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Polina

On Some Bathonian Mollusca from Skye

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(PLATE XI)

THE present paper is based on material partly from the collection of the Geological Survey of Great Britain and partly from a collection made by myself in May, 1947, at Kilmalaug Bay, North Trotternish, Skye. It is believed that the species of mollusca here reported form the first records from the Bathonian beds exposed there. Tate (1873) did not make any reference to this locality, although the area was marked as "Aird" on the map of the Islands of Skye and Raasay forming plate xi of Bryce's paper (1873), to which Tate's work was an appendix.

The stratigraphical position of the deposits exposed at Kilmalaug Bay is about 180 feet below the base of the Oxford Clay and is in the upper part of the so-called "Great Estuarine Series". The deposits consist of a bed of sandy limestone about 1 ft. thick, followed in downward succession by a very thin band of black shale of 1½ in., a band of fine-grained cementstone of about 4 in., and a bed of sandy limestone of 1 ft. at the base. The fine-grained cementstone bed contains the following species of gastropods in addition to some undeterminable pelecypods :—

Procerithium cf. *pisoliticum* (Hudleston)

Procerithium cf. *vetustum* (Phillips)

The sandy limestone bed yields a large number of individuals of one species of pelecypod and two species of gastropods, namely—

"*Cyrena*" *jamesoni* Forbes

Bathonella cf. *scotica* (Tate)

Bathonella bithynoides n. sp.

These fossiliferous deposits occur above the "Lower Ostrea Bed", from which they are separated by several beds of soft sandstone, black shales, ostracod-marl, and sandy shales, amounting in total to a thickness of about 9 feet.

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The presence of two species of *Procerithium* together with some *Spirorbis*-like forms in the fine-grained cementstone bed indicate clearly that the enclosing rock is of marine origin: the tubular *Spirorbis*-like form of minute size occurs aggregated in masses in the deposit. The molluscan evidence as to the depositional environment of the sandy limestone bed is less certain, however, and the *Cyrena*-like forms in the rock are usually supposed to indicate an estuarine facies.

DESCRIPTIONS OF MOLLUSCAN SPECIES

The following species of mollusca are recorded from the above-mentioned beds. Among them one genus and one species are herein described as new, while others are comparable to allied species. All the types and other specimens recorded in the present paper are preserved in the Palaeontological collections of the Geological Survey Museum.

Bathonella, new genus

Shell naticoid, umbilicated, having a more or less acutely conical spire, and a descending, ventricose body whorl. Whorls increasing rapidly in size, strongly and evenly convex and slightly shouldered. Early whorls bearing marked spiral and growth lines, the spiral lines obscurely traceable on the later whorls, and the lines of growth becoming more pronounced and distinctly curved towards the base of the body whorl. Aperture ovate in outline and barely attaching to the preceding whorl, having its peristome continuous, outer lip margin retreating at the base, parietal wall short, and columella gently arched or nearly straight. Umbilicus narrow in the young and well open in the more mature shells.

Genotype: *Paludina scotica* Tate.

This genus is characterized by having an acute angle to the spire, strongly convex whorls, a rapidly dilated body whorl, a laterally descending aperture with continuous peristomal margin, a short parietal wall, and a nearly straight columella. These features in combination produce an entirely different aspect of the shell from that of any species of *Viviparus* hitherto recorded.

The shell outline recalls some forms of *Natica*, but its thin shell substance, and the absence of the umbilical callosity differentiate *Bathonella* from any genus of Naticidae. The general outline of the shell and the simple sculpture are reminiscent of *Recluzia* Petit de la Saussaye, a genus of the recent fauna occurring in warm seas, and this indicates well that a *Viviparus*-like form of shell can be found in the marine fauna.

Judged by the similarity in morphological features and taking into

consideration the geological age, the nearest group related to this new genus may be *Coelostylina* Kittl, a genus recorded from Permian to Jurassic. However, *Bathonella* differs from that genus by its more strongly convex whorls, more rapidly increasing in size, its almost circular peristomal margin, and its straight columella. On morphological resemblance *Bathonella* is for the present assigned to the family Coelostylinidae Cossmann.

The holotype of *Paludina scotica*, as F. W. Anderson has recognized, is an immature specimen. Through his kindness I am able to illustrate the more mature specimens of this species (Pl. XI, fig. 1a, b, c, d). There seems to be little doubt that the species resembles very closely *P. langtonensis* Hudleston (Pl. XI, fig. 2a, b, c, and fig. 3) from the Sharp's Hill Beds in North Oxfordshire, and *Viviparus aurelianus* Cossmann from St. Gaultier in Indre, France. The three forms are most probably congeneric, and those from Oxfordshire and Indre may be only varieties or subspecies of *Paludina scotica*.¹

Whether a constituent of fossil or of recent faunas, there seems to be no doubt that *Viviparus* has always been a genus of true freshwater habitat. Its prolific occurrence in any bed would therefore positively indicate freshwater deposition. Usually it is accompanied by other genera of freshwater mollusca or invertebrates, as in the Morrison beds in North America and the Purbeck in Europe.

Bathonella, however, has nowhere been found in association with fossils of undoubted freshwater origin. In Skye, as already seen, it occurs with *Procerithium*; in North Oxfordshire, Walford (1906, p. 8) states that it occurs with such true marine genera as *Ataphrus* and *Nerinea*; while in Indre the associated genera are *Nerinea*, *Delphinula*, *Emarginula*, and *Patella*. The evidence suggests, therefore, that *Bathonella* was a genus of marine habitat.

Bathonella bithynoides n. sp.

(Pl. XI, fig. 4a, b, c, d)

Holotype: Geol. Survey 75538; paratypes, G.S. 75535-7, 75539-47.

