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**A monograph of the Mollusca from the Great Oolite, chiefly from
Minchinhampton and the coast of Yorkshire**

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Notes and corrections.

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NOTES AND CORRECTIONS.

Fossils figured in the former parts of this Monograph from the Coast of Yorkshire, and attributed to the Great Oolite.

It may now be stated, as the general conviction of Palæontologists who have critically studied the subject, that the Testacea of all the marine beds intercalated with the important but local plant-bearing shales and sandstones of the Yorkshire coast, intermediate the Cornbrash and the Dogger, constitute an Inferior Oolite fauna, but that the mineral character of these deposits and their sequence are peculiar to the locality; it is found also, as might be expected in deposits so isolated in their general conditions, that the fauna of these several marine beds, although undoubtedly pertaining to the Inferior Oolite, cannot be arranged with precision upon any corresponding horizons of the same formation, either in Britain or upon the Continent. But in discarding the correlative value of the minor subdivisions, it appears that they may be assigned approximately to those groups of beds which constitute the upper portion of the Inferior Oolite, and which have been divided by Quenstedt, Oppel, and others, into two distinct stages, the lower of which is characterised by the presence of *Ammonites Humphriesianus*, the upper by *Ammonites Parkinsoni*. Upon the coast of Yorkshire these Ammonites, however, have occurred in the same bed, and the number of marine floors is so few that they cannot be considered as representing the two superior stages in the entity of their mass and of their fauna; their deficiencies are more especially remarkable in the rarity of the Brachiopoda and of the Ammonites.

These conclusions have been arrived at by an investigation of a series of details so extensive and decisive in their results as to admit of no uncertainty upon the subject. That the marine beds in question should have been assigned to the Great Oolite upwards of thirty years since by the author of the 'Geology of Yorkshire' will not excite surprise in any one who is able to recall to memory the rudimentary condition of Palæontology at that period, and the absolute ignorance which then prevailed of the Testacea of the Great Oolite; that the Palæontology of the Jurassic portion of the work in question constituted a great advance upon the previous work of Messrs. Young and Bird was at once recognised, and the author candidly stated that he assigned these marine intercalated beds to the Great Oolite solely from their position—higher than certain beds of undoubted Inferior Oolite, and lower than the Cornbrash. The progress of knowledge tending to arrange them with the Inferior Oolite, was gradual. Following the work of Professor Phillips, in 1839 appeared the two well-known memoirs of Professor Williamson on the distribution of organic remains in the Oolitic rocks of Yorkshire, in which the subordinate beds of the Lower Oolites and their organic

contents are detailed with all the care and precision that might be expected from a person who had been long resident in the locality. Within the few years following appeared the elaborate works of Goldfuss, Ziethen, Roemer, Dunker, Agassiz, Deshayes, Sir R. Murchison's second edition of the 'Geology of Cheltenham,' the 'Catalogue' of Professor Morris, the memoir of D'Archiac on the Aisne, several memoirs by M. Eudes Deslongchamps on the fossils of the Oolites of Normandy, a portion of the 'Paléontologie Française' of D'Orbigny, Quenstedt's 'Wurtemberg,' and the 'Lethæa' of Bronn. These works, together with others which bear less directly upon the subject of the Lower Oolites, tended very materially to extend and correct the knowledge of their fossils. During the same period also the fossils of the Great Oolite in Gloucestershire had become extensively dispersed, and were compared with those from the Yorkshire coast, collected and distributed with great perseverance by Mr. Bean during a lengthened period. The first published results of influences so potential appeared in 1850, when M. d'Orbigny, in his 'Prodrome de Paléontologie,' placed many of the so-called Great Oolite Yorkshire fossils in his *Étage Bajocien*, or *Inferior Oolite*. In the same year appeared the first part of the monograph on the Great Oolite Mollusca, in the introductory remarks to which the authors pointed out the affinity of the Yorkshire so-called Great Oolite fauna to that of the *Inferior Oolite*, and, as a measure of precaution, were careful to keep the doubtful Yorkshire fossils distinct, both in plates and descriptions, from the Great Oolite fossils of the south of England. The various works and lesser memoirs upon the Lower Jurassic rocks published between 1850 and the present time would of themselves constitute a considerable list. Without enumerating them, it will be sufficient to mention that, in 1856-8, Dr. Albert Oppel, in his remarkable work, '*Juraformation*,' placed the Yorkshire Phytiferous beds with the *Inferior Oolite*, and considered that they did not even represent the highest stage of that formation. In 1857 the present writer expressed, in a little work, '*The Cotteswold Hills*,' convictions of similar import. In 1859 Dr. Wright enforced similar views, accompanied by extensive details and lists of *Inferior Oolite* fossils, in a contribution to the '*Journal of the Geological Society*.' The previous Great Oolite Monograph contains four plates of these Yorkshire intercalated marine Testacea; some of which, however, pass upwards into the Great Oolite of the Cotteswolds and into the Cornbrash, as will be ascertained from the descriptions. In excluding them from the present Supplementary Monograph, the writer begs to state that he consented to their admission into the former work with great reluctance, in deference to the opinion then prevalent that they pertained to the Great Oolite, but with a strong impression (formed in 1839, upon perusing the memoir of Professor Williamson) that they constituted an *Inferior Oolite* fauna.

