29. *On the OSTRACODA of the PURBECK FORMATION ; with NOTES on the WEALDEN SPECIES.* By Prof. T. RUPERT JONES, F.R.S. F.G.S., &c. (Read May 13, 1885.)

[PLATES VIII. & IX.*]

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§ I. INTRODUCTION.

In the 'Geological Magazine,' dec. 2, vol. v. (March and June 1878), pp. 103 & 277, I offered some observations on the Ostracoda of the Purbeck and Wealden Formations, and endeavoured to determine the species already described and figured by Sowerby, Fitton, F. A. Römer, and W. Dunker, and by E. Forbes, Lyell, and P. de Loriol. One of these species was further noticed (as *Cythere ? purbeckensis*) in the 'Proceedings of the Geologists' Association,' vol. viii. 1883, p. 58, together with an additional species which I had defined as *Cythere boloniensis*† [*bononiensis*] in the Bull. Soc. Géol. France, ser. 3, vol. viii. 1882, p. 616.

* These Plates have been drawn by aid of a grant from the Royal Society, for the illustration of Fossil Entomostraca.

† Now corrected to *bononiensis*, in accordance with the Latin name of Boulogne, "*Bononia*."

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PURBECK OSTRACODA.

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PURBECK OSTRACODA.

Having been enabled, by the help of the Rev. O. Fisher, Mr. W. Cunningham, Mr. Horace B. Woodward, Mr. J. C. Mansel-Pleydell, Prof. J. F. Blake, and other friends, to add considerably to my own collection of Purbeck Entomostraca, among which are many specimens collected by Fitton and Brodie, and having been kindly aided in my practical work by Mr. E. T. Newton, F.G.S., and Mr. C. D. Sherborn, I have begun to examine and determine the whole series of Ostracodous species characteristic of the Purbeck-Wealden beds. As far as opportunities have offered, I have also studied the specimens preserved in other collections and museums.

§ II. THE OSTRACODA OF THE PURBECK BEDS.

Sources of Information.

Professor Edward Forbes commenced this work of determining the Purbeck Ostracoda long ago*; but his results were not fully recorded, nor, indeed, is it now possible (as already intimated in the papers referred to above) to recognize each of the typical specimens he intended to be preserved, or all the species that he intended to determine, although a near approximation, on the whole, has been obtained.

The chief aids in this inquiry have been:—(1) The woodcut figures in Sir Charles Lyell's 'Manual of Elementary Geology,' 5th edit. 1855, and in later editions, copied presumably from diagrams made (between 1851 and 1855) for Prof. E. Forbes by his brother, James Forbes, for his lectures at the Museum of Practical Geology; (2) Some of these diagrams now remaining in that Museum; (3) Some hand-specimens in the same Museum, with names given by E. Forbes attached to them; (4) Two MS. notes, containing rough sketches by E. Forbes, one not fully dated, but probably written on July 18th, 1851, and sent to Mr. Bristow (with which he has most kindly favoured me), and the other to myself, dated July 23rd, 1854.

Sir C. Lyell's Woodcuts, and the Diagrams at the Museum of Practical Geology.—From the figures and accompanying remarks in Lyell's 'Manual' &c., 1855, p. 294 &c., and the next edition of the same work, with the title of 'Elements of Geology,' 6th edition, 1865, pp. 378 & 387, we find that

1. "*Cypriſt gibbosa*," fig. 368, *a*,
2. "—— *tuberculata*," fig. 368, *b*,
3. "—— *leguminella*," fig. 368, *c*,

are referred to the "Upper Purbecks;"

* Report Brit. Assoc. for 1850, Trans. Sect. pp. 79–81; and Edinb. New Phil. Journ. vol. xlix. 1850, pp. 311–313. No names of the species are given in either of these publications.

† "*Cypriſ*" is far from being the genus to which all these Ostracoda are really referable. The generic relationships will be discussed later on in this paper. On these points my friend Dr. George S. Brady has favoured me with his advice and opinion.

4. "*Cypris striatopunctata*," fig. 371, *a*,
5. " — *fasciculata*," fig. 371, *b*,
6. " — *granulata*," fig. 371, *c*,

are referred to the "Middle Purbecks;" and

7. "*Cypris purbeckensis*," fig. 375, *a*,
8. " — *punctata*," fig. 375, *b*,

are referred to the "Lower Purbecks."

All of these species, except *granulata** (fig. 371, *c*), were referred to "E. Forbes" by Lyell; presumably, however, *tuberculata* is after Sowerby, and *striatopunctata* was named probably after Römer, but erroneously. The woodcuts, and the remaining few of the diagrams from which they were probably reduced, are very unsatisfactory illustrations of these Ostracods, several essential features not being shown in the oblique and clumsy drawings; and in some cases probably waterworn or weathered specimens have been taken for types. This is especially noted in Proc. Geol. Assoc. vol. viii. 1883, p. 58, as regards fig. 375, *a*, which is comparable with only one individual on the slab of Purbeck limestone, X_B4, in the Museum of Practical Geology, probably examined by E. Forbes, and that is a waterworn or weathered little "specimen, in which the valve lying uppermost has been worn or dissolved away by water so far as to leave the edge of the underlying valve exposed all round it, and like a marginal rim belonging to it."

Of the foregoing list, No. 1 is not readily recognizable, and is not noticed in the MS. note of July 23, 1854 (hereafter mentioned); but it is probably a variety of *punctata*, and, like that, most common in the upper part of the series. To this conclusion, Forbes's letter to Mr. Bristow (July 18, 1851) and the study of *punctata* and its variations easily lead me, having in view a large series of Purbeck specimens. No. 2 is met with rarely in the Middle and Upper stages of the Purbeck formation. No. 3 is easily recognized in the Middle, and occurs also in the Upper beds.

No. 4. The form here intended is rare; it is better figured in the sketch in the letter to Mr. Bristow. It is found in the Middle Purbeck. No. 5 is very characteristic of the Middle Purbeck (as is also noted by E. Forbes, and known to the Rev. O. Fisher and Mr. W. Cunningham), both by its abundance there and its absence from the other divisions of the series. No. 6. This, if intended for the *granulosa* of Sowerby, is not that species. Most probably it is the *granulosa* of Römer and Dunker, which is rare (as *Dunkeri*, see p. 339) in the Middle and Upper Purbecks.

No. 7 is the characteristic Lower-Purbeck form; and, although badly drawn in fig. 375, *a*, it is well known to the Rev. O. Fisher and Mr. W. Cunningham by direct information from E. Forbes, and is plainly indicated in his letter to Mr. Bristow. No. 8 is different from any Lower-Purbeck† species, and, indeed, is recognizable as an

* Referred to "Sowerby." It is not, however, the *granulosa* of Sowerby, but is rather the *granulosa* of Römer and Dunker, which I now term *Dunkeri*.

† Although this form occurs in the so-called "Lower Purbeck" of Swindon, we must remember that the whole of the series (Upper, Middle, and Lower) is represented there. (See further on, p. 331.)

abundant and characteristic Upper-Purbeck species and the predecessor of *Cypridea valdensis* of the Wealden formation. It is mentioned in the Cat. Foss. Mus. Pract. Geol. 1865, as belonging to the Upper Purbeck, probably by mistake.

E. Forbes's Letter, July 18, 1851.—The sketches in E. Forbes's letter to Mr. Bristow, dated only "Friday, 18th," but, from internal evidence, written in July 1851, are:—

I. For the Upper Purbeck:—1. "*Cypris spinosa*: a large black *Cypris* in some beds, with very prominent spines." This is probably an exaggerated form of *Cypridea tuberculata* (Sow.), which in some cases has larger tubercles than in others. 2. "A usually dark or black species, smooth to the eye, but really punctate; *C. gibbosa*, perhaps identical with *C. valdensis*." This I take to be E. Forbes's *punctata* and its variety *gibbosa*. 3. "A very small fellow, like snail's dung, shaped like a pea-pod." This is called "*C. leguminelloides*," and is evidently the *leguminella* of Lyell's list.

II. In the Middle Purbeck:—1. "A granulated species; scarce: *C. granulosa*." Not the *granulosa* of Sowerby, though evidently thought to be so here and when given as *granulata* in Lyell's list (1855) and in the MS. note of 1854. 2. "*C. fasciculata*. A fasciculated species, perhaps a variety of *granulosa*; with two little bundles of tubercles, one at each end. This is the most characteristic Middle-Purbeck species." It is the *fasciculata* of Lyell's fig. 371, *b*; and it is essentially the same as *Cypridea granulosa* (Sow.). 3. "An oblong species, with punctations and striations both; *C. striatopunctata*. This is rare, and only in the 'Inter-marine Beds.'" Probably named after Römer's *striatopunctata*, but it matches neither Römer's nor Dunker's figures and descriptions, and Prof. Dr. Dunker* believed it to be different. 4. "I have notes also of a peapod-shaped species, larger than that of the" [*leguminelloides*]. This larger peapod-form is probably my *Cyprione Bristovii*.

III. "In the Lower Purbeck the Cyprides are all smooth and oblong†, and rather fat: *Cypris purbeckensis*." This sketch is free from the false margin referred to above (p. 313).

E. Forbes's Letter to T. R. Jones.—In his note of July 23, 1854, Prof. E. Forbes informed me whereabouts the Purbeck "Cyprides" were to be found (just about as now) in the Museum at Jermyn Street, and enumerated the following names, as "given to the principal ones," together with small rough sketches:—

"*Cyp. tuberculata*?,
—— *leguminella*,
+ *granulata*,
—— *fasciculata*,
—— *punctata*,
—— *purbeckensis* (smooth),
—— *striatopunctata*."

* In letter. (See further on, p. 319, note.)

† By these two features *C. punctata* is shut out from the Lower Purbeck, in which Bristow (in Damon's 'Geology of Weymouth' &c., new edition) and Lyell give it by mistake.

There is no special order kept in this list. The false margin is partly indicated for *purbeckensis*, and the name *granulata*, as in Lyell's list (fig. 371, c), is probably given by mistake for *granulosa* of Römer and Dunker.

The Vertical Sections published by the Geological Survey.—Only three "Cyprides" with specific names (*tuberculata*, *leguminella*, and *purbeckensis*) are affixed to any particular bed in the Geological Survey's "Vertical Sections" (Sheet No. 22) of the Purbeck strata, made after Prof. E. Forbes had finished his survey-work. In the successional table of the strata seen at Durlston Bay there are six Cypridiferous beds, or groups of beds, indicated for the "Upper Purbeck," the topmost containing "*C. tuberculata*;" for the "Middle Purbeck" twelve such beds; and for the "Lower Purbeck" two such special zones. Among the strata seen at Worbarrow Bay there are indicated one such bed for the "Upper," two for the "Middle," and five for the "Lower Purbeck;" at Mewps Bay, one for the "Upper," three for the "Middle," and three for the "Lower Purbeck." For the section at Ridgway Hill, north of Weymouth, there are two such zones in the "Upper;" four in the "Middle," in one of which "*C. leguminella*" is named; and six in the "Lower Purbeck," in the uppermost of which "*C. purbeckensis*" is mentioned.

The persistency of several of these Cypridiferous zones throughout the Dorsetshire sections is very noteworthy. How far the same species of Ostracoda hold their own along these zones is not yet determined; but possibly the appended lists (though imperfect) will throw some light on this subject.

Lists of Purbeck Strata by H. W. Bristow, J. H. Austen, and O. Fisher.—In Mr. Bristow's Purbeck list, in the new edition of Damon's 'Geology of Weymouth' &c., 1884, pp. 202, 207, & 209, the species referred to the three divisions of the Purbeck series are the same as in Lyell's 'Manual' above quoted. No "Cyprides" are specially mentioned in the Rev. J. H. Austen's list* in his 'Guide to the Geology of the Isle of Purbeck' &c., 1852; or in the Rev. O. Fisher's list of the strata at Swanage Bay, Trans. Camb. Phil. Soc. vol. ix. p. 568 &c., 1855; but in his list of the strata at Ridgway Hill, "*Cypris purbeckensis*" is affixed to one of the Lower Purbeck beds. Both the Rev. O. Fisher and Mr. Cunningham have favoured me with named specimens of *C. purbeckensis* and *C. fasciculata*.

Fitton and Sowerby; and Dr. Fitton's Specimens in the Museum of the Geological Society.—Of the Cypridæ referred by Fitton in 1836 to the Purbeck formation, unfortunately we cannot speak with full certainty.

Cypridea valdensis (Fitton), first and erroneously referred by J. de C. Sowerby to *Cypris faba*, Desmarest, was figured and described by him (1824) in the 'Mineral Conchology,' pp. 136–138,

* In G. Wilson and A. Geikie's 'Life of Edward Forbes' (1861) it is suggested, at p. 477, note, that this list was based on information obtained from the Geological Surveyors.

pl. 485, and the figure is very characteristic of a *Cypridea* common in the Weald Clay, as mentioned by Sowerby. This same species was referred to, and named *Cypris valdensis*, by Dr. Fitton in the Trans. Geol. Soc. ser. 2, vol. iv. 1836, pp. 177, 205, & 228, and by Sowerby at p. 344; but unfortunately another form was confused with it and figured (pl. 21. fig. 1) instead of it. Whether this other species was obtained from the Wealden or from the Purbeck beds is not evident from the memoir. At pp. 229 & 260 *C. valdensis* is also referred to as occurring in the Purbeck beds; but, in the first place, I did not meet with it, after long and careful search in that formation, until lately, when it turned up, quite rare, in one thin bed of the Middle Purbeck at Ridgway; and, secondly, hand-specimens* collected by Dr. Fitton and marked "*C. faba*" (which was at that time regarded as the same) really contain *C. purbeckensis*, and not *C. valdensis*. Fitton's fig. 1 comprises five sketches, namely:—(1) a piece of black shale crowded with Cyprids; (2) an individual of the natural size; and (3) three views of a specimen quite different from the real *C. valdensis*. Believing that I found some specimens like the fig. 1 above mentioned in the Weald Clay of Peasemars, Surrey, and in the Ironstone of Shotover, I separated this form as *Cypridea Austeni* in 1878 (Geol. Mag. dec. 2, vol. v. pp. 110, 277).

Fitton's fig. 2 (pl. 21) comprises two species under one name:—*b* and *c* are *Cypridea tuberculata* (Sowerby, in Fitton's memoir), and *a* is *C. Fittoni* (Mantell), both from the Weald Clay (pp. 177, 205, 228, & 345). Fig. 3 is *Cypridea spinigera* (Sowerby), from the Weald Clay (p. 345). Fig. 4, termed "*Cypris granulosa*" by Fitton and Sowerby (pp. 177, 260, and 345), is an important species, one of the modifications of which is the *Cypridea fasciculata* (Forbes), very common in the Middle-Purbeck beds. The little Cypridiferous light-coloured block figured resembles a bit of the common soft whitish Purbeck limestone, or calcareous shale, often full of *C. fasciculata*; and the two views of the bivalved carapace show the surface to be, as usual, nearly bare of tubercles about the middle region. The notch was missed by the artist, and the outline not quite accurately given. This species is quoted, at p. 177, from the "ferruginous sand, Tilgate Forest" (Mantell's Collection); but of this locality for it I have no certainty, and, indeed, *C. tuberculata* was probably mistaken for *granulosa*, as was decidedly the case with a specimen collected by Dr. Mantell, and now in the British Museum. The localities given at p. 260—"between Dallard's Farm and Catherine Ford" and at "Dashlet, between Penthurst and Teffont"—are doubtlessly true for this species.