Shell ovately oblong in outline, narrowly umbilicated, having an acutely conical spire and a dilated body whorl. Whorls six to eight, rapidly increasing in size, evenly convex and bearing strong lines of growth, which are very wavy towards the base of the body whorl. The sculpture on the early whorls is not traceable. Aperture ovate in outline, descending and barely attaching to the preceding whorl,

¹ I am confirmed in this opinion after an examination of the type of *P. langtonensis*, made available to me for study through the kindness of Mr. A. G. Brighton, of the Sedgwick Museum.

having a continuous peristome ; outer lip retreating below ; parietal wall short and columella gently arched.

	mm.	mm.	mm.	mm.
Altitude of shell .	11.0 +	12.0 +	11.6	11.0
Width of shell .	7.0	8.6	7.1	7.2
Height of aperture .	6.0	7.0	5.3	5.0
Width of aperture .	5.0	6.0	4.9	4.5

This species differs from *Bathonella scotica* (Tate) in its much smaller size, more oblong outline, higher spire, and narrower umbilicus. The sculpture is poorly preserved on the specimens available, and the apical whorls in most cases are not well preserved. However, its general outline and apertural features seem to justify its reference to *Bathonella*. It differs from the young individuals of *B. scotica* in its more oblong outline and higher spire.

Procerithium cf. *vetustum* (Phillips)

(Pl. XI, fig. 6)

Cerithium vetustum Phillips, Hudleston, 1888, p. 148, pl. 8, figs. 5a-6.

A few examples in the collection resemble this species. It is narrowly slender in outline and has over twelve whorls, which are scarcely convex. The sculpture consists of four to five spirals, which are intersected by sparse axial riblets producing constrictions in places, particularly noticeable near the suture. One example measures 12 mm in height and 3.5 mm in its greatest width.

Procerithium cf. *pisoliticum* (Hudleston)

(Pl. XI, fig. 5a, b)

Cerithium pisoliticum, Hudleston, 1888, p. 164, pl. 9, fig. 13a, b.

This form is comparatively broad in shell outline, with more strongly convex whorls. The sculpture consists of both spiral and axial lines ; they are fine and closely arranged, producing a granular appearance on the surface. One example measures 12 mm in height of shell and 4.5 mm in its greatest width.

Both these forms of *Procerithium* were found in the thin band of fine-grained cementstone in association with some *Spirorbis*-like form and an undeterminable species of pelecypod. They are represented by several individuals, though most of them are imperfectly preserved. Their general outline, sculpture, short anterior notch, and columellar callosity seem to characterize them as forms of *Procerithium*. They may not be conspecific with Hudleston's *pisoliticum*, but any definite specific status will have to be based on better preserved specimens.

"*Cyrena*" *jamesoni* Forbes

(Pl. XI, fig. 7)

Cyrena jamesoni, Forbes, 1851, p. 111, pl. 15, figs. 7-8.

On the basis of the external form and size I provisionally assign these specimens to this species, which was described from the "estuarine shales" at Loch Staffin in Skye.

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EXPLANATION OF PLATE

- FIG. 1a, b, c, d.—*Bathonella scotica* (Tate). Specimens collected by F. W. Anderson from greenish grey shelly shales at about 270 feet above the top of the Inferior Oolite Series near Lealt River, Inver Tote, Skye. Fig. a, an adult specimen (altitude 29.6 + mm, width 24.4 mm, last four whorls), Geol. Survey Scotland, No. V 1017c ; Fig. b, a body whorl of an adult specimen (width, 31 mm), No. V 1016c ; Fig. c, a young specimen (altitude 9.6 + mm, width, 9.4 mm, last three whorls), $\times 2$, No. V 1034c ; Fig. d, a young specimen (altitude, 25.2 mm, width, 18.5 mm, $4\frac{1}{2}$ whorls), No. V 1024c.
 FIG. 2a, b, c.—*Bathonella scotica langtonensis* (Hudleston). Specimens from the Sharp's Hill Beds at Sharp's Hill, near Hook Norton, Oxfordshire. Fig. a, an adult specimen (altitude, 28.5 + mm, width, 21 mm, five whorls), G.S.M. No. Zd 3368 ; Fig. b, another adult specimen (altitude, 23.8 + mm, width 18.6 mm, last four whorls), G.S.M. No. Zd 3369 ; Fig. c, an imperfect adult specimen with its first four whorls preserved, $\times 2$, G.S.M. No. Zd 3370.
 FIG. 3.—*Bathonella scotica langtonensis* (Hudleston). Specimen from the Neaeran Beds at Castle-Barn Quarry, near Chipping Norton, Oxfordshire. A variety of the form (altitude, 18.6 + mm, width, 12.8 mm, last four whorls), G.S.M. No. Zd 3410.
 FIG. 4a, b, c, d.—*Bathonella bithynoides* n. sp. Specimens from a sandy limestone bed about 180 feet below the base of the Oxford Clay at Kilmalug Bay, North Trotternish, Skye. $\times 2$, Holotype G.S.M. No. 75538.
 FIG. 5a, b.—*Procerithium* cf. *pisoliticum* (Hudleston). Specimens from a fine-grained cementstone bed about 180 feet below the base of the Oxford Clay at Kilmalug Bay, North Trotternish, Skye. $\times 2$, G.S.M. No. 75551.
 FIG. 6.—*Procerithium* cf. *vetustum* (Phillips). Same as the preceding species. $\times 2$, G.S.M. No. 75551.
 FIG. 7.—"*Cyrena*" *jamesoni* Forbes. Same as *Bathonella bithynoides*. $\times 2$, G.S.M. No. 75548.

