"Nor is it only in minute vegetable forms that this is seen. The exquisite researches of Mr. Charles Darwin upon the habits of the climbing plants have made manifest something nearly akin to "instinct" in their deportment and motion. When a climbing plant first springs from the ground, the extremity of the shoot performs slow gyrations in the air, as if searching for a support, a motion clearly voluntary. The climbing plant twines round its support either with or against the sun. The object is to expose as large a surface as possible to the sun and air, but how the motion is accomplished can not be determined; yet it is impossible to study the deportment of the whole group of "creepers" without becoming assured of their possession of some almost sentient controlling power. The tendrils of some of these plants coil, others are sensitive to a touch and bend, while others yet secrete a glutinous fluid which attaches it to its

support. The tendrils of a bignonia, for example, are sensitive; hence in growing and revolving amid the branched twigs of some supporting tree the tendrils wanting supports soon get touched, and at once they clasp the twig like a bird when perched. The tendrils of another species were seen to slowly travel over the surface of a piece of wood, and when the apex of one of them came to a hole or fissure it inserted itself; the same tendril frequently withdrew itself from one hole to insert itself in another, as if seeking for what exactly pleased it; and Mr. Darwin has seen a tendril withdrawn from a hole after having chosen it and remained fixed there for thirty-six hours. And this apparent selective power is carried still further in some climbing plants of tropical forests, which will travel on, prolonging their growth indefinitely and avoiding all other supports until they reach the tree which they peculiarly affect, and then they will at once attach themselves. It is not too much to say that the same behavior in a definite animal would be taken as an evidence of "instinct." But even commoner instances of locomotion amongst plants present themselves. In the deep ponds and watercourses of England the common bladderwort is often found. This plant is usually at the bottom of the pond, its roots immersed in the mud. But it cannot expand its flowers and be fertilized in this position. At the right time, therefore, it rises to the surface of the water, opens its flowers, the pollen is shed upon the pistil, and once more it sinks to its former position.

SENSITIVENESS OF PLANTS.

"Not less remarkable is the fact that sensitiveness and reflex movement is as strikingly possessed by the vegetable as by the animal world. It has long been known that certain plants exhibit intense susceptibility to external influences. The *Mimosa pudica*, or sensitive plant, is one of these. Not only do the leaflets fold their upper surfaces together, the branches of the leaf-stalks bend to each other, and the whole leaf-stalk falls instantly when touched, but if the leaves are only breathed upon, if one of them is touched with a speck of acid, or sunlight focussed upon it by a lens, the same results ensue. Nay, it has been affirmed that in the savannahs of tropical America, where this beautiful plant abounds, the vibrations caused by the hoofs of an approaching horse will cause all the mimosas instantly to contract; and, just as in the animal organism a cessation of sensation supervenes, and 'numbness' results from a diminution of temperature, so if this plant be placed in an atmosphere below 15° centigrade all sensibility is gone.

"Now, we must no longer suppose that this plant is singular, or in any very remarkable sense an exception. The researches of Charles Darwin and others now prove irresistibly that sensation, or what is a remarkable approach to it, is very widely distributed in vegetable organisms. Nothing can be more remarkable than the sensitiveness of irritability displayed by some plants as a means employed to secure fertilization. In the common berberry, for example, the stamens lie down upon the petals, and the nectar which the insect seeks is produced by six pairs of honey-glands at the bases of the petals; but the stamens are at their bases highly sensitive or irritable, the consequence being that when the insect touches them they spring forward and throw their pollen upon the intruder, to be carried to another flower. Still more striking is the sensitiveness of a group of orchids, of the genus *Catasetum*. In these plants the pollinia, or pollen-caskets, and the stigmata—the surfaces prepared for the reception of the fertilizing pollen—are in different flowers. Of necessity, then, the pollen must be carried by some active agent to the stigma. This is done by insects, but the adaptations are remarkable in a high degree. The flower containing the pollinia, which is highly elastic, carries it under considerable tension in a part which the insect visiting the flower for nectar never approaches; but in obtaining the nectar the insect comes into contact with a delicate spur, which is so sensitive that the excitement of the touch is carried along the tissues of the plant until it reaches the extremely thin membrane which confines the pollen mass; the membrane is instantly ruptured, the pollinia, with a force that will carry it three feet from the flower, flies out, and, being armed with a gummy disk, it sticks to the insect, which carries it to the next flower, and thus eventually fertilizes the female flower."