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LVIII.—On the Foraminiferal genus Orbitoides of d'Orbigny

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possibly have been contained in the tissues lining the coelom ; but of this fact I cannot be absolutely certain.

Summary.

The most important facts recorded in this paper are the following:—

- (1) *Coccidium* occurs in the Oligochæt *Perichæta*.
- (2) In two species of *Perichæta* from different parts of the world (i. e. *P. novæ-zelandiæ* from New Zealand and *P. armata* from Borneo) the same species, or at least closely allied species, occur which differ from other forms.
- (3) The cyst-membrane is double and the outer membrane is of very great thickness, though extremely transparent.
- (4) There is a conspicuous "micropyle" (often two) which does not appear to be a perforation of the cyst-membrane, but merely a local bulging, perhaps due to reagents.
- (5) The protoplasm of the parasite breaks up into a large number of spores.

EXPLANATION OF PLATE XV.

Lettering:—*a*, inner cyst-membrane ; *b*, outer cyst-membrane ; *c*, micropyle ; *d*, protoplasmic contents ; *d'*, sporoblasts.

Figs. 1-13, 15. *Coccidium* from *Perichæta armata*.

Fig. 14. *Gregarina*, sp. ? , found in company with *Coccidium* in *Perichæta armata*.

Fig. 16. *Coccidium* from *Perichæta novæ-zeelandiæ*.

LVIII.—On the Foraminiferal Genus *Orbitoides* of d'Orbigny. By H. J. CARTER, F.R.S. &c.

THERE are several discoid fossils among the Nummulites which, having a central plane covered in on each side by a more or less convex crust, look so much like Nummulites that, without close inspection, they would appear to present no difference ; and these in totality have been named "*Orbitoides*" by d'Orbigny, whose diagnosis, together with typical

illustrations of the structure of the genus, taken from *Orbitoides media*, d'Orb., of 1847, olim *Orbitolites media*, d'Archiac, of 1837, = *Orbitolites* of Faujas de Saint-Fond in 1799, may be found in his 'Cours de Paléontologie et de Géologie' (vol. ii. pp. 193, 194) and 'Prodrome' (vol. ii. p. 279), where he has also assigned to them as their existence in time the geological interval between his "Sénonien" and "Parisien" divisions, that is between the Upper Chalk and the Nummulitic series inclusively.

Now this would probably be quite sufficient if the structural type of *Orbitoides media* was the same as that of all the other species; but this is not the case, inasmuch as the structural type of *Orbitoides papyracea*, which d'Orbigny has placed in his "Suessonien" division of the Eocene Period (*op. cit.* vol. ii. p. 732), is markedly different.

The typical structure of *Orbitoides media*, d'Orb. (making allowance for the diagrammatic nature of his illustrations), is precisely like that of *Nummulites Mantelli*, Morton, of the Claiborne Beds in Alabama, saving the presence of the superficial layer in the latter and the difference in the marking of the surface in the former, as will be more particularly seen hereafter when I come to describe the type forms of these fossils respectively, while the structure of *Orbitoides papyracea* is almost precisely like that of *Lycophris ephippium* delineated by J. de C. Sowerby in his illustrations of Grant's "Memoir of the Geology of the State of Cutch, in Western India" (Trans. Geol. Soc. Lond. 1840, 2nd ser. vol. v. pl. xxiv. figs. 15 *a* and 15 *b*). D'Orbigny's genus, then, dates from 1847 and Sowerby's from 1840.

