

the most effectual resistance to the force of the winds, which, acting upon so large a surface as that presented by the branches covered with dense foliage, must possess an immense mechanical power.

The principal seat of the vitality of a plant is the part which intervenes between the root and the stem. Injuries to this part are always fatal to the life of the plant.

As the roots penetrate downwards into the earth to different distances in order to procure the requisite nourishment, so the stem grows upwards for the purpose of obtaining for the leaves and flowers an ample supply of air, and the influence of a brighter light, both of which are of the highest importance to the maintenance of vegetable life. The stems of the grasses are hollow tubes; their most solid parts, which frequently consist of a thin layer of siliceous matter, occupying the surface of the cylinder. Of all the possible modes of disposing a given quantity of materials in the construction of a column, it is mathematically demonstrable that this is the most effective for obtaining the greatest possible degree of strength.*

The graceful continuous curve with which the stem of a tree rises from the ground, is the form which is best calculated to give stability to the trunk. Evidence of express mechanical design is likewise afforded by the manner in which the trunk is subdivided into its branches, spreading out in all directions, manifestly with a view to procure for the leaves the greatest extent of surface, and thus enable them to receive the fullest action of both light and air. The branches, also, are so constructed as to yield to the irregular impulse of the wind, and again, by their elasticity, to return to their natural positions, and by these alternate inflexions on opposite sides, to promote the motion of the sap in the vessels and cellular texture of the liber and alburnum. Nothing can exceed the elegance of those forms which are pre-

* Galileo, the most profound philosopher of his age, when interrogated by the inquisition as to his belief in a Supreme Being, replied, pointing to a straw on the floor of his dungeon, that from the structure of that object alone he would infer with certainty the existence of an intelligent Creator.