ing some resemblance to leaves; these were called *cotyledons*. The common garden bean, the peach, the oak, and a great variety

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follow, that the central part of the stem would be first to decay. Where the matter deposited in those parts is not of such a character as to protect them from decay, this is frequently found to be the case. The resinous matter, deposited in the heart wood of the pine, is of such a nature as effectually to resist the disorganizing agencies which operate upon it; and hence it is that pines, even those of the greatest age, are never found hollow. But such is not the fact with respect to the matter deposited in the heart wood of the sycamore, (*platanus occidentalis*,) and hence, all the oldest trees of that kind, are little more than shells.'

'Endogenous stems differ very much from exogenous ones in their structure. The characteristic differences are the arrangement of the tissues, and the manner of their growth. Besides this, endogens differ from exogens, in having neither pith, medullary rays, bark, or wood, properly so called, but consisting of a confused mass of woody bundles, imbeded in cellular tissue. In the stalk of the corn, (*Zea mays*,) which affords a good specimen of a stem constructed on the endogenous plan, we find an external conical integument, without liber, and bundles of woody matter, so arranged throughout the cellular tissue, as to be much more numerous and compact at the circumference, than towards the centre. In the stem of the garden asparagus, (*asparagus officinalis*,) the woody bundles are distributed uniformly, throughout the stem, and so soft as scarcely to be recognized as woody matter. The same arrangement of the woody bundles, exists in the green brier, (*smilax rotundifolia*,) the only endogenous shrub common in Virginia. In the stems of grasses, which have been said to be the least endogenous of all endogenous stems, the structure is so modified as not to be at once evident. The peculiarity of these stems is, that they are hollow, except at the nodes, or joints, which are very compact discs, closing the stem entirely. They are, however, in every instance, at first solid, and become hollow in the course of their growth. In other respects, the stems of grass present no variation from the typical structure of endogens.'

'The life of endogens, as well as their diameter, is limited by the nature of their rind. When the lateral growth of the stem has proceeded to a certain extent, the rind hardens, and the stem being, in this way, prevented from increasing in diameter, can only grow in length; and as the consequence, stems of this character are generally slender. The continual deposition of new matter, within the unyielding rind, finally produces a total solidification of the stem, and death follows as a necessary consequence. Thus the life of an endogenous stem is limited; for, unless destroyed by some external agency, it must die of old age. The individual, however, is seldom destroyed; for, whilst the trunk is thus slowly perishing, the great accumulation of sap in the roots, causes the development of new shoots from the base of the stem, and these continue the life of the individual when the original trunk dies down to the ground. In this view, the life of endogenous trees is unlimited.'

'In the structure of exogenous stems, on the other hand, there is nothing to limit either their increase or duration; they never die purely of old age, but when destroyed, are destroyed by some external agency. The central wood of exogens, it is true, dies in the course of time, but the death of the stem does not follow as a consequence of this; for nothing is more common than to see a tree hollow, destroyed at its centre, whilst it is growing vigorously at its circumference. The sycamore, (*platanus occidentalis*,) furnishes a remarkable and well known illustration of this. The oldest trunks are generally all destroyed, excepting a few of the outer and recently formed layers, which prolong the existence of the individual.'—*An Essay*