Here it should be remembered that Sowerby's illustrations of the structure of his *Lycophris ephippium* (viz. pl. xxiv. figs. 15 *a* and 15 *b*) are very different from those of his *Lycophris dispansus* close by (viz. 16 *a* and 16 *b*), as in his "fig. 16 *a*" there are none of the columns which are so characteristic of his *L. ephippium* in "fig. 15 *b*," and the columns indicated in the section of *L. dispansus*, fig. 16 *b* (since the chambers of the central plane are not shown), may or may not be those of the ephippial type, as will be seen hereafter, although I confess to a leaning towards the latter. Sowerby also, in adverting to his illustrations in the paragraph following his explanations, states that "possibly these two forms may be different stages of the growth of the same species." I mention this here to point out that, although the presence of the "columns" is a persistent character of those *Orbitoides* which present the structural type of *Lycophris ephippium*, it is by no means so in that of *Orbitoides media*,

d'Orb. (*op. et loc. cit.*), and therefore to apply the term "*Orbitoides dispansa*" indiscriminately to the two fossils, viz. *Lycophris ephippium* and *L. dispansus*, may be a mistake; while if they really belonged to the types that I have mentioned respectively, it may be inferred that both are found together in the bed of Nummulites at Lukput, in Cutch, from which these fossils are stated by Captain Grant, in his "Memoir," to have come (*op. et loc. cit.*).

For excellent illustrations of the microscopical structure of *Orbitoides papyracea* and all the known species of this type brought together I must refer the reader to Gümbel's "Beiträge zur Foraminiferenfauna der Nordalpinen Eocäengebilde," Taf. iii. n. iv. (Abhandl. k. bayer. Ak. Wiss. vol. x. p. 581, 1868), whereby he will become acquainted with this type. Thus the reader will observe here, no less than in Sowerby's delineations of his *Lycophris ephippium*, to which I have alluded, that horizontally the central plane is composed of more or less oblong rectangular chambers, and that vertically, that is on each side of the central plane, the crust-like structure is composed of columns of vertically compressed cells intermingled with conical columns (which columns consist of non-tubular, opaque, white shelly substance), whose obtuse ends project above the surface in the form of little knobs and whose pointed ones extend down to the central plane (Gümbel, *op. et loc. cit.* Taf. iii. fig. 21).

On the other hand, equally typical microscopical illustrations of Morton's *Nummulites Mantelli* from the Claiborne beds of Alabama, with the exceptions just stated, are represented in d'Orbigny's illustrations of the structure of his *Orbitoides media* (*op. et loc. cit.*), whereby the reader may become equally well acquainted with the prevailing type of this Orbitoid structure as with its differences from that of *Orbitoides papyracea*. Thus it will be observed here in *Nummulites Mantelli*, no less than in my own illustrations of the Sindian species of 1853 ('Annals,' vol. xi. pl. vii. figs. 40 *a*, *b*, *c*, and 41), that horizontally the central plane appears to be composed of circular, or, from their juxtaposition, slightly hexagonal cells, so arranged in the interstices of obliquely crossing lines that, radiating centrifugally from the centre to the circumference, they present the pattern of an "engine-turned" watch-case (see especially d'Orbigny's illustrations of his "Coupe horizontale" of *Orbitoides media*), and that vertically here the crust-like structure is composed of columns of vertically compressed cells, which are *not* intermingled with the "conical columns" before mentioned, but are separated from each other simply by the translucent sub-

stance of the fossilized test; while the whole, in the Sindian species as well as in the Alabama fossil, is covered in by a thin superficial layer of still more compressed cells, which are in juxtaposition, and in lieu of being "circular" are so irregular in outline that altogether they present a reticulated appearance ('Annals,' l. c. pl. vii. fig. 40, *a, b*), simulating a similar layer in the surface of *Nummulites lævigatus* from the Bracklesham beds in England.

Hence it will have been seen that the central plane in *Orbitoides papyracea* is composed of "chambers," and that these chambers are rectangular in form; whereas in *Nummulites Mantelli* it is composed of cells, and these cells circular or spheroidal in form (I call them "cells" because they are spheroidal in form and not rectangular): the former arranged in rows radiating centrifugally from the centre ('Annals,' l. c. pl. vii. fig. 26), and the latter circularly in the interstices of crossing lines also radiating from the centre, but in opposite directions, so as to intersect each other obliquely and thus present the "engine-turned" pattern to which I have alluded. Moreover, that in *Orbitoides papyracea* there are the conical columns of opaque, white, non-tubular shell-substance, and that in *Nummulites Mantelli* there are none. Further, that there is on the surface of the Sindian species a cortical portion possessing a reticulated structure, which is concealed in the Alabama fossil under a smooth structureless surface, and that in *Orbitoides papyracea* there is nothing of the kind.

