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XXI.—On two new genera allied to *Loftusia*, from the Karakoram Pass and the Cambridge Greensand respectively

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The colour of the upper parts is brown, each side of the body being ornamented with a series of large dark-coloured triangles, the point of each triangle meeting that of the other side in the median line of the back. Lower parts whitish, with a series of large rounded black spots on each side and smaller ones of irregular shape in the middle. The upper part of the head is uniform black; a sharp line, which runs from the eye along the middle of the temporal scutes to the angle of the mouth, dividing the black coloration of the upper parts from the white of the lower.

This species is very remarkable not only on account of the rostral lobe, but also for the modification of the scutellation of its compressed tail. Although this modification cannot in any way be taken as an initial step in the development of the rattle of *Crotalus*, the rattle being a modification of the last dermal scute only into which the vertebral column is not prolonged, yet the tail of this species may exercise in a much smaller degree the same function as in the rattlesnake, and may be an instrument by which vibrations and sound are produced. It is well known also that many innocuous snakes are able to vibrate the extremity of their tail. To judge from its size and from the development of its poisonous apparatus this snake must be extremely dangerous.

Three specimens are in the collection, of which the largest is 46 inches long, the tail measuring $6\frac{1}{2}$ inches.

XXI.—On two new Genera allied to *Loftusia*, from the *Karakoram Pass* and the *Cambridge Greensand* respectively.
By H. J. CARTER, F.R.S. &c.

[Plate XIII.]

IN the month of December, 1887, Mr. W. Theobald, M.R.A.S., late Deputy Superintendent, Geological Survey of India, submitted for my examination six of the fossils commonly called "Karakoram stones," which were brought from the "Karakoram Pass," in the Karakoram range of mountains, North-east Kashmir, where they were collected by the late Dr. F. Stoliczka. Five of these are undoubtedly *Parkeriæ*; but the other, of which, unfortunately, there is only half, is totally different, and so very like *Loftusia* in composition, although not in form and structure, that (as will be seen hereafter) I have allied it to the latter and proposed for it the

term "*Stoliczkiella Theobaldi*," thus coupling two names well known in the Geological Survey of India.

To the five specimens of *Parkeria* I will more particularly refer hereafter; meanwhile let us proceed to the description of

Stoliczkiella Theobaldi, gen. et sp. n. (Pl. XIII. figs. 1-4.)
(Half the specimen.)

General form when entire (according to Mr. Theobald, who had it cut through the short axis into equal halves) a compressed spheroid; hence the outline of the half about to be described represents a hyperbola $1\frac{1}{4}$ in. high, with a nearly elliptical base, whose long axis is $2\frac{5}{8}$ in. and the short one $1\frac{1}{4}$; so that with these dimensions and Mr. Theobald's statement, viz. that the other half was the same in size, the entire shape of the fossil may be easily assumed (Pl. XIII. fig. 1).

Surface of this half remarkable for the presence of a star-like radiation in relief (fig. 1, *a*), of which the centre is on one side of the summit of the hyperbola, and thus eccentric, so that its axis would pass obliquely through the base; but whether this "eccentric" position is natural or caused by the situation of the sectional line or other circumstances, such as rock-contortion &c., the *half* fossil does not enable me to determine; again, the centre of the "star-like" radiation is oval in its circumference, with the long axis directed obliquely across the half fossil on one side of the summit, and this is all that can now be stated of its position with relation to the rest of the fossil when entire. This stelliform group consists of a great number of narrow lanceolate segments, in relief, which, radiating from a central point, vary in length and size under $\frac{1}{2}$ in. long, while they are shorter and more or less overlap each other about the centre, as they lie upon the convexity of the fossil, indicating that they have been successively developed (figs. 1 and 3). Beyond the ends of the "segments" of this stelliform portion come a great number of lozenge-shaped projections, more or less in juxtaposition, which seem to represent the external ends of internal "segments," and in their tessellated arrangement, circumscribed by obliquely intercrossing linear grooves, which separate them, simulate the surface of a fir-cone (fig. 1, *b*). These projections are only partially scattered over the surface, as they are interrupted by the presence of a large quantity of foreign material (fig. 1, *cc*), which in many places occupies so much of the fossil as to frequently insulate

