John Bull

DARWIN ON PLANTS.*

The various volumes on plants and their habits published by Mr. Darwin are marvellous for the amount of patient observation which they present, for the industry which has accumulated the facts stored up within their covers, and for the conscientious care with which they have been tabulated. Such minute observations are hardly to be found elsewhere. More minute observations have scarcely, we venture to assert, ever been made. Indeed, a similar contribution to a history of the law and order which reign even in the most insignificant movements of plants can, we imagine, be found in no English writer. With this there is a refreshing but singular absence of theorising. The present, like the former volumes on the same subject of plants and their movements, is full of patient observation. Many of the conclusions of Mr. Darwin no doubt, as is inevitable, will have to be modified, either by himself or others working on his lines. Many of the phenomena recorded with such care will be found hereafter to owe somewhat to accident, or even to the methods pursued by Mr. Darwin in the course of his observations. Yet, making full allowance for these disturbing causes, the result is the tabulation of a mass of minute facts which will enable the botanical student to understand more about the movements of plants than he has yet done. If these volumes stimulate him to emulate the patient industry and discriminating care with which the simple phenomena of vegetable life have been noted by Mr. Darwin, a great gain will have been obtained, and the physiology of plants be better understood than it is at present. As yet, indeed, the facts recorded in this volume need that verification which only an independent observer can contribute. However, even prior to such verification, and admitting that some of the phenomena noted in the chapters of this volume are exceptional and not normal, we have before us an amount of facts which will guide the researches of younger physiologists and direct them to conclusions which will take their place among the certainties of science. Such accumulated facts are worth more than any amount of ingeniously devised theories, which too often, indeed, hinder instead of promote the progress of true science.

Few of our readers who have noted the way in which a bean thrusts itself above the ground, or have seen the motions which are made by the tendrils of the vine during the growth of the plant, will have been prepared to learn that—disturbing causes being absent—this movement of cotyledon, stolon, leaflet, radicle, and every other member of a plant, however humble, is made in accordance with some law, varying in the different classes and even orders of such plants; that the grasses, for instance, in their almost infinite variety, differ in the mode of their growth both above and below the ground from the orchis and the daffodil, the anemone and daisy, which spring up in their midst; and that in the cabbage of our kitchen gardens we have an instance of a complex movement, on which its growth depends, analogous to, but seemingly more elaborate than, the play of muscle and nerve in the body of man, and that the tips of the shoots of a tree are all as sensitive at least as the most sensitive organs in the human frame.

Amid the mass of observations conducted with such minute care, and dealing with movements as delicate as those of plants during their growth, we despair of presenting the reader with any adequate specimens of the industry with which Mr. Darwin has pursued his task and has recorded the results of his experiments. Only a sight of the woodcut diagrams with which this volume abounds will give any idea of the minuteness of his observations. In any degree to comprehend these records the reader, however extensive his botanical knowledge may be, will have to add largely to his vocabulary, since this and the former volumes abound with new and uncouth, however regularly formed words, without which the writer's meaning would not have been understood. We do not complain of this: a book so technical in its details as that before us cannot be written without the aid of technical words and phrases wholly new, and therefore requiring an effort of memory which makes the account of these researches somewhat hard reading.

This volume is mainly taken up with what Mr. Darwin calls the circumnutation, or with what Sachs terms the revolving nutation of plants; with the nyctitropic condition or sleep of plants; and with the effect of light on the movements of various plants. It will be new to most of our readers to learn that, in its circumnutation of a plant, this movement or nutation of the apex of a plant, however irregular, yet describes a circle, and that if the observer notes a stem bent, for instance, towards the north, he will, if he patiently watch it, trace it gradually bending more and more easterly until it faces the east and so onward, to the south, and then to the west, and back again to the north. This is done, not by means of a regular whorl, but elliptically, and the variety of these ellipses differs in different classes or orders of the vegetable world. This movement, except when turned awry by obstacles, is observable in the root as well as in the stem and leaflets of plants. As the jerks by which a stem advances is rarely greater than the two-hundredth part of an inch, we need not say the observation is only to be made with much patience and great skill in the use of the microscope.

The sleep or nyctitropic condition of plants Mr. Darwin not only describes with great minuteness, but makes plain to the reader, by the use of woodcuts made from photographs of plants taken during their wakeful and again during their somnolent condition. He has, on this head, accumulated a mass of curious and minute observations, on which, in the state of our columns, we regret that we are unable to dwell. The effect of light on plants, the superior sensitiveness of some to a dull, and of others to a bright, light will be new to most readers, and will not fail to interest all who possess any knowledge of plants, or who care to study the operations of Nature in the vegetable world. But on this we must refer such readers to Mr. Darwin's volume, which again we must note to be a marvellous monument of patient industry, of minute observation, and of sober narrative—a volume which is full of statements it is no disparagement to say requiring verification and which will stimulate younger students to verify in the conscientious spirit in which "the movements of plants" has been observed and noted by Mr. Darwin.

* *The Power of Movement in Plants.* By Charles

A Commission is all very well as giving time for reflection and considering the somewhat difficult question of the Supreme Appeal. But the fact is that the entire Ecclesiastical jurisdiction is paralysed by the wretched Public Worship Regulation Act. It reaches beyond itself to every part of the coercive discipline of the Church. Lord Penzance is simply powerless; no one obeys or will obey his decrees in spiritual matters, and it is plain the offenders cannot be sent to gaol again. It remains to be seen whether his sentence of deprivation will fare better. Meantime, the resistance gathers strength. The English Church Union has steadily increased in numbers since it openly defied the secularised Courts. The game is in their hands. The Courts have done their worst, and Ritualism is all the stronger. The Archbishop had better repeal his Act before people discover they can do very well without any Ecclesiastical Courts at all.

Reviews.

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