The Palæontologists of France, in their expositions of the Great Oolite fossils of that country, have, within the last few years, fully proved, by the general identity and association of species, that the fauna of the Minchinhampton beds is not exceptional or local merely, as some have supposed, but represents a very ample and characteristic series of Mollusca, a large number of which are also found in other and distant localities at the same geological horizon. Other not less interesting and important facts, confirmatory of this view, have recently been afforded by researches in English strata of the same epoch. The Oxfordshire railway sections of the Great Oolite and Forest Marble have yielded to Mr. Whiteaves a varied series of Testacea, a list of which he has kindly communicated to me, together with many of the fossils, including those which are not known in the Minchinhampton beds; the result is, that of 122 Great Oolite and 48 Forest Marble shells, in all 140 species, obtained by that gentleman in the Oxfordshire beds, upwards of 114 are also common to the Minchinhampton beds. An extensive series of Forest Marble shells from the clay beds of Wiltshire, Somersetshire, and Dorsetshire, liberally placed at my disposal by Mr. Walton, has produced a larger number of novel forms, as might have been expected from the very different lithological conditions of the deposit; nevertheless there is still a majority of Minchinhampton shells, and the entire assemblage is even more remotely allied to the Yorkshire fauna than is that of Minchinhampton. The general discordance, therefore, of the Yorkshire and southern faunas of the supposed Great Oolite within so small an area as England would lead us to infer their separation chronologically, even if we were unable to assign the northern series to that of an older and well-known era.

The following is a list of Yorkshire Testacea figured in the former Monograph which are not known to occur in any stratum more recent than the gray limestone of Scarborough, and should therefore, in accordance with the foregoing views, be excluded from the fauna of the Great Oolite:

PART I.

- AMMONITES BRAIKENRIDGII. Tab. XIV, fig. 1.
 — BLAGDENI. Tab. XIV, figs. 3 *a*, *b*.
 BELEMNITES GIGANTEUS. Tab. XIV, figs. 4, 4 *a*.
 SERPULA PLICATILIS. Tab. XIV, figs. 5, 5 *a*, *b*.
 — SULCATA. Tab. XIV, fig. 6.
 CERITHIUM BEANII. Tab. XV, fig. 5.
 CHEMNITZIA (?) VETUSTA. Tab. XV, fig. 7.
 — SCARBURGENSIS. Tab. XV, fig. 8.
 ACTEON SEDGVICI. Tab. XV, figs. 9, 9 *a*.
 — PULLUS. Tab. XV, fig. 11.
 ACTEONINA GLABRA. Tab. XV, fig. 10.
 — TUMIDULA. Tab. XV, fig. 14.
 PHASIAVELLA LATIUSCULA. Tab. XV, fig. 16.
 NATICA ADDUCTA. Tab. XV, figs. 17, 17 *a*.
 — (EUSPIRA) CINCTA. Tab. XV, fig. 20.
 TROCHUS LECKENBYI. Tab. XV, figs. 21, 21 *a*.