the lozenge-shaped projections and thus destroy their continuity (fig. 1, *d*). In composition the segments consist of clouded, striated, granular calcspar of a grey colour; but there is a small fragment of polygonal cell-tissue near the centre (of which the divisions are 1-900th in. in diameter), which not only leads to the inference that the granulated condition of the calcspar composing the segments generally might have originated in this way, but points out that this can only be decided by a specimen where the structure generally is better preserved than in the present instance. On the other hand, the brown foreign material which intervenes between the projections and is composed of foraminiferal detritus also presents, where weathered, a granular character on the surface. So that, in fact, the form of the calcareous development may be said to be struggling to make its appearance through the foraminiferal detritus.

Turning to the *base* of the cone or half-specimen (fig. 2), we find that it presents an indistinct radial structure of the "segments," the axis of which is also eccentric and rather towards one end of the ellipse (fig. 2, *a*), on the surface of which the obliquely cut ends of the segments in juxtaposition here and there, of a lozenge-shape (fig. 2, *b*), indicate that the general structure of the fossil is foretold by that on the surface; while the whole is more or less cut up and thus obscured by the presence of the foraminiferal detritus, which not only separates the segments longitudinally in the form of straggling, unequal, thread-like accumulations, but traverses them in all directions in more or less delicate ones, swelling out here and there into larger masses as on the surface (fig. 2, *c c c*).

Thanks to the fine polish which the lapidary has given this basal plain, one can see by strong light, when well condensed and reflected, under microscopic power the minute elements of which it is composed, and these consist of the above-mentioned clouded grey calcspar and the brown foraminiferal detritus; the former pervaded by the faint remnants of what appears to have been a reticulated membrano-tubular structure, and the latter (as seen under the microscope) consisting of a yellowish substance of a tangled thready nature, infinitely divided dendritically and reticulatingly, like veined marble or frothy, filiferous protoplasm (fig. 4), densely charged with more or less broken-down tests of minute Foraminifera and a great number of opaque scarlet spherules (fig. 4, *b*), following the grooves between the "segments" and those circumscribing the lozenge-shaped projections on the surface, contrasting strongly in colour with the whitish-grey clouded calcspar. This appears to be identical with Brady's "accessory

structures" in *Loftusia persica*, which he has aptly compared to "a piece of fine sponge" (Phil. Trans. 1870, p. 745) —the largest foraminiferal test seen being discoid and about 1-164th in. in diameter (fig. 2 *d*) and the scarlet spherules about 1-1500th, but very variable in this respect, from circumstances which will appear hereafter.

As might be expected, the foraminiferal detritus presents a great number of minute and microscopic forms which appear to be chiefly discoid, among which are some like *Discorbina* and *Planorbulina*, wherein the great thickness of the marginal cord and ribs or intercameral septa is out of all proportion to the size of the cavities of the test; but they are one and all more or less broken down in a manner that evidences assimilative digestion; so that it becomes impossible for any one but an expert to say what their original forms were, and thus point out the families or genera to which they respectively belong; while fragments of the marginal cord and intercameral septa, often crossed by transverse striæ like the marginal cord and of tubular appearance, are plentifully scattered through the whole substance, which fragments might be mistaken for the remains of structure *proper* to the fossilized animal, were they not occasionally connected (that is a portion of the striated cord with a bit of the intercameral septum attached to it), so as to reveal their true nature.

But these fragments and the number of foraminiferal tests mixed up with the striated granules of calcspar and the tangled thread-like "yellow substance" produce a confusion of material in which it becomes difficult to distinguish the indistinctly marked "fragments" of the proper animal.

Still of all these parts the most interesting are the opaque scarlet spherules (fig. 4, *b*), which are not only so numerous scattered throughout the mass as in some places to give it a reddish hue, but appear in many instances *in* the chambers of the foraminiferal tests themselves (fig. 5), thus evidencing the source from which they were originally derived, as I shall more satisfactorily show in the "Observations" that will be appended to this description; while in many places they may be seen in linear or reticular arrangement indicative of having been in a tubular structure or investment of the yellow substance, although nothing but the faintest tinge of this remains, so that it might have been no more than a simple line of protoplasm (fig. 4, *a*).

