

openings from the coelom are open. The egg-sacs are pigmented, but the testis is not.

The mesonephric duct of the left side appears to function as a ureter, while that on the right has its distal end slightly dilated, suggesting the presence of a rudimentary seminal vesicle.

The horny epidermal pads are strongly developed on *both* "thumbs," and densely black.

The eggs of the present season have been laid and fertilized, and during the amplexus this animal conducted as a female. I am unable to state whether in any previous or subsequent amplexus it had or could conduct as a male, but from the structural evidence it seems not impossible—nor even unlikely.

The chief point of interest is that though a testis is present on one side only, the pads on the "thumbs" (male, secondary sexual characters) are developed on both—a case in nature parallel with Sir R. Owen's classical experiment.

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VIII.—*Diagnoses of new Species of Non-marine Mollusca from Portuguese South-east Africa.* By M. CONNOLLY.

FULLER particulars and illustrations of the shells described below will be given in a more important treatise in the Transactions of a learned Society, before which it was read two years ago. However, the exorbitant cost of printing, which has so seriously affected scientific publication throughout the British Empire—although, judging from beautiful works recently received, it has not been allowed to influence the output in other countries—has delayed further progress towards its appearance; and, as some of these new species have been distributed for several years under their manuscript names, it seems advisable to publish them provisionally in this little paper, pending the production of the larger volume.

*Gonaxis cressyi*, sp. n.

Shell very small, oval, narrowly rimate, smooth, thin, glossy, transparent, pale olivaceous. Spire short, with parallel sides, axis almost straight, slightly bent backward at the bluntly pointed apex, which is only just visible from the front. Whorls 6, moderately convex, rapidly increasing,

with very faint transverse striation on the later ones, showing crenulation, under a lens, in the shallow sutures; the last whorl less rounded than its predecessor, and almost flat, receding somewhat towards the aperture in front. Aperture quadrate, rounded at the base; outer lip slightly receding; peristome white and shining, narrowly reflexed, columellar margin more so; rima very small; dentition none.

Long. 6·2; lat. 3·8; apert., alt. 2·2, lat. 2·0; last whorl 4·5 mm.

*Type-locality.* Mtisherra River Valley (*B. Cressy*).

*Gonaxis (Eustreptaxis) vengoensis*, sp. n.

Shell comparatively large, oval, rimate, thin, transparent, olivaceous, smooth and glossy in front, less so on back. Spire produced, left side very convex, right nearly straight; apex roundly conoid. Whorls  $6\frac{1}{2}$ , rather flat, rapidly increasing, the  $1\frac{1}{2}$  apical microscopically malleate and faintly spirally striate; the next four covered with close, prominent, oblique, transverse striæ, with spiral pitting in the interstices; except immediately below the suture on the back of the shell, the sculpture becomes very faint on the last whorl, which is almost smooth, especially in front; suture simple, shallow. Aperture quadrate, rounded at base; peristome white, shining, slightly thickened; columella straight, margin moderately reflexed over the rima; callus and dentition none.

Long. 25·2; lat. 14·6; apert., alt. 8·8, lat. 8·6; last whorl 19·5 mm.

*Type-locality.* District 15 miles north of Macequece (*B. Cressy*).

*Gulella enneadon*, sp. n.

Shell rather small, tun-shaped, broadly rimate, thin, transparent, faintly olivaceous vitreous. Spire produced, sides nearly parallel, slightly convex; apex bluntly rounded. Whorls  $7\frac{1}{2}$ , nearly flat, gradually increasing, the 2 apical smooth, remainder covered with close fine striæ, which are only just visible without a lens; suture shallow. Aperture nearly square, only slightly rounded at base, showing the following nine-fold dental process:—a small sharp denticle in the centre of the paries; a large curved parietal plait on its right; a large bifid tooth halfway down the outer lip; two minute denticles between the last-mentioned and the base; a small sharp basal tooth; and a two-cusped fold in the angle of the columella and paries; peristome shining, white, reflexed; rima circular.

Long. 6.2 ; lat. 3.3 ; apert., alt. 1.7, lat. 1.2 ; last whorl 3.5 mm.

*Type-locality.* District north of Macequece (B. Cressy).

*Gulella praelonga*, sp. n.

