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XLIX.—*Mediterranean Mollusca* (No. 3) *and other Invertebrata.* By J. GWYN JEFFREYS, LL.D., F.R.S.

[Plate XVI.]

IN the 'Annals and Magazine of Natural History' for July 1870, I gave a list of some species dredged by Capt. (now Admiral) Spratt and Capt. (now Sir George) Nares in parts of the Mediterranean, at depths ranging from 20 to 310 fathoms; and in the December number for the same year I added some remarks on the list. Since that time have appeared numerous publications by Professor Aradas, Sr. Benoit, Abbé Brugnone, Prof. Brusina, M. Clément, MM. Dautzenberg and Dollfus, M. Dubreuil, Dr. Fischer, Dr. Foresti, Sr. Granata-Grillo, M. Granger, Dr. Hidalgo, Prof. Issel, Herr Klécak, Dr. Kobelt, Prof. Marion, Prof. v. Martens, the Marchese de Monterosato, M. Morlet, Dr. Schneider, Prof. Seguenza, Prof. Stalio, Sr. M. Stossich, Dr. Tiberi, M. Vayssière, Herr Weinkauff, and myself.

I mention the above list of writers to give some idea of the extent to which this favourite branch of natural history has been carried of late years; but I would especially invite attention to the very useful catalogue of the Marquis de Monterosato, who has done so much to promote our knowledge of

the subject, not only by his own researches, but by his laborious and conscientious study of the synonymy.

Nevertheless the field has not yet been exhausted ; nor can it be until the greater depths of the Mediterranean have been sufficiently explored. The Italians and French have, within the last few years, done something to supplement the short and tentative expedition of the 'Porcupine' in 1870 ; and the former intend this year to continue their exploration on a larger scale, under the direction of their eminent zoologist Prof. Giglioli.

I now propose to add another contribution, in consequence of my friend Admiral Spratt having kindly placed at my disposal a small quantity of material which he dredged, about thirty years ago, off Crete, in from 70 to 120 fathoms. Most of the species are small, and many of them minute. For the "trriage" of this dredged material I am indebted to the careful and scientific industry of Mr. and Mrs. David Robertson of Glendale, near Glasgow. Mr. Robertson has also obligingly supplied me with lists of the Ostracoda and Foraminifera which he found with the Mollusca, and which I will subjoin to the present list of Mollusca.

I would refer to my papers on the Mollusca of the 'Lightning' and 'Porcupine' expeditions in the 'Proceedings of the Zoological Society of London' for 1878, 1879, 1881, 1882, and 1883, for the geographical and geological distribution of the following species, as well as for their synonyms.

BRACHIOPODA.

Argiope decollata, Chemnitz.

CONCHIFERA.

Anomia ephippium, Linné, and var. *aculeata*.

Pecten pes-lutræ, L. *P. similis*, Laskey.

Lima elliptica, Jeffreys.

Mytilus phaseolinus, Philippi.

Dacrydium vitreum (Holböhl), Möller.

Arca lactea, L. *A. pectunculoïdes*, Scacchi.

Leda fragilis, Chemn. *L. pella*, L.

Nucula ægeensis, Forbes. *N. sulcata*, Bronn. *N. nitida*, G. B. Sowerby.

Montacuta bidentata, Montagu.

Loripes fragilis, Ph. *L. divaricatus*, L.

Axinus croulinensis, Jeffreys.

Cardita aculeata, Poli.

Cardium ciliare, L. *C. echinatum*, L. *C. minimum*, Ph.
Isocardia cor, L. ; fry. Hundreds of specimens.
Circe minima, Mont.
Venus rudis, Poli. *V. fasciata*, Da Costa. *V. ovata*, Pen-
 nant.
Tapes aureus, Gmelin.
Mactra subtruncata, Da Costa.
Scrobicularia longicallus, Sc. *S. alba*, W. Wood. *S. pris-*
matica, Mont.
Pandora inæquivalvis, L.
Poromya granulata, Nyst and Westendorff.
Neæra cuspidata, Olivi. *N. costellata*, Deshayes.
Corbula gibba, Ol.
Saxicava rugosa, L.
Xylophaga dorsalis, Turton.

SOLENOCONCHIA.

Dentalium dentalis, L. *D. filum*, G. B. Sowerby, Jun.
Siphodentalium lofotense, M. Sars. *S. quinquangulare*, Forb.