The figures given by Sowerby for Fitton's memoir approach very closely *C. fasciculata* (E. Forbes), as intimated above; and, indeed, Forbes (in the letter to Mr. Bristow) refers his *fasciculata* with some doubt to *C. granulosa* (meaning, no doubt, Sowerby's species, though the sketch does not agree with it) as a variety of that species. Forbes's *fasciculata* does not occur in the Wealden beds;

* Such as those referred to at pp. 259, 260, of Fitton's memoir.

but a form resembling our figs. 10 and 17, Pl. IX., is figured by Römer (badly) and by Dunker from the Wealden of Obernkirchen and the Purbeck limestone of the Deister, as *C. granulosa*, Sow.; and Forbes's MS. sketch of *granulosa* (in Mr. Bristow's letter) also approximates to fig. 17, Pl. IX.

Among Dr. Fitton's collection deposited in the Museum of the Geological Society, there are mounted specimens of the *C. tuberculata*, fig. 2 (pl. 21), and *C. spinigera*, fig. 3, both Wealden species. There are none mounted, however, of the forms represented by his figs. 1 & 4; but specimens like fig. 4 occur freely in some of the rock-specimens preserved in that collection.

For the specific names of the Cypridæ mentioned and figured in Dr. Fitton's memoir (1836) in only one case I refer to Fitton as the authority. He especially states that he gives the name *valdensis* at p. 177; but the other species were determined by J. de C. Sowerby, and to him I refer as their authority, as, indeed, does Dr. Dunker, though F. A. Römer regarded them as Fitton's species.

Interesting notes on the casts of "*Cypris*" observed in the Lower-Purbeck beds, overlying the Portland Stone at Portland, are given at pp. 219 & 229 of Dr. Fitton's memoir "On the Strata below the Chalk" &c., Trans. Geol. Soc. ser. 2, vol. iv. (1836); but their importance is much lessened by the absence of definite descriptions and figures. A species said to be near to *C. spinigera*, and one with a "protuberance at the end of the valves," are indicated. At p. 212 "*C. tuberculata*" and "*C. valdensis*?" are also referred to as occurring at Portland, about 20 feet above the Portland Stone*. The specific determinations of these little organisms, however, were in many cases inaccurate in those days. The Cypridiferous beds in the Purbeck of Bucks are noticed at p. 297; of Wilts at pp. 259 & 260; of Dorset at p. 229.

Other Collections.—The Purbeck specimens in the Museum of Practical Geology and the British Museum have also been carefully examined. The results are incorporated with the lists given in the sequel. So, also, with specimens kindly communicated by the Rev. O. Fisher, F.G.S., and W. Cunningham, Esq., F.G.S., as well as my own large collection.

§ III. THE OSTRACODA OF WEALDEN AND REPUTED WEALDEN STRATA.

Fitton, Sowerby, and Mantell.—In treating of the Purbeck Ostracoda it is obviously necessary to have a preliminary notice of the Wealden species so far as they have been described; for some of the forms recur in this upper formation, and most of the series have some mutual relationships. *Cypridea valdensis* (Fitton), *C. Austeni*, Jones, *C. tuberculata* (Sow.), and *C. spinigera* (Sow.), have been referred to above, being noticed in Fitton's memoir.

In 1844 ('Medals of Creation,' vol. ii. p. 545, lign. 119, fig. 2)

* Probably No. 389, further on, at p. 325, is such a specimen, definitely characterized by *C. bononiensis*, *C. ansata*, and *C. purbeckensis*.

Dr. G. A. Mantell separated, as "*Cypris Fittoni*," a characteristic Wealden species, some of the figures of "*C. tuberculata*" in Fitton's memoir (1836).

Römer and Dunker.—The so-called "Wealden" beds of North Germany yield several interesting species, some of which are found in England also.

In 1839 Fr. A. Römer ('Verstein. norddeutsch. Oolithengebirges') figured and described (p. 52) from the "Wealden" beds of North Germany—

1. *Cypris valdensis*, Fitton, pl. 20. fig. 20, *a, b*. Badly drawn, and with strong beak, although the reference is made to fig. 1, pl. 21, Trans. Geol. Soc. ser. 2, vol. iv.
2. — *oblonga*, Römer, fig. 21. Figured differently by Dunker afterwards.
3. — *striatopunctata*, Römer, fig. 22, *a, b*. Figured by Dunker more distinctly afterwards.
4. — *tuberculata*, Fitton, fig. 23. Differing, however, somewhat in shape.
5. — *granulosa*, Fitton, fig. 24. Figured differently by Dunker subsequently.

The figures are poor, and the descriptions scanty; but the forms can mostly be recognized with the help of Dr. W. Dunker's 'Monographie nordd. Wealdenbildung,' 1846. Herein he gives—

1. *Cypris valdensis*, Sow., p. 59, pl. 13. fig. 29, *a, b*. Copied apparently from Sowerby's original figure.
2. — *laevigata*, Dunker, p. 59, pl. 13. fig. 25.
3. — *oblonga*, Römer, p. 60, pl. 13. figs. 24 & 26, *a, b*. Figured here with a beak.
4. — *striatopunctata*, Römer, p. 60, pl. 13. fig. 32.
5. — *granulosa*, Sow., p. 60, pl. 13. fig. 31. Differing from *C. granulosa*, Sow., in Fitton's memoir, pl. 21. fig. 4.
6. — *tuberculata* (?), Sow., p. 60, pl. 13. fig. 30, *a, b*. Differing from *C. tuberculata*, Sow., Fitton's memoir, pl. 21. fig. 2.
7. — *rostrata*, Dunker, p. 61, pl. 13. fig. 27.
8. — *pinnæformis*, Dunker, p. 61, fig. 13. fig. 28.

These are all figured as belonging to the genus *Cypridea*, having the antero-ventral notch and beak.

Of the several Ostracoda described by F. A. Römer (1839) and W. Dunker (1846), from the Purbeck-Wealden formation of North Germany (see above, and Geol. Mag. dec. 2, vol. v. 1878, pp. 104–106), Dr. C. Struckmann* refers *C. valdensis*, *C. oblonga*, and *C. granulosa* to the Purbeck division. These determinations, however, are probably open to revision.

The late Dr. Dunker regarded the Wealden of Hanover, and that of North Germany in general, as the equivalent of the English Purbeck. (In letter†.)

* 'Die Wealden-Bildungen der Umgegend von Hannover,' 1880, p. 56.

† My old friend, the late Dr. W. Dunker, of Marburg, wrote the following

Unfortunately there is much difficulty in correlating several of the above-mentioned species. In the first place, Römer gives the *beak* to one only, and Dunker figures all as being *beaked* more or less distinctly; secondly, the outlines given by the two authors disagree in nearly every case.

In the British Museum are some specimens, from Obernkirchen and the Deister; and a careful examination of them gives me the following species (associated with *Estheria elliptica*, Dunker):—

1. *Cypridea punctata* (Forbes), as figured in the Appendix of my Monogr. Foss. Estheriæ, pl. 5. figs. 26–30. I presume that Römer's fig. 20 and Dunker's figs. 27 & 28 may have been drawn from variously modified (and partially imbedded?) individuals of this species.
 2. — *Dunkeri*, n. sp. Presumably Römer's fig. 24, and certainly Dunker's fig. 31, represent a good species, which is not Sowerby's "*granulosa*," and therefore has been renamed in the sequel (p. 339).
 3. *Cyprione Bristovii*, gen. et sp. nov., and } These two may pos-
 4. *Darwinula** *leguminella* (Forbes). } sibly have been in-
- cluded under the "*Cypris oblonga*" of Römer and Dunker; but Römer's fig. 21 and description fall short of the reality of the first, and do not illustrate the second; and Dunker's fig. 26, though nearly like the first in outline, is markedly *beaked*, and therefore diverges, either really or by misadventure, from it and still more from the second form mentioned, which, however, is very abundant, and would readily furnish material for Dunker's fig. 24—a little Cypridiferous slab, of natural size.
5. *Cypridea granulosa* (Sow.), = *fasciculata* (Forbes), also occurs in these Hanoverian shales at Münden†, though not mentioned or figured by Römer and Dunker. This, we shall see, is a true Purbeckian species in England.

note, a very short time before his death, in reply to some inquiries I had made:—

"The *Cypris striatopunctata*, Ed. Forbes, is altogether different from *C. striatopunctata*, Römer: see Dunker's 'Monographie' &c., where the latter is sufficiently well figured. Unfortunately I cannot send you a specimen, as the originals were borrowed by me and have long ago been returned. Your new species from the English Purbeck [judging from figures supplied] has nothing in common with the *C. striatopunctata* of Römer. In my opinion the Wealden of Hanover, and of North Germany in general, is equivalent to the Purbeck of England."

Communicated to me by Dr. Brockmeier, at the request of Madame Dunker, March 18, 1885.

* The generic name "*Darwinella*" was given by Brady and Robertson to a very interesting Ostracod to which this Purbeck-Wealden form is distinctly related. The same name, however, has been used already for a Sponge by Fritz Müller; and "*Darwinula*" has been suggested by a friend, and approved of by G. S. Brady, as a substitute. See further on, p. 346.

† Perhaps these belong to the "Münder-Mergel," described by Struckmann as transitional between the Portland and Purbeck formations. See Geol. Mag. dec. 2, vol. viii. 1881, p. 479.

Shotover and Netherfield Specimens.—In 1878 (Geol. Mag. dec. 2, vol. v. pp. 103–109, pl. 3. figs. 3–10) I described and figured some Ostracoda from the Ironstone of Shotover Hill, near Oxford. These include both Wealden and Purbeck species. Some of the specific determinations require revision. *Candona Phillipsiana* (p. 108), fig. 3, seems to be a good species; but I failed in my endeavour to fix the *Cyprideæ* figured as 5, 6, and 7; for fig. 6 is in all essentials equivalent to the Purbeck species, *C. granulosa* (Sow., in Fitton, which I now find has the *beak and notch*), being granulated at the ends and not in middle, and it was badly grouped with the spinose valves (with *sharp* tubercles), figs. 5 and 7; nor was the collocation of fig. 4 (a coarsely tuberculate form) with these correct. They are all called *verrucosa* (pp. 108, 109), but the last may well be the type of the species, the intensity of its warty ornament having caused it to be regarded as the strongest, or var. *crassa* (p. 108); whilst the spiny valves are not truly verrucose or warty, and the slightly verrucose fig. 6 must go to *C. granulosa* (Sow.), since the latter is found to be really a *Cyprideæ*. I now find specimens like figs. 5 and 7 in the Wealden shales of Sussex, and propose to call them *C. aculeata*.

Fig. 8 and fig. 1 of Fitton's pl. 21 (which latter is not "*valdensis*," though called so by him and Sowerby) were treated by me, in the paper referred to, as *Cyprideæ Austeni* (pp. 109, 110, 277). Figs. 9 and 10 were named by me *C. bispinosa*; and this seems to be a permanent form, having representatives in the Sussex Weald. Fig. 11 is an outline of the common *C. valdensis*, like that of Kent and Sussex.

Of the other Ostracoda in pl. 3, Geol. Mag. 1878, figs. 12–16 were from the "Subwealden Boring" at Netherfield, near Battle, in Sussex. Fig. 12 is probably a *Darwinula*, near to *D. leguminella* (Forbes); figs. 13–15 are *Cyprideæ punctata* (Forbes), not "*valdensis*," p. 110; and fig. 16 is *C. granulosa* (Römer and Dunker), p. 110, but, for convenience of nomenclature, now named *Dunkeri*: all from the Upper Purbeck.

The Shotover species will therefore stand thus :—

Fig. 3. *Candona Phillipsiana*, Jones.

4. *Cyprideæ verrucosa*, Jones.

5, 7. — *aculeata*, Jones.

6. — *granulosa* (Sow.). A characteristic Mid-Purbeck species.

8. — *Austeni*, Jones.

9, 10. — *bispinosa*, Jones.

11. — *valdensis* (Fitton).

Those from the boring at Netherfield thus :—

Fig. 12. *Darwinula*?

13, 14, 15. *Cyprideæ punctata* (Forbes).

16. *C. Dunkeri*, Jones.

In Mr. Topley's 'Geology of the Weald' (Geol. Surv. Mem. 1875)

there are several references to the occurrence of Cypridæ in the Purbeck beds near Poundsford, Mountfield, and elsewhere in Sussex (pp. 31, 41, 408, &c.); but the specific determinations are doubtful. The specimens were noted on the spot by Mr. Etheridge, but have been since mislaid.

Synonyms of CYPRIDEA AUSTENI *, Jones, 1878.

Cypris valdensis, Fitton and Sow. (not Sow., Min. Conch. tab. 485), Trans. Geol. Soc. ser. 2, vol. iv. 1836, p. 177, pl. 4. fig. 1.

Cypris granulosus (part), Mantell (not Sow.), Wonders of Geology, 1838, vol. i. p. 344, tab. 46. fig. 7; *C. granulosa*, 6th edit. 1848, vol. i. p. 405, lign. 98, fig. 1; 7th edit. 1857, p. 419, lign. 104, fig. 3; Medals of Creation, 1844, vol. ii. p. 545, lign. 119, figs. 1, 1 a; 2nd edit. 1854, vol. ii. p. 527, lign. 174, figs. 1, 1 a.

Cypris valdensis, Lyell (not Sowerby, Min. Conch.), Elements of Geology, 1838, p. 348, fig. 185; 2nd edit. 1841, vol. i. p. 417, fig. 201; 3rd edit. (as 'Manual of Elem. Geol.'), 1851, p. 228, fig. 233; 4th edit. 1852, p. 228, fig. 233; 5th edit. 1855, p. 263, fig. 306.

Cypridea Austeni, Jones, Geol. Mag. dec. 2, vol. v. 1878, pp. 109. 110, 227, pl. 3. fig. 8.

Dr. Fitton's wording at p. 177 of his memoir would necessitate the adoption of the name "*valdensis*" for this form, to the figure of which (his fig. 1, pl. 21) he there refers, were it not that he alludes to Sowerby's description of the real *valdensis* as *Cypris faba* (a name by which it was at first known), and especially refers to Sowerby's figure in the 'Min. Conch.' tab. 485, as well as to the "profuse abundance" of the species in the Wealden Beds.

§ IV. LIST OF SPECIMENS WITH WELL-DETERMINED LOCALITIES AND HORIZONS.

I. *Ostracoda from the Upper-Purbeck Beds.*

DORSET.

§ 1. *Durlston Bay* †.

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species ‡.
117 & 293.	{ "Near Peverel Point," Swanage "W. of Flagstaff; below other marl"		{ <i>punctata</i> and var. <i>posticalis</i> .

* Named after my friend the late Mr. R. A. C. Godwin-Austen, of Shalford, in whose company I found the specimen at Peasemars, and who directed me to the shale-heap of Upper-Weald Clay, thrown out in digging a reservoir at the brewery there.

† A general account of the Purbecks of Durlston Bay is given by Mr. Huddleston and others in the Proc. Geol. Assoc. vol. vii. pp. 377 and 386-390.