PART II.

- MYTILUS (MODIOLA) LECKENBYI. Tab. XIV, fig. 9.
 CUCULLÆA CANCELLATA. Tab. XIV, fig. 12.
 UNICARDIUM GIBBOSUM. Tab. XIV, fig. 11.
 TRIGONIA SIGNATA—DECORATA. Tab. XV, fig. 1.
 ASTARTE ELEGANS, *Phil.* (non *Sow.*). Tab. XIV, fig. 14.
 ISOCARDIA CORDATA. Tab. XV, fig. 5.
 MYACITES BEANII. Tab. XV, figs. 11 *a*, *b*.
 — SCARBURGENSIS. Tab. XV, fig. 13.
 — EQUATUS. Tab. XII, fig. 15.

Cornbrash of the Coast of Yorkshire: its Mollusca.

The Mollusca of the Yorkshire Cornbrash offer, in their association, some marked contrasts with those of the southern counties and of the Continent upon the same geological horizon. In the southern localities the marine floors, crowded almost exclusively with Brachiopoda, is the predominating feature that arrests the attention; in the northern the Conchifera constitute the great majority; the Brachiopoda, few individually, are reduced almost to the two species *Terebratula lagenalis* and *T. obovata*, the latter being represented by forms dwarfed to about a third of the linear dimensions which the species attains in Wiltshire. The condition of the Testacea also offers some interesting contrasts. In Wiltshire the Conchifera are usually in the condition of casts, of which a large proportion are compressed and distorted; in Yorkshire the hard, dark-coloured limestone has preserved the more delicate external characters in a very

perfect manner, including the thin tests of *Pholadomya*, *Myacites*, *Gresslya*, *Goniomya*, and *Cercomya*, together with the outer, granulated tegument of the four latter genera; and when the matrix is less hard, even their internal hinge characters may be disclosed. The Gasteropoda are few, both as to species and individuals; the Cephalopoda are, with the exception of a small Belemnite, limited to *Ammonites macrocephalus*, which affords great variety in the details of its figure and ornamentation, but which never attains to the large dimensions of Wiltshire specimens.

Its Mollusca, viewed comprehensively, may be regarded as a transitive series, a chain of life serving to connect the fauna of the Inferior Oolite with that of the Oxfordian rocks, comprising a considerable proportion of the former, perhaps an equal number of special forms, a much smaller number of species which pass upwards into the Oxfordian beds, and a still lessening proportion of forms which are recognised in the Great Oolite or Forest Marble, but these latter consist almost entirely of shells which pass upwards from the Inferior Oolite.

Minute Testacea of the Great Oolite and Forest Marble.

Only a portion of these have been selected for illustration, others, inconveniently minute, having been rejected upon that account. That some of these minute forms attain to much larger dimensions under different conditions may be inferred from the fact that many minute Gasteropoda and Conchifera associated with them are only dwarfed forms of well-known Great Oolite species, which in other beds are of the dimensions figured in the former parts of this Monograph.

Forest Marble Testacea.

The following note, kindly communicated by Mr. Walton, describes the localities of the Forest Marble cited in this Monograph:

"The principal localities from which these fossils have been obtained are Farleigh, Hungerford, in Somersetshire; Pound Pill, near Corsham, and Laycock, in Wiltshire; and Burton Bradstock, about five miles from Bridport. The lithological character of the Forest Marble is very various, demonstrating the littoral character of the deposit, which is shown also by the trails of animals and the numerous remains of what can hardly be anything but Fucoids. The best locality at Farleigh is a superficial cutting opposite Wick Farmhouse, made in forming the new Warminster Road, and the bed is a crumbly, shelly marl, and the fossils, when first found, apparently mere lumps of clay. In the small quarries near Hinton Charterhouse, Cumberwell, and Philips Norton, the rock is a hard, calcareo-arenaceous stone, and at Pound Pill it is as hard and more intractable than Carboniferous limestone. At the railroad-cutting near Laycock it is a cream-coloured clay, containing shells better preserved than usual, and from this nearly all the small shells have been procured. In many places the Forest Marble is a mere mass of broken shells, and frequently formed almost exclusively of crushed Rhynchonellæ. At Burton Bradstock the Forest Marble clay rests on the lower beds of the Inferior Oolite, and most of the fossils from that locality were picked up from a bank on the sea-shore. I have never found an Ammonite in the Forest Marble, and only one very doubtful trace in the Cornbrash."