GASTROPODA.

Tectura virginea, Müller.
Emarginula rosea, Bell. *E. cancellata*, Ph. *E. papillosa*,
 Risso.
Calyptræa chinensis, L.
Scissurella crispata, Fleming.

*Cyclostrema minutum**, Jeffreys. (Pl. XVI. fig. 1.)

SHELL globular, with a somewhat oblique outline, rather thin, transparent, and glossy : *sculpture*, none : *colour* clear white : *spire* raised, but short : *whorls* 3, convex ; the last equals three fourths of the shell ; top whorl prominent and twisted : *suture* rather deep : *mouth* circular, with a tendency to angularity at the upper corner ; peristome continuous, but not so completely disunited from the periphery as in other species of this genus : *umbilicus* contracted, with a small perforation : *operculum* chitinous, multispiral. L. 0·025, B. 0·025.

Of this microscopic but peculiar species I found about two hundred specimens. *Rissoa fulgida* might have been supposed to be one of the most minute of European marine shells ; but the present species is not one third of its size.

Trochus magus, L. *T. fanulum*, Gm. *T. Guttadauri*, Ph.

* Minute.

T. Adansonii, Payraudeau. *T. Montacuti*, W. Wood.
T. striatus, L. *T. exasperatus*, Penn.

Clanculus cruciatus, L.

Turbo rugosus, L. *T. sanguineus*, L.

Rissoa cimex, L. *R. calathus*, Forb. & Hanl. *R. reticulata*,
 Mont. *R. cimicoïdes*, Forb. *R. zetlandica*, Mont. *R.*
Testæ, Aradas. *R. punctura*, Mont. *R. variabilis*, v. Mühl-
 feldt. *R. costulata*, Alder. *R. pulchella*, Ph. *R. incon-*
spicua, Ald. *R. obtusa*, Cantraine.

Rissoa concinnata *, Jeffreys. (Pl. XVI. fig. 2.)

SHELL forming a short cylinder, moderately solid, semi-transparent, and glossy: *sculpture*, none except some slight and remote lines of growth on the last whorl: *colour* whitish: *spire* extended; apex blunt: *whorls* 4, convex, gradually enlarging; top whorl regular: *suture* deep: *mouth* nearly round: *outer lip* sharp: *inner lip* adhering to the lower part of the periphery: *umbilicus* shallow, but imperforate. L. 0·03, B. 0·02.

About sixty specimens. This differs from *R. obtusa* of Cantraine not only in its much smaller size, but in its cylindrical shape, the absence of spiral striæ, and the deeper suture.

Rissoina decussata, Mont.

Jeffreysia cylindrica, Jeffr.

Vermetus semisurrectus, Bivona.

Turritella terebra, L., var. *gracilis*. *T. pusilla*, Jeffr.

Scalaria Cantrainei, Weinkauff. *S. pulchella*, Biv.

Aclis ascaris, Turt.

Aclis attenuans †, Jeffreys. (Pl. XVI. fig. 3.)

SHELL forming an elongated cone, thin, semitransparent, and glossy: *sculpture*, none: *colour* clear white: *spire* gradually tapering to a rather fine point: *whorls* 6–7, convex; the last, with the mouth upwards, equals the rest of the shell; first whorl globular: *suture* well defined but not deep, nearly straight: *mouth* projecting, more round than oval and inclined to squarish, contracted above and effuse or spread out below; the base is entire and not sinuous or notched: *outer lip* sharp-edged, expanding: *inner lip* or pillar curved, somewhat reflected and thickened behind, where there is a slight chink but no perforation. L. 0·05, B. 0·03.

Ten specimens. *A. Gulsonæ* is its nearest ally; but that

* Fitly joined together.

† Lessening.

shell is four times as large and cylindrical, and it has the mouth sinuated or notched at the base.

Odostomia minima, Jeffr. *O. clavula*, Lovén. *O. unidentata*, Mont. *O. diaphana*, Jeffr. *O. fenestrata*, Forb. *O. Humboldti*, Risso. *O. tricineta*, Jeffr.

Odostomia brevicula *, Jeffreys. (Pl. XVI. fig. 4.)