Shell elongate, cylindrical, rimate, somewhat calcined in the type, but normally thin, pale olivaceous, semi-transparent, with a silky sheen. Spire much produced, sides almost parallel, apex rounded to a blunt point. Whorls  $7\frac{1}{2}$ , flattish, gradually and regularly increasing, the apical smooth, remainder covered with close, regular, almost straight, transverse striæ, which extend into the sutures and are just visible without a lens ; suture shallow, but well-defined. Aperture subquadrate, only slightly rounded at base ; peristome white, very narrowly reflexed ; columellar margin more broadly so, almost concealing the rima. Dental processes three : an inconspicuous columellar fold or swelling ; a small parietal plait, starting at the junction of the outer lip and paries and only receding an extremely short distance within the shell ; and a very small single deuticle, corresponding to a hardly noticeable external depression halfway down the outer lip.

Long. 8.8 ; lat. 3.5 ; apert., alt. 2.0, lat. 2.0 ; last whorl 4.1 mm.

*Type-locality.* Mount Vengo, Macequece District (B. Cressy).

*Gulella tristãoensis*, sp. n.

Shell small, rimate, cylindrical, rather thin, moderately glossy, transparent, pale olivaceous. Spire produced, sides parallel, apex bluntly rounded. Whorls 7, somewhat convex, gradually increasing, the last exceeding half the length of the shell ; the first 2 smooth and shining, remainder covered with close, prominent, regular, nearly straight, transverse striæ ; suture well defined. Aperture nearly circular, outer lip somewhat bowed outward immediately below the suture ; columella almost straight ; peristome white, shining, reflexed ; dental processes three : a moderate-sized, almost straight, parietal plait, not reaching far within the shell ; a small sharp tooth on the slight sinuosity of the outer lip and a blunt fold on the columella, some distance within the aperture.

Long. 5.3 ; lat. 2.3 ; last whorl 2.8 mm.

*Type-locality.* District north of Macequece (B. Cressy).

*Sitala diaphana*, sp. n.

Shell small, imperforate, globose-conic, very thin, transparent, smooth, shining, pale yellow-corneous. Spire somewhat elevated, sides regular, meeting at an angle of about  $80^\circ$ ; apex pointed. Whorls 5, rapidly increasing, rounded, with very slight peripheral carination; covered on both sides and almost to the apex with very faint, irregular, straight, transverse striæ, which are only visible under a lens, and microscopic, close, spiral striæ, allowing the surface to appear smooth and polished to the naked eye; suture simple, well defined. Aperture rounded-lunate; peristome simple, acute; columella short and straight, upper margin very narrowly, solidly reflexed; callus none.

Diam. maj. 4.2, min. 3.8; alt. 4.0; apert., alt. 2.0, lat. 2.2 mm.

*Type-locality.* District north of Macequece (*B. Cressy*).

*Trachycystis ambigua*, sp. n.

Shell small, rimate, subconic-globose, very thin, translucent, rather dull, carneo-corneous. Spire a little elevated, apical angle about  $95^\circ$ ; apex pointed. Whorls 5, rounded, with faint peripheral carination, rapidly increasing, the apical smoothly punctate, remainder covered on both sides with extremely close, straight, transverse, microscopic striæ, with spiral sculpture commencing on the 4th and stronger, crossing the transverse striæ, on the 5th whorl; suture simple, moderately impressed. Aperture nearly semi-lunar; peristome simple, acute; columella very short, margin very narrowly reflexed, but almost covering the minute rima.

Diam. maj. 4.5, min. 4.0; alt. 3.7; apert., alt. 2.5, lat. 2.1 mm.

*Type-locality.* Head-waters of R. Inyamkarrara, 4500 ft. (*B. Cressy*).

*Trachycystis sericea*, sp. n.

Shell small, umbilicate, subglobose, rather thin, translucent, dark reddish corneous with a silky sheen. Spire slightly raised, apex bluntly rounded. Whorls 5, very round, rather gradually increasing, the apical half-whorl smooth, remainder prettily sculptured with very close, slightly curved, regular, prominent, transverse striæ, clearly visible without a lens, between each of which are 3 or 4 microscopic transverse striæ, the whole imparting a silky

lustre to the shell; suture simple, deep. Aperture rounded-lunate; peristome thin, simple; columella short, upper margin narrowly reflexed, but not concealing the very narrow, though deep, umbilicus.

