C. conradi.*

Length of hand 16.4 mm.; breadth 13 mm.; thickness 6 mm.

Type Locality.—Head of Bohemia Creek, Delaware.

It differs from *C. conradi* chiefly in the more numerous punctures of the back of the head. None of the New Jersey individuals of *C. conradi* shows so many punctures.

Occurrence.—MONMOUTH FORMATION. Head of Bohemia Creek, Delaware; Brooks estate near Seat Pleasant, Prince George's County, Maryland.

Collection.—Maryland Geological Survey.

CALLIANASSA CLARKI n. sp.

Plate XI, Figs. 6-8

Description.—The manus is somewhat more convex on its outer face; the lateral edges are pinched into acute, beautifully crenulated keels. The pollex has a low rounded median tooth on the grasping face, thereby differ-

ing from *C. conradi.* The dactylus is irregularly ovate in transverse section, having an acute, finely crenulated cutting edge, even with the outer side, the grasping face within this cutting edge being slightly concave and receding, then rounded, there being no angle along the inner edge of the grasping face. The back of the dactylus has two contiguous angles, one irregularly crenulated, the other finely and regularly crenulated. Laterally, on the outside, the dactylus has a rounded longitudinal rib, and a series of punctures lies in the concavity between this rib and the cutting edge.

Length of palm 10.2 mm.; breadth 7.5 mm.

The carpus (of another individual) is very short and broad, sharp-edged, produced into sharp lateral angles distally; concavity for the condyle of the merus small. Length 8 mm.; width 12.4 mm.

In the type specimen the carpus is largely concealed in a very hard nodule, which could not be further removed without danger to the specimen. The manus has lost a large part of the surface on the exposed side, and the tips of the fingers. Another hand which has lost the fingers has two longitudinal series of punctures, four in each, on the outer side. It is also somewhat broader. Length of palm 13.5 mm.; width 10.8 mm.; thickness 4.7 mm. In this species the convexity of the two sides of the hand is less unequal than in *C. mortoni,* and the lateral edges are nearly straight, not deflected near the proximal angle, as in that species. The shape of the carpus is very different, if I am right in associating the example of this with the manus found at the same place.

Named for Dr. Wm. Bullock Clark, director of the Survey.

Occurrence.—MATAWAN FORMATION. Post 105, Chesapeake and Delaware Canal, Delaware.

Collection.—Maryland Geological Survey.

CALLIANASSA sp. undet.

Plate X, Fig. 7

Description.—Two hands from the Chesapeake and Delaware Canal, the palmar aspect of one of them drawn in fig. 6, are probably either the smaller claw of *Callianassa* or from one of the small peræopods. The

lateral edges are acutely carinate but not crenulated. The palmar face is much less convex than the back and both are rather abruptly contracted close to the wrist. The pollex is subtriangular in section. The surface is nearly smooth, without punctures.

The specimen from Post 105: Length of hand with pollex 11.7 mm.; length of palm 9 mm.; breadth about 5 mm.; thickness 2.5 mm.

Specimen from 1½ miles east of the Maryland-Delaware Line: Length with pollex 14 mm.; length of palm 9.8 mm.; breadth 7 mm.

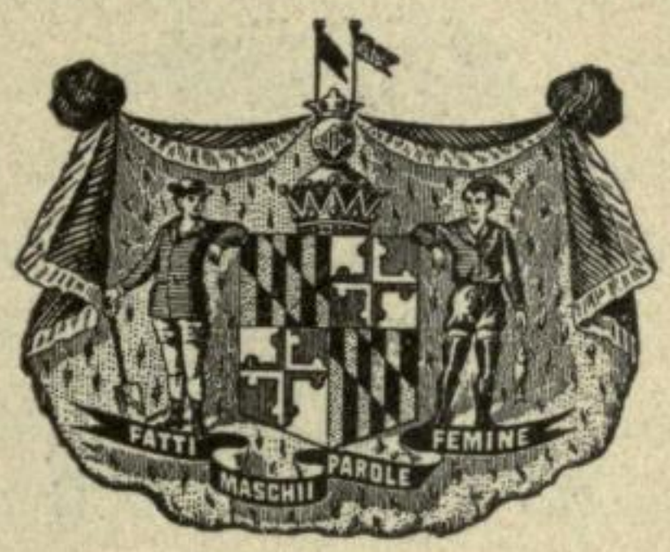
Callianassa clarki was found at Post 105 and *C. mortoni* also occurs elsewhere in the Canal. The hands described above may prove to belong to one of these species. It is a peculiar circumstance that no similar remains have been found in the New Jersey deposits, which have supplied large numbers of the large claws of *Callianassa.*