Thus I was led in 1853 to adopt the name of *Orbitolites Mantelli* for Morton's *Nummulites Mantelli*, more especially because it appeared to me that this compound structure was but an evolutionary development of the more simple one of *Orbitolites marginalis* of Lamarck.

But to understand this more clearly it is desirable that *Orbitolites marginalis* (which is not only widely spread throughout the warmer regions of the earth, but also typical of the fossilized species, which at least date as far back as the Nummulitic series) should be particularly described. Thus, in general form it is circular, wavy, and concave on both sides, owing to the smallness of the central or first-formed cells and their increasing in size and number of layers towards the circumference. The largest specimens of the recent species that I possess are 5-12ths of an inch in diameter and were obtained from the Gulf of Suez, while the largest fossilized specimen that has come under my notice is from the Nummulitic series on the south-east coast of Arabia, and this measures 1 inch in diameter and about 1-12th of an inch in thickness (Geol. Papers of Western

India; Carter (reprint), Bombay, 1857, p. 587). The cells of which *Orbitolites marginalis* is composed are spheroidal and so arranged respectively in the interstices of obliquely inter-crossing lines which radiate centrifugally from the centre to the circumference in opposite directions as to present the same "engine-turned" appearance as that of the central plane of *Nummulites Mantelli*; and not being accompanied by the conical "columns" of opaque shelly substance, incipient or otherwise, they thus altogether present precisely the same appearance as that of the central plane of *Nummulites Mantelli*. Hence by the evolutionary development of the collateral crusts of *Nummulites Mantelli* it so becomes allied to *Orbitolites marginalis* that I have been led to adopt the name of *Orbitolites Mantelli* for the former in contradistinction to that of "*Orbitoides*" in *O. papyracea* and its like, which, on the other hand, all together seem to be equally based upon another type of Foraminifera, viz. *Cycloclypeus*.

Thus *Cycloclypeus*, Carp. ('Introduction,' pl. xix.), consists horizontally of a thin discoid test, which is composed of a number of rows of rectangular chambers that radiate centrifugally from the centre, in the angles of which chambers are incipient conical pillars of opaque white shelly substance ("cones of non-tubular substance," Carp., see fig. 5, *op. et loc. cit.*), whose obtuse ends project beyond the surface in the form of little knobs, so as to give it a granular appearance, whereby the form is simply that of the central plane of *Orbitoides papyracea* and its like. Thus by the evolutionary development of the collateral crusts of the latter it so becomes allied to the former that *Orbitoides papyracea* (following the same reasoning) must be regarded as much a derivative from *Cycloclypeus* as *Orbitolites Mantelli* is from *Orbitolites marginalis*; and hence the difference in the structure of these fossils to which I have alluded.

The same with *Nummulites*, which, *mutatis mutandis*, appears to be an evolutionary development of *Operculina*.

It is evident that Gümbel must have seen this or he would not have proposed a subgenus of *Orbitoides*, d'Orb., viz. "*Lepidocyclus*," for species of the type of *Orbitolites Mantelli* = *Orbitoides Mantelli*, d'Orb. (Gümbel, *op. cit.* p. 139, separate copy).

All this I pointed out in 1861 ('Annals,' vol. viii. pl. xvi.); the plate then given is entirely devoted to parallel columns of structural illustrations, in order that the facts I have stated might be directly realized. Whether or not this has had the desired effect I cannot say, but at all events in de Lapparent's

'Traité de Géologie' of 1883, p. 1027, the name of *Orbitolites Mantelli* appears among the Alabama fossils.

