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On *Margaritifera durrovensis*, a New Species of Pearl Mussel from Ireland.

BY

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ON *MARGARITIFERA DURROVENSIS*, A NEW SPECIES OF PEARL MUSSEL FROM IRELAND.

By R. A. PHILLIPS, M.R.I.A.

Read 13th January, 1928.

PLATES III–V.

EARLY in the year 1926 Mr. B. B. Woodward wrote me concerning five specimens of a freshwater Pearl Mussel from " Durrow, Queen's County ", a locality not recorded for the genus, which were found in the Philip B. Mason collection of non-marine mollusca recently acquired, through the kindness of Mr. R. Winckworth, by Mr. A. S. Kennard. " These shells," Mr. Woodward wrote, " exhibit such important departures from the examples we ordinarily meet with that investigation of them and their surroundings is very desirable." After describing their peculiarities Mr. Woodward added, " here we seem up against either a very distinct variety or possibly a new species. More specimens, however, are needed ere this can be decided."

Being in the district the following month I visited Durrow and, searching along the River Nore, found in a pool on a little sandy beach one living mussel, evidently washed in by flood, agreeing in every particular with those described by Mr. Woodward, but did not on that occasion discover the animal's true habitat.

In the following October I was at the Nore again, and on that occasion had the advantage of being accompanied by Mr. C. Oldham, Mr. A. W. Stelfox, and Mr. R. J. Welch. In a shallow part of the stream a mile below the spot at which I had found the single specimen we got several dead shells and higher up the river were fortunate in discovering a flourishing colony of the mollusc and there obtained numerous adult living specimens, all similar in form and character to those already mentioned.

The habitat at this place is so unlike any in which *Margaritifera* has previously been taken in the British Islands as to merit some description. The Nore, after leaving the hills in which it rises, runs through the central Irish limestone plain, an intensely calcareous area, its waters are therefore " hard " to a degree supposed to be fatal to the existence of *M. margaritifera*.[1] At the time of our visit the river was rather low, still the animal was living in sandy mud among large limestone boulders at a depth of from 4 to 5 feet, the whole place darkly shaded by overhanging trees growing on the river banks.

M. margaritifera, in my experience and apparently in that of other investigators, appears to live only in swiftly running, rather shallow, open stretches of river usually exposed to full sunlight.

The more obvious peculiarities of these Nore shells were pointed out by Mr. Woodward in his letter already quoted. Comparing the five original specimens, the largest of which did not exceed 3¼ inches in length, with examples of *M. margaritifera*, of the same size, from the Tay, Mr. Woodward wrote : " The shells are not so coated with black, the ventral margin is not so incurved nor are the umbones eroded. The posterior ends of those that have not been ' cleaned ' have a black staining and are coated with ' race ', a limy deposit due to the growth of a lime-secreting alga. The anterior buried ends, save in the oldest specimen, have no black stain but are of the original liver-brown colour. The umbonal rugæ are well preserved and differ from the characteristic rugæ of the genus."

The large series of adult specimens obtained in October showed conclusively that the characters noted above are general and not confined to immature or selected individuals and closer examination revealed further important distinctions both external and internal, the principal being the flexure and concavity on the anterior side of the umbo, the broad conspicuous lunule, the downward curve of the anterior teeth, which differ markedly in shape from those of *M. margaritifera* and approach *M. auricularia*, and the varying relative size of the adductor scars.

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[1] Dr. Boycott, to whom I sent a sample of the water by Mr. C. Oldham, found (*Proc. Malac. Soc.*, xvii, 1927 p. 184) that it contains 79 mgms. calcium per litre, or about 20 degrees of hardness on the ordinary scale.


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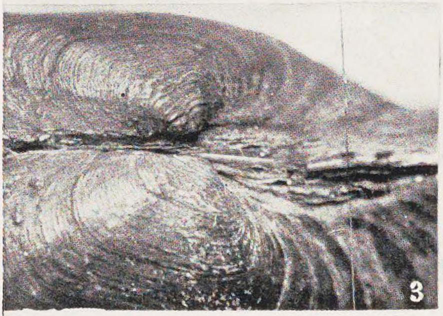
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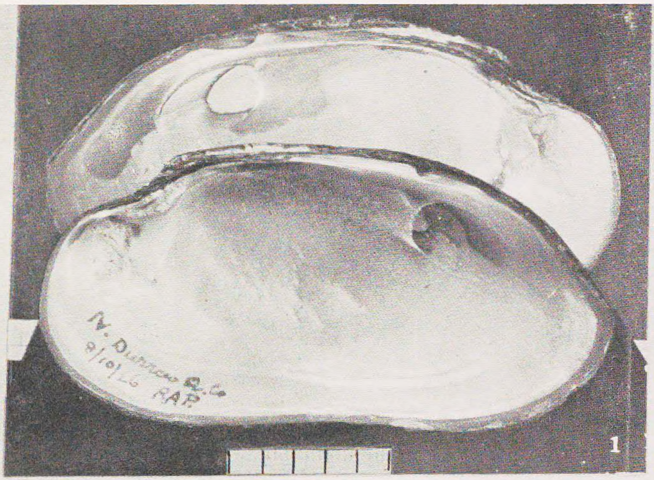
Altogether the shell seems to constitute a form intermediate between *M. margaritifera* and *M. auricularia*, but differing from each in many respects and whether it be regarded as a fixed product of local environment, or as a distinct form, possibly more widely distributed than our present knowledge would indicate, its peculiarities entitle it to specific description and a distinguishing name. Accordingly it is here described as—