Diam. maj. 3·9, min. 3·5; alt. 3·2; apert., alt. 2·1, lat. 1·7 mm.

*Type-locality.* District 16 miles north of Macequece, 4500 ft. (*B. Cressy*).

NOTE.—The sculpture of the seven minute species which follow is described subject to a magnification of about 50.

*Trachycystis mcdowelli*, sp. n.

Shell very small, depressed, circular, umbilicate, thin, silky, translucent, corneous. Spire almost flat. Whorls  $4\frac{1}{4}$ , rounded, slowly and regularly increasing; protoconch faintly microscopically punctate, showing traces of transverse striation after the first whorl; remaining whorls covered with very close, clear, nearly straight, transverse, microscopic striæ; suture narrow, but well-defined. Aperture lunate; peristome simple, acute; umbilicus rather narrow, extending to the summit and just exposing all the whorls.

Diam. maj. 1·7, min. 1·5; alt. circa 0·8 mm.

*Type-locality.* Maforga Siding, B. & M. Railway (*B. F. McDowell*).

*Trachycystis rudicostata*, sp. n.

Shell minute, umbilicate, nearly flat, thin, transparent, pale corneous. Spire but little raised, apex submamillate. Whorls  $3\frac{1}{2}$ , convex, rather rapidly increasing, the apical  $1\frac{3}{4}$  microscopically punctate and clearly, closely, spirally striate; remainder sculptured on both sides with prominent, raised, curved, oblique, transverse liræ, increasing in distance toward the aperture and becoming lamelliform on the periphery; between each of these are very close transverse, crossed by equally close spiral, striæ; suture simple, deep. Aperture nearly circular; peristome simple, columellar margin not reflexed, umbilicus wide and deep, extending to the summit and exposing all the whorls.

Diam. maj. 1·8, min. 1·6; alt. circa 0·9 mm.

*Type-locality.* Dargle, Natal (*H. C. Burnup*): also found on Mt. Vengo, Macequece (*B. Cressy*).

*Trachycystis soror*, sp. n.

Shell minute, depressed, conic-globose, umbilicate, thin, pellucid, pale corneous. Spire somewhat raised, apex rounded. Whorls  $3\frac{1}{2}$ , regularly, but not very rapidly, increasing; protoconch rather indistinctly microscopically punctate for half a whorl, and then showing rather distant radial striæ, corresponding to the lamellæ on the later whorls, which are sculptured with transverse lamellæ, of which there are about 20 on the last whorl, where they are from .12 to .15 mm. apart, interspersed with rather fine, irregular transverse, crossed by very fine spiral, striæ; suture well-defined. Aperture rounded-lunate; peristome simple, acute; umbilicus rather wide, extending to the summit and exposing all the whorls.

Diam. maj. 1.5, min. 1.3 mm. ; alt. circa 0.8 mm.

*Type-locality.* Mount Vengo, 5500 ft. (*B. Cressy*).

*Trachycystis pura*, sp. n.

Shell minute, depressed circular, umbilicate, thin, milky-translucent. Spire nearly flat. Whorls  $3\frac{1}{2}$ , slowly and regularly increasing, covered all over with close, strong, regular, nearly straight, transverse striæ, which are about .025 mm. apart on the last whorl, but closer together towards the apex, except on the first half of the first whorl, where they are slightly more distant than on the second half; protoconch furnished with almost invisible spiral striæ, which also occur round the umbilicus; suture narrow, but well defined. Aperture rounded-lunate; peristome simple, acute; umbilicus rather wide, extending to the summit and exposing all the whorls.

Diam. maj. 1.2, min. 1.05; alt. 0.7 mm.

*Type-locality.* Mount Vengo, 5500 ft. (*B. Cressy*).

*Trachycystis vengoensis*, sp. n.

Shell minute, umbilicate, depressed-globose, thin, translucent, reddish corneous. Spire nearly flat, each whorl just showing above the next. Whorls  $3\frac{1}{2}$ , rounded, gradually increasing, protoconch microscopically reticularly punctate, remainder covered on both sides with microscopic, close, straight, regular, transverse striæ, crossed by almost invisible spiral striation round the umbilicus; suture simple, deep. Aperture rounded-lunate; peristome thin, simple; columellar

margin not reflexed, umbilicus not wide, but deep, extending to the summit and disclosing all the whorls.