‡ The generic names are omitted for convenience.

|| See also Catal. Rock-specimens Mus. Pract. Geol. 1862, pp. 143, 144, "compact freshwater limestone in thin bands, in Upper Cypris-shales of the Upper-Purbeck Beds." Note also that "*C. punctata*" is quoted from the Marble-rag beds, Upper Purbeck. at p. 143.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
34 & 48.	"Durlston Bay.	J. Morris," April 1, 1883.	
34 A.	"Durlstone." Collected by Prof. E. Renevier when he was in England in 1854-5.		<i>punctata</i> .
34 B & 34 C.	Peveler Point	J. C. Mansel-Pleydell, F.G.S.	<i>punctata</i> .
34 D.	"Durlstone. Brodie, Jun."	British Museum.	<i>punctata</i> .
405.	Durlston Bay. "Between Burstone and Marble-beds." Impure laminated limestone, composed of <i>C. punctata</i> and broken <i>Cyclas</i> .	J. C. Mansel-Pleydell, 1884.	<i>punctata</i> .
397 A & B.	Durlston Bay. "A. Cypris-shale." Rotten calcareous shale, composed chiefly of <i>C. punctata</i> and a small form.	J. C. Mansel-Pleydell, 1884.	<i>punctata</i> . <i>ventrosa</i> . <i>leguminella</i> . <i>Dunkeri</i> . <i>ventrosa</i> . <i>Bristovii</i> .
40.	"Durlstone Bay."		<i>punctata</i> . <i>ventrosa</i> . <i>Bristovii</i> .
40 A & 40 AA.	Durlston Bay. Cypris-beds. Rev. O. Fisher, F.G.S. British Museum "59254;" and another specimen.		<i>punctata</i> . <i>ventrosa</i> . <i>Bristovii</i> .
133.	Durlston. "No. 4 bed of Austen's list." "Cypris-shales."		<i>punctata</i> .
367.	"Peveler Point. Bed no. 84 of Mr. Bristow's list in Damon's new edition of the 'Geology of Weymouth,' 1884, p. 201. Dark-grey shales, with band of crystalline limestone."	Horace B. Woodward *, F.G.S., 1884.	<i>ventrosa</i> .
379.	"Durlstone Bay, bed no. 84. Dark-green shales."	H. B. W. 1884.	<i>punctata</i> .
	Durlston Bay. "Crocodile Bed."	W. R. Brodie. Brit. Mus.	<i>punctata</i> .
§ 2. Mewps Bay.			
27.	"Meups Bay" †. "Cypris-shales."		<i>punctata</i> . <i>tuberculata</i> . <i>Bristovii</i> (small).
	"Mupes Bay." Thin Cypridiferous limestone. Museum Practical Geology, Xb §.		<i>punctata</i> and var <i>gibbosa</i> . <i>Dunkeri</i> .
377.	"Mewps Bay, Upper Cypris-shales." Thin, blue-hearted limestone, composed of Cyprids ‡.	Horace B. Woodward, July 1884.	<i>punctata</i> . <i>leguminella</i> .
378.	"Mewps Bay. Limestone bands in Upper Cypris-shales."	H. B. W. July 1884.	<i>punctata</i> . <i>leguminella</i> .

* Of all the specimens presented to me by Mr. Horace B. Woodward, there are good representatives in the Museum of Practical Geology.

† "Mewps Bay" in Catal. Rock-specimens Mus. Pract. Geol. 1862, p. 144.

‡ So abundant are the Cypridæ in the Purbeck formation that many strata are wholly composed of these Microzoa. Some such beds furnish good building stone. The Rev. O. Fisher informs me that the spire of All-Saints' Church in Dorchester was built of the "Cypris-freestone," "No. 143" in his list of the Swanage strata in the Trans. Cambridge Phil. Soc., and topped with a conical block of stone from the bed no. 134, consisting of cockle shells.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
§ 3. <i>Bacon Hole</i> .			
Bacon Hole.			
Specimen Xb $\frac{1}{2}$	(Catal. Foss. M. P. G. 1865, p. 254).		<i>punctata</i> .
Bacon Hole.	Thin Cypridiferous limestone.		<i>tuberculata</i> .
	British Museum.		<i>leguminella</i> .
§ 4. <i>Ridgway</i> .			
Ridgway.	With <i>Paludina</i> .	M. P. G. X $\frac{1}{2}$	<i>punctata</i> .

Cypridea punctata is notably the most abundant species in the Upper-Purbeck Series.

II. *Ostracoda from the Middle-Purbeck Beds.*

I.—DORSET.

§ 1. *Durlston Bay*.

- 39 & 118. Near Swanage. Specimens chipped off a large block of Purbeck Limestone (bearing vermiform markings and two large pachydactylous trifid footmarks), which formerly stood in the Hall of the Geological Society's Apartments in Somerset House, before the removal to Burlington House. Another such block is in Corfe-Castle Museum. } *fasciculata* *.

"The bed with trifid marks comes in the 'Corbula-beds' of the Middle Purbeck at Durlston Bay [nos. 24–29 of J. H. Austen's section, 1852]. It is the 'Toad's-eye Limestone' marked 'No. 68' in the section published in the new edition of Mr. Damon's book, 1884, p. 203. This 'Toad's-eye Limestone' is a variable bed, splitting up into three or four layers; but sometimes these are not distinct, and it then simply has 'rotten' veins of indurated marl."—H. B. Woodward; Letter, 26th October, 1884.

74.	"Durlston Bay. Top of the Cinder-bed." †	<i>fasciculata</i> .
31.	"Lower beds of Middle Purbeck. Cypris-limestone."...	<i>fasciculata</i> .
44.	Hard, blue-hearted, thin limestone or compact Cypridiferous shell-grit. "Below the Reptile Bed. ‡	<i>ventrosa</i> , and
	J. Morris, Nov. 21, 1873."	var. <i>globosa</i> .
		<i>Bristovii</i> .
56, 57,	{ Shale. Cypridiferous shale, largely composed of broken and perfect valves. "Lower bed of Middle Purbeck."	<i>punctata</i> .
58.	{ "Below Beckles's bed" (no. 93 of Austen's list, p. 13, called a "dirt-bed," but really a lake-bottom).	<i>Bristovii</i> .
	Durlston Bay. Thin crystalline limestone, composed of Cyprids, and showing them freely on the weathered flaking of the surface.	<i>fasciculata</i> .
	M. P. G., Xb $\frac{1}{2}$.	
	Durlston Bay.	M. P. G., Xb $\frac{1}{2}$. <i>punctata</i> .

* This name is used here for convenience, it being well known and indicating the more pronounced and common modification of *Cypridea granulosa* (Sow.).

† See 'Catal. Rock-specimens, M. P. G.' 1862, p. 142.

‡ There are several reptiliferous beds; if the bed worked by Mr. S. H. Beckles be intended, it is no. 93 of the Rev. J. H. Austen's list, 1852, at the base of the Middle Purbecks.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
	Durlston Bay. Thin limestones.	M. P. G., Xb $\frac{1}{2}$.	<i>punctata</i> . <i>ventrosa</i> . <i>leguminella</i> .
388*	Durlston Bay. Very thin Cypridiferous limestone.	M. P. G., Xb $\frac{1}{2}$.	<i>punctata</i> . <i>tuberculata</i> . <i>leguminella</i> .
	Durlston Bay.	M. P. G., Xb $\frac{1}{2}$.	<i>punctata</i> . <i>fasciculata</i> . <i>punctata</i> . <i>Forbesii</i> .
	Durlston Bay.	M. P. G., Xb $\frac{1}{2}$.	<i>fasciculata</i> . <i>punctata</i> . <i>Forbesii</i> .
	"Durlston; between H and I." With <i>Melanopsis</i> .	M. P. G., $\frac{1}{2}$.	<i>fasciculata</i> (very large).
369.	"Durlston Bay. Bed no. 48*; 'lias rag.'"	H. B. W., 1884.	<i>punctata</i> .
408 & 409.	{ "Durlston Bay, Swanage, 'Turtle-beds,' between Free-stone Quarry and Down's Vein," with <i>Cyrena</i> . (Austen's nos. 63-67, about.)	J. C. Mansel-Pleydell, 1884.	<i>paucigranulata</i> .
74.	Durlston Bay. "From the top of the Cinder-Bed."	Rev. O. Fisher, January 1883.	<i>fasciculata</i> .
406 & 407.	{ "Durlston Bay, Swanage. Above Cinder-bed."	J. C. Mansel-Pleydell, 1884.	<i>paucigranulata</i> , fine and large specimens.
396.	"Durlston Bay. Under Cinder-bed." With <i>Ostrea</i> . (Lower part of Austen's no 71 ?)	J. C. Mansel-Pleydell, 1884.	<i>paucigranulata</i> .
401, 402, 403.	{ "Durlston Bay. Below Cinder-bed." With <i>Cyrena</i> and <i>Melanopsis</i> ? (Austen's no. 72.)	J. C. Mansel-Pleydell, 1884.	<i>paucigranulata</i> .
	"Button Bed. Purbeck I. 8809. Greenough."	Geol. Soc.	<i>fasciculata</i> .
	"Tombstone Bed. Swanwick. 8743. Greenough. In clayey parting."	Geol. Soc.	<i>punctata</i> ?
	This is no. 45 of Bristow's List (in Damon), 1884; and nos. 69 and 70 of Austen's List, 1852.		
	"Tillywhim Hill. Fitton, 929." Limestone.	Geol. Soc.	<i>fasciculata</i> .
§ 2. <i>Mewps Bay</i> .			
	Mewps Bay. With <i>Valvata</i> .	M. P. G. $\frac{1}{2}$.	<i>fasciculata</i> . <i>posticalis</i> . <i>Dunkeri</i> . <i>leguminella</i> . <i>Forbesii</i> .
61.	Mewps Bay.	And M. P. G. Xb $\frac{1}{2}$.	
§ 3. <i>Worbarrow Bay</i> .			
370.	"Worbarrow Bay. Marly limestone. <i>Cypris</i> abundant. Cherty freshwater."	H. B. W., July 1884.	<i>fasciculata</i> .
§ 4. <i>Ridgway</i> .			
	Ridgway.	M. P. G. Xb $\frac{1}{2}$.	<i>posticalis</i> . <i>Dunkeri</i> . <i>leguminella</i> ? <i>Forbesii</i> .
381.	"Ridgway Hill. Coarse marly limestone with yellow stains."	H. B. Woodward, July 1884.	<i>fasciculata</i> .

* Mr. Bristow's list in the new edition of Damon's 'Weymouth,' &c.

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List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
123 A.	Ridgway. Chert and its dirt-bed.	1855. With	<i>valdensis</i> †.
	Chara, fishbone, &c.		<i>punctata</i> .
	"Chert-bed, Ridgway. O. Fisher."	With Chara, and Geol. Soc.	<i>Forbesii</i> .
	<i>Planorbis</i> ?		<i>leguminella</i> .

II. WILTS.—*Vale of Wardour*.

38 & 45.	Teffont.	W. Cunningham, F.G.S., Sept. 1870.	<i>fasciculata</i> .
83, 84, 85.	Teffont.	Rev. O. Fisher, January 1883.	<i>fasciculata</i> .
	Teffont. The Rev. O. Fisher, in the Rev. P. B. Brodie's paper, Quart. Journ. Geol. Soc. vol. x. p. 476, mentions		<i>fasciculata</i> .
	Vale of Wardour. With <i>Cyrena</i> .	M. P. G. $\frac{3}{4}$.	<i>fasciculata</i> .
387*.	"Dallard, Wilts. Fitton." Limestone, made up of Cypridæ.	Geol. Soc.	<i>punctata</i> .
194.	"Between Hand Cross and Chicks Grove." See Fitton's 'Memoir on the Strata below the Chalk,' &c., 1837, pp. 251, 260 Cypridæ, with some casts of <i>Cyrena</i> , making up the rock. Casts of <i>Cyrenæ</i> full of Cypridæ. The rock a mass of Cypridæ.		<i>fasciculata</i> .
197.	Ladydown. See Fitton's 'Memoir,' &c., pp. 262, 272.	Geol. Soc.	<i>fasciculata</i> .
	"Lady Down. Miss Benett. 9674."	Geol. Soc.	<i>fasciculata</i> .
	"Lady Down in Tisbury. Miss Benett." With Fish-remains (<i>Sauropsis</i>).	Geol. Soc.	<i>fasciculata</i> .
	"Between Dallard and St. Catherine's Ford. Fitton."	Geol. Soc.	<i>fasciculata</i> .

Cypridea granulosa (*fasciculata*) is particularly characteristic of this division of the series, and *Metacypris Forbesii* is also peculiar to it.

III. *Ostracoda from the Lower-Purbeck Beds*.

I. DORSET.

§ 1. *Portland*.

389.	"Purbeck stone, Portland." Fitton.	Geol. Soc.	<i>bononiensis</i> .
	Marked as containing " <i>C. faba</i> " (= <i>C. valdensis</i>).		<i>ansata</i> .
	A white limestone.		<i>purbeckensis</i> .

§ 2. *Durlston Bay*.

366 & 368.	"Durlston Bay, Isle of Purbeck. Bed No. 9 of Lower Purbeck †. Soft grey Cypris-shales."		<i>purbeckensis</i> †.
	Horace B. Woodward, July 1884.		

† This is the only instance in which I have found *Cypridea valdensis* in the Purbeck beds. Some doubtful specimens, however, may be mentioned as occurring in black shales from a pit in Archer Wood, near Battle, Sussex, and in ironstone at Poundsford.

‡ Mr. Bristow's list in Damon's new edition.

§ *Cypris purbeckensis*, M. P. G. Xb4, is entered in the Catal. Fossils M. P. G. 1865, p. 254, as belonging to the "Middle Purbeck" (of Durlston Bay?), together with *Serpulites* and *Archæoniscus*; but this, I think, must be a mistake, for this species and the other fossils here mentioned, for by far the most part, characteristically belong to the Lower Purbeck. It is referred to as "17 in O."

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.

Locality.

Collector or Museum.

Species.

§ 3. *Worbarrow Bay.*

371.	"Worbarrow Bay. Hard slaty limestone with occasional partings of sandy shale. Hard Cockle-beds."	H. B. W. July 1884.	} <i>purbeckensis</i> .
375.	"Worbarrow Bay. Brown Cypris-freestone."		
		II. B. W. July 1884.	} <i>purbeckensis</i> .

§ 4. *Lulworth.*

273.	Lulworth.	{	<i>purbeckensis</i> .
<i>bononiensis</i> .

In the 'Catalogue of Rock-specimens, Mus. Pract. Geol.' 1862, p. 141, a piece of "grey slaty limestone" of the Lower-Purbeck Series, "with pale marly clay," in the "Soft Cockle-beds," and containing pseudomorphous casts of salt-crystals, is described as having its "upper and under surfaces . . . , as well as the casts of crystals . . . thickly covered with *Cypris leguminella*." Though these little bodies at first sight closely resemble *Darwinula leguminella*, they are really minute, subcylindrical, oolitic concretions * composing the rock. They stand out whitish on the surfaces, more distinctly than elsewhere, on account of weathering; in the limestone they have a brownish tint, and under the microscope the cementing matrix is calcareous. Mr. Cunningham has shown me a specimen from Chicksgrove (not far from Teffont), which has these oolitic grains interstratified with a dense argillaceous limestone.

In a grey marly limestone from Teffont, with chert, and containing fish-remains (in the Rev. W. R. Andrew's collections), I have seen a thin layer of similar oolitic granules, some botelloid, but most of them round and ovoid.

§ 5. *Ringstead Bay.*

376.	Ringstead Bay. From H. B. W. July 1884. This is a mass of small roundish granules and Cypridæ, coated more or less with calc-sinter, including also small tubes (<i>Serpulæ</i> ?). This is comparable with a similar Purbeckian bed near Boulogne, see 'Proceed. Geol. Assoc.' vol. viii. p. 58, and 'Bullet. Soc. Géol. France,' ser. 3, vol. viii. p. 616.	} <i>purbeckensis</i> .

§ 6. *Ridgway.*

67.	Ridgway Hill. From the Rev. O. Fisher †, Jan. 1883.	<i>purbeckensis</i> .
372.	"Ridgway Hill, Upway. Middle rock. Soft Cypris-limestone."	} <i>purbeckensis</i> .
	H. B. W. July 1884.	
373.	"Ridgway Hill, Upway."	<i>purbeckensis</i> .
380.	"Ridgway Hill, Upway. Dense Cypris-limestone."	} <i>purbeckensis</i> .
	H. B. W. July, 1884.	

* This is a different oolite from that of the specimen no. 384 from Ridgway, p. 327.

† See the Rev. O. Fisher's "Mém. on the Purbeck Strata," &c. Trans. Camb. Phil. Soc. vol. ix. 1855; Nos. 1 and 2 of the Ridgway List. Given also in Damon's 'Geology of Weymouth,' &c. 1860, p. 111.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
384.	"Upway, Dorset." and coarse oolite.	Marly limestone with shell-grit H. B. W. 1885.	<i>purbeckensis</i> .