Loc. Karakoram Pass, Karakoram range of mountains. "The so-called 'Karakoram Stones,' *i. e.* corals, occur in dark shales below the limestone, which are capped by a yellowish limestone, well bedded, but of unascertained age:"

such is the only remark that accompanied them, which is extracted from the late Dr. F. Stoliczka's diary, made on the "17th June, 1874," barely two days before his death, for which he was then sickening ('Scientific Results of the Second Yarkand Mission,' published by order of the Government of India, Calcutta, 1879). Would that he had lived to have written more!

Obs. With only half the fossil it may at first appear presumptuous to endeavour to establish a new genus, but with the above data it will appear to those who are acquainted with the structure and composition of *Loftusia persica* to be otherwise; at the same time, if this be objected to, then we must regard the description as "provisional," for under no other circumstances can the facts connected with this apparently unique specimen be recorded.

It may be learnt from the above statements that the fossil is composed to a great extent of foraminiferal detritus or sea-bottom, and thus it may be assumed that the Foraminifera were taken in by the animal for nutritive purposes; while the whole is totally different both in general form and internal structure from any species of Foraminifera that has been made known.

Comparing its composition with that of *Loftusia persica*, it will be found that the two are almost identical; thus, setting aside the misleading resemblance to *Alveolina* &c. in outward form and the "lamino-spiral" development in *Loftusia persica*, we have absolutely nothing left to identify it with *Alveolina* or any other evident form of Foraminifera; while the difference in size of the largest recorded specimen, viz. 3 in. long by $1\frac{1}{2}$ in. broad, so far exceeds that of any known specimen of the Foraminifera, that it alone is almost sufficient to negative such a supposition. Hence there can be no objection on this score to allying the Karakoram fossil to that of Persia, viz. *Loftusia persica*, on which account it becomes necessary to create a new family for *Loftusia persica* and *Stoliczkiella Theobaldi* that may be termed "Loftusiidæ."

It is not my object here to go at length into the minute structure of *Loftusia persica*, for that has been described and illustrated by Mr. H. B. Brady, in the 'Philosophical Transactions' for 1869 (vol. clix. p. 739), in a way which does not require repetition; but there are one or two points in connexion with *S. Theobaldi* which are of great interest as bearing not only upon the identity of composition in *Loftusia persica* and *Stoliczkiella Theobaldi*, but on the propagative elements of the Foraminifera generally; I allude more particularly to

the presence of the "opaque scarlet spherules," which are as abundant in *L. persica* as in *S. Theobaldi*, and to be seen in both in the chambers of foraminiferal tests (from which they all originally come) as well as dispersed through the substance of the body generally (figs. 5, *a*, and 4, *b*). I could not specify the kind of test in which they appear in *S. Theobaldi*, for the fragments are too much broken down for recognition; but in the microscopic slice of *Loftusia persica*, about 2 in. long by 1 in. in diameter, which Mr. H. B. Brady, F.R.S. &c., kindly gave me several years ago, the instances are both clear and numerous, among which I have marked one for observation of a discoid form in which four or five of the chambers respectively present an opaque scarlet spherule (fig. 5), and another, a *Textularia*, in which ten of the chambers on one side and upwards of the same number on the other each present an opaque scarlet spherule; so that there can be no doubt whatever that in both *S. Theobaldi* and *L. persica* the opaque scarlet spherules come from the chambers of foraminiferal tests, as above stated, and thus are to be regarded as foreign material in both respectively. And here the difference in size of these scarlet spherules, to which I have already alluded, may be explained, viz. by the spherule when large often presenting the appearance of being composed of a great number of much smaller ones of the same kind in a spherical capsule; so that the scarlet mass, both in the chambers and out of them, may not only when breaking up present an irregular form, but the opaque scarlet body may vary very much in diameter.

That these scarlet bodies are reproductive particles may be learnt from what Max Schultze described and illustrated in recent species in 1854 and 1857, all of which was summarized and illustrated by Dr. Carpenter in 1862 ("Introduction to the Study of the Foraminifera," Ray Soc. Publ. p. 37 &c. and pl. xiv.), while all was confirmed by myself, not only in recent but in fossil forms, in 1861 ('Annals,' vol. viii. pp. 318, 325, and 451, pl. xvii. figs. 12 and 13, 14 and 15, and 1, *o*, respectively).