Testacea from the Clays of the Forest Marble compared with those from the Limestones of the Great Oolite.—As might be anticipated from the widely differing mineral conditions of the two deposits, they are tenanted to a great extent by different races of Molluscs. The fossils figured in this Supplement from the Forest Marble by no means represent the whole of the additional species contained in the clay beds of that stage, but such only as from their state of preservation are suitable for our plates; a large proportion have

suffered from vertical compression and consequent distortion, so that in many instances it has only been possible, even with the choice of numerous specimens, to select one or two as representatives of their respective species, and some tablets covered with shells have with reluctance been rejected when specific forms could only have been made up by the aid of doubtful restorations. Our note on the age of the gray limestone of the Yorkshire coast alludes to the general identity of species which obtains between the Testacea of the Great Oolite and Forest Marble limestones of Gloucestershire and of Oxfordshire; they form, in fact, but one fauna, the most prominent species of which are abundant only over very limited areas. In the Forest Marble clays we find that the great mass of the organic forms belong to but few genera; the deficiencies in this respect are very striking. The large collection of Mr. Walton contains not a single Ammonite or Belemnite; of Gasteropoda there is almost an entire absence of *Nerinaea*, *Cylindrites*, *Ceritella*, and *Trocholoma*, genera so abundant and varied in the limestones; these deficiencies are to a great extent compensated for by an abundance of special forms of *Phasianella* and of *Acteonina*, which is the more remarkable as the latter genus is everywhere one of the most rare forms of the limestones. The genus *Cerithium* is abundant, consisting of forms less dwarfed than is usually seen in the limestones. The genera *Nerita*, *Trochus*, and *Monodonta*, are well represented, but the two latter genera for the most part by forms special to the clays. Of the Conchifera the clays produce *Tancredia* comparatively in small numbers and apparently of few species, but their condition is usually such as will not admit of a rigid scrutiny; a similar paucity applies to the *Arcas*, *Trigonias*, *Limas*, and *Pectens*. *Perna*, *Gervillia*, *Pteroperna*, and *Astarte*, are for the most part represented by species special to the clays or rare in the limestones; *Pholadomya*, *Homomya*, *Myacites*, and *Goniomya*, appear to constitute the rarest generic forms in the deposit; *Cercomya* and *Thracia*, perhaps, are absent altogether. Wanting these, the clay banks swarmed with a profusion of *Nuculæ* and *Cyprinae*, usually of forms differing from those of the limestones. Perhaps about 25 per cent. would be a fair estimate of the testaceous species special to the clays; but taking only the more common forms of each deposit, the differences between them are much more marked and important than would be inferred from such a proportion of species.

The following, probably, have not been obtained in any other deposit than the Forest Marble:

<i>Turbo</i> <i>Burtonensis</i> .	<i>Pleurotomaria</i> <i>Bathonica</i> .
<i>subtexata</i> .	<i>Ostrea</i> <i>Wiltonensis</i> .
<i>nodifera</i> .	<i>Gervillia</i> <i>Waltoni</i> .
<i>Trochus</i> <i>Burtonensis</i> .	<i>Perna</i> <i>obliqua</i> .
<i>Monodonta</i> <i>comma</i> .	<i>Trigonia</i> <i>arata</i> .
<i>Waltoni</i> .	<i>Lucina</i> <i>Burtonensis</i> .
<i>arata</i> .	<i>Corbis</i> <i>rotunda</i> .
<i>tegulata</i> .	<i>Corbula</i> <i>Hulliana</i> .
<i>Onusbus</i> <i>Burtonensis</i> .	<i>Islipensis</i> .
<i>Natica</i> <i>arata</i> .	<i>Agatha</i> .
<i>texata</i> .	<i>Corbicella</i> <i>subangulata</i> .
<i>alta</i> .	<i>Cyprina</i> <i>bella</i> .
<i>Acteonina</i> <i>Luidii</i> .	<i>Davidsoni</i> .
<i>Suessea</i> .	<i>Astarte</i> <i>robusta</i> .
<i>fasciata</i> .	<i>rustica</i> .
<i>Wiltonensis</i> .	<i>fimbriata</i> .
<i>Phasianella</i> <i>variata</i> .	<i>ignota</i> .
<i>Solarium</i> <i>turbiniiformis</i> .	<i>Hilpertonensis</i> .
<i>Waltoni</i> .	