SHELL conical, solid, opaque, and glossy: *sculpture*, short, strong, straight, and rather sharp longitudinal ribs, of which there are about a dozen on the last whorl; they terminate abruptly at the periphery, which is bluntly angulated; the interstices of the ribs have an excavated appearance; under the microscope the whole surface is covered lengthwise with very fine and close-set striæ; the apex is quite smooth and polished: *colour* clear white: *spire* short: *whorls* 4 (besides the bulbous and heterostrophe embryonic nucleus), compressed, and gradually enlarging; the last is almost equal to half the spire: *suture* shallow and nearly straight; *mouth* oval, pointed at the base: *pillar* curved: *tooth* small and indistinct, tubercular, placed on the upper part of the pillar: *umbilicus* none. L. 0·1, B. 0·05.

Two specimens, more or less imperfect.

O. nitens, Jeffr. *O. acicula*, Ph. *O. nitidissima*, Mont. Besides undeterminable young and fragmentary young specimens of other species.

Pyramidella minuscula, Monterosato.

Eulima intermedia, Cantr. *E. distorta*, Deshayes, var.?

A specimen is intermediate between this species, which is usually (although problematically) regarded as the eocene species, and the variety *gracilis*, which has been named *beryllina* by Monterosato. Mr. Watson, who has seen this specimen, considered it *E. intermedia*; but, independently of the greater size, the shell of the latter species is less slender and the last whorl is proportionally much larger than the other whorls. *E. subulata*, Donovan. *E. Jeffreysiana*, Brusina.

Eulima acutalis †, Jeffreys. (Pl. XVI. fig. 5.)

SHELL forming an elongated pyramid, thin, semitransparent, and very glossy: *sculpture*, none on the surface; but the periphery is encircled by a distinct keel, which gives the base an angulated appearance: *colour* clear white: *spire* long, straight, and sharp-pointed: *whorls* 7, slightly convex or rounded, gradually enlarging to the last whorl,

* Somewhat short.

† Pointed.

which bulges and takes up nearly half of the spire; top whorl globular: *suture* rather straight, well defined, but not deep: *mouth* oval, acute-angled above and below; its length equals about one third of the spire: *outer lip* sharp-edged: *inner lip* inconspicuous: *pillar* short and straight: *base* somewhat flattened, imperforate. L. 0.05, B. 0.025.

Of this remarkable species ten specimens were found.

Eulima perminima *, Jeffreys. (Pl. XVI. fig. 6.)

SHELL slender, rather solid for its minute size, semitransparent, and glossy: *sculpture*, none: *colour* clear white, with a faint and irregular tinge of yellowish brown on the body-whorl: *spire* long, straight, and rather bluntly pointed: *whorls* 6-7, compressed and compact; last whorl (the mouth being placed upwards) forming nearly half the shell; first whorl semiglobular: *suture* slight, but distinct, straightish: *mouth* roundish-oval, contracted above, equal in length to one fourth of the spire: *outer lip* not very thin: *inner lip* conspicuous and reflected: *pillar* curved: *umbilicus* none. L. 0.05, B. 0.03.

Eight specimens.

This almost microscopic species differs from *E. distorta* (*Philippii*, Weinkauff) and its variety *gracilis* (*beryllina*, Monterosato) in size, being proportionally narrower throughout and having a shorter spire and smaller mouth. I have also detected the present species among my Zetlandic shells.

Natica flammulata, Requien.

Neritina viridis, L.

Family Solariidæ.

BRUGNONIA, n. gen.

SHELL globosely conical, imperforate: *pillar* angulated and spread out at its base.

The shell in different genera of this family is not always, as Woodward says in his description of *Solarium* (which he strangely placed in the *Littorinidæ*, and regarded as the only genus of the present family), "Orbicular, depressed; umbilicus wide and deep." The umbilicus is not a universal character in the *Solariidæ*. Of the hitherto known species of *Sequenzia* two have a wide umbilicus, while the typical species is imperforate. In *Solarium hybridum* (the type of Gray's genus *Philippia*) the umbilicus is reduced to a small and narrow perforation.

* Exceedingly small.

I have ventured to dedicate the above briefly described genus to my kind friend and correspondent the Abbé Brugnone, of Palermo, whose discoveries of recent and Tertiary shells in Sicily are or ought to be well known to all conchologists.

Brugnonia pulchella *, Jeffreys. (Pl. XVI. fig. 7.)

