had very decided bony crutches as a modification of its pectoral fins ; and therefore I think we need not reject such a supposition too hastily in the case of *Pteraspis*. We have not yet been able to refer all the bony defences (*Onchus*, as they are called) which abound in the Ludlow bone-bed, the Downton Sandstone, and the fish-beds of the Old Red, to Placoid fish ; and we may yet be led by these few tracks on sandstone to look out for such adjuncts to the fore limbs of Cephalaspidæ.

At least, all I can say is, that if *Pteraspis* had not such a bony crutch, I do not see how he could make such an impression on the sand ; and if my impression is not a correct one, I cannot offer a better, nor suggest what aquatic or amphibious creature could possibly produce successive impressions of the form and direction I have shown to occur in these, unless it were *Pteraspis*, or the Acanthodian or Squaloid fishes before mentioned.

And now comes a very interesting point in proof that these imprints were made by fishes. If the water were not quite deep enough to float the animal (and that it was not, in the case of track A A*, is certain), then the stroke made by the leaning side must necessarily be shorter and somewhat deeper, and the fin itself behind the defence would touch the ground. In proof that these imprints (fig. 1) are the records of a struggle to attain the water, I need only refer to the specimens (which are placed in the Society's museum), where, on the back of slab 1, the weight of the instruments has been such as to indent the sand for more than half an inch, and to penetrate into a layer below, which is, of course, not seen in this specimen.

I owe the recognition of this circumstance to Prof. R. Owen, whose acumen in determining track-markings is almost an instinct ; and to whom I showed the slab, telling him that I had come to the conclusion it was made by a fish (*Pteraspis*), and could be made by nothing else. His reply was very characteristic ; for, turning up the back of the slab, which I had neglected to do, he at once pointed out the depth of the two impressions, which must have been made when the creature was struggling on the shore ; and though he did not hastily adopt my conclusion, he at least convinced me that, if the track was made by a fish, it was a fish out of water.

4. On a NEW LINGULELLA from the RED LOWER CAMBRIAN ROCKS of ST. DAVIDS. By J. W. SALTER, Esq., A.L.S., F.G.S., and H. HICKS, Esq.

Fossils in the red Cambrian rocks are so rare, that no apology seems due for introducing a single small specimen, lately gathered, after great research, by one of the authors of this paper. The search has been systematically pursued since 1862, when the first fossil of the Menevian group was described by Mr. Salter from this neighbourhood ; and the labour has chiefly fallen upon Mr. Hicks, who resides at St. Davids. He has literally not left a stone unturned to find the

true place of *Oldhamia*, and, if possible, of the mythical *Palæopyge*, in these old red rocks. He has been rewarded, during the search, by many additions to the Menevian fossils, found at successively lower and lower horizons, in the grey rocks which form the passage from the Lower to the Upper Cambrians. But, until quite lately, not a vestige had occurred to him in the actual red rocks themselves.

The fossil is but a small one, a line and a half long; but it is unquestionably a *Lingulella*, and apparently of the same species as one very common in the lowermost of the layers which have yielded *Paradoxides*, and the fossils of which will be described in our next memoir. With the *Paradoxides Hicksii*, Salter (the species formerly published in *Siluria*, 2nd edit., as *P. Forchammeri*?), several species of shells, Brachiopod and Pteropod, occur—and among them a *Lingulella*, of which figures and a description are appended, and which appears to be the same as that now found 200 feet lower in the red Cambrian slates.

LINGULELLA FERRUGINEA, Salter, spec. nov. Fig. 1.

Length fully $2\frac{1}{2}$ lines. Form ovate-oblong, the front rather obtuse, but not straight-edged; the sides nearly parallel; the obtusely pointed beak includes an angle of about 75° . Generally convex, especially down the median area; the sides bevelled obliquely; the surface concentrically and very finely striated; the inner surface rather coarsely sulcate concentrically, indicating close ridges or sharp waves of growth upon the outer surface (not visible in our specimens). The inner surface (and probably the outer) shows radiating lines (rather coarse ones) over the median area, but not on the sides.

The pedicle-groove is so wide and pyramidal as to open at an angle of 40° ; and its edges are so strongly pronounced as to give the appearance of hinge-plates. A short median ridge divides this area, and extends but a very short distance. A specimen, apparently of the shorter valve, has also a median line, but fainter and longer. This is uncertain, the specimen being much crushed.

Loc. Lowest strata of the black flags in the Menevian group, Pen-y-pleidiau, St. Davids.

Figs. 1-3.—*Lingulella ferruginea*, Salter.

Fig. 1. *Lingulella ferruginea*, Salter. Natural size.
2. *L. ferruginea*, var. *ovalis*, Hicks. Natural size.
3. The same, magnified.

Var. *a. ovalis*, Hicks. Figs. 2 & 3.

Shell ovate, $1\frac{1}{2}$ line long: front edge rounded, not obtuse.

Loc. Red Rocks of the Menevian group, near St. Davids.

Except the shape of the front edge of this small shell, which is rounded off, and not squared at all, this variety is not to be distinguished from the other.

We give this variety a distinct varietal name, as it is important to distinguish all marked forms. When there is a difference in geological position, as well as some peculiarity in the form, it is wiser to distinguish, at least as a variety, any important specimen. Until it shall have been clearly proved, by intermediate forms, to belong to the self-same species, there can be no reason for allowing a theoretical opinion of descent with modification to influence us, as naturalists, in determining the nomenclature of a fossil or recent shell. And the contrary proceeding would throw all our useful binomial or trinomial appellations into oblivion; while it would not advance by one iota the real study of the group to which the fossil belongs.

That *Lingulella ferruginea*, var. *ovalis*, may have been the progenitor of the more ordinary variety, which is found in rather newer beds, is probable. That both may be only steps in the series by which we at last reach, through several Lower Lingula-flag species, the characteristic *Lingulella Davisii* and *L. lepis* of the Pfestiniog and Tremadoc groups, is also possible, if not highly probable. But we have no proof of it. Still less have we any proof that *Lingulella* merges into *Lingula*, or this into *Obolella*, or the last into *Discina*, &c., or that any or all of them had some common ancestor of whose nature we know nothing.

I only intend by these remarks to show the importance of still adhering, in our nomenclature, to old and well-established rules. Whatever may be our theory as to the derivation of species, it behoves us, as descriptive naturalists, to keep our minds free from the delightful fetters of theory, while we strictly and truly describe the medals of creation as they are shown to us.

I think my friend Mr. Davidson, in whose acumen and talent I have profound confidence, has of late years set us a bad example in this particular. He merges *Lingulella* in *Lingula* (though one has a pedicle-groove, and the other has not), and *Trematis* in *Discina* (though one has a marginal foramen and a radiated surface, and the other a closed foramen, and a horny concentrically ribbed shell).

I may mention, while speaking of fossils from the Lower Cambrian rocks, which I regard as a portion of the great Menevian group, that Mr. Alfred Marston, of Ludlow, has within the last few years found other portions of the so-called *Palæopyge*, or some allied crustacean form. They are in the truly rich museum in Jermyn Street. He has also lately sent me word that my small Arenicolites are not the only tenants of the Longmynd. A large worm-tube, comparable to the *Histioderma* of the Wicklow rocks, has been found in the Longmynd by him.—J. W. S.