Alaria parvula, p. 22. Tab. III, fig. 12; and *A. cirrus*, p. 22. Tab. III, fig. 13.

Further observations lead to the conclusion that the former shell is the young condition of the latter,

and that the differences in the last volution are owing only to the stage of growth to which the specimens have respectively attained.

Index to Tab. XII, Part II, *add* figs. 13, 13 *a*, Hinge of Corbicella.

Page 95, fifth line from the bottom, *add*, and Tab. XII, figs. 13, 13 *a*.

Index to Tab. XIII, fig. 16, *for* p. 139, *read* p. 140.

Myoconcha Actæon, p. 77, Part II, *for* Tab. III *read* Tab. IV.

Tab. XIII, fig. 18, Part II, *alter* the reference to, *Pholas costellata*, p. 142.

Index to Part II, *add*, *Pholas oolitica*, p. 126. Tab. IX, fig. 21.

Alaria trifida, Part I, p. 21, *add* the following to the description:—The first two or three volutions are longitudinally costated, the transverse striations extend even upon the caudal and digital processes.

Pholodomya oblita, Part II, p. 142*; Tab. XII, fig. 5. It is now ascertained that the specimen figured was erroneously assigned to the Great Oolite; its true position is in seams of sandy marl near to the base of the Inferior Oolite, in which position it occurs at various localities in the vicinity of Stroud and Nailsworth; the officers of the Ordnance Geological Survey have also procured it from a similar position in Somersetshire. It sometimes attains very large dimensions, as is exemplified by a remarkable specimen in the Bristol Museum, which has been mistaken, as in other instances, for the aged condition of *Pholodomya fidicula*, Sow. The delicate, radiating lines are scarcely distinguishable upon the aged and inflated examples of *P. oblita*, but are always acute and conspicuous upon *P. fidicula*.

Trigonia decorata, Lyc., Part II, p. 133, Tab. XV, fig. 1, *alter* the title to *Trigonia signata*, Ag., a fine species, abundant in the Upper Trigonia Grit of the Inferior Oolite in the Cotteswolds, and more rarely in the gray limestone of the coast of Yorkshire; it occurs in a similar geological position at various Continental localities. Professor Quenstedt has figured it from Wurtemberg under the name of *Trigonia clavellata*. It has never been found to pass upwards into the Great Oolite.

Patella paradoxa, Part I, p. 90, Tab. XII, fig. 2. This rare species is the *Patella lata*, Sow., 'Min. Con.,' t. 484, fig. 1, p. 133. [The compressed and imperfect specimen figured in the latter work will account for our having failed at an earlier period to identify it with the very few examples which have been obtained at Minchinhampton.

Tancredia curtansata, Part II, p. 93, Tab. XIII, figs. 7, 7 *a*, 7 *b*, *alter* the title to *Tancredia sub-curtansata*; it is much less inflated, the umbones are more elevated and pointed, the posterior side is more produced, and it is destitute of the large longitudinal plications which distinguish the species of the Coral Rag; the latter is also a much larger shell, only two specimens of which have come to my knowledge, the type specimen in the York Museum, the other in the fine collection of Mr. Leckenby at Scarborough. *Tancredia Lycetti*, Opper, from the Inferior Oolite of Wurtemberg and of Gloucestershire, is also nearly allied to the Coral Rag shell, and appears to be equally rare.