MARGARITIFERA DURROVENSIS, n.sp.

Since the simplest way to describe a bivalve and at the same time show its distinctive characters is to compare or contrast it with a better known species, I have placed the description of the new species and that of *M. margaritifera*, its closest ally, side by side, in tabular form, indicating the points of difference between the two.

M. margaritifera.	*M. durrovensis.*
EXTERIOR. (Pl. III, Fig. 2.)	EXTERIOR. (Pl. III, Fig. 1.)
Elongate oval, somewhat tumid.	Elongate oval, more oblong and tumid.
General coloration black, young individuals sometimes olive brown.	*General coloration* a dark brown sometimes becoming black-coated in old individuals.
Lines of growth, strong but shallow ; the striæ, or wrinkling of the periostracum, radiating from the umbo, faint.	*Lines of growth,* strong, deep and regular ; striæ, or wrinkling of the periostracum, radiating from the umbo, strong and even.
Umbones not prominent, always decorticated.	*Umbones* prominent, not decorticated.
Umbonal rugæ generally wanting owing to decortication, shown on young shells (*Proc. Malac. Soc.*, xvi, p. 282, Pl. XXIII, Figs. 6 and 7) to consist of three or four ridges surrounding the umbo, curving round anteriorly, but drawn out into a fairly sharp point or angle posteriorly where they cross the umbono-postero-ventral ridge.	*Umbonal rugæ* mostly present (Pl. III, Fig. 3) owing to absence of decortication, consist of concentric wavy ridges coincident with the growth lines of the young shell, at first relatively coarse and interrupted (recalling those of *Anodonta anatina*), but becoming finer and more regular as in *M. auricularia* (Pl. V).
Lunule narrow and indistinct.	*Lunule* broad and conspicuous.
Dorsal margin a continuous curve.	*Dorsal margin* posteriorly straight, anteriorly interrupted by a pronounced concavity on the anterior side of the umbo (as in *M. auricularia*).
Dorsal and ventral margins not parallel.	Dorsal and ventral margins almost parallel.
Ventral margin straight or sometimes definitely incurved.	*Ventral margin* slightly incurved.
Anterior side rounded.	*Anterior side* rounded but shorter, broader and more swollen in proportion than *M. margaritifera*, thus resembling *M. auricularia*.
Posterior margin rounded acuminate, the most prominent point usually just below the line of the longitudinal axis.	*Posterior margin* rounded acuminate, the most prominent point well below the line of the longitudinal axis.

