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The name of Charles Darwin on the title page of any book would at once vouch for the deeply scientific character of its contents. His present volume on "The Movements and Habits of Climbing Plants;" comes to us as a "second edition, revised;" the original essay having first appeared in the ninth volume of the journal of the Linnæan Society, published in 1865. The subject, which he discusses, has of late years attracted considerable attention among naturalists, and Mr. Darwin refers to several works, which he says ought to be carefully studied by all inquisitive botanists. He begins his explanations by stating that climbing plants may be divided into four classes.

Firstly, those which twine spirally round a support, and are not aided by any other movement. Secondly, those endowed with irritable organs which, when they touch any object, clasp it; while plants of the third class ascend merely by the aid of hooks, and those of the fourth by rootlets, but as in neither class do the plants exhibit any special movements they present little interest, and generally, when speaking of climbing plants, the author refers to the two first great classes. He then takes "twining plants" for more specific descriptions as the largest subdivision, and apparently the primordial and simplest condition of the class. The shoot of a hop (humulus lupulus) furnishes him with an illustration in point. When it rises from the ground the two or three first-formed joints or internodes are straight and remain stationary; but the next formed, whilst very young, may be seen to bend to one side, and to travel slowly round towards all points of the compass, moving, like the hands of a watch, with the sun.

He notes some observations which he carefully made as to the rate of these evolutions at different seasons and under certain conditions of temperature, and the result may be broadly given in the fact that "the revolving movement continues as long as the plant continues to grow; but each separate internode as it becomes old ceases to move." Also he shows that with the hop in question three internodes were at the same time revolving, and explains on organic principles and by apt illustrations that twining stems are not irritable as has been asserted by some naturalists.

Their winding movements, he considers, proceed alone from the necessity of finding a support, for when a shoot twines round some prop its evolutions are always slower than while it revolves freely and touches nothing. Hence he concludes that his theory is correct, especially as nature always economises her means, and irritability in twining would have been superfluous. After explaining some curious facts relative to the position of the leaves on the stem, and growth of the shoots, the learned professor gives a table showing the direction and rate of movement of several twining plants, with a few appended remarks.

Thus not only is the "rate of revolution" of the various species plainly indicated, but it is shown that as a rule the "acotyledons" move against the sun, while in the case of the different varieties both of the "monocotyledons" and the "dicotyledons" some follow and others move contrary to the sun. Taken together, however, a greater number of twiners revolve in a course opposed to that of the sun, or to the hands of a watch, than in the reverse direction, and consequently the majority, as is well known, ascend their supports from left to right.

The next sections of the work take in due order, first, the "leaf-climbers," or plants which ascend by the aid of spontaneously revolving and sensitive petioles, and then the "tendril-bearers," which, as a large class, are divided for consideration in two chapters.

Palm and Mohl, indeed, whose opinions are frequently referred to by Mr. Darwin, class the leaf-climbers, he says, with those which bear tendril; but as a leaf is generally a defined object, the present classification, though artificial has at least, he thinks, some advantages. Leaf-climbers are, moreover, intermediate in many respects between twiners and tendril-bearers, and he illustrates his theories by defining the habits, movements, and conditions of the different varieties in this family of climbing plants. He notes the clematis-tropæolum, nasturtium and maurandia, as having flower peduncles which move spontaneously and are sensitive to a touch; the rhodochiton and lophospermum, with sensitive internodes; the solanum, with the peculiarity of a "thickening of clasped petioles, or foot-stalks"; and also the fumaria and adlumia, as in some sort belonging to this genus; and lastly, the "plants which climb by the aid of their produced midriles, such as the gloriosa, flagellaria, and nepenthes.

His description of the different species of "tendril-bearers" is similarly arranged, and presents some curious facts. He follows Lindley's classification, giving 10 families of tendril-bearing plants according to the following imperfectly annotated list:-

Bignoniaceæ, which comprise many tendril-bearers, some twiners, and some root-climbers; polemoniaceæ, exemplified by the coboea scandens, an excellently constructed climber; leguminosæ, or pea tribe; compostitæ, an immense family, but including very few climbing plants, of which the mutisia clematis is here described; smilaceæ, with tendrils rising in pairs from the petiole, which are considered as "lateral leaflets" or "modified stipules;" fumariaceæ, the tendrils of which again are foliar, and the author regards some of the species as in an actual state of transition from a leaf-climber to a tendril-bearer; and, lastly, the cucurbitaceæ-vitaceæ, or vine, sapindaceæ, and paseifloraceæ may be placed together as all in their measure exhibiting the peculiarity of their tendrils being "modified flower penduncles."

Mr. Darwin enlarges on the points thus briefly noted with his usual acuteness, and, by dint of keen and patient observation, has been enabled to explain the minute distinctions which exists between some of these very similarly-organised plants. He closes this section of his work by a summary on "the nature and action of tendrils," which will materially assist botanical students in arriving at the drift of his theories. The same may be said of the

concluding remarks which follow his short explanations on the movements and habits of "hook and root-climbers" in his final chapter.

The entire book, it will be percieved, is of an eminently abstruse character; and although general readers perhaps would have preferred a more familiarly-written account of some of our beautiful "climbing plants," yet there can be no

"The Movements and Habits of Climbing Plants, by Charles Darwin, M.A., F.R.S., &c. Second edition, revised, with illustrations. London: John Murray."

question of the value of Mr. Darwin's essay as a notable contribution to our standard works in the department of natural history.