

pens," by W. P. Wilson; "A Nascent Variety of *Brunella vulgaris*," by J. T. Rothrock; and "Preliminary Observations on the Movements of the Leaves of *Melilotus alba* L. and Other Plants," by W. P. Wilson. Numerous new points are brought out by the studies of Dr. McFarlane on *Dionœa*. Among others he notes that two touches of the sensitive hairs are usually necessary to cause closure of the leaf. What he calls "memory power of the protoplasm," that is, response to a second stimulus when the first had no appreciable effect, he finds is sharply retained for from 30 to 45 seconds; and in from 55 to 60 seconds the effect of the first stimulus is lost. He also found that the hairs were not alone sensitive, although they were most so. But both outer and inner leaf surfaces show a marked degree of sensitivity. It was observed, likewise, that, although falling water, like rain, had little or no effect, immersion in water caused closure of the leaves as soon as the water touched the hair. Although three is the normal number of hairs on each blade of the leaf, our author has seen seven on one and six on the other half of a leaf; and he says leaves are frequently observed with from 8 to 13 hairs. "Such facts give countenance to the view that the sensitive hairs were once more numerous and diffuse in distribution, a condition still retained by *Drosera*." The hairs are jointed just above the base, and this seems to be the special irritable centre.

The epidermal cells of the leaves are stated to be admirable objects for observing the continuity of protoplasm. After proper treatment, the method being described, there are seen "along each side 18 to 30 protoplasmic bridges, which are slightly constricted on either side of the cellulose wall, and form a central swelling at the passage through the pore aperture. The transverse or oblique walls are traversed by 5 to 8 similar processes, so that the protoplasm of each epidermal cell is linked to that of neighbor cells by 50 to 75 fine connecting threads, and these again collectively are united with the cylinder of sensitive cells in the irritable hair." Various other subjects are considered, but they cannot be referred to here.

In the Bulletin of the Denison University, above mentioned,

we have a catalogue of 945 species of plants occurring in Licking County, Ohio. Mr. H. L. Jones, the author, gives a list of the herbaria consulted, a short sketch of the county geology, and other facts. Among them are the times of flowering of the plants, and we note that in November 44 species bloom, in December 11, in January 14, in February 9, in March 17, and up to July 530. Thus no month of the year is without some flowers.

JOSEPH F. JAMES

Washington, March 1.

An Introductory Manual for Sugar Growers. By FRANCIS WATTS, F.C.S., F.I.C. London and New York, Longmans, Green & Co. 151 p. Ill. 8°.

In the rapid extension of agricultural chemistry and scientific agriculture, a vast amount of tabular matter has been prepared, thousands of analyses have been made, and yet the results are neither satisfactory nor proportional to the work done. Professor Whitney has recently placed the position very clearly in saying, "There has been no satisfactory interpretation as yet of much of the work which has been done on the chemical composition of soils and plants, and the results of plat experiments have in most cases been very conflicting and uncertain." In this country the government experiment stations are issuing bulletin after bulletin of valuable and interesting reading; but even they, with all their superior advantages, have, as yet, fallen far short of their purpose. One reason for this is in the pre-eminence given to analysis and in the slighting of "condition," which latter feature forms a prominent part in the opening chapters of "An Introductory Manual for Sugar Growers," by Mr. Francis Watts, government chemist at Antigua, W. I. The first half of this interesting little book may be perused with profit by agriculturists the world over, presenting as it does a remarkably clear and intelligible dissertation on the elements of agricultural chemistry, treating first of soils, then of plant life and plant food, and finally of manures and fertilizers. The remainder of the work is devoted exclusively to the sugar industry, beginning with the planting and cutting of

CALENDAR OF SOCIETIES.

Anthropological Society, Washington.

Mar. 7. — George H. Boehmer, Pre-Historic Naval Architecture of Northern Europe; George R. Stetson, Mental Atrophy in the Working Classes.

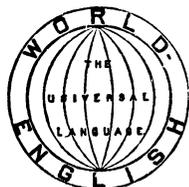
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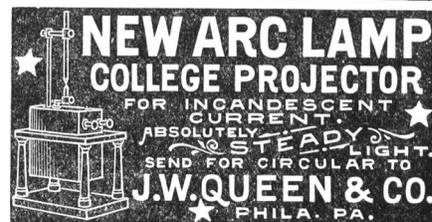
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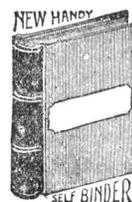
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