Tancredia axiniformis, p. 93, Tab. XIII, fig. 6, and Tab. XII, fig. 7, *alter* the title to *Tancredia extensa*, Lyc. In this instance the name proposed in my first notice of the Genus *Tancredia*, 'Ann. and Mag. Nat. Hist.,' Dec., 1850, must be retained, as an examination of many Yorkshire specimens of *T. axiniformis* leaves no doubt that it is a distinct species, which occurs in the Inferior Oolite, both in that county and in Gloucestershire; compared with the Great Oolite *T. extensa*, it is shorter, more flattened, approaching more nearly to the outline of *T. brevis*, but with much less convexity.

Tab. XV, Part II, figs. 2, 2 *a*, *alter* the title to *Ceromya Bajociana*, D'Orb.; the figure represents the usual size attained by this *Ceromya* in the Inferior Oolite of the Yorkshire coast; in the Cotteswolds the same formation produces it of far larger dimensions, and justifies the terms in which it is described by D'Orbigny in his 'Prodrome,' p. 274, as follows:—"Magnifique espèce courte, renflée à crochets très-

contournés, ornée de stries concentriques d'accroissement, comme rostrée à la région anale." It is the *Isocardia concentrica* of Phillips, 'Geol. York.,' i, pl. xi, fig. 40, but not of Sowerby. The Yorkshire examples may, therefore, be considered as dwarfed forms of this really magnificent shell, the southern examples of which have the distinguishing features of the species much more strongly marked; the umbones, more especially, are larger and more elevated, the posterior extremity being also more rostrated. It is worthy of remark that this degenerated form is the only one of the genus that has been obtained from the whole of the Jurassic rocks of Yorkshire.

XI

Anatina undulata and *Anatina plicatella*, Tab. H, Part II, transpose figs. 6 and 4 upon the tab.; the references to them at p. 118, and also upon the page facing the tab., will then be correct.

Pholadomya ovulum, Part II, Tab. XIII, fig. 12, alter the title to *Pholadomya ovalis*, Sow.; also at p. 122.

Turbo capitaneus, Goldf., Part I, p. 65, erase the words "Tab. IX, fig. 33," and alter to "Supplement, Tab. XLI, fig. 1." The index to Tab. IX, fig. 33, should be altered to *Amberleya Jurassi*, Supplement, p. 19.

Stomatia? Buvignieri, Part I, p. 85, alter the generic title to *Nerita*. Another figure is given, Supplement, Tab. XLI, fig. 7.

Part II, Tab. VI, fig. 15, p. 67. I agree with Dr. Oppel ('Juraformation,' p. 487) in the propriety of separating this *Lucina* from *L. Bellona*; its title should, therefore, be *Lucina Lycetti*, as suggested by Dr. Oppel.

Cerithium Roissii, Part I, p. 32, alter the generic title to *Fibula*. See p. 10 of this Supplement.

Myacites crassiusculus, Part I, p. 112, alter the generic title to *Homomya*. See p. 89 of this Supplement.

Myacites Vezelayi, Part I, p. 111, alter the generic title to *Homomya*. See p. 88 of this Supplement.

Myacites gibbosus, Part I, p. 138, alter the generic title to *Homomya*. See p. 88 of this Supplement.

Corbula involuta, Part I, p. 97, alter the title to *Corbula Buckmani*. See p. 63 of this Supplement. *Corbula Buckmani* will be found refigured, Tab. XXXIV, figs. 6, 6 a.

Part II, p. 123, erase the first reference to *Pholadomya Semanni*, Tab. II, fig. 1, which is *P. solitaria*.

Part II, p. 28, Tab. IV, fig. 12. This little shell, erroneously ascribed to the *Modiola pulcherrima* of Roemer, has been rectified by Professor Morris, 'Catal.,' p. 210, under the appellation of *M. Lycetti*. Compared with the allied species of the Hilstone, it is smaller, more inflated, the radiating lines are more narrow or more distantly arranged, the test is very thin, and the specimens are usually imperfect.