Occurrence.—MATAWAN FORMATION. One and one-half miles east of the Maryland-Delaware Line on the south side Chesapeake and Delaware Canal; Post 105, Chesapeake and Delaware Canal, Delaware.

Collection.—Maryland Geological Survey.

MARYLAND

GEOLOGICAL SURVEY



UPPER CRETACEOUS

TEXT AND PLATES

BALTIMORE
THE JOHNS HOPKINS PRESS
1916

PLATE X

PAGE

Figs. 1-4. HOLOPARIA GABBI Pilsbry 361

1. Proximal part of left manus. Deep Cut, C. & D. Canal.
2. Carpus with part of manus. Same locality.
3. Surface of manus. × 4.3. Lenola, N. J.
4. Manus, lacking proximal end. Length as broken 33.7 mm. Lenola, N. J.

Fig. 5. CALLIANASSA CONRADI Pilsbry 366

Manus and carpus. Brooks' Estate near Seat Pleasant, Prince George's County.

Fig. 6. HOLOPARIA GLADIATOR Pilsbry 362

Manus of holotype. Lenola, N. J.

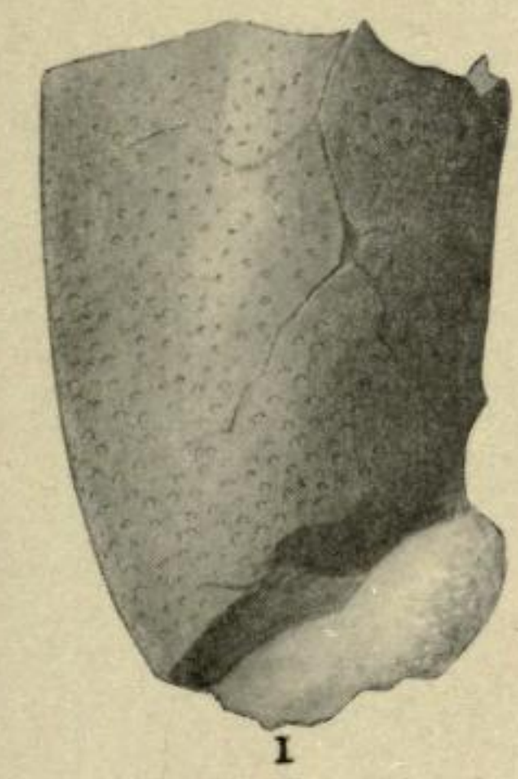
Fig. 7. CALLIANASSA sp. undet 369

Post 105, C. & D. Canal.

Figs. 8, 9. HOLOPARIA GABBI Pilsbry. Type 361

8. Edge of manus showing worn teeth of the pollex.
9. Side of manus.

Lenola, N. J.



