

The following Communications were read :—

- I. *Notice of the occurrence of "Actinocrinus pulcher" (Salt. MSS.) in the Upper Silurian Flag of Denbighshire, North Wales, being a new locality for this Encrinite.* By DAVID W. ROBERTS, M.B., C.M. (Illustrated by a lithograph figure of the specimen, Plate XV.)

Some time ago, while examining an old and now abandoned quarry, near Galt-y-celyn, Derwen, Denbighshire, I was fortunate enough to find an undoubted specimen of a very rare encrinite—the *Actinocrinus pulcher* of Mr Salter's MSS.* On first examination I was unable to refer it to its exact species, but by the aid of Sir Roderick J. Murchison, Bart., to whom I forwarded the original specimen for identification, its specific characters were clearly made out. Mr Robert Etheridge, F.G.S., of the Museum of Practical Geology, Jermyn Street, and the palæontologist of that institution, confirmed the diagnosis of Sir Roderick—that the specimen was undoubtedly *Actinocrinus pulcher*. Mr Etheridge was so delighted with the beauty of the specimen when he saw it, that he expressed a wish to retain it for the Jermyn Street Museum. To this request I cheerfully acceded. The lithographed chalk drawing (Plate XV.) which accompanies this notice, is an exact representation of the original specimen, after a sketch drawn by Mr C. R. Bone, of Jermyn Street, whose name as an artist is a sufficient guarantee for its accuracy of detail and expression. From this plate you will have an excellent idea of the peculiarities of the species, especially of the spine-like processes that characterise its column. This encrinite has never been found in Scotland, and undoubted specimens have only been obtained from *two* localities in North Wales, previous to my discovery of it as after mentioned.

Professor Sedgwick,† of Trinity College, Cambridge, who was its discoverer, found a specimen of it in the Wenlock Shale of Nant-gwrhwyd-uchaf, to the south of Llangollen, and this has been figured in plate i. D, figure 3, of his own and Professor M'Coy's Palæozoic Fossils, by Mr J. W. Salter, F.G.S.‡ So far as I can ascertain, this is the only drawing we have hitherto possessed of the species. It is of natural size, and exhibits three perfectly-shaped cups, with relative rays, attached to as many columns. Three old columns, without cups, are also

* For the characters of the genus *Actinocrinus* see "Sedgwick and M'Coy's Pal. Foss.," p. 55.

† For Professor Sedgwick's description of this species (*new* to science in 1852), see "Sedgwick and M'Coy's Pal. Foss.," pp. 55 and 56.

‡ For Mr Salter's description of this species, see "Sedgwick and M'Coy's Pal. Foss.," App. A, p. i.

included in the figure. No spines, however, appear upon the columns, and, in so far as these are absent, Mr Salter's drawing conveys a somewhat inadequate idea of this beautiful encrinite.

Subsequent to Professor Sedgwick's discovery of this species in the Wenlock, fragments of its remarkable column, with the spine-like auxiliary processes unbroken, were found in the Upper Ludlow Quartzite of Shepherd's Quarry, Kendal, Westmoreland, but I do not know by whom.

I have been able to add a third locality to the two just mentioned, by discovering this rare species near Galt-y-celyn, Derwen, Denbighshire. I have since discovered another and fourth locality for this Encrinite at Pen-y-Forrest, Llanellidan, Denbighshire.

Having regard to its extreme rarity, it has been thought that the accompanying lithographed Plate will prove a useful reference to palæontologists, as it embodies all the known characters of the species. It is rare to discover any specimen of this species with the attachment of cup to column entire; and this circumstance increases the value and interest of the specimen now figured, as the specific characters of its cups, columns, and spines, are combined and exhibited in a single specimen.

II. *On two River Channels Buried under Drift, belonging to a period when the land stood several hundred feet higher than at present.* By JAMES CROLL, of the Geological Survey of Scotland. (Illustrated with map of Midland Valley of Scotland, fig. 1., and relative section, fig. 2, Plate XVI.)

Remarks on the Drift Deposits.—The drift and other surface deposits of the country have chiefly been studied from sections observed on the banks of streams, railway cuttings, ditches, foundations of buildings, and other excavations. The great defect of such sections is that they do not lay open a sufficient depth of surface. They may no doubt represent pretty accurately the character and order of the more recent deposits which overlie the boulder-clay, but we are hardly warranted in concluding that the succession of deposits belonging to the earlier part of the glacial epoch, the period of the true till, is fully exhibited in such limited sections.

Suppose, for example, the glacial epoch proper—the time of the lower boulder-clay—to have consisted of a succession of alternate cold and warm periods; there would, in such a case, be a series of separate formations of boulder-clay; but we could hardly expect to find on the flat and open face of the country, where the surface deposits are generally not of great depth, those various formations of Till, lying the one superimposed upon the other.