
INSECTIVOROUS PLANTS.(a)

WE have already briefly indicated what may be considered the most extraordinary points in the discoveries by Mr. Darwin in his investigations on the *Drosera*. These were—the remarkable powers of motion displayed by certain parts of this plant; their still more extraordinary power of transmitting impulses through considerable distances; and the power of actually digesting and absorbing animal substances in a way quite analogous to that seen in animal digestion. The mechanism is sufficiently simple. The leaf is covered with hair-like processes, short near the centre, longer towards the circumference. These hairs are composed of cells placed end to end, and support at their extremity a glandular organ, commonly covered with an exceedingly tenacious secretion. These hair-

(a) "Insectivorous Plants," by Charles Darwin, M.A., F.R.S., &c. London: Murray. Pp. 462.

like processes have the power of spontaneously bending inwards, and again, of course, outwards, when the central ones do so when they are irritated by the presence of a fly, or even of any dead body possessed of weight; not only so, but each tentacle (as Mr. Darwin calls them) may be made to bend itself inwards when its own particular gland is irritated. Moreover, there exudes from these glands, when closely inflected and holding in their grasp a fly or particle of organic matter, a fluid truly digestive in its character, and consisting of an acid and an organic body similar to pepsin.

Now, as regards the movements, nothing is more striking than the exceedingly small weights capable of exciting them in individual tentacles. A portion of hair perfectly infinitesimal in weight ($\frac{1}{75170}$ gr.) gave rise to decided movement, and so of other particles of matter equally small. Here a particle of matter, too small to be appreciated by even such a sensitive organ as the tongue, was able to produce an impulse on the surface of a vegetable gland, which impulse had to be transmitted from cell to cell for some distance, till properly active motile cells could be reached, and to influence these cells so as to induce unmistakable movements.

Temperature, as might perhaps be expected, exercises an important influence on the motions of the plant; at 110° Fahr. the tentacles become somewhat inflected, and more readily stimulated; about 120° Fahr. they become inflected of their own accord; whilst 130° Fahr. seems to paralyse them so that recovery is only possible in cold water. Higher temperatures coagulate their albumen. As already hinted, all stimulants do not have the same effect in respect of causing motion. Nutritive bodies of an albuminous kind seem to act most powerfully in this way, as particles of meat or its infusion, cabbage and green-pea water. When so stimulated, the fluid secreted by the glands is so powerful as to dissolve even bone, and even tooth-cartilage is treated in the same way. A careful inquiry was made as to the effects of certain salts on the leaves. Of all thus tried, certain salts of ammonia, especially the carbonate, the nitrate, and the phosphate, proved most effectual. The quantity of these salts necessary to set a tentacle in motion by their direct application to its gland is something like the twenty-millionth part of a grain. That such a minute quantity should suffice to send a motor impulse through many cells is very wonderful. Of the many substances tried, and of their effects, we need hardly here speak. Suffice it to say that some seemed to act more powerfully on the *Drosera* than on animal tissues, and some which destroy animal tissues seemed to be harmless to its cells. Notably, some of the poisons which act specially through the nerves in animals are powerless on the *Drosera*. Such is the case also with cobra poison.

Lastly, we must speak of the motor impulse and its results. Only the glands may be said to be sensitive, and from them the impulse proceeds through the common cellular tissue of the plant, not the fibro-vascular bundles, to the root of the tentacle, where alone the cells are motile; but thence it spreads in the same way to either side and towards the centre of the leaf. When once contracted, and the glands are bent to the centre, and are concerned in digestion and absorption, no further motion takes place, though they occupy the same attitude for days, and only begin to relax when digestion is over. In the minute mechanism of this process something very much like reflex action is to be seen; and the whole is so extraordinarily like nerve-action that the resemblance is quite startling. The immediate cause of the motion is not yet perfectly clear; undoubtedly it is connected with the movements of the protoplasm in the motile cells, but how this acts is not quite clear; its own motions seem purposeless. Even now experiments have shown that, as in the case of the Venus fly-trap, the movements are similar in their electrical results to those of animal motion. These, in brief, are the results obtained by

Mr. Darwin in his investigations of *Drosera*. How great they are, and how important, we need hardly say; yet their author speaks of them with the utmost modesty.

Others of the *Droseraceæ* have been examined by Mr. Darwin, especially the *Dionæa*, but none of them so fully as the *Drosera rotundifolia*. Inquiries into the properties of other carnivorous plants are also given in some detail, especially the curious phenomena of *Pinguicula*, a plant often found in situations similar to the *Drosera*, not unfrequently side by side with it; and *Utricularia*, a water plant, whose bladders often hold water insects and other aqueous inhabitants; but with regard to all of these much has yet to be studied, and to this Darwin's wonderful researches clearly point the way.

THE WEEK.

TOPICS OF THE DAY.

It was stated, at the annual meeting of the Metropolitan Asylums Board, held on the 17th inst., that there was no reason to fear any extraordinary pressure upon the accommodation at the hospital at Stockwell, in consequence of the present prevalence of fever in London. Although many cases had been reported as occurring among the upper and middle classes, during the previous fortnight not a single patient had been received at Stockwell from the London poor, suffering from either typhus or enteric fever. Sixty-nine cases of scarlet fever had been admitted during the same period, and only five cases of small-pox from the whole of the unions of London; these latter, with two patients already in hospital suffering from the same disease, represent all the cases in London under the Poor-law authorities.

Mr. Bailey Denton reports that there has fallen on the surface of the country during the last month (with but few places excepted), within the short period of one hour, as much rain as would, if conserved, supply the entire population with water for domestic and other purposes for a whole year. There has already fallen within the present year sufficient rain "per square yard of surface" to furnish 50 per cent. more water than would satisfy each unit of the population with all required for drinking purposes. Mr. Denton asks if an inquiry into the capability of utilising such excesses, and so equalising extremes, should not be at once made, when it is remembered that amidst all the deluges of rain that have recently fallen, there are even now places where an insufficient provision of water exists.

A Convalescent Home for sixty inmates has been erected on the verge of Rombald's Moor, near Ilkley, Yorkshire, through the liberality of Mr. Charles Semon, of Broughton Hall, near Skipton, who has expended £8000 in constructing a suitable building. The home is intended for the use of poor people from all parts of the country, to enable them by the benefit of fresh air to regain the strength lost in illness. With a view of promoting a spirit of independence, and to relieve the Home from any appearance of charity, a small sum is to be charged weekly to each patient. The institution is to be opened for the admission of patients on the 3rd prox., and the five acres of land which surround it are being laid out as pleasure-grounds for the recreation of the inmates.

The account of the floods now prevailing in the northern counties shows the pressing necessity for a Bill to prevent the pollution of rivers. From Doncaster it is reported that the last few days' heavy rains have caused the River Don between Sheffield and Thorne to overflow; large quantities of fish of various sizes have been netted, most of them when taken out being dead or nearly so. This is to be attributed to the dreadful state of the river, the whole sewage from Sheffield, Rotherham, Mexborough, and other smaller places emptying itself into the Don, with the consequence that when the river