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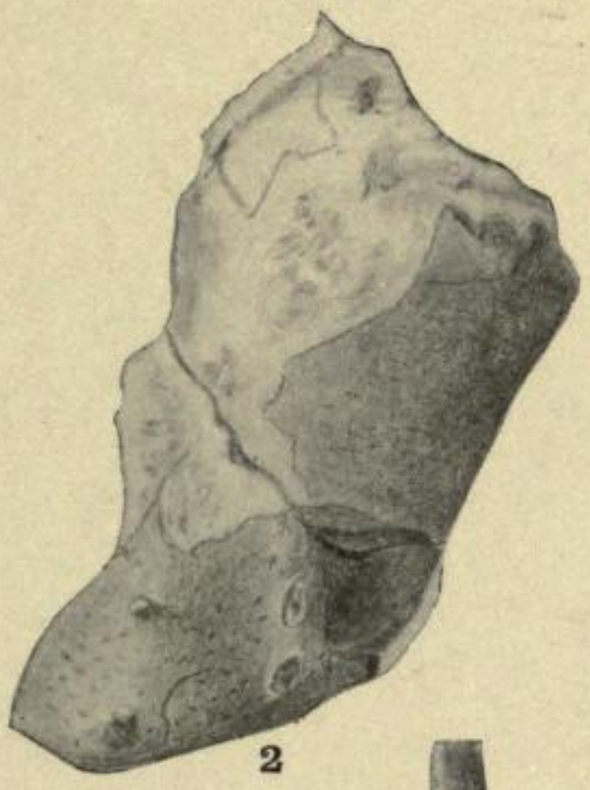

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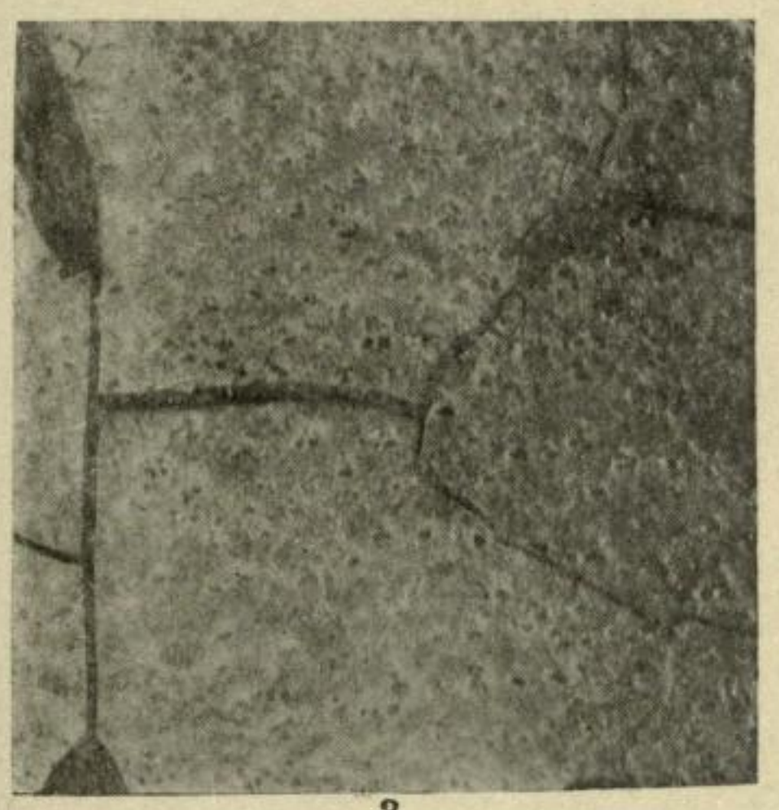

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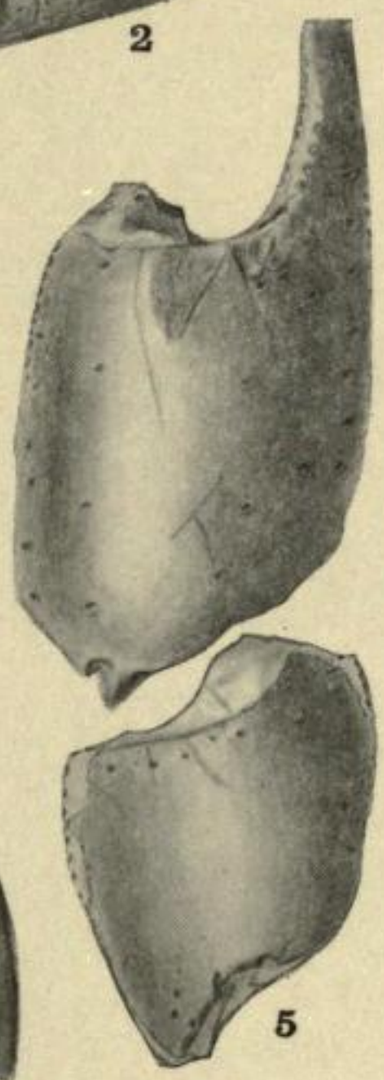