II. WILTSHIRE.

§ 1. *Vale of Wardour.*

	Teffont. In the Quart. Journ. Geol. Soc. vol. x. p. 477, the Rev. O. Fisher * refers to the local species from the Lower Purbeck of Teffont.	<i>purbeckensis</i> .
	Teffont. Specimen in Mr. W. Cunnington's Collection, named by Prof. E. Forbes.†	<i>purbeckensis</i> .
230.	Vale of Wardour. Silicified wood with very fine specimens of	<i>purbeckensis</i> , <i>purbeckensis</i> , <i>bononiensis</i> , <i>ansata</i> .
75-82.	Vale of Wardour.	
365.	Lowest Purbeck Bed ‡, lying on the Portland Limestone at Oakley (Wockley) Quarry near Tisbury, in the Vale of Wardour. A block of this is preserved in the Museum of Practical Geology, Jermyn Street. It has been described by H. W. Bristow, in the 'Catalogue of the Rock-specimens in the M. P. G.' 3rd edit. 1862, p. 139; and it has been referred to by Prof. J. F. Blake in the Quart. Journ. Geol. Soc. vol. xxxvi. 1880, pp. 190, 200; by Sir A. C. Ramsay, <i>ibid.</i> p. 236, and by W. H. Hudleston, in the Proc. Geol. Assoc. vol. vii. 1881, p. 174.	<i>bononiensis</i> , <i>ansata</i> .

* I have also received from him (Jan. 1883) *C. purbeckensis* collected at Teffont by the Rev. W. R. Andrews.

† Extract from a paper on 'The Geology of the Vale of Wardour,' by Mr. W. Cunnington, F.G.S., read at the Blackmore Museum, Salisbury. (In a letter from Mr. Cunnington, February 1885.) "According to Prof. E. Forbes *Cypris tuberculata* is found only in the Upper Purbecks, *Cypris fasciculata* in the Middle, and *Cypris purbeckensis* in the Lower.....It appears that the Upper Purbecks are altogether wanting in the Vale of Wardour....."

"In the year 1851 I had the pleasure of accompanying Prof. E. Forbes and other geological friends in a tour through the Vale of Wardour. Passing down a lane between Teffont and Tisbury, I broke off from the rock at the side of the road, a small piece of stone full of Cyprides; and, showing it to him, he said, 'This is *Cypris fasciculata*; within a few yards lower down you ought to find *Cypris purbeckensis*;' and, as he predicted, within the space mentioned, I found the very species. The specimens are now on the table.....As this was Mr. Forbes's first visit to the spot, the incident affords a striking proof of his geological knowledge."

‡ Possibly the estuarine Portlandian (succeeding the marine Portlandian), or the "precursor of the Purbecks," Hudleston, Proc. Geol. Assoc. *loc. cit.* See also Prof. Judd's remarks on the passage from the Portland into the Purbeck, Quart. Journ. Geol. Soc. vol. xxviii. 1871, p. 223, and Mr. Godwin-Austen's Section at Swindon, Quart. Journ. Geol. Soc. vol. vi. 1850, pp. 464-467, also Prof. Blake's, *ibid.* vol. xxxvi.

The geology of the Vale of Wardour has been treated of by Dr. W. Fitton in his memoir "On the Strata below the Chalk" &c. Trans. Geol. Soc. ser. 2, vol. iv. 1836, and the Purbeck beds of the district are especially mentioned, thus:—Dallard's Farm, pp. 250, 260; Dashlet, pp. 250, 260; Chicksgrove, pp. 251, 260; Wockley, p. 252; Teffont, pp. 259, 260; Lady Down, pp. 262, 272. See also the Rev. P. B. Brodie's papers, Proc. Geol. Soc. vol. iii. 1839, 1842, pp. 134, 780; Quart. Journ. Geol. Soc. vol. x. 1854, pp. 475, 482; and especially the Rev. W. R. Andrews's memoir, Quart. Journ. Geol. Soc. vol. xxxvii. 1881, pp. 248-253, and Mr. W. H. Hudleston's in Proc. Geol. Assoc. vol. vii. 1881, pp. 161, &c.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s Collection.	Locality.	Collector or Museum.	Species.
	"Chicks Grove or Wockley.	Bottom of the Cap.	With { <i>purbeckensis</i> . <i>ansata</i> .
	Fish-remains.	Geol. Soc.	

§ 2. *Swindon*.

364. Swindon. Collected by the Rev. Prof. J. F. Blake *. { *transiens*.
retirugata.

III. BUCKINGHAMSHIRE.

§ 1. *Whitchurch, &c.*

363. South Oving, Bucks.
J. F. Blake (Quart. Journ. Geol. Soc. xxxvi. p. 215). { *purbeckensis*.
bononiensis.
ansata.
234. "Quainton. Western pit. Pendle." † Fitton, May 18, 1834, vol. 15, p. 122" (notebook?). See Fitton's memoir, p. 290. { *bononiensis*.
ansata.
235. Quainton. Pendle, with "*Mytilus*, *Cyclas parva*, and *Cypris*." Fitton. { *ansata*.
- 232 & 228. } "Whitchurch." "Pendle." Fitton. "May, 1834, vol. 15." { *purbeckensis*.
bononiensis.
ansata.
226. "Whitchurch." "224." Fitton's memoir, p. 289. { *ansata*.
227. Whitchurch? "1527-1053." "*C. faba*." Fitton. { *purbeckensis*.
bononiensis.
purbeckensis.
ansata.
- "Whitchurch. 1520. Fitton." Shell-grit with Geol. Soc. { *purbeckensis*.
bononiensis.
ansata.
- "Whitchurch. Fitton. 1522." Geol. Soc. { *purbeckensis*.
bononiensis.
ansata.
- "Pendle. Whitchurch. Fitton." Geol. Soc. { *purbeckensis*.
ansata.
- "Pendle. Whitchurch." With vertebræ of fish, an oblong bivalve, and an impression of a leaf (?). Geol. Soc. { *ansata*.
- Stewkley. M. P. G. Xb $\frac{1}{2}$. Catal. Foss. 1865, p. 253. { *purbeckensis*.
bononiensis.
ansata.
- See also Fitton's memoir, p. 291.

In an interesting section of Purbeck and Portland strata ‡ at the farm called the Warren, 1 $\frac{1}{4}$ mile south of Stewkley Church, which I had the pleasure of examining with Prof. A. H. Green in 1862, I noticed a Cypridiferous shale above the true Portland beds, and below a bed with *Trigonia*. Unfortunately I have mislaid the specimens then collected.

§ 2. *Hartwell, near Aylesbury* ||. *The Pit near the Bugle Inn*.

- 172, 176, 178, 179, 184, 189, 191A. Soft limestones, marls, and clay. { *purbeckensis*.
bononiensis.
ansata.
rugulata.
retirugata.
- 179, 180, 191A. Soft limestone, marls, and clays.....
- 179, 189, 191A. Soft limestones, marls, and clays
173. Dense green clay.
180. Crumbly clay.

* See Quart. Journ. Geol. Soc. vol. xxxvi. pp. 203-207. See also C. Moore's remarks on the section and fossils of Purbeck beds at Swindon, Proc. Geol. Assoc. vol. iv. 1879, p. 543, &c.; and further on, p. 330.

† The "pendle," a Purbeckian bed, found in both Bucks and Wilts, consists of a white, grey, or creamy limestone, somewhat argillaceous, generally fissile above and solid below, and contains at Whitchurch rounded whitish particles. It has been found to contain, at places, "*Cyprides*," *Modiola*, *Paludina*, *Cyclas parva*, *Planorbis*?, and *Potamides carinatus*.

‡ See also Fitton's Memoir, p. 291.

|| The particulars of the sections of this and the following quarries having been partly mislaid, their more perfect exposition is delayed for some future opportunity.

List of Specimens &c. (*continued*).

Nos. of the specimens in T. R. J.'s

Collection.	Locality.	Collector or Museum.	Species.
§ 3. <i>Hartwell</i> .— <i>Barnard's Pit</i> (or “ <i>pit at Barnett's Close</i> ”) *.			
162, 166. } 162, 166, } 166. }	Shaly beds.	{	<i>purbeckensis</i> . <i>ansata</i> . <i>retirugata</i> (var. <i>textilis</i> , Pl. ix. f. 24).
§ 4. <i>Hartwell</i> .— <i>Bishopstone Pit</i> (on the road between Bishopstone and Stone). Fitton's Memoir, pp. 287, 297 (“ <i>Horton's pits</i> ” and “ <i>Dr. Lee's pit</i> ,” at p. 297). This is the same as pit “no. 200” on the plan of the late Dr. Lee's property at Hartwell.			
238, 241, } 245. }	{ Blue clay, with fish-scales (<i>Pleuropholis</i>). Fitton's Memoir, p. 287. Marked “200” on Fitton's label. See also Brodie's section of this quarry (near Stone), Proc. Geol. Soc. vol. iii. 1842, p. 781.		<i>purbeckensis</i> . <i>bononiensis</i> .
§ 5. <i>Hartwell</i> (<i>other pits</i>).			
	Near Aylesbury; with <i>Mytilus</i> .	M. P. G. 3.	{ <i>bononiensis</i> . <i>ansata</i> . <i>bononiensis</i> . <i>ansata</i> . [f. 20). <i>rugulata</i> (Pl. ix.
258.	Grey clay on the Pendle.		
247, 255, } 260, 261, } 350?, & } I. 165, } British } Museum. }	The Pendle.		{ <i>purbeckensis</i> ? <i>bononiensis</i> . <i>ansata</i> .
269.			{ <i>rugulata</i> (Pl. ix. <i>ansata</i> . [f. 19). <i>rugulata</i> (Pl. ix. f. 17 & 18). <i>bononiensis</i> ? <i>ansata</i> ?
256.			{ <i>bononiensis</i> . <i>ansata</i> . [f. 21-23). <i>retirugata</i> (Pl. ix. with an Echino- derm spine.
253.	“Last Portland bed.”		{ <i>purbeckensis</i> . <i>ansata</i> . [f. 21-23). <i>retirugata</i> (Pl. ix. with an Echino- derm spine.
353, 350, } 361, 355. }	Soft limestones and clay (361)		<i>purbeckensis</i> . <i>bononiensis</i> . <i>ansata</i> . <i>bononiensis</i> . <i>ansata</i> .
360.	Soft friable limestone. }		{ <i>bononiensis</i> . <i>ansata</i> .
354.	Grey clay. }		
357.	Friable shale. “ <i>Trigonia</i> ; next to Portland.”		<i>bononiensis</i> , <i>rugulata</i> .

In the Lower-Purbeck series the characteristic Ostracods are :—

Cypris purbeckensis,
Candona bononiensis,
Candona ansata,

as will be seen by reference to the foregoing local lists for Wilts, Dorset, and Buckinghamshire. At Swindon, however, Prof. J. F. Blake found a “Purbeck” stratum which has yielded two new

* ‘London University Magazine,’ June 1856, p. 103.

species of *Cythere*, *C. transiens* and *C. retirugata*. Of these, the latter occurs in the lowest Purbeck beds in two of the stone-pits at Hartwell, near Aylesbury, namely the "Bugle pit" and "Barnard's pit." A variety, or the male form (*rugulata*), of *C. retirugata*, occurs both in the last-mentioned quarry and in similar low Purbeck (if not really *estuarine Portland*) beds in other pits near by.

The mingling of what seem to be freshwater with marine species in these lowest strata is a subject of much interest, and will require further attention and close study of the succession of strata. *C. transiens* has been found also in white, soft, Portland Stone, from Brill in Bucks.

IV. *Purbeck Beds near Mountfield and Poundsford, Sussex.*

The overlying Cypridiferous shales near Mountfield contain *Cypridea valdensis*, *Darwinula leguminella*, and *Cypridea Austeni* (?), and belong to the Wealden series; but the limestones that have been brought up from the old pits at Limekiln Wood, near by, contain Purbeck species, thus:—

63. Light-coloured limestone { *granulosa*, Sow.
 (= *fasciculata*, Forbes.)
25, 286, 312, 346. Solid bluish limestone, apparently composed of
Cypridæ, and showing them as casts and moulds on the
weathered surfaces *punctata* ?
307. Blue shale, with a thin layer of the small botelloid oolite
which is seen in Purbeck specimens from Telford, &c. In the shale,
Dunkeri ?
Oyster-bed. Ostracods, chiefly casts, weathered out free ... *Cythere* ? &c.

In ironstone at Poundsford we find *Cypridea valdensis* (?), *Darwinula leguminella*, and insect-remains.

Purbeck beds from the Sub-Wealden Boring at Netherfield.

- 390, 411, 412. Dark grey impure limestones, at 85 feet and 96 } *punctata*,
feet depth } with *Chara*.

V. *The late Mr. Charles Moore's Specimens from the Purbeck Beds at Swindon, Wilts.*

In the 'Proceed. Geol. Assoc.' vol. iv. 1876, pp. 544-546, there is an account of the late Mr. Charles Moore's discovery of many fossils in the Purbeck beds in the Great Quarry at Swindon; and among the fossils mention is made of four or five species of *Cypris*.

The Rev. H. H. Winwood, F.G.S., has been so good as to look for these fossils in the Bath Museum; and from among C. Moore's Upper-Oolite collection he has sent me six little glass tubes containing Ostracodal valves. On examination, these prove to be similar to other Purbeck species. Thus:—

- Tube 59. *Cypridea punctata*, ordinary; and *C. Dunkeri*, with very strong beak and notch. *C. Dunkeri* is much more numerous than the other. About 90 altogether.
Tube 60. *Cythere retirugata* and its var. *rugulata*; ordinary; about 60.

- Tube 61. *Cythere retirugata* and its var. *rugulata*, ordinary; and one *Cypris purbeckensis*: 20 specimens altogether. In both 60 and 61 *rugulata* is more common than the other.
- Tube 62. *Cypridea punctata*; very large. Numerous; about 80.
- Tube 62*. *Candona bononiensis* and *C. ansata* (both ordinary), 15; and *Cypridea punctata* (ordinary), only one.
- Tube 65. *Cypridea punctata*, ordinary; and *C. Dunkeri*, like that of tube 59, more numerous than *C. punctata*; about 250 of the two together.

Certain strata at Swindon containing "*Cyprides*" are described, *loc. cit.*, as freshwater marls and limestones, 10 feet thick, with depressions ("pipe-like veins") in them, containing material derived from the Lower Greensand. Further, they are referred to as chalky limestones, in which are one or two darkish bands of earthy, carbonaceous marls and loose grits, containing mixed marine and freshwater forms. C. Moore also remarked that "the chalky limestones or marls contain few remains of recognizable character"; but, together with several smaller *derived* fossils, he got four or five species of *Cypris* "from the black bands," or "earthy carbonaceous marls and loose grits" (the "black carbonaceous friable loam," Hudleston, *op. cit.* p. 548). The specimens in the tubes above referred to are (from both internal and collateral evidence) believed to be Mr. C. Moore's Swindon specimens.

These deposits † were referred to the Middle Purbeck, with some doubt, by Mr. C. Moore; and he suggested that Purbeck beds of older date may have been cut into, disturbed, and mixed up with them. Prof. Morris gave his opinion (p. 547) that these beds "might be the equivalents of the entire thickness" of the Purbeck series (300 feet at Durlston Bay).

Either of these suggestions will account for the occurrence of the Lower-Purbeck species:—*retirugata*, *rugulata*, *bononiensis*, *ansata*, and *purbeckensis* in company with *Dunkeri* and *punctata*. Had *fasciculata* turned up also, we should have had a fairly representative and complete group.

§ V. CONCLUSION.

In conclusion there are fourteen species of Ostracoda in E. Forbes's three divisions of the Purbeck series of deposits. Five of them occur only in the Lower Purbeck. Of the others, six occur in both the Middle and the Upper. Of the fourteen, five go up into the Wealden, from the Middle and Upper divisions only. See the following Table (p. 332). *Cypridea punctata* for the Upper, *C. granulosa* (*fasciculata*) for the Middle, and *Cypris purbeckensis* for the Lower Purbeck, are especially characteristic.