With reference to the specific value of the "conical columns of non-tubular, opaque, white, shelly substance;" in distinguishing the two types of Orbitoid structure to which I have alluded, I now find that it is by no means so great as I had anticipated; for while this character appears to be persistent in the type of *Orbitoides papyracea*, it is only partially so in that of *Orbitolites Mantelli*, seeing that the columns are undoubtedly absent in the Alabama species, in that from Arabia, and that from Burma which I have lately described ('Annals,' 1888, vol. ii. p. 342), but not always so in the specimens from Sind. They are undoubtedly absent in the infiltrated specimen from Sind which I have figured in the 'Annals' (*l. c.*), while in the same ferruginous mass of Nummulites from which the latter came there is an *uninfiltrated* specimen about an inch in diameter in which the "columns" are so undoubtedly present that, but for the presence also of a portion of the characteristic central plane of this type, I should have set it down as belonging to *Orbitoides papyracea*. Again, in the specimens of *Orbitolites Mantelli* from Nal, in the province of Jhalawan, they are not only indicated by the presence of their obtuse ends among the reticulated structure of the surface, but in the section may be seen to have their pointed ends in the intervals between the cells of the central plane. While it will presently be seen that they are equally characteristic of d'Orbigny's *Orbitoides media* from Maestricht, although they are not represented in his illustrations of this species (*l. c.*), that is if it be the one which it is stated to be in his 'Cours de Géologie' (*l. c.*). Hence it becomes necessary to describe a genuine specimen of *Orbitoides media* from the Upper Chalk of Maestricht first, and then to compare it with d'Orbigny's illustrations afterwards; but before entering upon this it is desirable to premise what the references are which appear to justify d'Orbigny's identification, for which purpose the following extract is given from the 'Prodrome,' vol. ii. p. 279, viz.:—

"ORBITOIDES, d'Orb. 1847.

"1349. *media*, d'Orb. 1847. *Orbitolites media*, d'Archiac, 1837. Mém. Soc. Géol. de France, t. ii. p. 178. Faujas de Saint-Fond, pl. xxxiv. figs. 1, 2, 3, 4. Royan (Charente-Inférieure), Lanquais (Dordogne); Maestricht."

Fortunately, through the kindness of Dr. H. Woodward,

of the British Museum, aided by sections made by Dr. G. J. Hinde, I am in a position to give the following description of a genuine specimen of *Orbitoides media* from the Upper Chalk of Maestricht:—

This is circular, slightly wavy, depressed, conical on one side, where it ends in a slight central papillary projection corresponding to a gentle depression on the opposite side, which is otherwise slightly convex, granular on both sides, the granules often presenting an indistinctly sinuous linear arrangement towards the circumference. Internal structure consisting of a central plane, in which the cells or chambers in a fresh state appear in a horizontal section to have been circular and situated respectively in the interstices of intercrossing centrifugal lines, which, radiating from the centre in opposite directions, thus present the “engine-turned” pattern to which I have above alluded, and show how the first-formed or central cells become smallest and the circumferential ones the largest; while in the vertical section the same circumstances cause the central plane to be thinnest in the centre and widest at the circumference, where apparently the layers of cells, by running into each other, cause the divisions of the central plane to present a series of curved cylinders, whose convexities are directed outwards. Central plane covered in on each side by a convex crust composed of columns of vertically compressed cells, intermingled with conical columns of more consolidated whitish shell-substance, whose obtuse ends form the granules of the surface and whose pointed ones appear to reach the angles of the interstices in the central plane. Size of specimens varying a little under 8-24ths inch in diameter and 2-24ths in thickness in the centre, including the papillary projection.

Loc. Upper Chalk of Maestricht.

Obs. The above description is quite sufficient to recognize the fossil, but would have been more satisfactory if the fossilization had been more crystalline and compact. No. of specimens “P. 1490.”

