APPOINTMENTS FOR THE ENSUING WEEK.

MONDAY,	Nov. 29	Sale of Bulbs and Plants, at Stevens' Rooms. Sale of Bulbs and other Roots, at the Auction Mart, by Protheroe & Morris.
TUESDAY,	Nov. 30	Sale of Nursery Stock, at Inverleith, Edinburgh, by Mr. David Mitchell Sale of Lilies, &c., at Stevens' Rooms.
WEDNESDAY,	Dec. 1	Sale of Roses, Fruit Trees, Bulbs, &c., at Stevens' Rooms.
THURSDAY,	Dec. 2	Sale of Imported and Established Orchids, at Stevens' Rooms.
FRIDAY,	Dec. 3	Sale of Insects, at Stevens' Rooms.
SATURDAY,	Dec. 4	Sale of Plants and Bulbs, at Stevens' Rooms.

WHILE the expectation of the general reader—whose tastes and appetencies, by the way, it would be difficult to define—is aroused by the announcement of a new novel by Lord BEACONSFIELD, and of a new volume of poems by the Poet Laureate, the attention of the naturalist is no less secured by the publication of a new volume from the pen of Mr. DARWIN.* We note the simultaneous publication of these works as a singular fact without wishing to inflict on the reader any comparison between such different products of mental activity, although those who are fond of speculation might indulge themselve in seeking out points of resemblance or contrast between them, and might discuss at any length the relative value of these productions to the human race, and the probable duration of their influence.

Mr. DARWIN'S present work, like others of his more recent publications, is devoted to the record of an elaborate series of observations and experiments, and to a brief statement of inferences to be drawn from them. Like all his works this, his latest, is marked by infinite patience in research, exhaustive accumulation of detail, clear statement of facts, legitimate inferences from them, and candid impartiality.

The general fact that plants possessed powers of movement has, of course, long been known. Mr. DARWIN himself has previously contributed in an eminent degree to our knowledge of the movements of climbing plants, and of those which take place in the flower in connection with the processes of fertilisation. Scattered observations, or more or less complete studies of certain phenomena—as, for instance, the motion seen in the so-called sensitive plants—have been made by many, but never before has such an exhaustive treatise on the movements which go on in growing plants, been given to the world—never one based on so much patient personal research. Taken in conjunction with his work on the movements and habits of climbing plants, we have now a complete representation of existing knowledge on the subject so far as regards the general subject—we introduce the qualification because the movements of the protoplasm and of the juices within the constituent cells of the plants are in the present volume only incidentally alluded to.

Although most persons accustomed to use their eyes are familiar with the sweeping motion of tendrils, the closing of leaves in sleep, or as a result of irritation, as in the Sensitive Plant, it will, we imagine, come as a surprise to many to find how universal is this property of motion in plants, and how organs and parts are shown by Mr. DARWIN to possess it in a marked degree, even in cases where it has hitherto not been obvious to the superficial observer. As these movements are intimately connected with the growth of the organs, with the influence of light and other conditions, their existence, now they are pointed out, will not occasion much surprise. What surprise will be experienced will probably result from the circumstance that such phenomena have not before attracted our attention. Mr. DARWIN'S object has been, as he tells us, to "describe and connect together several large classes of movements common to all plants." Most of these movements are comprised under what has been called "revolving nutation," as, for instance, where the growing tip of a climbing plant revolves, and, of course, in so doing bends successively to all points of the compass. For this movement Mr. DARWIN adopts the general descriptive epithet of "circumnutation." This movement depends essentially on a rush of fluid, causing turgescence of the cells, now on one side, now on another side of a growing organ, and to the disproportionate growth of the constituent cells on that same side—the convex one. This gyratory mode of growth is now shown by Mr. DARWIN to exist in all parts of growing plants—in the seedling plant, in the young radicle, in the caulicle, in the cotyledons, in the plumule, in the stem, the branches, the leaves, the flowers. Experiments in support of this statement are detailed with a profusion of illustration that enforces assent.

Perhaps the most wonderful part of Mr.

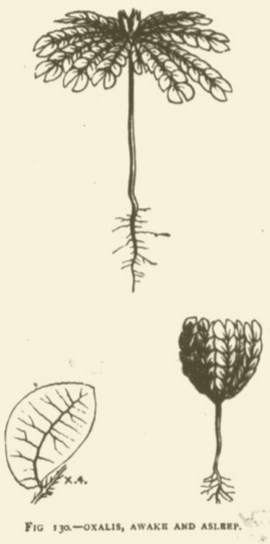

FIG 130.—OXALIS, AWAKE AND ASLEEP.