The beautifully infiltrated specimens by which the latter was confirmed I have still by me, for at the time they were obtained, now thirty-six years ago, I ground down their surfaces, covered them with balsam, and attached them to glass slips, through which their minute structure, from its brilliant colours and clear definition, can even now be seen not only as well as ever, from its imperishable nature, but more satisfactorily than in the recent specimen, the shell-structure remaining pure opaque white, the tubular structure

between the chambers being filled with bright ochraceous yellow matter, and the opaque scarlet spherules in the chambers of the central plane—especially brilliant in *Orbitoides dispansa*, but less so in *Nummulites Ramondi*, from not being so highly coloured (that is, rather brownish), and being imbedded in the clear calcspar filling one of the central plane of chambers, where they are also a little translucent and separated—look like the “roe of a herring;” so that, but for these specimens, I should never have realized the nature of these bodies either in *Stoliczkiella Theobaldi* or *Loftusia persica*. I have already alluded to the fragments of marginal cord and intercameral septa scattered throughout the body-substance of both these specimens, in which, from the absence of striæ on the calcspar in the microscopic slice of *Loftusia persica*, they are much more evident than in the Karakoram specimen, where, on the other hand, all the grains of this mineral are striated (that is, present the lines of cleavage), and thus by intercrossing more or less obscure their outlines.

At this period I received from my kind friend Dr. J. Millar, F.L.S. &c., several specimens of *Parkeria* that had been obtained from the Cambridge Greensand, both massive and in their microscopic sections, among which was one (noticed by Dr. Millar as different from the rest) which proved on examination to be a species of *Loftusia*, but so unlike *Loftusia persica* and *Stoliczkiella Theobaldi* that it must form the type of a *third* genus of the family Loftusiidæ, for which I would propose the name of “*Millarella*,” and for the specimen that of *Millarella cantabrigiensis*, after the friend who gave it to me and the locality from which it was obtained*.

Millarella cantabrigiensis, gen. et sp.n. (Pl. XIII. figs. 6–8.)

General form subspherical, with a small, irregular cup-like, shallow excavation about 4-8ths of an inch in diameter at one end (? accidental)†. Consistence hard and earth-like, *not* crystalline. Surface very rough and irregular, unevenly granular throughout. Granulations of three sizes, viz. small, minute, and microscopic, the former of a brown colour charged

* I was writing this paper, viz. about the 8th January, 1888, and on the 19th, after eleven days' illness of bronchitis, Dr. Millar died. Then lost Natural History one of her ablest advocates and I one of my best and dearest friends!

† This now appears to have been the place where the organism was originally attached to some submarine object (see concluding part of footnote, p. 181).

with foraminiferal detritus, the minute dark green particles consisting of glauconite, and the microscopic ones of fine white silico-calcareous sand, in which the others are imbedded. From the margin of the cup-like excavation there is an indistinct linear radiating arrangement of the larger granulated projections, which extends for a short distance outwards, where it becomes lost among the irregular granulations of the surface, which is amorphous, that is, *without any pattern*.

Internally the composition is the same, only the detail rendered more evident by the polished surfaces of the pieces and the mounted microscopical section, where the "brown-coloured" material is seen to be literally *crammed* with foraminiferal detritus, consisting of minute foraminiferal tests of various forms and sizes, chiefly *Globigerina* and *Orbulina* (?*Globigerina*-ooze) more or less broken down (fig. 8), in some of whose chambers may be seen glauconite (fig. 8, *dd*) and in others the opaque scarlet spherules above mentioned (fig. 8), the instances of the latter being so numerous and the dispersed spherules (fig. 8, *g*) so abundant in some places as to impart a red tint to the surrounding material; also various forms of sponge-spicules (fig. 8, *c*) and a large quantity of (comparatively large) glauconite grains (fig. 8, *e*), which, from what has been just stated, appear to originate in the chambers of the foraminiferal tests, although from subsequent segregation they often present no particular form. I also notice in many places little masses of material like the frothy yellow substance described in *Stoliczkiella Theobaldi*, only of a white colour, looking like the broken-down remains of germinal tests about to be assimilated or discharged.