Mytilus (Modiola) tumidus, Part II, p. 37, Tab. IV, fig. 5. It is stated that the rude figure of a *Modiola*, Young and Bird, 'Geol. York. Coast,' pl. vii, fig. 10, is intended to represent this shell, and that Professor Phillips inserted it in his list of Yorkshire fossils, 'Geol. York.,' i, p. 171, in the following terms:—" *Modiola unguolata*, *Coralline Great* and *Inferior Oolite*." It is not uncommon in the upper stage of the Inferior Oolite in the Cotteswold Hills.

Purpuroidea Moreausea, Part I, p. 27, Tab. IV, figs. 1—4, alter the title to *P. Morrisea*. The publication of the splendid work of M. Buvignier on the Palæontology of the Meuse has shown that we were mistaken in assigning our Minchinhampton species to that figured in a very indifferent manner in the little memoir by M. Buvignier in 1843. The new specific name selected for our shell by the latter author should therefore be adopted.

Part I, Tab. II, figs. 3, 3 a, p. 12. The Ammonite obtained at the base of the Great Oolite, and referred doubtfully to *A. macrocephalus*, is now ascertained to be *A. viator*, D'Orb., 'Pal. Fr. Terr. Jurass.,'

tab. 172, of which numerous specimens are now in the British Museum, obtained from a similar geological position in Somersetshire; in some of these the last volution quite conceals all the others, leaving only a small umbilical orifice; the absence of costæ upon the inner portion of the last volution distinguishes it from *A. macrocephalus*. Dr. Oppel ('Juraformation,' p. 478) proposes for it the new title of *A. Morrisii*, which, in accordance with the above views, must remain as a synonym of *A. viator*.

Acteonina? parvula, Part I, p. 104, alter the generic title to *Ceritella*.

Part II, Tab. 5, figs. 18 a, 19 a. Both these figures represent the young condition of *Trigonia Goldfussii*.

Trochus pileolus, Part I, p. 66, Tab. 10, fig. 5. Additional specimens have proved that the smoothness of the surface is accidental; traces of encircling striations are sometimes visible; the shell then becomes identical with *Turbo obtusus*, Sow., of which *Trochus Bixa*, D'Orb., is also a synonym.

Nerita hemispherica, Roem., Tab XI, figs. 14, 16; *Nerita minuta*, Sow., Tab. XI, fig. 19. A comparison of very ample materials, including all the connecting forms, leaves no choice but to regard *N. hemispherica* as the adult shell of *N. minuta*. The preservation of the epidermal pattern of coloration has materially tended to this result; the older shells, as in fig. 14, with their strong, rugose plications, thickened columellar lip, and entire absence of the epidermal coat, appear at first sight sufficiently distinct, but from these we pass to specimens of less advanced growth, as in fig. 16, without plications, but still possessing the callosity upon the inner lip; some in this state, however, retain portions of the external tegument, in which may be traced remains of the two broad bands of white between the three of dark-coloured pigment, the latter consisting of transverse, wrinkled lines. From these to the smallest forms the transition is easy; the latter are most commonly more ovate, but this is by no means an invariable feature, nor are the adult shells very constant in the degree in which the spire is produced. The minute forms, which usually retain the epidermal coat, are smooth and shining; with advance of growth the shell exhibits continual and considerable increase of thickness. The two extremes of aspect are fairly represented in figs. 14 and 19. *Nerita minuta* is so inappropriate a name for the adult shell, that it seems desirable to adopt *Nerita hemispherica*, although the former has priority.

Fusus? subnodulosus, Part I, Tab. V, fig. 9, p. 23, alter the generic title to *Brachytrema*.

Phasianella conica, Part I, Tab. XI, fig. 30, p. 74; *Phasianella acutiuscula*, Tab. XI, fig. 28, and Tab. IX, fig. 2. An examination of numerous additional specimens has led to the conclusion that these forms should be regarded as only varieties of one species; for although some examples are even more lengthened than the figures of *P. acutiuscula*, others connect the typical specimens of each variety in a very perfect manner.

Genus *Brachytrema*, Part I, p. 24. Further information has shown that the generic description before given should be slightly modified; the outer lip was stated to be thin, which is correct as far as regards the greater number of specimens; but some species, as *B. varicosa* and *B. pygmea*, acquired at certain arrests of growth thickened outer lips or varices, as in Triton; from the latter genus they are distinguished by the shorter trochiform spire and absence of denticulations upon the borders of the aperture.

