well in plants whose structure is wholly cellular; a fact which proves that vessels are not, in all cases, necessary for its conveyance. In many instances, the sap in known to deviate from its usual rectilinear path, and to pursue a circuitous course, very different from that of any of the known vessels of the plant. The diffusion of the sap in different directions, and its subsidence in the lowest parts, on certain occasions, are facts irreconcilable with the supposition that it is confined in these vessels.

Numerous experiments have been made to discover the velocity with which the sap rises in plants, and the force it exerts in its ascent. Those of Hales are well known: by lopping off the top of a young vine, and applying to the truncated extremity a glass tube, which closed round it, he found that the fluid in the tube rose to a height, which, taking into account the specific gravity of the fluid, was equivalent to a perpendicular column of water of more than forty-three feet; and, consequently, exerted a force of propulsion considerably greater than the pressure of an additional atmosphere. The velocity as well as the force of ascent, must, however, be liable to great variation; being much influenced by evaporation, and other changes, which the sap undergoes in the leaves. Various opinions have been entertained as to the agency by which the motion of the sap is effected; but, although it seems likely to be resolved into the vital movements of the cellular structure already mentioned, the question is still enveloped in considerable obscurity. There is certainly no evidence to prove that it has any analogy to a muscular power; and the simplest supposition we can make is that these actions take place by means of a contractile property belonging to the vegetable tissue, and exerted, under certain circumstances, and in conformity to certain laws, which we have not yet succeeded in determining.