As regards structure, all that can be learnt from the sections is that, on the surface of the transverse one close to the "cup-like excavation," the material is so condensed in the centre as to occupy a circular space about 3-12ths in. in diameter, which is continued upwards through the axis of the fossil, extending outwards in a less condensed state, and then followed by a great number of little pits or vacuities (interstices of a reticulated structure, figs. 7*b* and 8*a*), which, although very irregular both in size and position, shadow forth a tendency to circumscribe circular divisions of more condensed material, each about 1-16th in. in diameter (the pits and the condensed material corresponding with the large granulated projections on the surface of the fossil and their intervals). A little higher up (that is, in the centre of the fossil) the mounted microscopic section presents the same characters without any appearance of "axial condensation;" that is, the "circular divisions" are continued to the centre, about which

they are much more defined and uniform (fig. 6, *a*), but lose this again towards the circumference, where the linear disposition of the "pits" (fig. 6, *b*) tends to indicate that they are transverse sections of a columnar structure which on all sides bends outwards towards the circumference. This radiation is more particularly shown by the surface of the section through the line of union between the seventh and eighth parts of the fossil in this direction, of which the eighth part or crown is unfortunately absent, while the other parts when all put together give the "subspherical" form mentioned.

When the mounted microscopic slice from the middle is viewed through a $\frac{1}{4}$ -inch focus the circular spaces or divisions are seen to be united by intercommunicating extensions (fig. 7, *b b*) of the more condensed brown material, which, being without the foraminiferal detritus, and thus better seen, becomes resolved, under a power of five hundred diameters, into minute brown granules. I should also have mentioned, however, that in the midst of the foraminiferal detritus there are the remains of a fungoid matted structure, only extremely fine and minute, composed of white, opaque, apparently solid, branched, interunited and tortuous filaments, about 1-3000th in. in diameter, which thus also ought to have been inserted among the elements represented in the illustration, fig. 8. Size of fossil, when all the parts are put together, about $1\frac{1}{2}$ in. in diameter, and, as before stated, subspherical in shape, or like that of a *Parkeria**.

* I have also three other specimens from the Cambridge Greensand, of the same nature as *Millarella*, in which this fungoid filamentous structure is more or less evident, viz. :—1, about $\frac{3}{4}$ in. in diameter, globular, with uneven earthy surface, composed of white chalky substance charged with the usual foraminiferous detritus and permeated by a meandering, defined, tortuous structure of a yellowish tint, entirely made up of the same kind of filament as that noticed in *Millarella*, forming altogether in amount about half as much as the white chalky substance; 2, another specimen about the same size and similarly composed, but in which the meandering development is not evident and the filamentous structure not so plain, while the surface is regularly tuberculated with a brown material, which appears to be nothing more than a condensed or hardened state of the foraminiferal detritus of the interior, so that difference in fossilization may have to be taken into account in these instances; and 3, a specimen which forms the nucleus or support upon which a Parkerian structure has been built. This consists of a slightly fusiform, conical, solid cylinder, in composition like the last specimen mentioned, about $1\frac{1}{4}$ in. long and 9-24ths in. in its greatest diameter, conical at one end and obtuse at the other, which appears to have been broken off from an original attachment. Be this as it may, however, this cylindrical form has been overgrown by a Parkerian development on all parts except the extremities, viz. the conical and the obtuse ends, to the extent of half an inch, so that until the spheroidal mass thus produced was cut through the whole looked like a globular *Parkeria*. Hence it is interesting to find

Loc. Cambridge Greensand.

Obs. Although in general form this fossil might be easily mistaken for a *Parkeria*, the total absence of all distinct tubuliferous structure both externally and internally, together with the quantity of foraminiferal detritus in its composition, is quite sufficient to point out the difference. I have alluded to the presence of glauconite in the chambers of some of the foraminiferal tests, and inferred that all the particles of this mineral originated in this way, although, when increasing in size, assuming forms which are totally unlike a foraminiferal test; but that they are so may be learnt from an examination of the green particles generally of the "Greensand,"—to which it is curious to add that this is going on at the present time in the Globigeriniferous sand of the bed of the Atlantic (see "Deep-sea Sponges dredged on board H.M.S. 'Porcupine,'" 'Annals,' 1876, vol. xviii. p. 474, under "Black Grains"); while it is also remarkable that glauconite is altogether absent in my specimens of *Loftusia persica* and only seen in very small quantity in *Stoliczkiella Theobaldi*.