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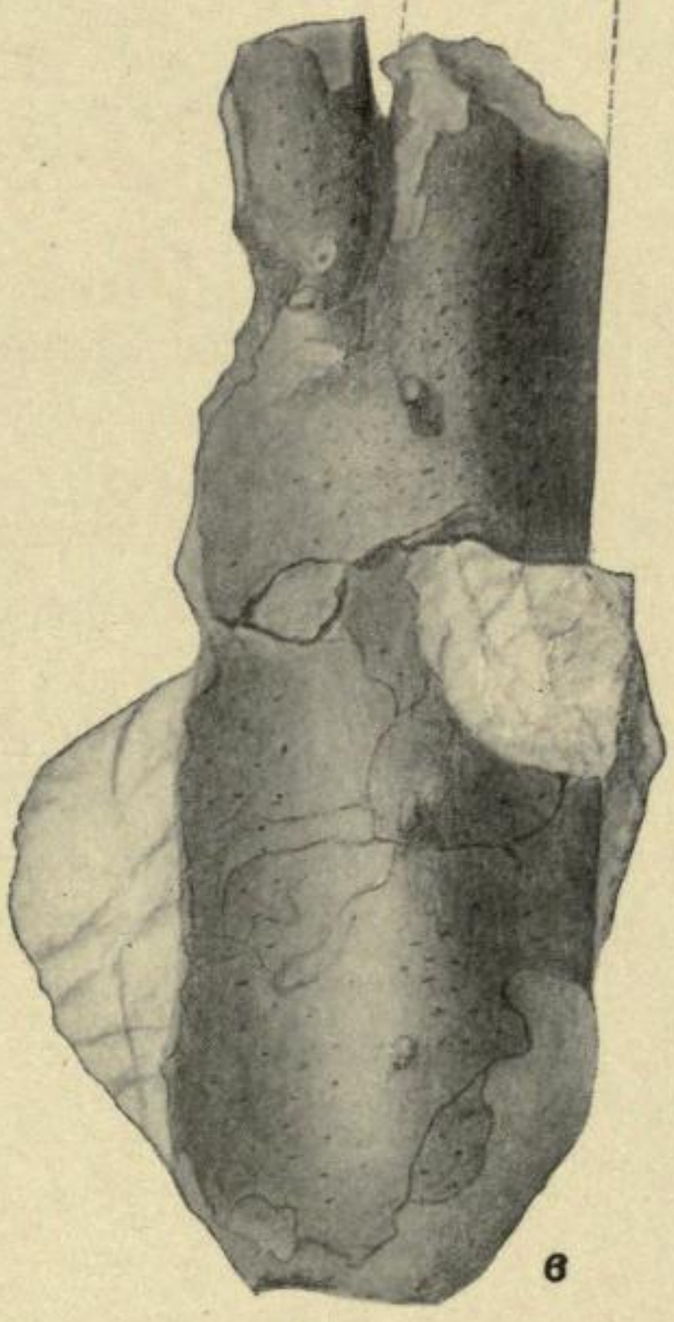

