

*The Power of Movement in Plants.* By CHARLES DARWIN, LL.D., F.R.S., assisted by FRANCIS DARWIN. London: John Murray.

It is well known that of late years Mr. Darwin has, with his usual ability and success, attacked the old traditional notion of an absolute distinction between plants and animals. His researches on the fertilisation of orchids, on insectivorous plants, and on the movements and habits of climbing plants, all militate against the supposition of an utterly inert and unconscious character so generally ascribed to the vegetable kingdom. Continuing his investigations he has now shown, by dint of a prolonged course of experiment and observation, that "all the parts or organs in every plant, whilst they continue to grow, are continually circumnutating,"—that is, the point of a growing stem, &c., is found to describe an irregular circular figure. This movement is not uniform, but consists—in some cases at least—of innumerable small oscillations. The phenomena thus produced closely resemble many of the actions performed, as is supposed unconsciously, by the simpler and lower animals. The author remarks that "even among allied plants one may be highly sensitive to the slightest continued pressure, and another highly sensitive to a slight momentary touch."

Mr. Darwin considers that the most striking resemblance between plants and animals is the localisation of their sensitiveness and the transmission of any influence from the part excited to some other part, which consequently moves. It is not of course, contended that plants possess a brain or other true nervous centre, and a system of nerves by which it is connected with the whole body. But it is, to say the least, doubtful whether such structures exist in the lowest animals, and it is probable that where present they serve merely for a more perfect transmission of impressions and a more complete intercommunication of the several parts.

The author calls attention to the wonderful character of the tip of the radicle, which is remarkably sensitive:—"If the tip be lightly pressed, or burnt, or cut, it transmits an influence to the upper adjoining part of the root, causing it to bend away from the affected side; and, what is yet more surprising, the tip can distinguish between a slightly harder and a softer object, by which it is simultaneously pressed on opposite sides. If, however, the radicle is pressed by a similar object a little above the tip, the pressed part does not transmit any influence to the more distant parts above, but bends abruptly towards the object. If the tip perceives the air to be moister on one side than on the other, it likewise transmits an influence to the upper adjoining part, which bends towards the source of moisture."

Taking these various kinds of sensitiveness into consideration, Mr. Darwin pronounces it hardly an exaggeration to say that

the tip of the radicle thus endowed, and having the power of directing the movements of the adjoining parts, acts like the brain of one of the lower animals, where the brain, seated within the anterior end of the body, receives impressions from the sense-organs and directs the several movements.

The conclusions thus reached are therefore of great importance to the philosophy of Biology, and the work will consequently well repay the study of all sufficiently acquainted with botanical terminology.

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