What the nature of the animal of the Loftusiidæ may have been it is difficult to conjecture further than that, in all three genera, it must have had the power of enclosing foreign material like the *Amæba*, and therefore its substance must have been rhizopodous, hence the absence of all wall indicating tubulation. Again, the broken-down forms of the tests might have been both for nutriment and skeletal purposes. The rhizopodous character of both Sponges and Foraminifera afford examples of this, *ex gr.* my genus *Holopsamma* ('Annals,' 1885, vol. xv. p. 211) and the arenaceous foraminiferal tests, in both of which the plasmic sarcode or protoplasm builds up foreign material into the specific form which the apparently identical simple substance is destined to produce. But here all identification of the Loftusiidæ with the Sponges and typical Foraminifera seems to cease, although there is a great resemblance between Brady's "*Syringamina fragillissima*" ('Challenger' Report on Foraminifera, vol. ix., text, p. 242) and *Millarella cantabrigiensis*, especially in illustration "*a*," but not in the tubular structure "*c*" (woodcuts), so that we must look still further for a nearer analogy.

Undoubtedly the same sarcodic structure in *Loftusia persica* which took in foreign material presents in the fossil a

that the *Parkeria* not only grew upon the *Millarella*, but that the latter presents signs in its obtuse end of having originally been attached to some submarine object, which would seem to be not uncommon, for there are three more instances of it in my cabinet.

membrano-tubular-labyrinthic structure (see Brady's illustration, *l. c.* pl. lxxix. figs. 1-3), remnants of which can, I think, be faintly seen in the more confused substance of *Stoliczkiella Theobaldi*, but not in *Miliarella cantabrigiensis*, where the brown substance alone represents the form *without any wall*. But larger fragments of foraminiferous tests in the two former and longer sponge-spicules than the diameter of the sarcodic divisions in the latter exist as in sponge-tissue after it has become *hardened*; so that one might infer that when they were taken in this tissue was in a plastic amoeboid state. And therefore all that I can conjecture of the nature of the animal substance of the Loftusiidae is that it was a solid plasma, like that of the *Æthalum*, which, during its *active* state, is capable of assuming every form, massive and reticulate, that can be conceived, at the same time that it can and does take in any particles of foreign material that suit its purpose; while, like the other Myxomycetes which present apparently the *same* simple protoplasmic substance during their active life, each protoplasm is destined to end in the specific form which it was intended to develop.

PARKERIA, Carp., 1869.

With reference to *Parkeria* I would only add, after the excellent paper written by Prof. H. A. Nicholson on this fossil ('Annals,' Jan. 1888, p. 1 &c.), that as there appears to be more than one British species and Prof. Martin Duncan in his Memoir makes of those from the Karakoram Pass which he examined several species and two genera ('Scientific Results of the Second Yarkand Mission,' Calcutta, 1879, p. 10), it seems to me, as with *Loftusia persica* of Brady, 1879, desirable that it should have a family name, for which I would propose "Parkeriidae," which, being but a patronymic of Carpenter's "*Parkeria*," established for that species and genus in 1869, when he published his beautifully illustrated description of this fossil in the 'Philosophical Transactions' (vol. clix. p. 721), should take precedence of Duncan's "Syringosphaeridae" of 1879 (that is ten years after), established for the "Karakoram Stones," which we now know to be *Parkeriæ*, not only from what Prof. Nicholson has stated from ocular demonstration ('Annals,' *l. c.* p. 11), but from what I have learned from an examination of the five specimens of these "Stones" mentioned at the commencement of this paper, some of which are identical with Prof. Duncan's representations.