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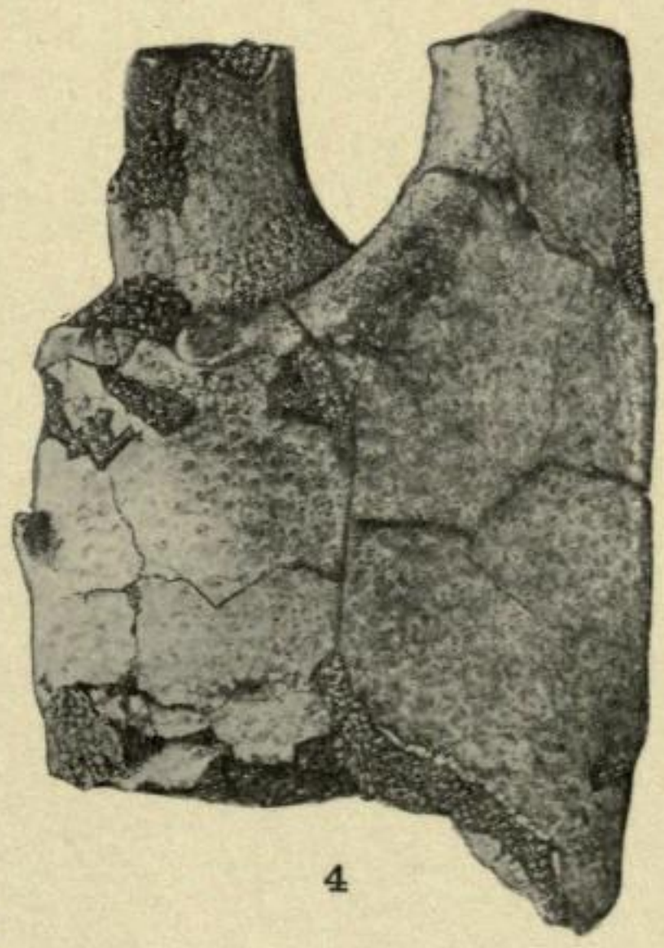

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PLATE XI

PAGE

Figs. 1-3. CALLIANASSA MORTONI Pilsbry 363

1. Inner view of manus.
2. Lateral view of manus.
3. Outer view of manus.

Head of Bohemia Creek.

Figs. 4, 5. CALLIANASSA CONRADI PUNCTIMANUS Pilsbry 368

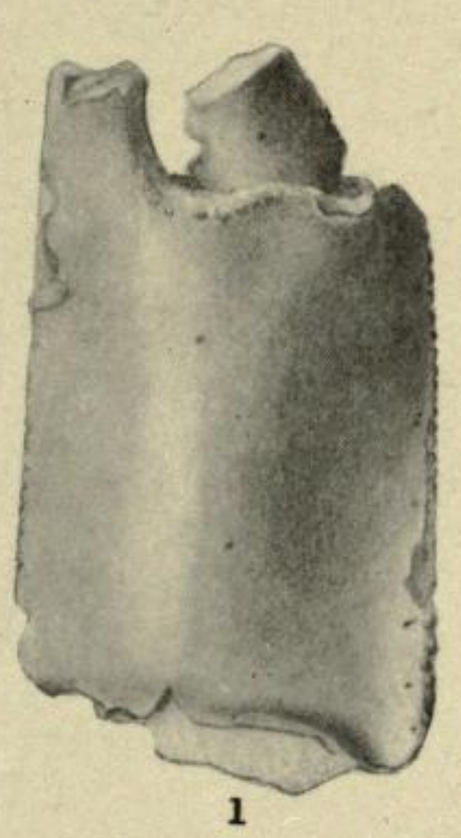
Figs. 6-8. CALLIANASSA CLARKI Pilsbry 368

6. Outside of manus, fingers broken off.
7. Carpus of another specimen.
8. Manus of type, the carpus almost all concealed.

Post 105, C. & D. Canal.

Figs. 9, 10. CALLIANASSA MORTONI MARYLANDICA Pilsbry. Holotype 366

Lateral and outside views of cheliped, the merus and ischium in large part concealed, and with the carpus, a little foreshortened, in Fig. 6a.



