the original wall uncovered. But this may be done in a great variety of ways.

The most ancient of these contrivances, and one still continued in the world of plants, is that of the barred or scalariform vessel. This may be either square or hexagonal, so as to admit of being packed without leaving vacancies. It is strengthened by a thick bar of ligneous matter up each angle, and these are connected by cross-bars so as to form a framework resembling several ladders fastened together. Hence the name *scalariform*, or ladder-like. Now, in a modern Lycopod there is a central axis of such barred vessels associated with simpler fibres or elongated cells. Even in *Sphenophyllum* and *Psilophyton*, already referred to as allied to Rhizocarps,* there is such a central axis, and in the former rigidity is given to this by the vascular and woody elements being arranged in the form of a three-sided prism or three-rayed star. But such arrangements would not suffice for a tree, and hence in the arboreal Lycopods of the Erian age a more complex structure is introduced. The barred vessels were expanded in the first instance into a hollow cylinder filled in with pith or cellular tissue, and the outer rind was strengthened with greatly thickened cells. But even this was not sufficient, and in the older stems wedge-shaped bundles of barred tissue were run out from the interior, forming an external woody cylinder, and inside of the rind were placed bundles of tough bast fibres. Thus, a stem was constructed having pith, wood, and bark, and capable of additions to the exterior of the woody wedges by a true exogenous growth. The plan is, in short, the same with that of the stems of the exogenous trees of modern times, except that the tissues employed are less complicated. The structures of these remarkable

* First noticed by the author, "Journal of Geological Society," 1865; but more completely by Renault, "Comptes Rendus," 1870.