Such are the characters of the little discoid fossil from Maestricht, and they are fundamentally the same as those presented by the large specimens of *Orbitolites Mantelli* from Nal, in the province of Jhalawan, to which I have just alluded. Dr. Cook states, in his “Topographical and Geographical Sketch of a portion of the Province of Jhalawan &c., or northern part of the Tableland of Beloochistan” (Trans. Med. and Phys. Soc. Bombay, no. vi. new ser. 1861, p. 71; whence the subjoined diagrammatic figure is taken), that “this limestone in some places is crystalline

and contains no fossils, but in others is almost *made up* of a large flat, thin fossil with an abruptly prominent centre closely resembling *Lycophris dispansus*. Its surface is covered with small tubercles (but they are not, I think, united by stellate lines). This fossil measured $2\frac{1}{2}$ inches in diameter, 1-20th inch thick, and 2-10ths inch in the centre." Among the



specimens which Dr. Cook kindly sent me at the time the central inflation considerably differs in thickness, since in some instances it is so slight that it is hardly distinguishable. But whoever studies the Foraminifera must be prepared for such differences, and must therefore be correspondingly careful as to the value he attaches to them in specific distinction.

It will now be seen that d'Orbigny's illustrations do not entirely accord with what has been stated of the Maestricht fossil, which was first described and illustrated by Faujas de Saint-Fond in 1799 ('Histoire Naturelle de la Montagne de Saint-Pierre de Maestricht'), in so far as there are no "columns" represented by d'Orbigny in the "Coupe verticale" of his *Orbitoides media* (*l. c.*) and no granulations on its surface, but in lieu thereof there are sinuous lines extending from the centre to the circumference and a central papillary projection on *each* side; while in the fossil from Maestricht the papillary projection is on one side *only*, as represented by Faujas de Saint-Fond in his fig. 3, as I learn from the tracing kindly made for me by Mr. Jones, of the Geological Society. Still, in other respects d'Orbigny's illustrations would suffice for the Orbitolitean type of the Maestricht fossil to which I have alluded.

What fossil, then, do d'Orbigny's illustrations in totality represent? Let us take his other reference, viz. that to *Orbitolites media*, d'Archiac, from the Chalk in the south-west of France, of which, as I have no specimen and there is no illustration to his description, the best thing that I can do is to append his own words in the following extract:—

"*Orbitolites media*, nob.

"Lenticulaire, déprimé. Du centre de chaque face partent de petits sillons nombreux, qui se croisent en se dirigeant vers la circonférence; pores irréguliers à la surface; souvent

le polyypier se divise en deux parties égales dans le sens de son épaisseur; l'intérieur présente alors des couches d'accroissement et des cercles qui, en se croisant, ornent ces lames de losanges disposés en quinconces circulaires. Diamètre des plus grands individus, 50 millim.; épaisseur, 3 millim.

"Les individus jeunes, dont on serrait tenté de faire une espèce, sont moins larges, plus élevés, proportion gardée, et ressemblent à deux cônes opposés base à base.

"Cette espèce est figurée dans Faujas de Saint-Fond ('Histoire de la Montagne de Saint-Pierre de Maestricht, pl. xxxiv. figs. 1, 2, 3, 4). Elle est aussi indiquée, mais non décrite dans le genre *discholite* de Fortis.

"*Loc. de S. Ouest.* Royan, Lanquais, Dordogne.

"*Etage* 4.

"*Loc. du Nord de la France et de l'Europe.* Maestricht.

"*Etage*, Craie tuffau.

"(Mém. Soc. Géol. de France, tome ii. 1837. 'Sur la Formation Crétacée du Sud-ouest de la France,' par M. le Vicomte d'Archiac, p. 178.)"

