

sides by rows of thick walled fibrous elements. The phloem, rather small in volume, is here much broken down, but it is situated radially outward, while in the other bundle (fig. 1), where it is rather more perfectly preserved, it is situated radially inward. The protoxylem is here seen as a group of smaller elements much altered by compression (fig. 1), or in other instances more perfectly preserved (fig. 1), sometimes on the outer face of the vessels, and sometimes on the inner face, but always between them and the phloem. While the bundles vary considerably in size, they all conform to the collateral type and it is of interest to note that in all their structural features, they agree very closely with the bundles of a species of *Myeloxylon* described by Solms Laubach,³ and also by Seward.²

From the present material I have been wholly unable to obtain satisfactory details of the structure of the bundle in longitudinal section, beyond the fact that the vessels are distinctly scalariform, and in this respect they conform to the type generally observed in ferns.

The peculiar situation of these bundles is not altogether easy to account for. They certainly appear to lie between, and are therefore mingled with, the strands of sclerenchyma, from which circumstance I was at first led to suppose them to be collateral, as in the case of *Phoenix* and other palms, but a very careful examination fails to disclose any satisfactory evidence of such relationship, while in some cases at least the vascular bundle is separated from the nearest sclerenchyma strand by a broad zone of fundamental tissue. Indeed, the evidence, so far as obtainable from the present material, seems to indicate that these bundles and the sclerenchyma are altogether independent of one another; but in the present unsatisfactory condition of the material now available, no final conclusion can be drawn. From the evidence at hand, however, it would seem that the vascular bundles have their extreme outward distribution in the central portion of the sclerenchyma zone. From this position they

³ Foss, Bot. 161, fig. 14 B.

² Ann. Bot. 7: pl. I and II, figs. 1, 9, 14.