in the cortex. Lower down, just *beyond* the transitional region between stem and root, and where root-structure already prevails, the central stele is of considerable width, and the constituent bundles farther apart, owing to the expansion of the parenchymatous tissues. The large bundles composing the secondary tissues of the stele are now in places connected by delicate, few-layered bands of secondary vascular tissue, whose course is rather difficult to follow.

So far the structure is normal enough. But outside the central normal stele are seen, in transverse section, other strands which, there can be no doubt, represent the extrafascicular vascular tissue of *Cycas*, *Macrozamia*, and *Encephalartos*. Now this extrafascicular vascular tissue, which, at this youthful stage, only occurs outside a small part of the circumference of the central stele, has this peculiarity: that it consists of two distinct parts, viz. an outermost normally orientated and an *innermost band whose parts are abnormally*, i. e. *inversely orientated*, with the xylem directed outwards and the phloem inwards. Of these two well-marked portions of the extrafascicular tissue, the inner—or that with inverted orientation—is, at this stage of the plant's life-history, the best developed of the two. Both portions, in accordance with the youthful age of the plant, are as yet in a very rudimentary stage of development, the xylem and phloem being in fact but just sufficiently advanced in differentiation for the determination of the above salient characters.

The above structure I regard as homologous with, although a slight modification of, that described by Gregg in the root of *Cycas Seemanni*, Al. Br., and by myself in the root of *Cycas revolula*, Thunb., and the stem of *Macrozamia Fraseri*, Miq.

It appears to me, moreover, to distinctly support the view put forward in the paper dealing with the latter plant, that the vascular tissues (at least, the extrafascicular zones) are derived by modification from those of plants like the Medulloseae, which normally possess vascular strands, each of which exhibits the mutually-inverted portions above described.

W. C. WORSDELL, Kew.

A NEW CARDIOCARPON-BEARING STROBILUS.—The writers have latterly each met with specimens of *Cardiocarpon*, as figured by the late Professor Williamson and other authors, but attached to a central axis in a strobiloid form (resembling a *Lepido-*

strobilus), which has not to their knowledge yet been found or described by any other persons.

The first strobilus was found in material from Moorside, near Oldham, some time ago. Latterly the writers have found portions of a strobilus, transverse and otherwise, and also a complete strobilus, in material collected by one of them from Hough Hill, Stalybridge. All the specimens are from the calcareous nodules found in the Upper Foot and Gannister Mines of the Lower Coal-Measures.

The interest attaching to these fossils lies in the fruits being borne in a spike-like cluster or strobiloid form, the larger and more matured fruits or carpels being at the base, and gradually decreasing upwards to the top of the cone. It would seem that this manner of growth would account for the difference in size of the fruit as found detached, and figured by authors.

The specimens have been placed in the hands of Dr. D. H. Scott, Hon. Keeper of the Jodrell Laboratory, Royal Gardens, Kew, for further investigation and description.

G. WILD, Bardsley, Ashton-under-Lyne.

J. LOMAX, Moses Gate, Bolton.