Diam. maj. 1.45, min. 1.35 ; alt. 0.4 mm.

*Type-locality.* Mount Vengo, 5500 ft. (*B. Cressy*).

*Punctum pallidum*, sp. n.

Shell minute, depressed globose, umbilicate, thin, glossy, pellucid, whitish corneous. Spire not much raised, apex smoothly convex. Whorls 4, slowly and regularly increasing, protoconch with microscopic spiral striæ, of which about 14 are visible on the upper exposed portion ; remainder of shell covered with narrow, but well-defined, slightly oblique transverse striæ, about 0.03 mm. apart on the last whorl, interspersed with finer ones, which are crossed by fine spiral striæ, the latter best developed near the umbilicus ; suture shallow, somewhat margined. Aperture lunate ; peristome simple, acute ; umbilicus not wide, but deep, extending to the summit and just exposing all the whorls.

Diam. maj. 1.2, min. 1.1 ; alt. 0.4 mm.

*Type-locality.* Mount Vengo, 5500 ft. (*B. Cressy*).

*Nesopupa bandulana*, sp. n.

Shell minute, ovate, rimate, thin, smooth, glossy, semi-transparent, dark corneous-brown. Spire moderately produced, sides convex, apex rounded. Whorls  $4\frac{1}{2}$ , moderately convex ; apex faintly microscopically punctate, later whorls sculptured with the same faint punctation and very faint, comparatively distant, slightly oblique, transverse striæ, hardly apparent under 50-fold magnification ; suture simple, shallow. Aperture quadrate, narrowing and rounded at the base, with a pronounced sinus at the top of the outer lip ; peristome white, very slightly thickened ; columellar margin a little reflexed ; dental processes six : a deep-set, inrunning, mid-parietal plait ; a smaller one, a little nearer the surface, halfway between the last-mentioned and the outer lip ; three rather deep-set, equidistant, basal denticles, and an equally deep-set horizontal lamella on the columella. Rima of moderate size.

Long. 1.5 ; diam. maj. 1.0 mm.

*Type-locality.* Near Bandula Siding, B. & M. Railway (*B. F. McDowell*).

*Edouardia junodi*, sp. n.

Shell rather small, broadly conoid, umbilicate, thin, shining, yellowish corneous. Spire moderately elevated, with straight sides meeting at an angle of  $80^\circ$ ; apex mamillate. Whorls 5, regularly and rather rapidly increasing, very convex, the last rounded with only the faintest appearance of carination; apex practically smooth, remaining whorls sculptured with faint, close, regular, transverse striæ, hardly visible without a lens; suture impressed. Aperture nearly circular, descending a little when viewed from the front; peristome simple, acute; outer lip straight, hardly receding at all toward the base; columella rather concave, margin somewhat broadly triangularly reflexed, concealing from the front, but not covering, the round umbilicus, which is narrow, but very deep, extending to the summit.

Alt. 10.8; lat. 10.2; apert., alt. 6.6, lat. 5.0; last whorl 8.5 mm.

*Type-locality.* Lebombo Mountains (*H. A. Junod*).

*Opeas vengoense*, sp. n.

Shell very small, elongate-fusiform, imperforate, thin, smooth, shining, transparent, very pale olivaceous-vitreous. Spire produced, sides regular, apex rounded. Whorls  $5\frac{1}{2}$ , flattish, rapidly increasing, the first smooth, second microscopically very faintly, rather distantly, vertically striate; remainder covered with fine, regular, somewhat oblique, curved, transverse striæ, which are only visible under a lens; suture simple and shallow, but well-defined. Aperture elongate, acuminate-ovate, rounded at base; peristome simple, acute; outer lip slightly bowed forward; columella weak, concave, adnately thickened, but not truncate.

Long. 6.3, lat. 1.7; apert., alt. 1.8, lat. 0.7; last whorl 3.6 mm.

*Type-locality.* Mount Vengo, 5500 ft. (*B. Cressy*).

*Opeas cressyi*, sp. n.

Shell small, elongate-fusiform, imperforate, thin, shining, transparent, pale olivaceous-vitreous. Spire produced, sides gradually and regularly tapering, apex rounded. Whorls 7, rather convex, regularly and rather rapidly increasing, the first 2 faintly microscopically punctate, remainder covered with close, clear, regular, curved, transverse striæ, visible to the

naked eye; suture simple, somewhat oblique, pronounced, but not deep. Aperture elongate, acuminate-ovate; peristome thin, simple; outer lip a little curved outward, well arcuate forward below the suture, receding more gradually to the base; columella weak, concave, almost imperceptibly truncate.

