

Trans. xiii. 58, tab. 6. fig. 2.—In India orientali: *v. s. in herb. Soc. Linn.*, Wall. Cat. 4957 B, C, D, E, F; *in herb. variis a multis locis*.

3. *Holopeira auriculata*, nob.—In India orientali: *v. s. in herb. Lemann.* (ex hort. bot. Calc. cult.).
4. ——— *torrida*, nob.—In Africa tropicali: *v. s. in herb. Hook.*, Africa occidentali (Cunon); Shire, Zambesi (Kirk).
5. ——— *lonchophylla*, nob.;—*Cocculus Ferrandianus*, *Seem.* (non *Gaud.*) *Fl. Fiji.*—In insulis Sandwich: *v. s. in herb. Hook.* Hue-hue (Hildebrand), Ohahu (Seemann, 2281).
6. ———, *fecunda*, nob.;—*Cocculus hexagynus*, *Ham.* (non *Roxb.*)—Forsan ex India orientali: *v. s. in hort. Kew. cult.*
7. ——— *laurifolia*, nob.;—*Menispermum laurifolium*, *Roxb. Fl. Ind.* iii. 815;—*Cocculus laurifolius*, *DC. Syst.* i. 530, *Prodr.* i. 100; *Deless. Icon.* i. t. 97; *Coleb. Linn. Trans.* xiii. 65; *Hook. & Th. Fl. Ind.* i. 191.—In India orientali: *v. s. in herb. Soc. Linn.*, Wall. Cat. 4965 A, B, C.
8. ——— *australis*, nob.;—*Menispermum Australe*, *Zucc. MS.*—In Japonia et Java: *v. s. in herb. Lindl.*, Japonia (Siebold, anno 1840), in hort. Monach. cult. sub nom. *Zuccarinio imposito* (*Menispermum Australe*); *in herb. DeCand.*, Java, ♂ (Zollinger, 1640), ♀ (Zollinger, 3184); *in herb. Hook.*, Japonia (De Vriese), Java (Lobb), *ibid.* (Horsfield, 245).
9. ——— *fusiformis*, nob.—In Java: *v. s. in herb. Mus. Brit.* (Horsfield).

[To be continued.]

VI.—On the Perforate Structure of the Shell of *Spirifer cuspidatus*. By WM. B. CARPENTER, M.D., F.R.S.

To the Editors of the *Annals and Magazine of Natural History*.

GENTLEMEN,

I read with much surprise in your Number for August last (p. 144) the statement, quoted from 'Silliman's American Journal' for May, to the effect that Mr. Meek had ascertained the shell of *Spirifer cuspidatus*, not only in American specimens referred to this species, but in an Irish specimen received by him from Mr. Davidson, to be "clearly punctate, contrary to the decision of Dr. Carpenter."

My determination of the imperforate character of the shell of that species was made, some twenty-five years ago, upon specimens obtained from St. Vincent's Rocks, near Bristol (where I was then residing), and authenticated by Mr. S. Stutchbury. In my Report to the British Association (1844, § 44),

I pointed out that the *Sp. cuspidatus* of the Mountain Limestone differs from *Sp. Walcotii* and other Liassic Spirifers in not being perforated,—the absence of the superficial punctations seen upon the latter not being due (as Prof. Morris had supposed) to the metamorphic condition of the shell, “since, although the structure of the shell is often obscured by this action, I possess sections in which it is extremely well preserved, and in which there is an evident *absence of the perforations*.”

The distinction which I thus drew between the two groups of *Spirifers* characterized respectively by the perforation and non-perforation of their shells, led Mr. Davidson to a more careful examination of the internal structure which they respectively present; and the differences which he then discovered were such as to lead him to separate these two groups generically, the designation *Spirifera* being retained for the original *Sp. striata*, *cuspidata*, and other imperforate species, whilst the perforated species were remitted to the genus *Spiriferina*.

The question as to the real character of *Sp. cuspidata* having thus come to be of no small importance, I have gladly responded to the suggestion of Mr. Davidson that I should re-investigate it; and I have commenced with a careful examination of my original Bristol sections. These, I again confidently affirm, show not the slightest trace of perforations, though the structure of the shell is well preserved.

I have obtained from the School of Mines, through Mr. Etheridge, and from the Museum of Irish Industry and that of the Geological Survey of Ireland, through Mr. W. H. Baily, chips of specimens from six different localities, all which specimens are vouched for by those gentlemen as genuine *Sp. cuspidata*. In not one of the sections I have made of these shells is there the smallest trace of perforations, though the structure of the shell is well preserved in every instance.

Further, at the suggestion of Mr. Davidson, I have examined chips from the shells of the following Carboniferous species, all of them more or less nearly allied to *Sp. cuspidata*: viz., *Sp. laminosa* and *Sp. distans*, procured for me by Mr. Etheridge from the Museum of the School of Mines; and *Sp. subconica*, kindly transmitted by Mr. Carrington from Derbyshire. These, like *Sp. cuspidata*, show no trace whatever of perforations.

I cannot but believe, therefore, that my original determination of the imperforate character of the shell of *Spirifera cuspidata* remains unshaken by Mr. Meek's contradiction; and I can only suppose either that Mr. Meek (like Prof. King*) has mistaken the accidental black points which often present themselves on

* See his ‘Permian Fossils of England,’ pp. 124, 125, and p. 110, note.

the surfaces of these shells for the punctations indicative of true perforations, or that (as he himself suggests) his punctated shell, though resembling *Sp. cuspidata* in external characters, really belongs to a different genus. I trust that I shall be able, ere long, to clear up this part of the question, Mr. Davidson having written to request that Mr. Meek will send me chips of his punctated *Spirifera*, and that Prof. Winchell will send me chips of a shell belonging to his genus *Syringothyris*. When I shall have examined these, I shall report to you the results without delay.

I remain, Gentlemen,
Your obedient Servant,
WILLIAM B. CARPENTER.

P.S.—Mr. Davidson permits me to add the following extract from a note which he has written to me after perusing the above:—"I have always placed the most implicit reliance on your admirable observations on the shell-structure of the Brachio-poda, and therefore, as far as I am personally concerned, would not have required the additional confirmation given by your recent researches; but I am not sorry that you should have again investigated the matter, as it can but strengthen the value of your discoveries,—and the more so, as I have always found this shell-structure to be combined with internal modifications, so that *a perforated species could not be generically the same as an imperforate one*. This has now been observed in so many instances, that the supposed exceptions brought forward by Messrs. Meek and King are, no doubt, the result of incorrect observation. To make this clear to the public was therefore a matter of some importance, and I am very glad you have done so."

University of London, Burlington House.
Dec. 10, 1866.

VII.—*On the Correlation of the Lower Lias at Barrow-on-Soar, in Leicestershire, with the same Strata in Warwickshire, Worcestershire, and Gloucestershire; and on the occurrence of the remains of Insects at Barrow and in Yorkshire.* By the Rev. P. B. BRODIE, M.A., F.G.S.*

As my friend Professor Jukes has already described the Lower Lias at Barrow and the neighbourhood in Potter's Charnwood Forest, it will merely be necessary thus briefly to refer to his account; but I shall draw attention to one section not given by

* Communicated by the Author, having been read at the Meeting of the British Association in Nottingham, August 1866.



Carpenter, William Benjamin. 1867. "VI.—On the perforate structure of the shell of *Spirifer cuspidatus*." *The Annals and magazine of natural history; zoology, botany, and geology* 19, 29–31.

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