† At p. 548, *op. cit.*, Mr. Hudleston notes that this "black carbonaceous friable loam" becomes further on a bed of *Cerithium portlandicum* in "dark friable marly grit," and "that above this bed the regular Portland Limestone comes on again," "Purbeck" and "Portland" conditions inosculating at this spot. Prof. Blake's interpretation of the section is different.

§VI. TABULAR CONSPECTUS OF THE PURBECK OSTRACODA.

Species and Varieties.	PURBECK. <i>England.</i>		PURBECK. ("Wealden.") <i>N. Germany.</i>	WEALDEN. <i>England.</i>	Remarks.
	Lower.	Middle. Upper.			
1. <i>Cypridea valdensis</i> (Fitton)	—	*	?	*	Very rare in the Purbeck, abundant in the Wealden of England.
2. — <i>punctata</i> (Forbes)	—	*	*		Characteristically abundant in the Upper Purbeck.
2*. — — <i>var. posticalis</i> , <i>nov.</i>	—	*			Strongest in the Middle Purbeck.
2**. — — <i>var. gibbosa</i> (Forbes)	—	*			Rare.
3. — <i>ventrosa</i> , <i>nov.</i>	—	*			Rather rare.
3*. — — <i>var. globosa</i> , <i>nov.</i>	—	*			Rare.
4. — <i>tuberculata</i> (Sow.)	—	*	*	*	Rather rare.
4*. — — <i>var. adjuncta</i> , <i>nov.</i>	—	—			Rare.
5. — <i>Dunkeri</i> , <i>nov.</i>	—	*	*	*	Rather rare in the Purbeck, abundant in some of the Wealden beds.
6. — <i>granulosa</i> (Sow.) <i>var. fasciculata</i> (Forbes)	—	*	*		Characteristic of the Middle Purbeck.
6*. — — <i>var. paucigranulata</i> , <i>nov.</i>	—	*			Not uncommon.
7. Cyprione Bristovii, <i>nov.</i>	—	*	*	*	Abundant in places.
8. Darwinula leguminella (Forbes)	—	*	*		Found only in the Middle Purbeck.
9. Metacypria Forbesii, <i>nov.</i>	—	*			Characteristic of the Lower Purbeck.
9*. — — <i>var. verrucosa</i> , <i>nov.</i>	—	*			Often abundant with <i>C. purbeckensis</i> .
10. Cypris purbeckensis, Forbes	*				Rare: and in the Portland (Brill).
11. Candona bononiensis, Jones	*				} Rare.
12. — <i>ansata</i> , <i>nov.</i>	*				
13. Cythere transiens, <i>nov.</i>	*				
14. — <i>retirugata</i> , <i>nov.</i>	*				
14*. — — <i>var. rugulata</i> , <i>nov.</i>	*				} Rare.
14**. — — <i>var. textilis</i> , <i>nov.</i>	*				

§ VII. APPENDIX.

1. *The Ostracoda of the Wealden Formation.*

DORSET.

Upper Weald.	Swanage Bay (Punfield Cove)	{ <i>Cypridea valdensis</i> <i>Cythere Fittoni</i> <i>Cypridea spinigera</i> , only in one bed and alone.	{ separate in some beds, together in others.
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ISLE OF WIGHT.

Upper Weald.	Grange Chine, W. of Compton...	{ <i>Cypridea valdensis</i> . — <i>Dunkeri</i> . — <i>valdensis</i> .	
Upper Weald.	Compton Bay	{ <i>Cythere Fittoni</i> . <i>Cypridea spinigera</i> . — <i>valdensis</i> .	
(Upper?) Weald.	West of Brook Point	{ <i>Cythere Fittoni</i> . <i>Cypridea Dunkeri</i> . — <i>valdensis</i> .	
(Upper?) Weald.	Brixton Bay	{ <i>Cythere Fittoni</i> . <i>Cypridea Dunkeri</i> .	
(Upper?) Weald.	Shepherd's Chine	{ — <i>valdensis</i> .	
(Upper?) Weald.	Cowleaze Chine	{ — <i>valdensis</i> . — <i>valdensis</i> . <i>Cythere Fittoni</i> .	
Upper Weald.	Atherfield	{ <i>Cypridea spinigera</i> . — <i>Dunkeri</i> . <i>Darwinula leguminella</i> . <i>Cypridea valdensis</i> .	
Upper Weald.	Sandown Bay	{ — <i>spinigera</i> . — <i>Dunkeri</i> . <i>Cythere Fittoni</i> . <i>Darwinula leguminella</i> .	

SUSSEX.

Weald Clay.	Pulborough (railway)	{ <i>Cypridea valdensis</i> . <i>Cythere Fittoni</i> .	
Weald Clay?	Pallingham, W. Sussex	{ — <i>Fittoni</i> .	
Weald Clay.	Petworth (Sussex marble).....	{ <i>Cypridea valdensis</i> . — <i>valdensis</i> . — <i>bispinosa</i> . — <i>aculeata</i> .	
Tunbridge- Wells Sand.	{ Northland shale - pit, near Chripp's farm and Cuckfield...	{ — <i>valdensis</i> . — <i>bispinosa</i> . — <i>aculeata</i> .	
Tunbridge- Wells sand or clay in it.	{ Between Ansty Gate and Slough Green, N.W. of Cuckfield; from a well	{ — <i>valdensis</i> . — <i>tuberculata</i> . <i>Darwinula leguminella</i> .	
Grinstead Clay.	{ Balcombe Tunnel, South-Eastern Railway	{ <i>Cypridea valdensis</i> .	
Shale in Tunbridge-Wells Sand.	{ Lindfield, N.E. of Cuckfield.....	{ — <i>valdensis</i> . — <i>spinigera</i> . <i>Cythere Fittoni</i> . <i>Cyprione Bristovii</i> .	
Grinstead Clay, patch of, let down and preserved by a fault, in the Railway-cutting near Brook Farm, south of East Grinstead		{ <i>Cypridea valdensis</i> . — <i>tuberculata</i> . — <i>bispinosa</i> .	
Tunbridge- Wells Sand.	{ Balcombe Quarry; with <i>Torna-</i> <i>tella Popei</i>	{ — <i>valdensis</i> . — <i>tuberculata</i> .	
Tunbridge- Wells Sand.	{ Uckfield	{ — <i>spinigera</i> .	
Wadhurst Clay.	{ Railway-cutting, about 1 mile east of East-Grinstead Station }	{ <i>Cypridea valdensis</i> .	
Wadhurst Clay.	2½ miles W. of Bexhill	{ <i>Cyprione Bristovii</i> . <i>Cypridea tuberculata</i> . — <i>valdensis</i> .	
Wadhurst Clay?	Bopeep, St. Leonard's	{ — <i>Dunkeri</i> . — <i>tuberculata</i> .	

Wadhurst Clay.	St. Leonard's, Hastings.....	{ <i>Cypridea valdensis</i> . — <i>Dunkeri</i> . — <i>tuberculata</i> . — <i>valdensis</i> .
Wadhurst Clay?	Crowhurst Road, Hastings	{ — <i>Dunkeri</i> ? — <i>valdensis</i> .
Wadhurst Clay?	Hollington, near Hastings	{ — <i>valdensis</i> .
Wadhurst Clay?	Silver-Hill Road, Hastings (Equisetum shales)	{ <i>Cythere Fittoni</i> . <i>Darwinula leguminella</i> .
Wadhurst Clay?	Tivoli, Hastings	{ <i>Cypridea valdensis</i> . — <i>valdensis</i> .
Wadhurst Clay.	Quarry near the Black Horse Inn, Telham Hill, near Has- tings.....	{ <i>Cythere Fittoni</i> . <i>Cypridea tuberculata</i> ? — <i>Dunkeri</i> . — <i>bispinosa</i> . <i>Cyprione Bristovii</i> .
Wadhurst Clay.	Ecclesbourne Glen, Hastings ...	{ <i>Cythere Fittoni</i> . <i>Cypridea tuberculata</i> .
Ashdown Sand.	{ East Cliff, Hastings (W. R. & H. Binfield)	{ — <i>valdensis</i> .
Ashdown Sands?	Mountfield (shales).....	{ — <i>valdensis</i> . <i>Darwinula leguminella</i> . <i>Cypridea Austeni</i> ?

KENT.

Weald Clay.	Sevenoaks Tunnel	{ <i>Cypridea valdensis</i> . — <i>spinigera</i> ? — <i>gyripunctata</i> , MS. <i>Cythere Fittoni</i> . <i>Darwinula leguminella</i> .
Weald Clay.	{ Near Maidstone; railroad at Great Buckland; and Watlingbury	{ <i>Cypridea valdensis</i> . <i>Cythere Fittoni</i> .
Weald Clay.	{ Great Chart, South - Eastern Railway	{ <i>Cypridea valdensis</i> . <i>Cythere Fittoni</i> .
Weald Clay.	"Adlington" (probably Aldington)	{ <i>Cypridea valdensis</i> . <i>Cythere Fittoni</i> .
Weald Clay.	Bethersden	{ <i>Cypridea valdensis</i> . — <i>valdensis</i> .
Weald Clay.	Hythe	{ <i>Cythere Fittoni</i> . <i>Darwinula leguminella</i> .
Tunbridge- Wells Sand?	Tunbridge	{ <i>Cyprione Bristovii</i> .
Tunbridge- Wells Sand?	Tunbridge-Wells; with <i>Torna- tella Popei</i>	{ <i>Cypridea valdensis</i> . — <i>valdensis</i> .
(Upper?) Tun- bridge-Wells Sand.	Langton Green	{ <i>Cythere Fittoni</i> . <i>Cypridea tuberculata</i> . — <i>bispinosa</i> ? <i>Darwinula leguminella</i> .

SURREY.

Weald Clay.	Peasemars, near Guildford.....	{ <i>Cypridea Austeni</i> .
Weald Clay.	Hazlemere (railroad).....	{ — <i>valdensis</i> ? <i>Cythere Fittoni</i> ?
Weald Clay.	{ Trout's Farm, and near Henhurst, at the foot of Leith Hill	{ <i>Cypridea valdensis</i> .
Weald Clay.	Dorking Tunnel	{ — <i>valdensis</i> .
Weald Clay.	Earlswood Common	{ — <i>spinigera</i> .

2. *Synoptical List of the Ostracoda of the Purbeck and Wealden Formations in England, showing their Stages and Recurrence. (Successively numbered, 1-20, upwards from those of the Lower Purbeck.)*

WEALDEN SPECIES (11 species, 5 of which come up from the Purbeck, Upper and Middle).

14. *Cypridea valdensis* (Fitton). Very rare in Mid-Purbeck, but very abundant here.
 13. — *Dunkeri*, nov. } Recurrent from the Purbeck
 10. — *tuberculata* (Sowerby). } beds.
 20. — *spingera* (Sow.).
 19. — *bispinosa*, Jones.
 18. — *dorsispinata*, nov. MS.
 17. — *gyripunctata*, nov. MS.
 16. — *aculeata*, nov. (part of *verrucosa*, Jones).
 15. *Cythere Fittoni* (Mantell). Common.
 8. *Cyprione Bristovii*, nov. } Recurrent from the Pur-
 7. *Darwinula leguminella* (Forbes). } beck beds.

UPPER-PURBECK SPECIES (6 species, all of which recur from the Middle Purbeck; 4 go on to the Wealden).

12. *Cypridea punctata* (Forbes). Very abundant.
 12*. — —, var. *gibbosa* (Forbes).
 12*. — —, var. *posticalis*, nov.
 13. — *Dunkeri*, nov.
 11. — *ventrosa*, nov.
 10*. — *tuberculata* (Sow.), var. *adjuncta*, nov.
 8. *Cyprione Bristovii*, nov.
 7. *Darwinula leguminella* (Forbes).

MIDDLE-PURBECK SPECIES (9 species, 2 of which are peculiar to this Division; but 6 recur in the Upper Purbeck, and 5 in the Wealden).

14. *Cypridea valdensis* (Fitton). Very rare in the Purbeck, but common in the Wealden beds.
 13. — *Dunkeri*, nov.
 12. — *punctata* (Forbes). { More abundant in the
 } Upper Purbeck.
 12*. — —, var. *posticalis*, nov.
 12*. — —, var. *gibbosa* (Forbes).
 11. — *ventrosa*, nov.
 11*. — —, var. *globosa*, nov.
 10. — *tuberculata* (Sow.).
 9. — *granulosa* (Sow.), var. *fasciculata* } Very abundant, and
 (Forbes). } peculiar to the Mid-
 9*. — —, var. *paucigranulata*, nov. } Purbeck.
 8. *Cyprione Bristovii*, nov.
 7. *Darwinula leguminella* (Forbes).

6. <i>Metacypris Forbesii</i> , nov.	} Rare, and peculiar to the
Mid-Purbeck.
6*. ———, var. <i>verrucosa</i> , nov.	

LOWER-PURBECK SPECIES (5 species, all peculiar to this Division).

5. <i>Cypris purbeckensis</i> , Forbes.	Most abundant.
4. <i>Candona bononiensis</i> , Jones.	} Often common with <i>C. pur-</i>
<i>beckensis</i> .
3. ——— <i>ansata</i> , nov.	
2. <i>Cythere transiens</i> , nov.	} Marine forms; rare.
1. ——— <i>retirugata</i> , nov.	
1*. ———, var. <i>rugulata</i> , nov.	
1**. ———, var. <i>textilis</i> , nov.	

§ VIII. DESCRIPTION OF THE SPECIES.

I. Genus CYPRIDEA, Bosquet, 1852.

Cypris, Auctorum.

Cypridea, Bosquet, 1852, Mém. couron. Acad. Roy. Belg. vol. xxiv. P. 47 of the Memoir, "Description Entom. foss. Terrains tert. France et Belg."

Cypridea (subgenus of *Cypris*), Jones in Morris's Catal. Brit. Foss. 1854, p. 104.

Cypridea (? subgenus of *Cypris*), Jones, Monogr. Brit. Tert. Entom. 1856, pp. 9, 10.

Cypridea, Jones, Monogr. Foss. Esth. 1862, p. 106, & Appendix, p. 127.

Cypridea, Huxley & Etheridge, Catal. Coll. Fossils Mus. Pract. Geol. 1865, p. 254.

Cypridea, H. Woodward, Catal. Brit. Foss. Crustac. 1877, p. 88.

Cypridea, Jones, Geol. Mag. dec. 2, vol. v. 1878, pp. 107 &c.

Carapace-valves subtriangular, obovate, or ovate-oblong; convex in the middle; broad (high) at the anterior third; narrower behind; one or both ends obliquely rounded; somewhat compressed anteriorly; notched at the antero-ventral angle, behind a small beak-like process; sometimes having only a slight indentation below and behind a thickening of the antero-ventral angle; sometimes this is traceable only by a curvature of the edge inside. Edge-view more or less narrow-ovate. End-view subovate. Surface punctate; sometimes almost smooth; often tuberculate; tubercles small or large, variously disposed. The hinge-margin is definitely straight along the middle third or more of the dorsal edge, with the hinge-angles more or less defined, and is oblique to the main axis of the valve. The left valve is the largest, and receives the dorsal edge and a straight ridge of the other valve in grooves on its dorsal and ventral contact-margins, the outer edge of the ventral margin of the left valve overlapping that of the right valve. The ridges and furrows or ledges of contact vary in intensity in different individuals.

1. CYPRIDEA VALDENSIS (Fitton). [Not figured here.]

Cypris faba, Sow. (not Desmarest). Annals of Philos. vol. viii. 1824, p. 376; Min. Conch. 1824, tab. 485, pp. 136-8.

Cypris valdensis, Fitton, Trans. Geol. Soc. 2 ser. vol. iv. 1836, p. 177 (not pl. 21. fig. 1).

