branches of Lindley and Hutton's original species of *Halonia*. Mr. Dawes considered the alternate branches to be merely the impressions of the tubercles which characterize the other species of *Halonia*. The specimen I here figure shows that these lateral branches attained to some length. In none of them is the natural termination shown. The size and form of the scars at the broken ends indicate that the branches were prolonged.

EXPLANATION OF PLATE VII.

- FIG. 1. Stem of *Bergeria* giving off a branch of *Halonia regularis*, Lindl. and Hutt. Drawn, two-thirds the natural size, from a specimen presented by Sir Ph. de M. Grey Egerton, Bart., to the British Museum.
- FIG. 2. Internal cast of *Halonia regularis*, in the condition to which Goldenberg gave the name *Cyclocladia*. Two-thirds nat. size. From a specimen in the Brit. Mus.
- FIG. 3. *Halonia regularis*, with the leaf bases and scars of *Lepidophloios*. Natural size. From a specimen in the British Museum.
- FIG. 4. One of the tubercles from Fig. 3, showing the persistent bases of the leaves surrounding the tubercle.

II.—NOTE ON *PTERASPIS KNERI*.

By MAGISTER FR. SCHMIDT,

Of the Imperial Academy of Sciences, St. Petersburg.

IN the course of last summer I visited the banks of the Dniester, in Podolia and Galizia, where I was fortunate in collecting, near Zalesczyki, a number of shields belonging to *Pteraspis* (*Scaphaspis*) *Kneri*, Lank.

As I observed that the shields of *Pteraspis* and *Scaphaspis* always occurred together, I was led to the conclusion that these shields might, in all probability, belong to one and the same animal, *Scaphaspis* representing the ventral shield of *Pteraspis*¹ in the same manner as in the genus *Coccosteus*, which possesses both a dorsal and a ventral shield.

Diagrams of the Shields of the several Genera of HETEROSTRACOUS CEPHALASPIDÆ (after Lankester).

Fig. 1. *Scaphaspis*.

Fig. 2. *Cyathaspis*.

R = Rostrum, or Rostral region. C = Cornua. D = Central disc, or Discal region. S = Posterior spine. O = Orbits.

Fig. 3. *Pteraspis*.

[In order to render Prof. Schmidt's views more clear to the readers of the GEO-

¹ See the "Placodermen des Devonischen Systems," by Pander, p. 4.

G.L. Griesbach

Mintern Bros. imp.

Microscopic Crystals Observed by Prof. Hull in the
Trap-rocks of Limerick.

LOGICAL MAGAZINE, we have reproduced the above diagram woodcuts from Mr. E. Ray Lankester's excellent monograph on "The Fishes of the Old Red Sandstones," Pal. Soc. Mon., vol. xxi., 1868, part i. p. 15.—EDIT. GEOL. MAG.]

This opinion has been greatly supported by the late Dr. A. Künth (Zeitschrift d. Deutschen Geol. Gesellsch., 1872, p. 1), who found *Pteraspis* (or *Cyathaspis*) in one piece, together with *Scaphaspis*.¹

But I cannot agree with Künth, who thinks that *Pteraspis* belongs to the CRUSTACEA! nor with Eichwald, who supports the old notion of Kner, that *Scaphaspis* is the bone of a Cephalopod.

Pteraspis Kneri occurs in the uppermost Silurian beds of Galizia, associated with *Leperditia*, *Beyrichia*, *Tentaculites ornatus* and *tenuis*, *Orthonota rotundata*, *Pterinea retroflexa*, etc. It is also very abundant in the Red Marls and Sandstones covering the Silurian Limestone. These sandstones represent the lowest stratum of the Old Red Sandstone, and contain, besides *Pt. Kneri*, remains of *Pterygotus* and pieces of ornamented tuberculated shields very much resembling those of *Pterichthys* and *Coccosteus*. I am satisfied that there exists in Galizia an unbroken succession of Animal life from the Uppermost Silurian strata to the Lowest Devonian, just as is the case in the West of England, in Herefordshire. (See Murchison's "Siluria," 1867, p. 243.)

In perusing the valuable Memoir by Mr. Ray Lankester (in vol. xxi., 1868, and vol. xxiii., 1870, published by the Palæontographical Society), I was sorry to observe that a former article of mine on the Russian Cephalaspidians (Ueber *Thyestes verrucosus* und *Cephalaspis Schrenkii*, in Verhandlungen der Kaiserlichen Mineralogischen Gesellschaft, St. Petersburg, 1866) had been overlooked by him. In that article I established the new genus *Tremataspis*, which, to some extent, connects by its microscopic structure the genera *Cephalaspis* and *Pteraspis*.

I regret that I have not any separate reprints of that article remaining, or it would have afforded me much pleasure to forward a copy to the author of "The Fishes of the Old Red Sandstone," but doubtless the "Verhandlungen," etc., exists in the Library of the Geological Society of London, to which I beg leave to refer Mr. Ray Lankester.

III.—ON THE MICROSCOPIC STRUCTURE OF THE LIMERICK CARBONIFEROUS TRAP-ROCKS (MELAPHYRES).

By PROFESSOR EDWARD HULL, M.A., F.R.S.

(PLATE VIII.)

[Read before the Royal Geological Society of Ireland, 12 March 1873.]

DR. MACALISTER, in his able Presidential Address, has furnished the Society with a summary of the work done, principally by German petrologists, with the object of determining the mineral constitution and structure of plutonic, metamorphic, volcanic, and other rocks, by the aid of the microscope. Forbes, Sorby, and Allport amongst ourselves have also represented British petrologists in the same field, but perhaps have not been sufficiently forward in giving

¹ For Mr. Lankester's reply to Dr. Künth's paper (extracted from the *Academy*) see *infra*, p. 190.