With reference, then, to d'Orbigny's illustrations of his *Orbitoides media*, it will be observed that d'Archiac does not mention the central papillary projection represented by d'Orbigny on each side of his specimen ("Profil," *l. c.*), even if his "sillons" be identifiable with the sinuous lines on the surface of d'Orbigny's *Orbitoides media*, which I much doubt. Nor do d'Archiac nor d'Orbigny notice any granulations on the surface, or the "columns" that extend therefrom to the central plane in the Maestricht fossil, although both the description of the interior by the former and d'Orbigny's "Coupe horizontale" indicate the structure that is typical of the Maestricht fossil (*viz.* the "engine-turned" pattern) which Faujas de Saint-Fond has represented in his fig. 4 (*l. c.*), as well as of *Orbitolites Mantelli*. Again, while Faujas de Saint-Fond's specimen was only 12 millim., that from the south-west of France described by d'Archiac was 50 millim. in diameter. Thus Faujas de Saint-Fond's species of 1799, d'Archiac's of 1837, and d'Orbigny's *Orbitoides media* all differ so far as has been above stated; but, as I have said, such differences in Foraminiferal species are of doubtful specific value, and the difference in size just mentioned need not be regarded as distinctive any more than the presence or absence of the "columns" in this type of Orbitoid structure, as I have above stated. Thus, after all, each of these three fossils might have been regarded by d'Orbigny as typical of his *Orbitoides media*, as each possesses the most persistent

and typical structure in the central plane. D'Archiac's specimen was evidently a more or less symmetrical fossil with a central plane, since he states that it was susceptible of being split into "equal parts," which is not the case with *Orbitolites marginalis* &c., as they present no "central plane."

Further I cannot go. D'Archiac's fossil is stated to have come from Royan &c., and all seem to agree that the cliff at Royan on the northern side of the estuary of the Garonne presents the "Maestrichtien" of France, which is equivalent to the Upper Chalk of Maestricht in the Netherlands.

Lastly, I have to advert to the type of *Nummulites Mantelli*, Morton, of 1834, viz. the Alabama species = *Orbitolites Mantelli*, Cart. (1853), for the examination of which I am again indebted to my kind friend Dr. H. Woodward; and here, for comparison, it is best to follow the same course that I have taken with the Maestricht fossil. Thus:—

The Alabama fossil is circular, flat, and thin, slightly undulatory and *smooth* on the surface, presenting a small, more or less gentle elevation in the centre, which is papilliform. Internal structure consisting of a central plane, in which the cells or chambers in a horizontal section appear to have been circular and situated respectively in the interstices of intercrossing centrifugal lines, which, radiating from the centre to the circumference in opposite directions, thus present the "engine-turned" pattern to which I have alluded, and in like manner show how the first-formed or central cells become smaller and the circumferential ones largest, while in the vertical section the same circumstances cause the central plane to be thinnest in the centre and widest at the circumference, towards which apparently the layers of cells running into each other vertically cause the central plane in the vertical direction to assume a series of curved lines whose convexities are directed outwards. Central plane covered in on each side by a convex crust composed of vertically compressed cells separated only by fossilized shell-substance in which there are no "columns;" cells gradually losing their original circularity outwards and becoming even still more compressed, so as to present a reticulated appearance, in which the interstices are extremely irregular both in form and size; finally concealed under a thin *smooth* layer of amorphous substance which, where it has been chipped off, shows the subjacent reticulation.

Colour white, chalk-like, in accordance with the earthy granular composition of the matrix in the hand-specimen, which appears to consist chiefly of microscopic Foraminifera

in which the specimens of *Nummulites Mantelli* of all sizes are abundantly and horizontally imbedded. Size of largest specimens $13\frac{1}{2}$ -12ths inch in diameter and 1-24th inch thick.

Loc. Claiborne beds of Alabama, United States North America.

No. of specimen "50515."

Obs. In all the *Orbitoides* there is a marked difference between the form of the chambers of the central plane and those of the crust, which consists in the increasing irregularity of the horizontal outline in the latter outwards; while the chambers in the central part of a vertical section of the central plane present a rectangular form, on account of the section of this part passing through them tangentially.