INTERIOR. (Pl. IV, Fig. 2.)	INTERIOR. (Pl. IV, Fig. 1.)
Hinge line an almost continuous curve.	*Hinge line* posteriorly straight, anteriorly sharply flexed at the umbo, as in *M. auricularia*, giving a downward direction to the anterior teeth.
Teeth :	Teeth :
Right valve : Anterior lateral narrow, sharp-pointed, upcurved, crenulate on its upper side, scarcely, if at all, separated on that side from the shell margin. (Pl. IV, Figs. 2, 4.) Traces of the cardinal and posterior lateral tooth are present.	*Right valve* : Anterior lateral wide, blunt-topped, not curved upward, but crenulated on upper side, where a distinct groove separates it from the shell margin. (Pl. IV, Figs. 1, 3.) Little trace of the cardinal but rather more of the posterior lateral.
Left valve : Cardinal not very prominent, almost flat-topped, crenulated on the dorsal side, the crenulation extending over the top at the anterior end and sometimes all along. A deep notch separates this from the anterior lateral, which is a little narrower, pointed, rises higher and is also crenulate. In old specimens these features are somewhat obscured by thickening. (Pl. IV, Fig. 4.)	*Left valve* : Cardinal less prominent, an arcuate ridge, crenulated all along. A shallow but comparatively wide notch separates this from the anterior lateral, which is not higher than the cardinal, is conical with the apex directed forward and sometimes obscurely crenulated. In general appearance these teeth resemble those of *M. auricularia*. (Pl. IV, Figs. 1, 3.)
Trace of the obsolete posterior lateral sometimes marked.	Trace of the obsolete posterior lateral more marked.
Scars : (Pl. IV, Fig. 2.)	Scars : (Pl. IV, Fig. 1.)
Anterior Adductor reniform, concave side to the rear. Surface often more or less covered with rugose overgrowth (as described for *M. auricularia* in *Proc. Malac. Soc.*, xvi, p. 280). A small triangular portion next to and resembling in shape, the Retractor Pedis, which it adjoins, is marked off.	*Anterior Adductor* same as in *M. margaritifera*, but rugose overgrowth much stronger, as in *M. auricularia*. The triangular portion next the Retractor Pedis seldom visible.
Anterior Retractor Pedis triangular and divided from the Adductor.	*Anterior Retractor Pedis* as in *M. margaritifera*.
Protractor Pedis an irregular oblong oval, sometimes with a tendency to the crescentic, lies close to the concave curve in the Adductor.	*Protractor Pedis* also as in *M. margaritifera*.
Posterior Adductor a nearly perfect oval, usually smooth, but some old specimens show traces of rugose overgrowth. About the size of, or slightly larger than, the Anterior Adductor.	*Posterior Adductor* a nearly perfect oval, surface smooth in the younger individuals but developing rugose over-growth with age. About 1½ times the size of the Anterior Adductor.
Posterior Retractor Pedis, small, of varying outline, is on the same plane, but separated from the Posterior Adductor.	*Posterior Retractor Pedis* small, deep, and usually triangular in outline, but occupying a slightly higher level than the Adductor from which it is sharply divided by a raised shelly threshold.
The nacreous layer above the Posterior Retractor is wide and reflected backwards to the dorsal margin.	The nacreous layer above the Posterior is narrow, not reflected, frequently a mere thickened ridge.



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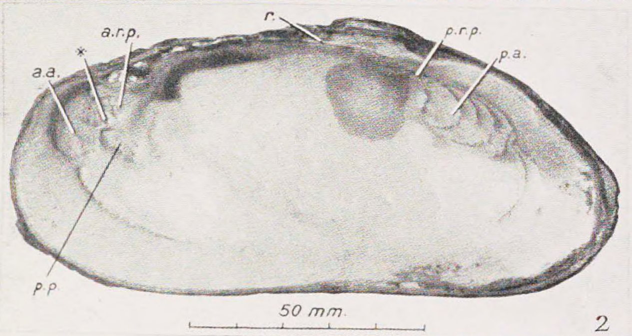

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There is the same ridge of thickened shell traversing the interior of the valve from the umbo to the middle of the ventral margin in both as in *M. auricularia.*

Adult specimens of the Nore shell range in size from 3½ × 1½ to 4½ × 2½ inches and are remarkably thick and heavy. The coating of " race " on the posterior ends sometimes becomes a hard crust nearly ¼ inch thick.

M. durrovensis is apparently not confined to the Nore as I have recently found, in sandheaps dredged from the River Barrow in Co. Carlow, a number of young dead valves, the largest 2½ inches in length, which in their outline, in the absence of erosion, the presence of a coating of " race " and in their rugæ are identical with the Durrow shells.

For assistance and co-operation in the preparation of the foregoing notes and descriptions, I am deeply indebted to Mr. B. B. Woodward, who was the first to detect and point out the distinctness of the Nore shells. My sincere thanks are due also to Mr. A. E. Salisbury for the excellent photographs which illustrate the paper, to Mr. H. H. Bloomer for his anatomical note as well as helpful correspondence and criticism, and to Mr. A. W. Stelfox, Mr. C. Oldham, and Mr. A. S. Kennard for specimens of *M. margaritifera* and *M. auricularia* from various localities for comparison.

EXPLANATION OF PLATES.

Plate III.

Fig.

1.—*Margaritifera durrovensis,* n.sp. Exterior from left side. N.B.—The posterior margin shows incrustation by " race ".

2.— „ *margaritifera* (Linn.), from the River Aughrim, Co. Wicklow. Exterior from left side.

3.—Umbonal rugæ of *M. durrovensis,* n.sp. Taken from one of the original specimens in the P. B. Mason Collection.

4.—Young shell of *M. margaritifera* (Linn.) from the River Conway, Llanrwst, Denbighshire, showing the characteristic rugæ. [Reprinted from the *Proc. Malac. Soc.*, xvi, Pl. XXIII, Fig. 7.]

Plate IV.

1.—*Margaritifera durrovensis,* n.sp. Interior views showing teeth and muscle scars.