SHELL forming a depressed cone above and angulated below, moderately solid for its minute size, semitransparent, and rather glossy : *sculpture*, numerous, close-set and very fine longitudinal and spiral striæ, which, by their intercrossing, make the surface delicately and microscopically reticulated ; the longitudinal striæ are flexuous ; the apex is smooth : *colour* pale yellowish brown : *spire* short : *whorls* 5, slightly convex ; the first 4 gradually increase in size, but the last or body-whorl is disproportionately large and takes up about three fourths of the shell ; the top whorl is somewhat twisted : *suture* well defined, but not deep : *mouth* triangular, narrowish : *outer lip* rounded, thin, and sharp-edged, ending above in an acute angle where it joins the periphery, reflected at the other end : *inner lip* filmy and scarcely perceptible : *pillar* short and straight, terminating at the base in a slight and open but not channelled groove : *base* not umbilicated nor perforate. L. 0.035, B. 0.035.

Two specimens only, one of them much younger than the other and half its size.

Adeorbis exquisitus †, Jeffreys. (Pl. XVI. fig. 8.)

SHELL semispheroidal, expanding laterally, rather thin, transparent, and glossy : *sculpture*, numerous and extremely delicate curved longitudinal striæ or lines, which are crossed by equally numerous and fine spiral lines, causing a most exquisite kind of microscopic decussation ; apex smooth : *colour* clear white : *spire* short and compressed, placed eccentrically : *whorls* 3, convex and rounded ; the last occupies four fifths of the shell ; top whorl somewhat twisted : *suture* deeply excavated : *mouth* obtusely triangular : *outer lip* semicircular, sharp-edged, inflected above at its junction with the periphery, thickened below : *inner lip* attached to the periphery, and slightly folded over the base : *umbilicus* wide, deep, and semicircular. L. 0.025, B. 0.0175.

A single specimen of this remarkable and beautiful species.

* Beautiful little.

† Exquisite.

Aporrhais Serresianus, Michaud.

Cerithium tuberculatum, L., var. *C. reticulatum*, Da C.

Triforis perversa, L.

Murex brandaris, L. *M. aciculatus*, Lamarck.

Lachesis minima, Mont.

Trophon syracusanus, L. *T. breviatus*, Jeffr.

Nassa reticulata, L. *N. pygmæa*, Lam.

Columbella scripta, L. *C. minor*, Sc.

Defrancia teres, Forb. *D. gracilis*, Mont. *D. Leufroyi*, Mich. *D. purpurea*, Mont., var.

Pleurotoma Loprestiana, Calc. *P. nuperrima*, Tiberi. *P. nebula*, Mont. *P. brachystoma*, Ph. *P. Stossichiana*, Brus. *P. clathrata*, de Serres. *P. rugulosa*, Ph. *P. costata*, Don. *P. Maravignæ*, Biv. Besides young and undeterminable specimens of other species of *Defrancia* and *Pleurotoma*.

Mitra ebenus, Lam.

Marginella secalina, Ph. *M. clandestina*, Brocchi.

Cypræa europæa, Mont.

Ringicula auriculata, Ménard.

Cylichna Jeffreysi, Weink.

*Cylichna parvula**, Jeffreys. (Pl. XVI. fig. 9.)

SHELL forming a short cylinder, rather solid for its minute size, semitransparent, and glossy: *sculpture*, numerous and very fine wavy lines of growth; the crown or apex is encircled by a thickened riblet or ridge; half-grown, and especially young, specimens exhibit a sunken spire of one or two whorls with a globular nucleus: *colour* clear white: *mouth* contracted above and in the middle, wide and rounded below: *outer lip* curved at each end, slightly projecting beyond the crown: *apex* perforated: *pillar* short, flexuous, notched at the base. L. 0.06, B. 0.03.

About 100 specimens.

This is perhaps the type of a distinct genus between *Cylichna* and *Utriculus*, which may be called *Cryptaxis*, because the spire is partly concealed. A little Madeiran shell, discovered by the Rev. Robert Boog Watson, and named by him *Utriculus tornatus* or *U. spretus*, somewhat resembles the present species, but is much larger and oval; and the spire is more visible, although sunken and partly concealed.

Utriculus globosus, Lov.

Bulla striata, Brug.

* Very small.

Scaphander lignarius, L. *S. punctostriata*, Mighels & Adams.
Philine quadrata, S. Wood.
Atlanta Peroni, Lesueur.

PTEROPODA.