Turbo? pygmeus, Tab. IX, Part I, figs. 29, 29 a, alter the title to *Brachytrema pygmea*. The doubt as to the genus expressed in Part I, p. 65, has been justified in an example with the aperture perfect, figured by M. Piette, 'Bull. de la Soc. Géol. de France,' 2 sér., pl. xv, fig. 21, under the name of *Brachytrema brevis*; the base is strongly striated, and the aperture much contracted.

Alaria lævigata, p. 17, Tab. III, figs. 3, 3 a; Tab. XLI, fig. 13, alter the title to *Alaria Myurus*, Desl., sp. It was stated at p. 17 "that in everything excepting its smooth surface this shell agrees with the *Rostellaria Myurus* of Deslongchamps." A specimen recently obtained exhibits some encircling striations upon the upper portions of the two larger volutions; the sole distinction, therefore, that separated it from

the species of Deslongchamps is thus removed. The specimen figured Tab. XLI, fig. 13, exhibits the first spine, which is monodactyle; a second and much larger spine, also monodactyle; the third and ultimate spine being didactyle.

Acteonina?, Part I, Tab. VIII, fig. 12*, is the young shell of *A. olivæformis*, p. 103.

Lima Luciencis, D'Orb., 'Gr. Ool. Mon.,' Part II, p. 28, Tab. III, fig. 4. This shell is a synonym of *Lima rudis*, Sow. The number of costæ vary from eight to eleven; the specimen figured in the 'Mineral Conchology,' tab. 214, has only seven costæ, and the figure is unusually gibbose. Its geological range is considerable; it occurs sparingly in the Great Oolite of the Minchinhampton district and in the Cornbrash of the coast of Yorkshire, but in the Coral Rag of Malton it is moderately abundant.

Sub-genus *Crossostoma*, Part I, p. 72. Of the three Oolitic species assigned to this proposed sub-genus of Delphinula, the only one which exhibits the distinctive characters is *C. Pratii*; the other two forms, *discoideum* and *heliceforme*, were formerly supposed to represent in their apertures the immature condition of that sub-genus. Subsequent observations of numerous specimens has compelled me to abandon that view, and to regard *discoideum* and *heliceforme* as adult shells, or discoidal forms of smooth Monodonta. Other examples of Monodonta allied to the Great Oolite forms, but less depressed, have been figured by Messrs. Hebert and Deslongchamps, in their 'Memoir on the Kelloway Rock Fossils of Montreuil-Bellay,' under the names of *Monodonta ovulata* and *papillata*.

Cerithium quadricinctum, Goldf., and *C. limæforme*, Roem. These two forms must be united into one species; individuals with large nodules and with only three distinct rows have been assigned to *C. limæforme*, but, even with these, indications of a fourth row are occasionally to be discovered, and the prominence of the nodules, and their number in each volution, are very variable. *C. quadricinctum* has a considerable geological range, and it occurs also in the Coral Rag of Germany.

Patella suprajurensis, Part I, p. 92, Tab. XII, figs. 9, 9 a. I can now only regard this form as a variety of *P. Aubentonensis*, in which the lamellæ of growth are strongly marked and the cancellated lines have disappeared. It is also not uncommon to meet with smooth examples of the latter species.

Pholadomya solitaria, Part II, p. 124, Tab. XI, fig. 1, et Tab. XII, fig. 2; erroneously printed *P. oblita* upon the reference facing the latter table. *Pholadomya oblita* is Tab. XII, fig. 5, p. 142*. The variations of figure and of ornamentation, either separately or combined, are so considerable in the cordiform examples of *Pholadomya*, that a large number are indispensable to enable us to legislate upon them with any confidence; probably *P. solitaria* is only a variety of *P. deltoidea*, Sow.

[Note.—The Author desires to tender his best thanks to Mr. West for the very careful drawings in the plates that illustrate this Monograph; and more especially for the fidelity and attention to the more minute details exhibited in the magnified figures of the smaller Gasteropoda, from the Great Oolite and Forest Marble.]