

his observations. The list of sun-spots at the end of the publication and the various extracts from the note-book will prove very useful to those who are engaged in researches of a similar kind. The observations seem to have been conducted with great care, and Dr. Lohse gives us in every case the exact method by which the measurements have been made.

If we endeavour to review a work which is not being continued, at least for the present, we rather turn to the actual results of the observations than to a mere list of accumulated facts. This list, no doubt, may prove hereafter to be the most important part of the work, yet it is only made important by those who discuss the observations. The more doubtful and hypothetical part, containing the conclusions, is therefore the better test for the moment, for we must not forget that without a guiding idea a mere tabular arrangement of facts is useless.

One of the most curious results of Dr. Lohse seems to be the discovery of a period of fifty days in the eruptive activity of the sun. Dr. Lohse took from the drawings of protuberances published by the Spectroscopic Society of Italy, the area of the protuberances as shown in the drawings for each day, and made a curve in which the times of observation formed the abscissæ and the area of the protuberances the ordinates. This curve first shows maxima and minima corresponding to maxima and minima of sun-spots. It next shows a short period of fifty days. During the years 1871, 1872, and the beginning of 1873, this period was well marked. From the middle of 1873, however, the whole solar activity became so small, owing to its chief periodicity of eleven years, that these secondary maxima cannot any more be distinguished.

We turn now to the spectroscopic observations, in which Dr. Lohse was led to somewhat similar conclusions as Mr. Lockyer. It is a well-known fact, that while nearly all the elements standing at the positive end of the electro-static series are found in the sun, we have as yet obtained no decided evidence of the more electro-negative elements. On the other hand, it is not probable that the sun should not contain so many bodies which play an important part in our world. Both Mr. Lockyer and Dr. Lohse came to the conclusion that we must look in the outer and cooler layers of the sun's atmosphere for evidence of the metalloids, but while Mr. Lockyer assumes that they exist as well in the hotter parts of the solar envelope, but under such conditions that we cannot identify their spectra, Dr. Lohse assumes that they do not exist except in the outer layers of the corona. Dr. Lohse is thus forced to assume a force in the sun which drives all the more electro-negative elements away from its centre. This is an hypothesis which we cannot accept, unless we have independent evidence in its favour, or unless it is the only one which will account for the facts; just as we could not accept Mr. Lockyer's hypothesis, if we had no evidence of changes in spectra produced by variations of temperature and pressure. Mr. Lockyer's hypothesis has a decided advantage over that of Dr. Lohse, for we have recently obtained such strong proofs of the changes of spectra produced by a variation of temperature and pressure, that we cannot help thinking that, had Dr. Lohse been acquainted with all these recent experiments, he would have come to the same conclusion

as Mr. Lockyer. This conclusion, indeed, seems inevitable, if it is once assumed that the metalloids really exist in the sun. It is important to mention that this presence of metalloids in the sun is rendered still more probable by the fact that the red and most likely cooler stars give spectra containing fluted bands.

It is interesting to notice that Dr. Lohse finds many of the unknown dark lines contained in the blue end of the solar spectrum to be reproduced in the spectrum of α Herculis, and although weaker in that of α Orionis, while they are absent in that of α Bootis.

Dr. Lohse does not seem to arrive at any results differing much from those of other observers in his observations on faculæ and sun-spots. It is a matter of regret that he, most likely for the sake of brevity, does not enter more fully into the explanation of his own views. A discussion of ideas described in such a cursory manner is impossible, as such a description is necessarily incomplete.

We hope that Dr. Lohse will have occasion to follow out his researches, and do not doubt that he will be rewarded by most interesting results.

ARTHUR SCHUSTER

OUR BOOK SHELF

The Absorptive Glands of Carnivorous Plants. By Alfred W. Bennett, M.A., B.Sc., F.L.S., Lecturer on Botany at St. Thomas's Hospital. Read before the Royal Microscopical Society, Dec. 1, 1875. With one plate.

MR. BENNETT notices the occurrence in *Drosera rotundifolia*, *Pinguicula vulgaris*, and *Callitriche verna* of peculiar bodies, which at first sight might be mistaken for stomata, and consisting of two nearly hemispherical cells filled with protoplasm. Each of the hemispheres contain a darker nucleus-like spot, and each is surrounded by a thin-walled cell containing chlorophyll. From these hemispherical bodies are developed the papillæ with thin walls and containing chlorophyll. *Drosera* and *Pinguicula* are carnivorous, and Mr. Bennett suggests that *Callitriche* may also be carnivorous, from the occurrence of these peculiar bodies. It seems probable that they are really as Mr. Bennett thinks, absorptive glands, and they certainly bear a strong superficial resemblance to the quadrifid processes found and described by Darwin in *Utricularia* and *Genlisea*. The subject is a very interesting one, and it is to be hoped that further research will throw more light on the matter. It is rather difficult to get a clear idea of the structures from the plate, which seems a little out of drawing, and rather confusing.

W. R. McNAB

Reseña de las Rocas de la Isla Volcánica Gran Canaria. Por Don Salvador Calderon. (Reprinted from the Anales de la Sociedad Española de Historia Natural. Tomo iv.) Madrid 1876.

IN this work, which is appropriately dedicated to M. Berthelot—to whom we owe one of the earliest descriptions of the geology of these interesting islands—the author gives some valuable information concerning the relations of the different classes of volcanic rocks to one another. He also describes some of the vast "Calderas" or craters so characteristic of this group of islands, and notices the theories which have been proposed to account for their origin. Of especial interest, however, is the account which he furnishes of the nature and composition of the different varieties of volcanic rocks, and the classification which he proposes for them. It would appear from this work of Señor Calderon, that the true or "sanidine-