Cypris valdensis, Römer, Verst. norddeusch. Oolithengebirg. 1839, p. 52, pl. 20. fig. 20 (*C. punctata*, Forbes).

Cypris valdensis, Dunker, Monogr. nordd. Wealdenbild. 1846, p. 59, pl. 13. fig. 29 (copied from Sowerby's figure?).

Cypridea valdensis, Jones in Morris's Catal. Brit. Foss. 2nd edit. 1854, p. 104.

Cypridea valdensis, Huxley & Etheridge, Catal. Foss. Mus. Pract. Geol. 1865, p. 254, 270.

Cypridea valdensis, H. Woodward, Catal. Brit. Foss. Crust. 1877, p. 89.

Cypridea valdensis, Jones, Geol. Mag. 1878, p. 109, pl. 3. fig. 11 (not fig. 13-15).

Largest specimen $1\frac{1}{2}$ mm. long (Wealden). Largest Purbeck specimen $1\frac{1}{8}$ mm.

J. De C. Sowerby's original figure and description in the 'Mineral Conchology' give very satisfactorily the shape and main characters of this species, although it often attains somewhat more bulky proportions. As noticed by Sowerby and Fitton, it is very plentiful in many of the true Wealden strata. They thought that they found it also in several of the Purbeck beds; but in this they were certainly mistaken, for Fitton's labels (in the Geol. Soc. Museum) show that he mistook *C. purbeckensis* and *C. punctata* for it. In one of the Purbeck beds, however, there are some few specimens, large, smooth, and elegantly shaped, quite different from the thicker and coarser *C. punctata*, which has often been mistaken for it. The stratum referred to is the Chert Bed of the Middle Purbeck, Ridgway, in which occur—

<i>Cypridea valdensis</i> .	Metacypris Forbesii.
— <i>punctata</i> (rare).	Chara, seed-vessel.
<i>Darwinula leguminella</i> .	Fishbone, &c.

There are also some doubtful instances of its occurrence in the deep "Purbecks" of Mid-Sussex.

2. CYPRIDEA PUNCTATA (E. Forbes).

[Only the insides of valves are figured in Pl. VIII. figs. 4 & 5; the outsides resemble figs. 1-3, 6, 8 in shape, without their varietal and distinctive features.]

Cypris punctata, Forbes, MS. July 23, 1854.

Cypris punctata, Forbes in Lyell's Manual of Elementary Geology, 5th edit. 1855, p. 297, fig. 339 *b*; id. Elements of Geology, 6th edit. 1865, p. 387, fig. 375 *b*.

Cypridea valdensis, Jones, Monogr. Fossil Esth. 1862, p. 127, pl. 5. figs. 26-30.

Cypridea punctata, Huxley & Etheridge, Catal. Coll. Foss. Mus. P. Geol. 1865, p. 254.

Cypridea punctata, H. Woodward, Catal. Brit. Foss. Crust. 1877, p. 89.

Cyprida valdensis, Jones, Geol. Mag. 1878, p. 110, pl. 3. figs. 13-15.

Length $\frac{3}{4}$ mm., and 1 mm.

Valves subtriangularly obovate, nearly obovate, or subpyriform, varying in the protuberance of the anterior hinge-joint. Both the front and the hind margin are obliquely rounded; but the latter is more contracted than the former. Convex medially; edge-view narrow-oval. Surface punctate; punctations subcircular, easily seen with a lens (see also E. Forbes's letter to Mr. Bristow, above, p. 314). The outer edge of the ventral margin of the left valve overlaps that of the right valve.

Notch and beak distinct, and often strong, but varying in intensity.

This species is broader (higher) and coarser than the typical *Cypridea valdensis* (Fitton), figured by J. De C. Sowerby in the 'Mineral Conchology,' pl. 485 (December 1824*), described there at pp. 136-138, and referred, with doubt, to *Cypris faba*, Desmarest. The small (young) forms accompanying adult specimens of *C. punctata* (no. 159) very much resemble *C. valdensis*.

It is quite probable that some of the coarser valves referred to *C. valdensis* by authors are really *C. punctata*, such as figs. 13, 14, 15, pl. iii. Geol. Mag. dec. 2. vol. v. from the Subwealden Boring in Sussex.

2*. CYPRIDEA PUNCTATA (Forbes). Var. POSTICALIS, nov. (Pl. VIII. figs. 1-3, 6, 8.)

Length generally 1mm. Fig. 8 represents a specimen $\frac{7}{8}$ mm. long.

Although *C. punctata* often has a neat acute-oval edge-view, yet very many individuals have the posterior extremity of each valve thickened with a more or less pronounced marginal lump, thick and round, low and broad, or narrow and faint, giving a blunt end to the edge-view (fig. 3). The close-set subangular or subcircular punctations are usually strongly marked.

2**. CYPRIDEA PUNCTATA (Forbes). Var. GIBBOSA (Forbes). (Pl. VIII. fig. 7.)

Cypris gibbosa, Forbes, MS. July 18, 1851.

Cypris gibbosa, Forbes in Lyell's Manual Elem. Geol. 5th edit. 1855, p. 294, fig. 334 a; id. Elem. Geol. 6th edit. 1865, p. 378, fig. 368 a.

Cypridea gibbosa, H. Woodward, Catal. Brit. Foss. Crust. 1877, p. 88.

Length $\frac{7}{8}$ mm.

Here the middle of the valve is locally swollen; this is a variable feature, not strong in fig. 7. See Forbes's letter, above, p. 314. The specimen here figured is nearly obovate in outline, and has a slightly thickened posterior edge (as in the foregoing var. *posticalis*).

* See "Dates de la publication des Espèces," &c., par M. E. Renevier, 'Bullet. Soc. Vaudoise Scienc. Nat.' 2 Mai, 1855.

In specimen XB $\frac{5}{3}$ Mus. Pract. Geol., the central swelling is well marked, without any posterior thickening of the valve.

3. *CYPRIDEA DUNKERI*, sp. nov. (Pl. VIII. figs. 9, 10, and 17.)

Cypridea granulosa, Römer (non Sowerby), Verst. nordd. Ool.-Geb. 1839, p. 52, pl. 20. fig. 24.

Cypris granulosa, Dunker (non Sowerby), Monogr. nordd. Wealdenbild. 1846, p. 60, pl. 13. figs. 31 *a*, *b*.

Cypris granulosa, Forbes (non Sowerby), MS. July 18, 1851.

Cypris granulata, Forbes, MS. July 23, 1854.

Cypris granulata, Forbes, in Lyell's Elem. Man. Geol. 5th edit. 1855, p. 295, fig. 337 *c*; Elem. Geol. 6th edit. 1865, p. 378, fig. 371 *c*.

Cypridea granulosa, H. Woodward (non Sow.), Cat. Brit. Foss. Crust. 1877, p. 88.

Length $\frac{3}{4}$ mm.

This has the obovate form and general features of *C. punctata*, but it possesses granules or small tubercles scattered irregularly over the surface. This is shown in Forbes's letter of July 18, 1851, but too roughly. In our figured specimens the tubercles vary in size, being feeble in the neat, small, nearly symmetrical figs. 9, 10, and strong in the larger and coarser fig. 17. In one individual (fig. 10) the punctuation consists of small and rather oblong pits on the anterior third of the valve, with an obscurely radiate arrangement. Taking both Purbeck and Wealden specimens of this species in view together, we find much variation in convexity and in tubercles; occasionally some of these are sharp (near Brook Point).

This subovate, or rather obovate, form has been confused with the suboblong *Cypridea granulosa* (Sow.). The latter is distinguished by its larger size, more oblong shape, and the tendency of its granules to leave the middle of the valve bare. This is plentiful in the Middle Purbeck, whilst the obovate form, with granules distributed over the whole surface, is rare in the Purbecks*; and this agrees with E. Forbes's note to Mr. Bristow (see above, p. 314).

In consequence of the confusion of names, I now dedicate this species to the memory of my late friend Dr. W. Dunker, of Marburg, by whom it was figured and described much more clearly and perfectly than by his predecessor F. A. Römer.

Cypridea Dunkeri is rare in the Upper and Middle Purbeck, but of rather more frequent occurrence (though rarely common) in the Wealden beds. It is met with in the Upper Purbeck at Mewps Bay (specimen XB $\frac{5}{3}$, M.P.G.), and at Durlston Bay, specimen no. 40. In the Middle Purbeck it occurs at Ridgway (XB $\frac{4}{5}$, M.P.G.); also in a specimen, given to me by the Rev. O. Fisher, and probably from Mewps Bay, there associated with *Cytheridea punctata*, var. *posticalis*, *Metacypris Forbesii*, and *Darwinula leguminella*.

The synonyms indicate that it also belongs to the black Cypridiferous shales of North Germany (see also above, p. 319).

* Except at Swindon, see p. 330.

4. *CYPRIDEA VENTROSA*, sp. nov. (Pl. VIII. figs. 25, 26.) And var. *GLOBOSA*.

Length 1 mm.

Valves thick and broad (high); obovate, with one edge (ventral), notched and less convex than the other; broadest (highest) at the anterior third; back elliptically rounded, with some protuberance at the anterior hinge, and a steep antero-dorsal slope. The ventral region has its border slightly curved, oblique, fuller in front, and broadly notched; and it is turned in suddenly so much as to form a broad flat base, on which the carapace can stand upright. The surface bears some irregularly placed coarse tubercles and ridges, the latter being on the ventral region, and having a direction in general parallel or conformable with the ventral and anterior borders. The beak comprises the anterior curved ridge much more definitely than shown in fig. 26. Edge-view subovate.

C. ventrosa has a near ally in *C. verrucosa*, var. *crassa*, Jones (Geol. Mag. 1878, p. 108, pl. 3. fig. 4), which should (I think) now be regarded as a distinct species (*C. verrucosa*; see page 320).

In specimen 44 the typical *C. ventrosa* is accompanied by a variety (*globosa*) which is quite smooth, and in some cases almost loses its ventral lateral projection, though retaining a strong gibbosity. The flat ventral base in *C. ventrosa* reminds me of a somewhat similar, but more regularly constructed feature in *Notodromas*, Lilljeborg (*Cyprois*, Zenker, and *Newhamia*, King).

C. ventrosa is found in the Middle Purbeck, together with its var. *globosa*; and it occurs also in the Upper Purbeck: at Durlston Bay in both cases.

5 & 5*. *CYPRIDEA GRANULOSA* (Sow.); and var. *FASCICULATA* (Forbes); and var. *PAUCIGRANULATA*, nov. (Pl. VIII. figs. 18-21.)

Cypris granulosa, Sow. 1836, Trans. Geol. Soc. ser. 2, vol. iv. pp. 177 (?), 260, 345, pl. 21. fig. 4,

Cypris granulosus, Mantell, Wonders of Geology, 1838, vol. i. p. 344, tab. 46. fig. 9 (fig. 7 is a bad copy of a part of Fitton's fig. 1, and fig. 9 of part of Fitton's fig. 4). *Cypris granulosa*, Mantell, Wonders, 3rd edit. p. 77, fig. 9, and 6th edit. 1848, vol. i. p. 405, lign. 98, fig. 3 (as fig. 9 above).

Cypris granulosa, Mantell, Wonders, 7th edit. (T. R. Jones), 1857, vol. i. p. 419, lign. 104, fig. 2.

Cypris granulosa, Mantell, Medals of Creation, 1844, vol. ii. p. 545, lign. 119, fig. 4; and 2nd edit. 1854, vol. ii. (T. R. Jones), p. 527, lign. 174, fig. 4.

Cypris fasciculata, Forbes, MS. July 18, 1851, & MS. July 23, 1854.

Cypris fasciculata, Forbes, in Lyell's Manual Elem. Geol. 5th edit. 1855, p. 295, figs. 337 b; Elements of Geology, 6th edit. 1865, p. 378, figs. 371 b.

Cypridea granulosa, Morris, 1854, Catal. Brit. Foss. p. 104 (omitting Dunker's synonym and the reference to *Wealden*).

Cypridea granulosa and *C. fasciculata*, H. Woodward, Catal. Foss. Crust. 1877, p. 88.

Cypridea verrucosa (var.), Jones, Geol. Mag. dec. 2, vol. v. 1878, p. 108, pl. 3. fig. 6.

Length 1 mm.

Suboblong or broadly obovate; anterior end obliquely and boldly rounded, posterior somewhat narrower and nearly semicircular; hinge-line slightly oblique, having the front hinge-joint at an obtuse angle. Beak and notch not always strongly developed. Contact-margins flanged and furrowed, nearly continuously, and subject to difference of intensity in individuals. Edge-view of carapace narrow-ovate; end-view oval. The surface punctate, and also granulated. The pitting consists of either subcircular pits, as on a thimble, or minute suboblong pits, almost forming a reticulate pattern. In no cases that I have seen are the granules distributed over *all* the surface, the median region always having fewer (as in Sowerby's figure 4, pl. 21, in Fitton's Memoir), and often none (see Pl. VIII. fig. 18). The granules are always grouped in two sets or fascicules, one on the anterior and one on the posterior third of each valve; hence the appropriate name "*fasciculata*" given by E. Forbes to this dominant Mid-Purbeck species. The number of granules in these local groups is variable, as above intimated. Sowerby's type-figure has many granules, some coming near to the middle of the valve; other specimens collected by Fitton, and labelled with Sowerby's name, have very few granules. There is no line to be drawn, so far as essential characters are concerned, between the multigranulate and paucigranulate modifications; but it will be convenient to recognize the varieties. In the Mid-Purbeck beds of Durlston Bay both abound, and at Teffont (No. 38), the multigranulate forms predominate. At Dashlet (also in the Vale of Wardour), and at Whitchurch, in Bucks, the paucigranulate variety occurs plentifully (figs. 8-20). In specimens (M.P.G.XB $\frac{4}{5}$) from the Mid-Purbeck of Durlston Bay the valves are mostly paucigranulate; one, at least, has the hinder fascicule obsolescent. They have a coarsely punctate or subreticulate surface. Some strong, squarish, convex individuals from Dashlet have very few tubercles, only five, or even four, in the fascicules; and the punctuation takes on a partially regular pattern, the pits on the anterior half of the valve being oblong and even elongate, curving round in front and radiating backwards for a little way from the anterior group of five granules. Even without regarding the modified punctuation, these specimens may be looked on as a variety, *paucigranulata*; whilst the ordinary multigranulate forms divide themselves into the common variety *fasciculata* (Forbes), and the rarer and earliest named *granulosa* of Sowerby with the granulation covering almost the whole surface. The name *fasciculata* has been, and still continues to be, convenient for general use.

C. granulosa (Sow. in Fitton, pl. 21, fig. 4, of Fitton's Memoir), is decidedly the *fasciculata* of E. Forbes, and its localities are there given (p. 260) thus:—"Between Dallard's Farm and Catharine

Ford, with *Cyclas* in slaty Purbeck stone; also, with *Cyclas* and *Modiola*, in grey freshwater limestone. Dashlet, between Penthurst and Teffont."

In two multigranulate specimens from Teffont (No. 83) the "lucid spots" ("muscle-spots") are visible, consisting of six suboblong marks, three in a short, slightly curved, transverse row, one lying behind and across them, and two others separate, at a little distance from the ends of the aforesaid row.

This species is highly characteristic of the Middle-Purbeck beds, both by its abundance and by its being peculiar to that division of the series.

Some forms of *Cypridea verrucosa*, Jones, 1878, were separated from *C. granulosa* (Sow.) on account of the supposed absence of the beak and notch in the latter; but one of these (fig. 6, pl. iii., Geol. Mag. 1878) is evidently the same as the *granulosa* (multigranulate) we have before us, and now know to have the notch.

This essentially Mid-Purbeck species certainly occurs in the Cypridiferous shales of Obernkirchen, Cassel, North Germany (specimens in the British Museum), although it is not described nor figured by Römer and Dunker. It is of much interest, as supporting the late Dr. W. Dunker's opinion that the Hanoverian shales are of Purbeck and not of Wealden age.

