The Micrographic Dictionary—Pollen Grains

I READ your criticism of this book in last number of NATURE with a good deal of interest, and I fully agree with your reviewer in his statement that "workers in different fields will place a different estimate on the importance of their own department." Allow me to call your attention to the two singularly erroneous figures of the pollen grains of *Mimulus moschatus* (Pl. 32, Fig. 24) in this work. I have frequently examined the pollen of this plant, and have never seen it anything like the figures in the "Dictionary," or in any way differing from the grains of many other members of the Scrophulariaceæ. The pollen of *M. moschatus* is like a grain of wheat, and not like the wonderful convolute ball shown in the "Dictionary."

In his "Common Objects for the Microscope," Plate 3, Fig. 21, the Rev. J. G. Wood reproduces the first of these two extraordinary figures, and describes the pollen as "belted with wide and deep bands," &c., but by an oversight he omits to give the source from which the erroneous figure is copied.

In his "One Thousand Objects for the Microscope," Plate 2, Fig. 6, Mr. Cooke copies the second extraordinary figure of this pollen, and says, "these curious granules resemble a band or cord rolled or folded in a spherical mass," as if he had so seen them. The "Dictionary" plate certainly does look like this, but in the letter-press the folds are referred to as "slits or furrows." By an oversight Mr. Cooke also omits to give the source from which his erroneous figure is copied.

W. G. SMITH

The Phylloxera

IN the report to the Department of the Interior of the Canton of Geneva by the commission appointed to inquire into the best means of stopping the ravages of Phylloxera, which I have just received from Prof. Forel, of Morges, it is stated that the insect was most probably introduced from England in some vines which were taken to Geneva to certain graperies of Baron Rothschild in 1869. These graperies are in the middle of the infected district—they were found to be infected within twelve months of the arrival of the plants, and no vineyards but those in the neighbourhood of these graperies have been infected in all Switzerland. Prof. Forel, in his letter to me, says that while the surrounding vines have perished, those attacked in Baron Rothschild's houses have suffered very little indeed, and bear plenty of fruit. These vines, he says, are Black Hamburg and Muscat d'Alexandrie or d'Alicante. He asks if in England anything is known which points out any kind of vine as suffering less than other kinds. Can any of your readers tell me anything about it?

Clifton, Jan. 23

G. H. WOLLASTON

Thermometer Scales

I SHALL feel greatly obliged if any reader of NATURE can inform me what scale the thermometer referred to in the following extracts was made to:—"7 Feb., 1775. This day the thermometer was down to 80, two hours after sunrise." "This thermometer has five inches divided into 75 degrees above temperate (*sic*); and 6½ inches below temperate, divided into 100 degrees; the spirit at 80 was about an inch from the bottom. In the frost in 1739 the spirit sunk below all the marks in this thermometer." Also—"Dec. 30, 1739. Thermometer sunk below all the marks. . . . This thermo was marked down to 7 below Fahrenheit's freezing point of 32; so this was below 25 of Fahr." Some very hot days in July 1757 are marked (I presume by the same thermometer) at 40, 41, 46, and 47 degrees; another day, "very near 50" is spoken of as the hottest day the writer thinks he ever remembers in England, "except the famous hot Saturday on the 11th of June, 1748."

In 1783-4, 13 below 0 of *Linnaeus* is mentioned as very severe cold. The scale of *Linnaeus* is mentioned several times. I have failed to discover the scale of the first thermometer, and never heard of that of *Linnaeus*. If any of your readers can enlighten me as to the relation of these scales to that of Fahrenheit or Réaumur, I shall feel greatly indebted.

Norwich, Feb. 1

THOMAS SOUTHWELL

OUR ASTRONOMICAL COLUMN

THE NEXT RETURN OF HALLEY'S COMET.—In the year 1864 the late Count G. de Pontécoulant made an important communication to the Paris Academy of

Sciences relating to the perturbations of this famous comet. He remarked at the outset: "I propose, in my new researches on the comet of Halley, to follow the course of that body from the epoch when it was observed for the first time in a manner sufficiently precise to allow of determining the orbit, until that of its next return to perihelion, which will take place in 1910, *i.e.* during an interval of nearly three hundred and eighty years, including five entire revolutions of the comet. I shall describe here, as succinctly as it is possible to do, the results of the immense calculations which it has been necessary to effect in order to attain this object." We shall confine ourselves in the present remarks to a few particulars relating to the appearance of the comet in 1910, reserving a further account of Pontécoulant's memoir for a future occasion. It is, however, impossible to avoid an expression of regret that the astronomer who has completed the enormous work indicated in the above extract, should have passed away without (so far as we know) putting upon record the successive steps of his calculations in sufficient detail to be of service to the future investigator, and it is to be hoped his papers may yet be made available for this purpose. Mere statements of final results, necessitating for their attainment such a prodigious amount of labour and such unusual skill, are hardly all that is required, though in this remark we imply no want of confidence in the accuracy of the work performed. It is almost certain that the perturbations of Halley's comet will be recomputed before the year of its next return, and it is as certain that the possession in detail of the various numerical results of Pontécoulant's work would be of very great service to anyone who may undertake its verification, not only by way of check as he proceeds, but as a guide to the effective management of the formidable mass of figures involved.

The perihelion passage in 1835 is fixed to Nov. 15.95 Paris mean time, at which moment the comet is found to have been moving in an ellipse with a period of 27895.81 days. The influence of the planet Jupiter upon the length of the present revolution is greater than in any of the four previous ones, and amounts to 679.37 days, by which the next perihelion passage is accelerated. Saturn retards the comet 2.79 days, while Uranus accelerates it 2.30 days, therefore nearly negating the influence of Saturn. The attraction of other planets is neglected. The total effect of perturbation during the actual revolution is thus found to be 678.88 days, the period being shortened thereby; and hence the time of revolution corresponding to 1835, Nov. 16, is diminished to 27216.93 days, and the next perihelion passage is consequently fixed to 1910, May, 23.87 Paris time, the comet then completing the shortest revolution since 1531, the preceding revolution having been the longest, and their difference is upwards of two years. The periodic time corresponding to the comet's motion at perihelion in 1910 is 27,790 days. A notable change is produced by the action of the planet Jupiter in the perihelion distance, which is increased by upwards of a tenth of the earth's mean distance from the sun, and the comet's orbit is thus brought into very close proximity to that of the earth at the descending node. In 1835 the comet at this point passed 0.1511 from our track; in 1910, according to Pontécoulant, it will be distant only 0.0157. The eccentricity of the orbit in 1910 is found to be 0.9617332; the semi-axis major, 17.95546; the longitude of perihelion, 305° 38' 14"; the ascending node, 57° 10' 33"; inclination, 17° 46' 51"; the motion is retrograde. The longitudes are counted from the mean equinox at perihelion.

The track of the comet calculated from these elements is a very favourable one for observation. At the end of October 1909 the comet has the same theoretical intensity of light as when it was last glimpsed by Dr. Lamont with the Munich refractor, on the 17th of May, 1836. (It is often erroneously supposed that the last observations