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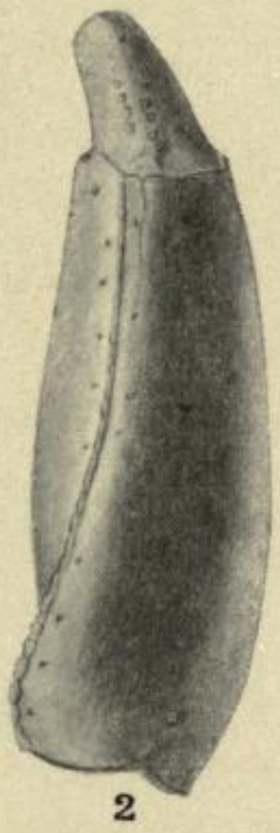

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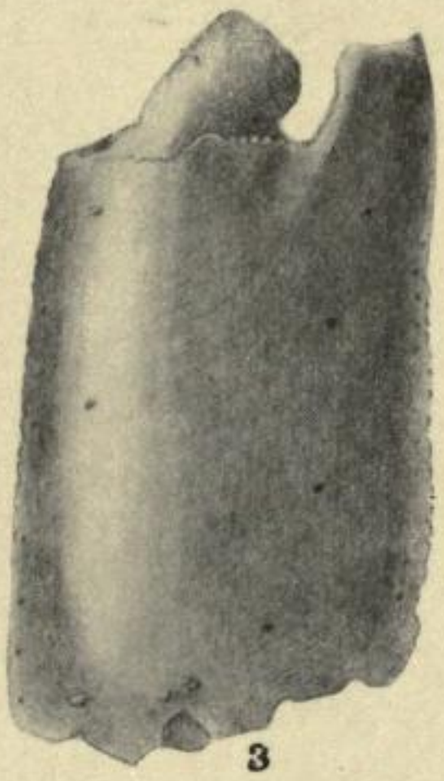

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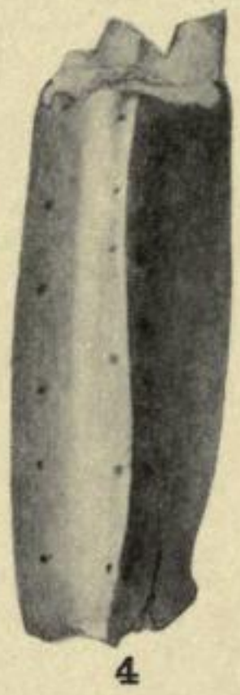

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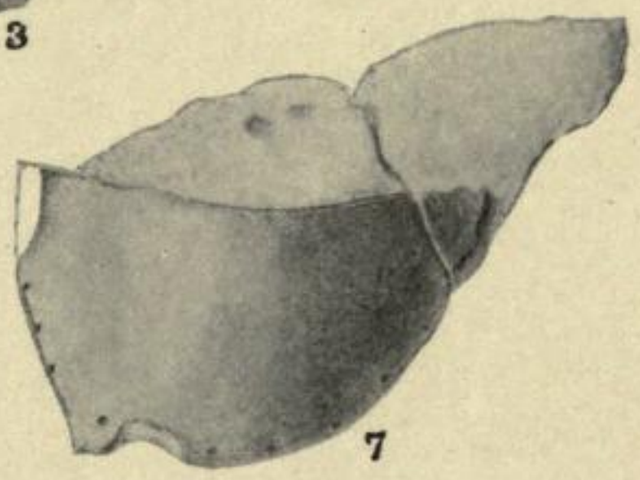

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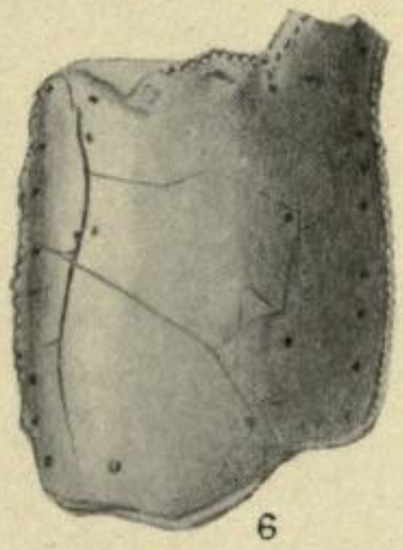