I cannot agree with Prof. Nicholson in his statement that

the "tubuli" do not present any "transverse internal partitions," as I have a polished section of *Parkeria* which Dr. Millar gave me, on which, here and there, these appear to me to be distinctly evident, and in a section through the centre of one of the *Parkeriæ* from the Karakoram Pass I also distinctly saw one in a portion of the tubuliferous structure which had been raised above the polished surface by etching with dilute nitric acid, while at the same time I could see nothing in this section particularly different from that of *Parkeria*, Carp, except that the lapidification is much more compact and crystalline and that there is an appearance of a darker, tree-like portion branching from the centre to the circumference, which seems to arise from the presence of the bundles of longer-tubed structure having been bent into this form, also seen, but in a straighter one, in the same kind of polished section of the Cambridge *Parkeria*.

It is also worth noticing that *Loftusia* and *Parkeria* are found together both in the "Greensand" of Cambridge and at the Karakoram Pass, in Asia.

*Provisional Characters of the Families Parkeriidae
and Loftusiidae.*

Parkeriidae.

Minute or basal structure consisting of tubuli intercommunicating freely with each other in juxtaposition, pierced by larger tubes (the zooidal tubes of Nicholson, *l. c.*), which radiate from the centre to the circumference. Specimens generally nucleated by, or growing upon, a foreign body.

Loftusiidae.

Minute or basal structure consisting of a *quasi*-membranolabyrinthic, hollow, reticulated fabric charged with foraminiferal detritus.

EXPLANATION OF PLATE XIII.

Fig. 1. Stoliczkiella Theobaldi, nat. size. Half the specimen. Lateral view, showing:—*a*, stelliform group of segments on the surface; *b*, external ends of internal segmentation; *c c*, foraminiferal detritus; *d*, insulated ends of internal segmentation; *e*, portion of fossil broken out.

Fig. 2. The same. Base, nat. size. *aa*, lines of segmentation; *b*, lozenge-shaped ends of truncated segments; *c c c*, foraminiferal detritus represented by the dark shade; *d*, discoid foraminiferal test.

- Fig. 3.* The same. Outline of the group of segments on the surface, nat. size. Drawn to measurement as if flat.
- Fig. 4.* The same. Portion of the yellow froth-like substance, greatly magnified. *a*, thread-like extension of the same branched and more or less charged with the opaque scarlet spherules in line; *b*, scarlet spherules dispersed. Diagrammatic.
- Fig. 5.* Discoid foraminiferal test, much magnified, showing scarlet spherules in the chambers. *a*, spherule. From a microscopic mounted longitudinal section of *Loftusia persica*. Nat. size of test 1-164th inch in diameter. Diagrammatic.
- Fig. 6.* *Millarella cantabrigiensis*. Microscopic slice from the centre of the specimen, nat. size, indicating the transverse diameter of the fossil. *a*, structure in the centre, composed of more or less circular divisions interuniting circumferentially by extensions of the same material; *b*, pits or vacuities indicating the intervals between the "extensions" where the "circular divisions" are not well-defined.
- Fig. 7.* The same. Portion of the centre, much magnified, to show the mode of union of the circular divisions by the intervening "extensions (reticulated structure)." *a*, circular division; *b*, intervening extensions. Diagrammatic.
- Fig. 8.* The same. Circular division, still more magnified, to show the character of the foraminiferal detritus with which it is charged. *a*, "intervening extensions (reticulated structure);" *b b*, foraminiferal tests; *c*, sponge-spicules; *d*, discoid test, whose chambers are filled with glauconite; *e*, amorphous portion of glauconite; *f*, test in whose chambers respectively there is a scarlet spherule; *g*, dispersed spherules.

XXII.—*Description of a new Earth-Snake of the Genus Silybura from the Bombay Presidency, with Remarks on other little-known Uropeltidæ.* By GEORGE E. MASON.

Silybura Phipsonii, sp. n.

Head smaller than in *S. nilgherriensis*; snout rather pointed, rostral shield nearly twice as long as the vertical and one third the length of the head, convex above, produced back but not separating the nasals; frontals somewhat smaller than nasals, broad below, very narrow upwards and only just meeting in front of the vertical; eye rather large, lying in the front of the ocular shield and occupying a third of its size; vertical diamond-shaped, longer than broad; caudal disk flat, not well defined, twice as long as broad; the terminal scute large, broad, and rough, moderately bicuspid, the caudal scales prominently 2-4-keeled; no chin-shields between the first pair of lower labials and the ventrals; scales in 17 rows round the middle of the body and