

the stem and branches, and interposing a barrier to the action of fluids, or other extraneous bodies, on the living organs. The cuticle is formed originally by the condensation of a layer of cellular tissue, of which the cells, being consolidated by exposure to the air, and by compression, compose a thin but impervious pellicle. Amici has distinctly shown, by means of his powerful microscope, the cellular structure of the cuticle, and also that the layer of cells of which it consists is independent of the subjacent cellular tissue.* Fig. 20 is intended to show this circumstance, the shaded part representing the cuticle with its series of cells.

Oval orifices, or *stomata*, as they have been termed, are discoverable on almost every part of the surface of the cuticle, but more especially in those that have a green colour.† They are placed at nearly equal distances from one another, and are particularly numerous in the cuticle of the leaves, where they occupy the intervals between the fibres. These orifices conduct into the interior of the plant, probably into the general cavity of the intercellular spaces. It is evident, from the functions they perform, that they must occasionally open and close; but the minuteness of their size precludes any accurate observation as to the nature of the apparatus provided for the performance of these motions. Amici describes their margins as formed by two cells, by the movements of which, combined perhaps with those of the adjoining cells, he conceives these orifices are opened and closed.‡ Great variety, however, is observable in the structure of the stomata in different species of plants.

Many plants have no stomata, either on the cuticle of the leaves, or on that of the stem. This is the case with such aquatic plants as are habitually immersed in water. In those that are only partially immersed, stomata are met with in those parts exclusively which are above the water. The

* Annales des Sciences Naturelles, II. 211.

† Fig. 22 is a magnified representation of the appearance in the cuticle of the *Lycopodium denticulatum*, taken in the central part of the lower surface of the leaf, from De Candolle. Fig. 21 is a still more magnified view of the stomata in the leaf of the *Lilium candidum*, from Amici.

‡ Annales des Sciences Naturelles, II. 215.