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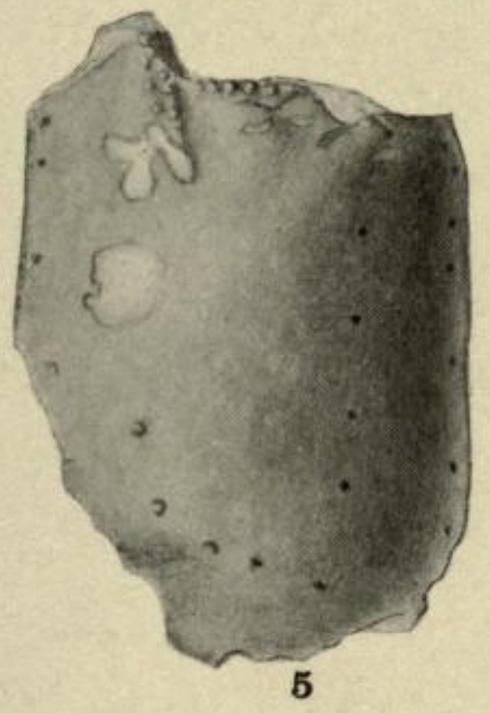

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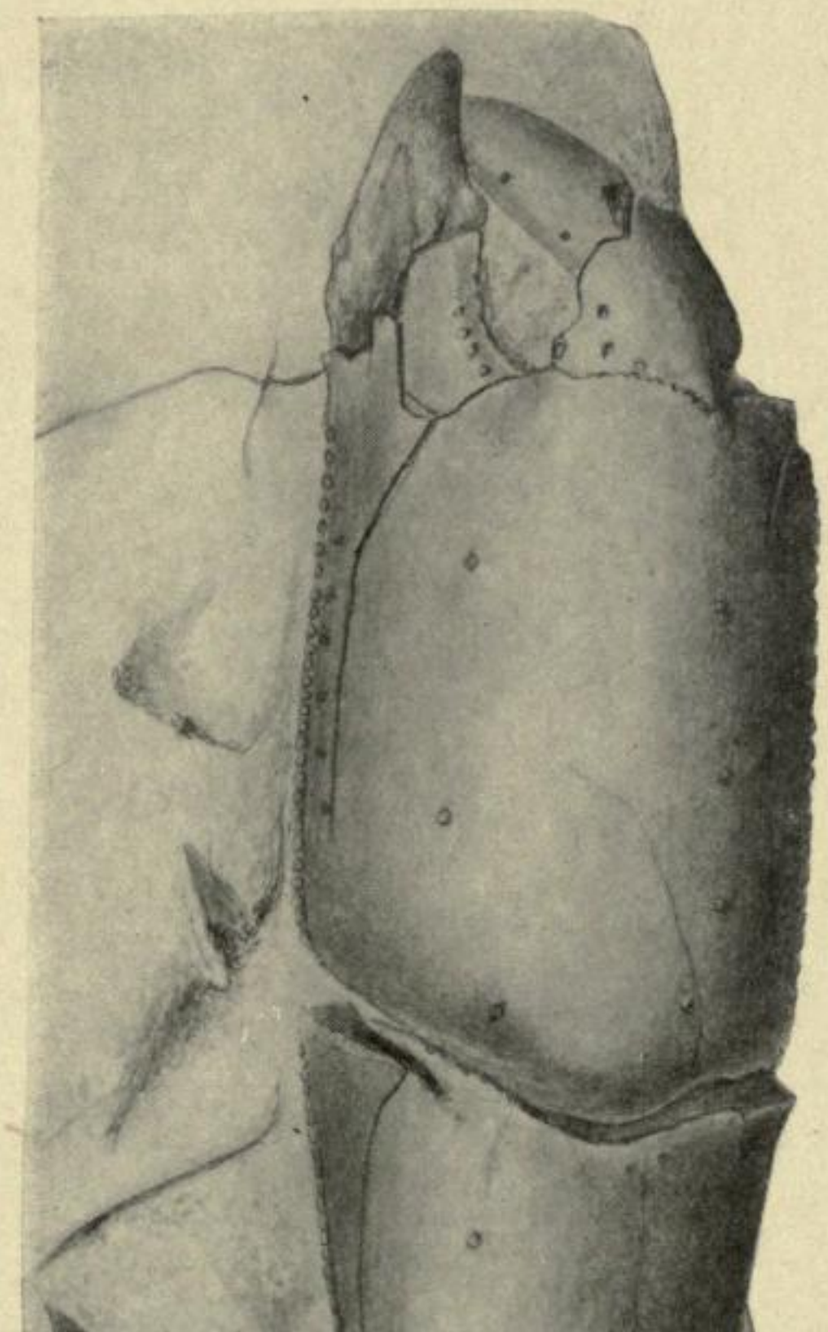