Long. 10·8, lat. 2·8; apert., alt. 3·3, lat. 1·2; last whorl 5·7 mm.

*Type-locality.* District north of Macequece (*B. Cressy*).

*Auriculastra acuta*, sp. n.

Shell of fair size, fusiform, imperforate, rather solid, bleached white and dull in the type, but probably glossy and creamy-olivaceous in fresh condition. Spire somewhat produced, with straight sides meeting at an angle of about 48°; apex acute. Whorls 7, almost flat, regularly increasing, each being about one-third greater in altitude than its predecessor, sculptured with very faint, close, regular, almost straight, transverse striæ; suture extremely shallow, strongly margined below. Aperture inverse elongate-auriform, very acute at apex and narrowly rounded at base; outer lip simple, blunt, gently outcurved, straight in profile; columella calloused, short and straight, furnished with two deeply inrunning folds, of which the upper is by far the most prominent.

Long. 17·8, lat. 8·0; apert., alt. 10·3, lat. 2·7; last whorl 13·3 mm.

*Type-locality.* Estuary of Nkomati River, Rikatla (*H. A. Junod*).

*Hippeutis junodi*, sp. n.

Shell small, discoid, umbilicate, thin, smooth, shining, semi-transparent, reddish corneous. Spire much impressed. Whorls 4, rapidly increasing, each rising considerably above its predecessor, the last, which comprises practically the whole shell, rounded and convex above, sloping somewhat abruptly downward to the roundly-keeled base, slightly concave beneath; microscopically sculptured on both sides with close transverse striæ of irregular prominence, undulating with the curves of the outer lip; suture impressed. Aperture barbate, pointing slightly downward in profile, squarely quadrate from beneath; peristome thin, simple, the curve of the outer lip at first receding infinitesimally, then advancing slightly and receding rapidly above, almost

straight beneath and not extending into the umbilicus, which is not wide, but deep, extending to the apex and hardly disclosing all the whorls.

Diam. maj. 5·3, min. 4·7; alt. 1·5; apert., alt. 1·5, lat. 2·4 mm.

*Type-locality.* Nwambukoto, Rikatla (*H. A. Junod*).

*Assiminia leptodonta*, sp. n.

Shell very small, broadly ovate, imperforate, solid, shining, translucent, darkish brown. Spire moderately produced, with straight sides meeting at an angle of about 50°; apex acute. Whorls 6, almost flat above, but well rounded at the periphery and very rapidly increasing; the apical  $1\frac{1}{2}$  microscopically punctate, later whorls sculptured with very faint, straight, slightly irregular striæ or growth-lines, only visible under a strong lens, crossed by much finer, extremely close, microscopic, spiral striæ; suture flat, broadly and very strongly margined below. Aperture subovate, somewhat flattened at the base; peristome simple, acute; outer lip straight in profile and hardly receding; columella white, slightly concave, margin narrowly adnate; callus white and thin.

Alt. 5·2, lat. 3·4; apert., alt. 3·0, lat. 2·0; last whorl 4·2 mm.

*Type-locality.* Estuary of the Nkomati River, Rikatla (*H. A. Junod*).

IX.—*Some new Silurids from the Congo.*

By EINAR LÖNNBERG and HIALMAR RENDAHL.

THE Silurids described below belong to the R. Nat. Hist. Museum in Stockholm.

*Clarias lualæ*, sp. n.

Depth of body about 9 times in total length, length of head  $4\frac{2}{3}$  times. Head  $1\frac{1}{4}$ – $1\frac{1}{3}$  times as long as broad, granular above. Occipital process angular. Fontanelles large; the frontal one has a rather peculiar shape, which is elucidated by the accompanying figure (fig. 1). Its anterior greater and somewhat blade-shaped portion partly divided from the posterior somewhat rounded portion by a pair of lateral processes. The occipital fontanelle is almost oviform and



Connolly, Matthew William Kemble. 1922. "Diagnoses of new species of non-marine Mollusca from Portuguese Southeast Africa." *The Annals and magazine of natural history; zoology, botany, and geology* 10, 113–122.

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