DARWIN'S work is that relating to the gyratory movement of the root-fibrils, and to the sensitiveness to touch of their tips, in virtue of which the upper part of the fibrils is bent away from any obstacle. The movement in the case of the root as it protrudes from the seed is immediately modified by the attraction of gravity, and it continues to be so. As a consequence of these interactions, the root-fibres are enabled to penetrate the soil, to overcome and pass by obstacles, following with unerring skill the line of least resistance. The whole details relating to root growth will be novel to most of our readers, and they will prove to be of very great interest to practical men interested in root growth. At another time we hope to give the substance of them in these columns; for the present we must confine ourselves to the mere mention of them. If the tip of a root, we are told, be lightly pressed, or burnt, or cut, an influence is transmitted to the upper adjoining part, causing it to bend away from the affected side, and, what is more surprising, the tip is able to distinguish between two objects, as to their degree of resistance, by which it may be pressed on either side. If, however, the radicle be pressed above the tip, no influence is transmitted to any distant part, but the root bends abruptly towards the object. If the air is moister on one side than another the tip of the root is influenced, and transmits the influence to the upper adjoining part, which bends towards the source of moisture, and so on with reference to light and gravity; the final purpose of all these separate or combined actions being the advantage of the root-fibre and the adaptation of the tip of the root-fibre so as to enable it to make the best of the situation in which it may be placed. The sensitiveness to contact is different at the apex and at the part immediately above the apex of the root-fibrils, and these facts, in association with the other causes before mentioned, lead, as we have said, the root into the channels most advantageous for the plant under the circumstances.

"A radicle," says Mr. DARWIN, "may be compared with a burrowing animal, such as a mole, which wishes to penetrate perpendicularly down into the ground. By continually moving his head, or circumnutating, he will feel any stone or any other obstacle, as well as any difference in the hardness of the soil, and he will turn from that side; if the earth is damper on one side than on the other side he will turn thither as a better hunting-ground. Nevertheless, after each interruption, guided by the sense of gravity, he will be able to recover his downward course and to burrow to a greater depth."

The movements executed by the growing ends of branches and of leaves are also carefully investigated, including those movements generally included under the "sleep of plants," the use of which seems to be to protect them from the ill effects of radiation. In the Oxalis, of which we give an illustration (fig. 130), for which we were indebted to the late Dr. WELWITSCH, it may be that the uplifting and infolding of the leaves protects the young buds in the centre from the chilling effects of nocturnal radiation. The "sleep-movements" of a similar nature in the seed-leaves or cotyledons are much less familiar, and Mr. DARWIN has accordingly studied them in no less than 153 genera.

Under the heading "sleep of leaves" Mr. DARWIN alludes to the movement in the leaves of Conifers, by virtue of which the glaucous undersurface, say of the leaves of Abies Nordmanniana, becomes exposed to the light. In so doing he quotes from M. CHATIN, who alleges that the movement takes place specially at night, which is just contrary to our experience, and as the point is one of some interest we allude to it here, and refer to some observations made at p. 663, vol. xii. The term "sleep" is, of course, a misnomer, and that it is even less of a resting period than has been hitherto supposed is shown by what Mr. DARWIN tells us of the movement of the leaves supposed to be asleep during the night. Night as well as day the growing leaves, though apparently still, are, at intervals, more or less moving throughout the whole twenty-four hours. The stolons, or runners, move or circumnutate in a conspicuous manner, with the object of passing between or over obstacles. The movements are modified by innate causes, such as differing degrees of growth on one side as contrasted with the other, and which are independent of external agencies, such as heat or light. To this class belong the movements of climbing plants. The coiling of the flower-spur of the Angræcum (figured at p. 693) round an adjacent spur, is due probably to this power of circumnutation, aided by the sensitiveness to contact which has been observed in tendrils, and which, as we are now told, occurs in root-fibres also. They are also modified by external causes—as in the case of the so-called sleep of plants before referred to, where they are dependent on alternations of darkness and light, or, as in the case of the opening and closing of flowers, on fluctuations of temperature.

Thus cursorily must we for the moment notice this remarkable book. As a contribution to science it is most valuable—as a storehouse of facts for the student of Natural Theology it will be found replete, and as offering hints to the practical cultivator most suggestive.

* The *Power of Movement in Plants*. By Charles Darwin, LL.D., F.R.S., assisted by Francis Darwin. Murray.