2.— „ *margaritifera* (Linn.). Interior aspect of right valve of a British specimen (ex collection W. J. Wintle) showing teeth and muscle scars. *a.a.* = anterior adductor scar; *a.r.p.* = anterior retractor-pedis scar; *p.a.* = posterior adductor scar; *p.p.* = protractor-pedis scar; *p.r.p.* = posterior retractor-pedis scar; *r.* = incipient, or vestigeal lateral tooth; * = small triangular depression in anterior adductor scar. [Reprinted from *Proc. Malac. Soc.*, xvi, Pl. XXII, Fig. 1.]

3.— „ *durrovensis,* n.sp. View of hinge teeth from below.

4.— „ *margaritifera* (Linn.). View of hinge teeth from below from a specimen taken near Barley Lake, co. Cork.

PLATE V.

[Reprint of Pl. XXI in *Proc. Malac. Soc.*, vol. xvi.]

1.—*Margaritifera auricularia* (Spengler). Interior of right valve of specimen dredged from the Neolithic deposit in the bed of the Thames at Barn Elms (ex coll. W. J. Wintle). N.B.—The lettering is the same as that for Pl. II, Fig. 2, preceding.

2.— „ *auricularia* (Spengler). Interior of left valve of a recent specimen in the Natural History Museum collection (74, 12, 11, 29. Figured in Reeve's *Conch. Icon.*, fig. 311.)

3.— „ *auricularia* (Spengler). Umbonal rugæ of the same specimen.

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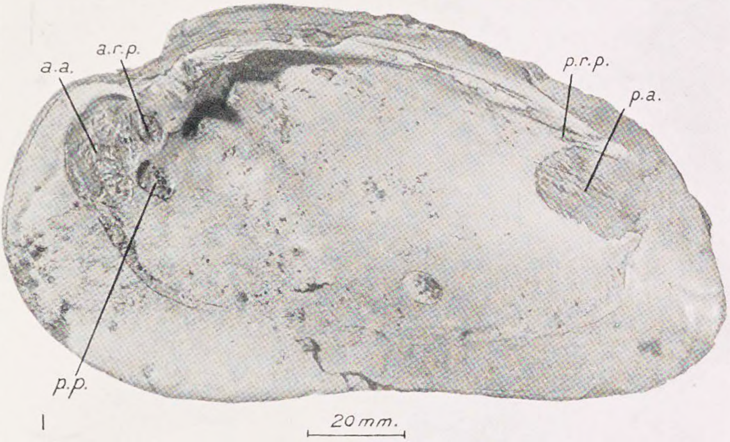

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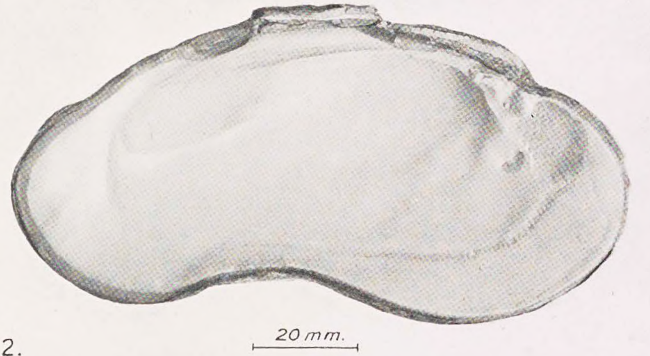

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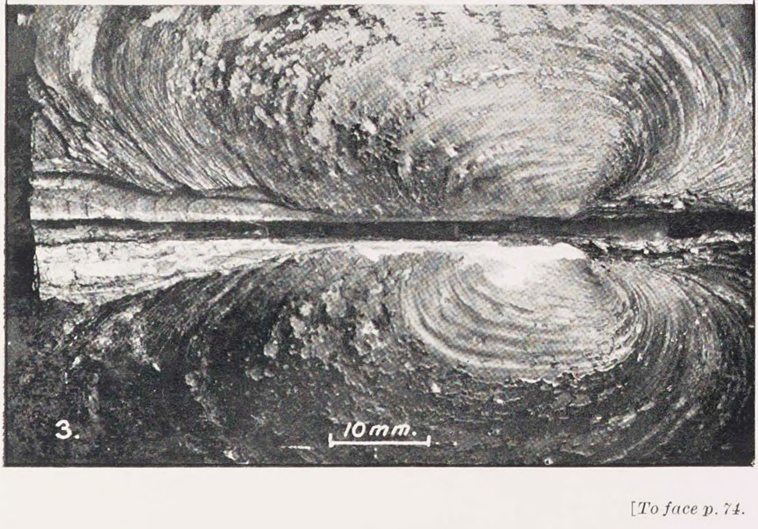

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