Embolus rostralis, Souleyet.
Spirialis trochiformis, D'Orbigny. *S. reticulata*, D'Orb.
Cavolinia gibbosa, Rang.
Clio subulata, Quoy & Gaimard. *C. acicula*, Rang.

OSTRACODA.

<i>Bairdia subdeltoidea</i> , Jones.	<i>Cythere Jonesi</i> , Baird.
<i>Cythere tarentina</i> , Baird.	<i>Cytheridea Mülleri</i> , Bosquet.
— <i>quadridentata</i> , Baird.	<i>Cytherella</i> (1 valve).
— <i>scabra</i> , Münst.	

FORAMINIFERA.

<i>Cornuspira foliacea</i> , Ph.	<i>Textularia sagittula</i> , Defrance.
— <i>coronata</i> , Costa.	— <i>trochus</i> , D'Orb.
<i>Paucispirina contraria</i> , D'Orb.	<i>Bigenerina digitata</i> , D'Orb.
<i>Biloculina elongata</i> , D'Orb.	<i>Clavulina parisiensis</i> .
— <i>depressa</i> , D'Orb.	<i>Bolivina dilatata</i> , Reuss.
— <i>subsphærica</i> , D'Orb.	<i>Nodosaria raphanus</i> , L.
— <i>ringens</i> , Lam.	— <i>raphanistrum</i> , L.
<i>Miliolina seminumum</i> , Linn.	— <i>bacillum</i> , Defr.
— <i>secans</i> , D'Orb.	<i>Dentalina obliqua</i> , D'Orb.
— <i>asperula</i> , Seguenza.	— <i>communis</i> , D'Orb.
— <i>pulchella</i> , D'Orb.	<i>Vaginulina legumen</i> , L.
— <i>Schreibersi</i> .	<i>Marginulina glabra</i> , D'Orb.
— <i>bicornis</i> , D'Orb.	<i>Cristellaria arcuata</i> , D'Orb.
— <i>Ferussaci</i> , D'Orb.	— <i>rotulata</i> , Lam.
— <i>trigonula</i> , Lam.	— <i>cultrata</i> , Montf.
— <i>tricarinata</i> , D'Orb.	— <i>italica</i> , Defr.
— <i>Candeiana</i> , D'Orb.	— <i>reticulata</i> , Schwager.
— <i>oblonga</i> , Mont.	<i>Polymorphina gibba</i> , D'Orb.
— <i>contorta</i> , D'Orb.	— <i>lanceolata</i> , Reuss.
<i>Spiroloculina limbata</i> , D'Orb.	<i>Uvigerina pygmæa</i> , D'Orb.
— <i>excavata</i> , D'Orb.	<i>Globigerina rubra</i> , D'Orb.
— <i>canaliculata</i> , D'Orb.	— <i>bulloides</i> , D'Orb.
<i>Peneroplis planatus</i> , F. & M.	<i>Orbulina universa</i> , D'Orb.
<i>Orbiculina compressa</i> , D'Orb.	<i>Sphæroidina bulloides</i> , D'Orb.
<i>Psammosphæra fusca</i> , Schultze.	<i>Discorbina parisiensis</i> , D'Orb.
<i>Hyperammia elongata</i> , Brady.	<i>Planorbulina mediterraneensis</i> , D'Orb.
— <i>vagans</i> , Br.	— <i>larvata</i> , P. & J.
— <i>ramosa</i> , Br.	<i>Truncatulina lobatula</i> , Walker.
<i>Jaculella acuta</i> , Br.	— <i>refulgens</i> , Montf.
<i>Rhabdammina</i> , sp., fragments.	<i>Polytrema rubra</i> , Lam.
<i>Rhizammina algæformis</i> , Br.	<i>Pulvinulina punctulata</i> , D'Orb.
<i>Reophax scorpiurus</i> , Montfort.	— <i>elegans</i> , D'Orb.
<i>Haplophragmium canariensis</i> , D'Orb.	— <i>Karstenii</i> , Reuss.
—, sp., allied to <i>globigerini-</i> <i>formis</i> .	<i>Rotalia Soldanii</i> , D'Orb.
<i>Ammodiscus incertus</i> , D'Orb.	— <i>Beccarii</i> , L.
<i>Webbina clavata</i> , Parker & Jones.	<i>Polystomella crispa</i> , L.
	<i>Operculina complanata</i> , Defr.



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