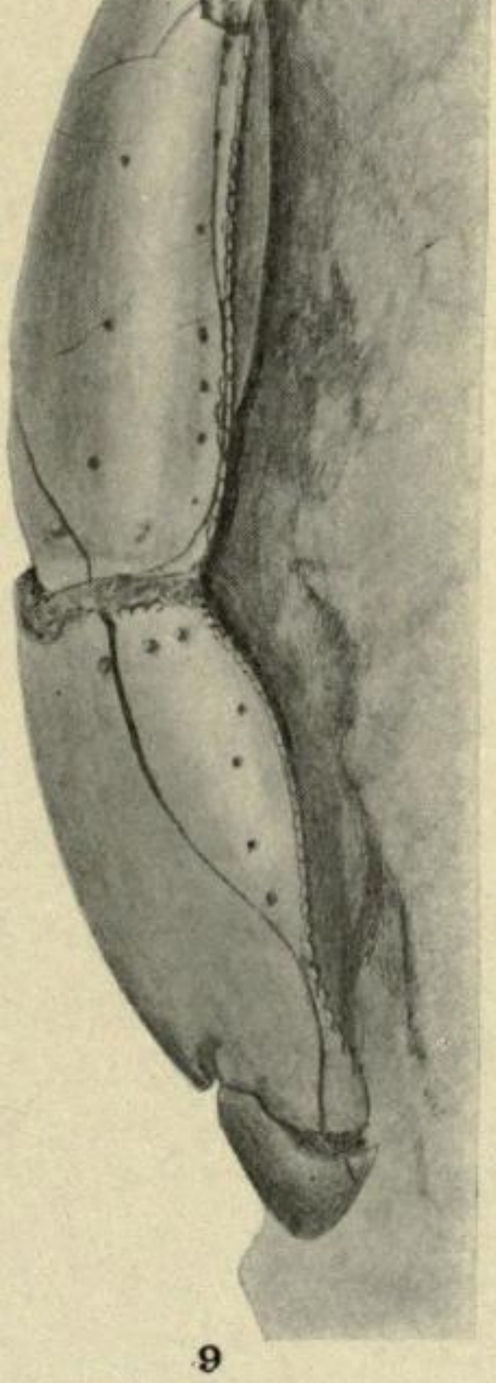

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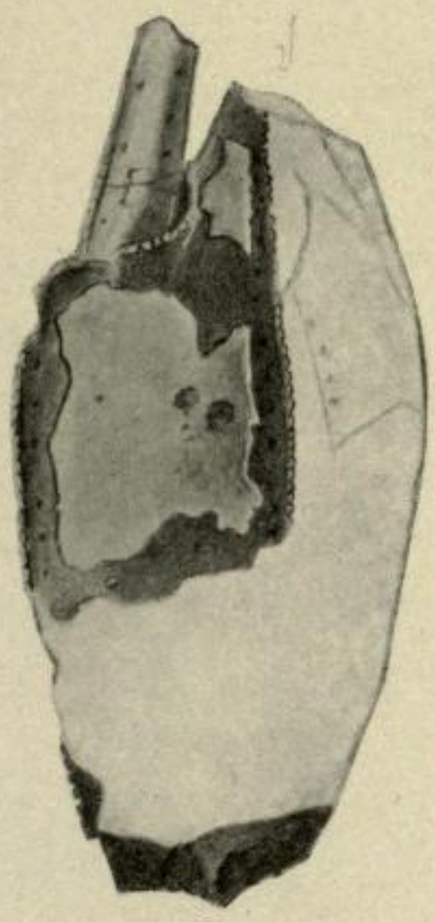

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