6. *CYPRIDEA TUBERCULATA* (Sowerby); and var. *ADJUNCTA*, nov. (Pl. VIII. figs. 22, 23, 24.)

Cypris tuberculata, J. De C. Sow., in Fitton's Memoir, Trans. Geol. Soc. ser. 2, vol. iv. 1836, pp. 177, 205, 228, 345, 352, pl. 21, fig. 2 (including another form, indicated in the description at p. 345, and subsequently separated off as *Cypris Fittoni* by Mantell).

Cypris tuberculata, Lyell, Elements of Geology, 1838, p. 348, fig. 186 (after Sowerby); 2nd edit. 1841, vol. i. p. 417, fig. 202; Manual of Elementary Geology, 3rd edit. 1851, and 4th edit. 1852, have the same woodcuts as the foregoing; 5th edit. 1855, p. 294, fig. 334 b (after E. Forbes); 6th edit. 1865, p. 378, fig. 368 b.

Cypris tuberculata, Römer, Verst. nordd. Ool. 1839, p. 52, pl. 20, fig. 23.

Cypris tuberculata, Mantell, Medals of Creation, 1st edit. 1844, vol. ii. p. 545, lign. 1819, figs. 3, 3a; 2nd edit. (Jones), 1854, vol. ii. p. 527, lign. 174, figs. 3, 3a (fig. 2 is *C. Fittoni*, Mantell, in both cases).

Cypris tuberculata?, Dunker Monogr. nordd. Weald. 1846, p. 60, pl. 13, fig. 30.

Cypris spinosa, Forbes, MS., July 18, 1851; *C. tuberculata*?, MS., July 23, 1854.

Cypridea tuberculata, Morris, Catal. Brit. Foss. 2nd edit. 1854, p. 104.

Cypridea tuberculata, H. Woodward, Catal. Brit. Foss. Crust. 1877, p. 89.

Length $\frac{3}{4}$ millim.

This is one of the suboblong forms of the genus, slightly broader (higher) in front than behind, and more boldly and obliquely curved anteriorly than posteriorly; the dorsal and ventral margins nearly parallel; the notch often strong, but sometimes obscured by tubercles; the contact-margins are much like those of *C. granulosa* (fig. 21); the beak sometimes almost obsolete, but traceable. The surface is punctate, with coarse, subcircular, close-set pits, giving an appearance like that of a thimble-top; it also bears numerous, large, scattered tubercles, somewhat variable in their strength and position; occasionally long, thick, and blunt, as noticed in E. Forbes's letter to Mr. Bristow, see above, p. 314, where he terms it "*C. spinosa*." Specimen Xb $\frac{4}{2}$, Mus. Pract. Geol., shows an individual of this kind, with long thick tubercles; it is strongly beaked, much more so than our fig. 22, Pl. VIII. In fact this specimen is rather longer than the typical form, and is less strongly beaked; and it ought to be regarded as a variety, *adjuncta*.

Edge-view long-ovate; end-view short-ovate (figs. 23 and 24).

The coarse tubercles remind us of a similar feature in *Cytheridea torosa* (Jones); but in the latter they are fewer and relatively larger, and the hingement of the valves is different.

C. tuberculata is not common. It comes from the Mid-Purbeck of Durlston Bay (Xb $\frac{4}{2}$, M. P. G.); and from the Upper Purbeck of Mewps Bay (specimen no. 27, fig. 22, Pl. VIII.), and of Bacon Hole (specimen in the British Museum, and Xb $\frac{5}{2}$, M. P. G.). This last is like the Wealden specimens figured in Fitton's Memoir, which are strictly Wealden, but do not occur nearly so frequently as *Cythere Fittoni* (Mantell), which was figured with them in fig. 2, pl. 21, of Fitton's Memoir, and has been often mistaken for *C. tuberculata*.

The Purbeck form (var. *adjuncta*) occurs also, I believe, in the Wealden beds, Eccleston Glen, Hastings. The Wealden species I hope to treat in full at a future opportunity.

Römer, 1839, evidently had *C. tuberculata*, Sow., in the black Cypridiferous Shales of North Germany, and Dunker, in 1846, repeats the observation; but his figure is very doubtful.

II. Genus CYPRIONE, gen. nov.

Animal unknown. Carapace bivalved; subcylindrical; right valve rather larger than the other; contact-margins ridged and furrowed almost continuously, but the flanges and corresponding ledges run closer together in some specimens than in others. Hinge-line along the slightly convex back-edge not specially defined. Valves smooth, elongate-oblong, with rounded ends, in the only species yet recognized.

The structure of the contact-margins of these valves is not essentially different from that in *Cypridea*, except that the latter has its characteristic antero-ventral notch. *Cypridea*, moreover, has much coarser and thicker valves, and always differs in shape.

The outlines of the carapace under notice approach those of *Darwinula*; but in the latter the valves meet with simple edges and considerable overlap; and, as no other genus among the Ostracoda

is characterized by this elongate and slightly tapering oblong shape, it seems advisable to take this feature and the contact-margins as giving the leading characters for a separate genus *Cyprione*.

7. *CYPRIONE BRISTOVII*, sp. nov. (Pl. VIII. figs. 27–29, and 32, immature.)

Length, adult 1 millim.; immature, $\frac{5}{8}$ millim.

Valves suboblong, elongate, with rounded ends, the anterior rather narrower than the other. The ventral somewhat straighter than the dorsal edge. The valves meet with slight ridges and furrows. The right valve overlaps the other nearly all round, although the figs. 28 and 29, being taken from odd valves, do not give this impression.

This may be the larger form, of a peapod-shape, which E. Forbes referred to in his letter (to Mr. Bristow) of July 18, 1851 (see p. 314). I name it after Mr. Bristow, F.R.S., F.G.S., Director of the Geol. Surv. of England, who worked so long and ardently on the Purbeck strata with his friend E. Forbes.

Cyprione Bristovii is met with in the Upper Purbeck (specimens —40, 40 A, 40 AA, Durlston Bay; 27, Mewps Bay, young form, fig. 32, Pl. VIII.); and in the Mid-Purbeck (44 and 56, 57, 58, Durlston Bay).

It occurs in the Wealden Beds, at the Black-Horse Quarry, near Hastings, and also near Bexhill, and at Lindfield.

In Germany it is found at Obernkirchen and the Deister, as shown by specimens in the British Museum. The "*Cypris oblonga*" of Römer and Dunker may possibly have been intended for this and *D. leguminella* (see above, p. 319); but the figures and descriptions are obscure and contradictory. Certainly fig. 34, pl. 5, Monogr. Foss. Esth., Appendix, p. 128, may be a near ally of *C. Bristovii*; but it best agrees with Römer's description of his *C. oblonga*, though not with his figure. The latter is too much arched on the back for *C. Bristovii*, and should be regarded as *Cyprione? oblonga* (Römer).

III. Genus *METACYPRIS*, G. S. Brady, 1870.

Metacypris, G. S. Brady, Nature, March 10, 1870, p. 484.

Metacypris, G. S. Brady and Robertson, Ann. & Mag. Nat. Hist. ser. 4, vol. vi. July 1870, pp. 19, 20; *Ibid.* vol. ix. 1872, p. 51; and Monogr. Post-tertiary Entom., Pal. Soc. 1874, pp. 112 and 116.

Valves subrhomboidal or suboblong, very convex; rounded before and behind, but unequally and somewhat obliquely; rather narrower and compressed in front; dorsal and ventral margins nearly parallel, but the latter turned inwards, or pressed in along the hinder half of its length, so that the body of each valve swells out beyond it. Hinge-line distinct, with thin flanges and narrow furrows; but our fossils do not show the details so well as the recent specimens of *M. cordata*, Ann. & Mag. N. H. 1870, pl. 6. The right valve is larger than the left. The surface is pitted in lines.

Only one recent species is known (see above); found in tidal rivers in the East of England. This genus was at first placed with the Cypridæ with doubt, but afterwards referred more certainly to the Cytheridæ†.

8. *METACYPRIS FORBESII*, and var. *VERRUCOSA*, sp. et var. nov. (Pl. VIII. figs. 11-16.)

Cypris striato-punctata, Forbes (non Römer et Dunker), MS. July 18, 1851; MS. July 23, 1854; Lyell's Manual Elem. Geol. 5th edit. 1855, p. 295, fig. 337a; Elem. 6th edit. 1865, p. 378, fig. 371a.

Cypris striato-punctata, Huxley and Etheridge, Catal. Coll. Foss. Mus. P. Geol. 1865, p. 254.

Cypridea striato-punctata, H. Woodward, Cat. Brit. Foss. Crust. 1877, p. 89.

Figs. 11-14: length $\frac{5}{8}$ millim.; figs. 15 and 16, $\frac{3}{4}$ millim.

This is remarkably like *M. cordata*, G. S. Brady (Nature, l. c.), above referred to, but it is less convex, and is longer in proportion to breadth (height); and it shows a strong tendency to become tubercled. The ornamental pitting may be described in Dr. Brady's words:—"Surface of the valves closely set with small rounded impressions, which are arranged in longitudinal rows, running on the ventral surface into interrupted furrows; ventral surface deeply and broadly sulcate along the greater part of the median line." We may add that the lines of dots, in both cases (recent and fossil) curve round on the front third of the valve, and in the fossil specimens they have a slight local swelling or a tubercle for their centre. The linear ornament curves round also (but less distinctly) behind, parallel with the posterior border. Edge-view, subovate or bluntly pyriform. End-view short, broad, ovate.

As E. Forbes seems to have referred this species (sufficiently well indicated in his letter to Mr. Bristow, see above, p. 314) erroneously to Römer's species, and as the surface character in both the recent and this fossil species is striato-punctate, I do not hesitate to give it a new name, dedicating it to the memory of the much-lamented palæontologist and geologist who worked out the three main divisions of the Purbeck series, as characterized by the fossils, among which especially were Ostracoda treated of in this paper. Prof. Dunker agreed with me in regarding this species as quite distinct from *Cypridea striato-punctata* (Römer), which may, I think, be possibly a variety of, or near ally to, *C. valdensis* or *C. punctata*.

8*. *M. FORBESII*, var. *VERRUCOSA*. (Figs. 12 and 14.)

Here we have the tendency towards tuberculation carried to the full, that is, as far as yet observed; and the individuals are not

† Egger's *Bairdia glutæa*, from the Miocene beds of Mairhof, near Ortenburg, in Lower Bavaria ("Die Ostrakoden der Miocän-Schichten," &c. in the 'Neues Jahrbuch f. Min.' &c. 1858, p. 408, pl. 1. fig. 6), has evidently the characters of this genus.

quite so nearly oblong in outline, being somewhat narrowed in front.

Metacypris Forbesii comes from Durlston Bay (specimens $Xb\frac{4}{5}$, M.P.G.); from Ridgway ($Xb\frac{4}{5}$, M.P.G.), and No. 123A, Ridgway, also No. 61, Mewps Bay. All these are from the Middle Purbeck.

IV. Genus DARWINULA.

[Note by G. S. BRADY, M.D., F.R.S., F.L.S., and D. ROBERTSON, F.L.S., F.G.S., June 12, 1885.

“Prof. T. Rupert Jones having kindly drawn our attention to the fact that the generic term *Darwinella* had already been appropriated by Fritz Müller, in 1865, for a genus of horny sponges (Schulze's Archiv für mikr. Anat. vol. i. p. 344), and *Darwinula* having been suggested as appropriate, we are glad to have the opportunity of adopting this suggestion and substituting the latter term.”]

Polycheles, G. S. Brady, Nature, March 10, 1870, p. 484.

Polycheles, G. S. Brady and D. Robertson, 1870, Ann. & Mag. Nat. Hist. ser. 4, vol. vi. July 1870, p. 25.

Darwinella, Brady and Robertson, 1872, Ann. & Mag. Nat. Hist. ser. 4, vol. ix. p. 50, note; and vol. xiii. 1874, p. 117; and Monogr. Post-tertiary Entom., Pal. Soc. 1874, pp. 112, 140.

Carapace smooth, subcylindrical, elongate, oblong-ovate, or sub-cuneate; valves thin and smooth, unequal, right larger than the left valve.

Only one recent species (*D. Stevensoni*, B. and R., locc. cit.) is known. It belongs to the brackish waters of tidal rivers. This or a very similar species has been found in the Forest-bed series of Suffolk by Mr. Clement Reid, F.G.S., of the Geological Survey.

9. DARWINULA LEGUMINELLA, Forbes. (Pl. VIII. figs. 30 and 31.)

Cypris oblonga (?), Dunker, Monogr. nordd. Weald.-Bild. 1846, p. 60, pl. 13. fig. 24.

Cypris leguminelloides, Forbes, MS. July 18, 1851.

Cypris leguminella, Forbes, MS. July 23, 1854; Forbes, in Lyell's Manual of Elem. Geol. 5th edit. 1855, p. 294, fig. 334c; Elements Geol. 6th edit. 1865, p. 378, fig. 368c.

Cypridea oblonga?, Jones, Monogr. Foss. Esther. 1862, p. 128, pl. 5. fig. 31 (and 33?).

Cypridea leguminella, H. Woodward, Cat. Brit. Foss. Crust. 1877, p. 89.

Length $\frac{1}{2}$ millim.

Valves small, smooth, shining, elongate, with rounded ends, one (anterior) narrower, more elliptically curved, and more compressed than the other; the left valve the largest. Carapace subcylindrical, tapering anteriorly, blunter behind.

This is very much like the Carboniferous *Darwinula berniciana*, Jones, 'Proceed. Berwicksh. Nat. Club,' vol. x. 1884, p. 325, pl. 2, fig. 4; but it is not so truncate posteriorly, and is slightly more

acuminate in front. It still more closely resembles the recent *D. Stevensonii*, B. C. and R.; and it is possibly identical with fig. 31, pl. 5, of my 'Monogr. Foss. Estheriæ,' 1862, Appendix, p. 128, though a little smaller. This last is a small valve from the Wealden of Obernkirchen, Cassel, near Hanover, and was very superficially described, together with other associated fossil valves, in the Appendix referred to. In 1878 (Geol. Mag. dec. 2, vol. v. p. 107) I made some remarks on these specimens. Fig. 30 is probably a *Candona*; fig. 31 a *Darwinula* * (see above); fig. 32 is obscure; fig. 33 may be an impaired specimen of *Darwinula* (?); and fig. 34 may be *Cyprione*? *oblonga* (Römer).

D. leguminella (E. Forbes) has been found in the following Upper-Purbeck specimens, 397 A and 397 B, Durlston Bay; Xb $\frac{5}{2}$ and Brit. Mus. Bacon Hole; 61, 377, and 378, Mewps Bay. In Middle Purbeck Xb $\frac{3}{2}$ & Xb $\frac{1}{2}$, Durlston Bay, and 123 A, Ridgway.

It occurs also in the Wealden Beds, near Atherfield, Sandown, Hastings, Hythe, &c. See pp. 333, 334.

D. leguminella abounds in some of the Hanoverian black Cypridiferous Shales from Obernkirchen and the Deister. Some specimens are in the British Museum. Although the description and figures of *Cypris oblonga* given by Römer and Dunker do not fit this species, yet it is possible that they were intended to cover both it and *Cyprione Bristovii*; *C. oblonga* (Römer), however, may be distinct. At all events Dunker's fig. 24 well suits a piece of shale loaded with little *Darwinula*. The species is figured in my 'Monogr. Foss. Esth.' l. c. from Obernkirchen, Hanover; fig. 31 is fairly good, and fig. 33 may be imperfect or partly imbedded.

V. Genus CYPRIS, Müller, 1785.

(See the memoirs on recent Ostracoda, by G. S. Brady and others, to whom he refers, for general and special descriptions.)