Thus it will be seen that the Alabama fossil has no "columns" and possesses a cortical layer, which *therefore* has a *smooth* surface, while that of the Maestricht fossil *has* "columns" with a granulated surface, where the granules represent the outer ends of the columns, which therefore more nearly allies it to, although it is not identical with, the much larger species, viz. *Orbitolites Mantelli*, Cart., from Nal, in Jhalawan, to which I have alluded, in which the distance between the knobs or granules on the surface and their indistinctness, together with the size, seem to ally this species more to Gumbel's "*Orbitoides dilata*" among his *Lepidocyclina* (*op. cit.* p. 139, Taf. iv. figs. 45-47) than any of the rest.

I cannot say more, however, of his figure representing part of the structure of the central plane of this fossil (viz. fig. 46) than that it is almost identical with that given by Carpenter of the Alabama species ('Introduction,' pl. xx. fig. 5); for according to the position of the cell and its surrounding lines I learn from my large infiltrated specimen from Sind that it may be at one time circular in outline and at another subcircular, as represented by Carpenter and Gumbel respectively, that is, according to the position of the section, while the cells in the *fresh state* would appear to be all spheroidal.

P.S.—I regret to say that in correcting the "proof" of my last paper in the 'Annals,' viz. that containing a description of the large variety of *Orbitolites Mantelli*, Cart., var. *Theobaldi*, from Burma (vol. ii. p. 342, Oct. 1888), there were several errors which, on account of illness at the time, were overlooked, but fortunately none which interfered with the descriptive part of the communication; still as it is desirable that they should be noticed, I append the following list:—

At page 344, 17th line from top, for *Cithereamensis* read *Citherea promensis*.

At page 346, 4th line from top, for *Orbitolites* read *Orbitoides*.

" " 7th " " for Parisien read Sénonien.

" " 10th " " for ten read seven.

" " 12th " " for 1837 read 1840.

" " 6th " bottom, insert "only" after the brackets.

" 348, 7th " top, insert "*Orbitolites Mantelli* that I have described ('Annals,' *loc. cit.*) with that of " after "all the specimens of."

In the month of June, 1864, I deposited in the museum of the Geological Society of London the type specimens of my *Conulites Cooki* and *Alveolina meandrina*, described and illustrated in the 'Annals' of 1861 (vol. iii. pp. 331 and 381, and pls. xv. and xvii. figs. 7 and 4 respectively). I mention this here because I know of no others of the same kind that have been found or publicly noticed.

Note.—Since this paper was written I have had the pleasure to receive (viz. on the 9th November) some beautiful specimens of the "Nummulitic Beds" of Alabama charged abundantly, as usual, with the *Nummulites Mantelli*, Morton, from Mr. Anthony Woodward, of New York, for whose great generosity and promptness in thus replying to my request I shall feel lastingly indebted to him.

LIX.—*Description of a new Species of the Longicorn Genus Cyriocrates.* By C. J. GAHAN, M.A., Assistant, Zoological Department, British Museum.

Cyriocrates elegans, n. sp.

Niger, nitidus; capite minutissime et sparse punctulato, genis, vittis duabus frontis et mandibulorum basibus pallide cæruleis; prothorace antice (linea media excepta) pallide cæruleo, postice nigro, cum lobo mediano distincto; elytris nigris, chalybeatis, fere impunctatis, fasciis quatuor incompletis et macula rotunda utrinque ad apicem pallide cæruleis; corpore subtus lateraliter cæruleo-maculato; antennis cæruleo-griseo annulatis.

Long. 32 mm.

Hab. Ruby-Mines District, Upper Burmah.

Head very minutely and sparsely punctured; black, with a large spot on each cheek, the epistome, the base of the mandibles, and a short vitta on each side of the front pale blue. The sides of the prothorax in front of the lateral spines