Valves subreniform or suboblong, thin, smooth, pitted or bristly; hinge simple, or with narrow furrows or flanges and slight ridges. The interiors of the front and hind margins are bevelled, and are sometimes continued into a more or less developed, narrow, laminar, oblique plate. Left valve the largest.

10. CYPRIS PURBECKENSIS, Forbes. (Pl. IX. figs. 1-6.)

Cypris purbeckensis, Forbes, MS. July 18, 1851; MS. July 23, 1854.

Cypris purbeckensis, Forbes, in Lyell's Manual Elem. Geol. 5th edit. 1855, p. 297, fig. 339a; Elem. Geol. 6th edit. 1865, p. 387, fig. 375a.

Cypris purbeckensis, Huxley and Etheridge, Catal. Coll. Foss. Mus. P. Geol. 1865, p. 254.

Cypris purbeckensis, P. de Lorient et Jaccard, Mém. Soc. Phys. Hist. Nat. Genève, vol. xviii. part i. 1866, pp. 81, 82, pl. 2. figs. 1-3.

* Figs. 23 and 24 in the same plate (*Candona*? *globosa*, from Linksfield) may represent a *Darwinula* also; for its lucid spot, of which I have drawings, is that of *Darwinula*.

Cypridea purbeckensis, H. Woodward, Catal. Brit. Foss. Crust. 1877, p. 89.

Cypris ? *purbeckensis*, Jones, Proceed. Geol. Assoc. vol. viii. 1883, pp. 57, 58.

Length $\frac{7}{8}$ mm. figs. 3-5; 1 mm. figs. 4 & 6; $1\frac{1}{4}$ mm. fig. 1; $1\frac{1}{2}$ mm. fig. 2.

Valves subreniform, arched on the back; nearly straight, or somewhat incurved, on the ventral edge; rounded at the ends, broadly and obliquely in front. Edge-view acute-oval. Surface smooth. Contact-margins simple. Insides of front and hind margins are sometimes more bevelled than in fig. 1.

The size and shape are both rather variable (compare figs. 1-6, Pl. IX). An exceptionally broad (high) left valve, with a remarkable sharp tubercle (local hypertrophy?) on the postero-dorsal edges, is shown by fig. 6. Figs. 3 and 5 are smaller *reniform* individuals. Age and sex probably determined these differences of size and shape.

A broken valve from the Post-tertiary freshwater beds at Copford, Essex, is figured (hind end upwards) in my 'Monograph Entom. Tert. Form.' 1856, pl. 1, fig. 5a, which closely approximates in form to fig. 1 of Pl. IX. here. It is the variety *tumida*, B.C. and R., of *Candona candida*. *Cypris virens* (Jurine), known also as *C. tristriata*, Baird, is a recent form of very similar make, and in G. S. Brady's "Monogr. Rec. Brit. Ostrac.," Trans. Linn. Soc. vol. xxvi. pl. 23. figs. 23-26, it is figured with the little gap seen also in our fig. 4, Pl. IX.

On the specimen in the Mus. Pract. Geol., X B4, probably one of the early slabs seen by E. Forbes, there are the two somewhat differing forms, namely, the *reniform* and the *subreniform*. They have all been weathered, and one side-surface has especially been thus modified, so as to account for the flat margin in the figure given by Lyell, and in one of those in Forbes's two letters. This specimen is referred, by error I believe, to the Middle instead of to the Lower Purbeck in the Museum of Practical Geology (see above, p. 325 note).

VI. Genus CANDONA, Baird, 1845.

Valves like those of *Cypris*. Difficult to be distinguished from that genus except by comparison with known recent forms, the structure of the soft parts supplying the critical differences. The general aspect of the Purbeck specimens here selected under this head reminds us of *Candonæ* rather than of *Cyprides*.

11. *CANDONA BONONIENSIS* (corrected, see above, p. 311), Jones. (Pl. IX. figs. 7, 8.)

Cythere boloniensis, Jones, 1882, Bullet. Soc. Géol. France, sér. 3, vol. viii. pp. 615, 616, 1883; Proceed. Geol. Assoc. vol. viii. p. 58.

Length $1\frac{1}{4}$ mm.

Valves suboblong, almost equally rounded at the ends, constricted a little in front of the middle, the posterior moiety being higher and

more convex than the front portion. Edge-view of carapace acute-ovate. Left valve the largest. Contact-margins simple; the nearly straight dorsal edge has the front hinge indicated by a slight angle and a faint impression behind it outside.

12. *CANDONA ANSATA*, sp. nov. (Pl. IX. figs. 9-12.)

Length $\frac{3}{4}$ mm. to $\frac{7}{8}$ mm.

Valves suboblong, obliquely rounded at each end, the slopes being antero- and postero-dorsal. Back straight; ventral edge slightly concave, with its edge turned in at the middle and swelling out at the posterior third, so as to form a strong projection, almost like the short, blunt handle of a crock (but upside-down). The surface is smooth; but in some cases the inside of the valve is pitted (by the decay of tubules?), and the bevelled translucent insides of the front and hind margins show radiating tubules (fig. 9). Lucid spots are visible in figs. 9-12, somewhat resembling those in *Cytheridea*. Edge-view of the carapace suboval. Left valve the largest. The contact-margins are simple; terminal edges bevelled inside; hinge-line distinct, with a faint angle in front (not strong enough in fig. 9), and a slight impression behind it on the outside.

The "lucid spots" are visible in a specimen from Hartwell (No. 269).

They form a pattern of six; four transverse, parallel, in a curve (convex backwards), and two in front, one near each end of the lower row.

VII. Genus *CYTHERE*, Müller, 1785.

Carapace of two nearly equal valves, suboblong, subrhomboidal, or subtriangular, thick, ornamented with pits, reticulation, riblets, and tubercles. Left valve usually rather larger than the right. Inside of the front edges in each valve bevelled off inwards. Hinge, for the most part, a barlike ridge on the left valve, ending in front with a tooth and a socket beyond, and ending behind at the socket which receives the tooth at the end of the furrow on the right valve behind the anterior tooth which falls into the front socket of the left valve. So that, typically, the left valve has a bar and front tooth, and a socket at each end; whilst the right valve has a corresponding sulcus and socket and a tooth at each end, besides a thin outer ledge or flange to fall into a furrow along the outer convexity of the wider left valve. Some of these features are often modified or obsolete. See examples in the Monogr. Tert. Entom., Pal. Soc. 1856. For the relationship of recent species, as based on the soft parts, see the memoirs by Sars and Brady on Ostracoda—for instance, G. S. Brady's "Report on the Ostracoda dredged by H.M.S. 'Challenger,'" &c. 'Zool. Chall. Exped.' pt. 3, 1880, pp. 61-62.

13. *CYTHERE TRANSIENS*, sp. nov. (Pl. IX. figs. 13-16.)

Length $\frac{1}{2}$ mm.

Valves subtriangular, or somewhat pear-shaped, rounded at ends,

high on the back at the anterior third, where the front hinge somewhat projects. Edge-view blunt, compressed oval. Surface coarsely pitted with a rough reticulation. Ventral edge much incurved.

Found at Swindon (specimen no. 364), in Purbeck beds, by the Rev. Prof. J. F. Blake, F.G.S., after whom it was at first named (when this paper was read); but another *Cythere* had already been assigned to him. *C. transiens* occurs also in a soft, white Portland stone from Brill.

14. *CYTHERE. RETIRUGATA*, sp. nov. (Pl. IX. figs. 17-24, including var. *rugulata*, figs. 17-20; and var. *textilis*, fig. 24.)

Length usually $\frac{3}{4}$ mm., fig. 19, $\frac{7}{8}$ mm.

Suboblong, with oblique ends, sloping from the front and hinder ends of the hinge-line, which is straight, and oblique to the long axis of the valve. Ventral border slightly sinuous, and much incurved at its edge. Edge-view oval, slightly acute. Surface pitted over two thirds of its area, and wrinkled or finely costulate along the ventral region; the pits in fig. 17 (var. *rugulata*) are wide apart and roundish; in other specimens (fig. 21) they take a rough reticulate pattern (*retirugata*); and in others (fig. 24) the reticulation is delicate (var. *textilis*), the meshes are open, with thin walls, and become regular and rectangular on the ventral region, where the longitudinal mesh-walls represent the riblets of other specimens.

At first I was inclined to separate figs. 17-20 off from the others as a distinct form (*C. rugulata*); but the gradation to fig. 21 is evident, and Dr. G. S. Brady has suggested that it may be the male form; nevertheless it will be convenient to keep *rugulata* as a varietal name. The pattern of fig. 24 is the same as that of the foregoing, although in detail the reticulation is more like lace-work, the meshes being much finer, and the costulation far more delicate. The last deserves a varietal name, *textilis*.

In figs. 17-20 each pit seems to open inwards in a little tube; and each mesh in figs. 21-23 has two or more of such little perforations.

C. retirugata (type) was found in specimen no. 253 (figs. 21-23), from Hartwell; and no. 364 from Swindon (Prof. Blake).

C. rugulata in four specimens, nos. 256 (figs. 17, 18), 258 (fig. 20), 269 (fig. 19), and 357, all from Hartwell.

C. textilis, also from Hartwell (Barnard's pit), specimen no. 166 (fig. 24), and from Brill.

EXPLANATION OF PLATES VIII. & IX.

(The specimens are figured with the front ends upwards.)

PLATE VIII.

Fig.			No. of Specimen.	Magnified (diam.).
1.	<i>Cypridea punctata</i> (Forbes), var. <i>posticalis</i> , Jones. Carapace, side view	Middle Purbeck; } Mewps Bay. }	61A, 5	25
2.	— — — — — Left valve.....	" "	61A, 6	25
3.	— — — — — Carapace, edge view	" "	61A, 2	25
4.	<i>Cypridea punctata</i> (Forbes). Left valve, inside	Upper Purbeck; } Durlston Bay. }	34, 13	30
5.	— — — — — Right valve, inside	" "	34, 20	30
6.	<i>Cypridea punctata</i> (Forbes), var. <i>posticalis</i> , Jones. Right valve	Mid-Purbeck; " Ridg- } way. }	382 (XB $\frac{1}{2}$), 2	20
7.	— — — — — var. <i>gibbosa</i> (Forbes). Left valve	" "	382, 3	20
8.	— — — — — var. <i>posticalis</i> , Jones. Left valve	" "	382, 4	20
9.	<i>Cypridea Dunkeri</i> , Jones. Carapace, edge view	Middle Purbeck; } Mewps Bay. }	61A, 16	25
10.	— — — — — Right valve	" "	61A, 17	25
11.	<i>Metacypris Forbesii</i> , Jones. Left valve	Mid-Purbeck; " Ridg- } way. }	382, 8	30
12.	— — — — — Carapace, end view	Middle Purbeck; } Mewps Bay. }	61, 3	30
13.	— — — — — Left valve (rather verrucose)	" "	61, 6	30
14.	— — — — — var. <i>verrucosa</i> , Jones. Carapace, dorsal aspect	" "	61, 2	30
15.	— — — — — Carapace, ventral aspect	Mid-Purbeck; " Ridg- } way? }	60A, 4	30
16.	— — — — — Right valve, inside	" "	123A, 3	30
17.	<i>Cypridea Dunkeri</i> , Jones. Right valve	" "	382, 1	25
18.	<i>Cypridea granulosa</i> (Sow.), var. <i>paucigranulata</i> , Jones. Left valve	" "	"	"
19.	— — — — — Carapace, ventral view.....	Mid-Purbeck; Whit- } church? }	229, 2	25
20.	— — — — — Carapace, end view	" "	"	25
21.	— — — — — Right valve, inside	" "	229, 13	25
22.	<i>Cypridea tuberculata</i> (Sow.), var. <i>adjuncta</i> , Jones. Right valve.....	" "	"	25
23.	— — — — — Carapace, end view	Upper Purbeck; } Mewps Bay. }	27, 3	25
24.	— — — — — Dorsal edge of valve	" "	"	25
25.	<i>Cypridea ventrosa</i> , Jones. Left valve, ventral aspect.....	Upper Purbeck; } Durlston Bay. }	40, 2	25
26.	— — — — — Outside of the same valve	" "	"	25
27.	<i>Cyprione Bristovii</i> , Jones. Left valve	" "	40, 11	30
28.	— — — — — Inside of right valve.....	" "	40AA, 1	30
29.	— — — — — Inside of left valve	" "	40AA, 2	30
30.	<i>Darwinula leguminella</i> (Forbes). Left valve	Middle Purbeck; } Mewps Bay. }	61, 21	30
31.	— — — — — Edge view of carapace	" "	61, 17	30
32.	<i>Cyprione Bristovii</i> , Jones. Immature form.....	" "	27, 11	30

Note.—The small numbers indicate the individual specimen on the slide.

PLATE IX.

Fig.			No. of Specimen.	Magnified (diam.).
1.	<i>Cypris purbeckensis</i> , Forbes. Inside of left valve	Lower Purbeck ; } Vale of Wardour. }	230, 6	20
2.	— — — Right valve	— — — — —	230, 2	20
3.	— — — (reniform variety). Left valve	Lower " Purbeck ; } Hartwell. }	350, 3	20
4.	— — — Edge view of carapace...	Lower Purbeck ; } Vale of Wardour. }	230, 1	20
5.	— — — Left valve	Lower Purbeck ; } Whitechurch. }	227, 1	20
6.	— — — Right valve (thick)	Lower Purbeck ; } Teffont. }	"Cunnington, 3"	20
7.	<i>Candona bononiensis</i> , Jones. Right valve	Lower Purbeck ; } Hartwell. }	353, 1	20
8.	— — — Edge of valve	" "	353, 2	20
9.	<i>Candona ansata</i> , Jones. Left valve, inside	" "	269, 11	30
10.	— — — Right valve	Lower Purbeck ; } South Oving. }	363, 3	30
11.	— — — Edge view of valve	" "	363, 2	30
12.	— — — Left valve	" "	363, 4	30
13.	<i>Cythere transiens</i> , Jones. Left valve, inside	Lower Purbeck ; } Swindon. }	964, 8	40
14.	— — — Right valve, inside	" "	364, 9	40
15.	— — — Carapace ventral view...	" "	364, 7	40
16.	— — — Left valve	" "	364, 2	40
17.	<i>Cythere retirugata</i> , Jones, var. <i>rugulata</i> , Jones. Left valve	Lower Purbeck ; } Hartwell. }	256, 2	30
18.	— — — Left valve, inside	" "	256, 4	30
19.	— — — Carapace, ventral view...	" "	269, 5	30
20.	— — — Right valve, inside	" "	258, 6	30
21.	<i>Cythere retirugata</i> , Jones. Left valve	" "	253, 8	30
22.	— — — Carapace, ventral aspect	" "	253, 2	30
23.	— — — Right valve, inside	" "	253, 11	30
24.	— — —, var. <i>textilis</i> , Jones. Right valve	" "	166, 1	30

DISCUSSION.

Prof. BLAKE thought that the Purbeck beds of Swindon were contemporaneous with the Portlandian further south, and that this view was confirmed by the mingling of marine and freshwater forms.

Dr. HINDE pointed out that the name of *Darwinella* had been already employed by Fritz Müller for a genus of horny sponges.

Mr. WHITAKER asked for further information as to the species of Ostracoda being characteristic of the several divisions of the Purbeck.

Dr. WOODWARD pointed out the necessity of indicating the dorsal and ventral aspects of all the forms, so as to facilitate their com-

parison with living forms. He regretted the number of names which had to be coined for the subgenera of *Cypris*.

THE AUTHOR said that *Darwinella* was a genus founded by Brady, and he regretted if that author had been forestalled. It is difficult at times to distinguish the ends in fossil Ostracoda, and it is not always possible to distinguish between the dorsal and ventral sides; but in these Purbeck forms there is no doubt or difficulty. With respect to Swindon, the study of these fossils seems to confirm the views of the late Mr. Charles Moore and Prof. Morris.