

panied. The comets of short period—a most interesting class—might well have been treated in somewhat greater detail, and in this division of the work we note several oversights. Thus it is stated that the researches of Dr. Axel Möller upon the motion of Faye's Comet, show that that body supports the theory of a resisting medium, first supposed to be indicated by Encke's investigations relating to the comet which bears his name; but as long since as the year 1865 Dr. Axel Möller had relinquished this idea, and from a rigorous discussion of the observations at the first three appearances, alluded to by M. Guillemin, had succeeded in representing the observations by the simple application of the planetary perturbations, without any hypothesis whatever, and his later researches have also negatived the existence of any trace of the effect of a resisting medium upon the motion of this comet. There is some ambiguity in the definition of the element π , or the longitude of the perihelion in the orbit of a comet; from the explanation given by M. Guillemin it might rather be inferred that the longitude is reduced to the ecliptic, which is not the case. The comet discovered by De Vico at Rome, February 20, 1846, is duplicated, appearing first on p. 140 with a revolution of fifty-five years, and again on p. 143 with a period of seventy-three years; the former period resulted from one of the earlier calculations. Pigott's comet of 1783 is named amongst the contents of a chapter p. 133, but there is no further reference to it. In the catalogue of orbits, there are several cases since the year 1866 where the inclination has been reckoned over 90° , as is frequently the case amongst the German computers, and with the unnecessary addition of the letter R in the column headed "direction of motion." To render these orbits consistent with the method hitherto in general use, and indeed adopted exclusively in the preceding part of the catalogue, the inclination given requires to be subtracted from 180° , and for the longitude of perihelion given in the fourth column, $2 \varnothing - \pi$, should be substituted.

These, however, are small defects which may easily be avoided in a future edition. As a whole, M. Guillemin's "World of Comets" must prove a welcome aid to the student on entering upon this branch of astronomy.

J. R. HIND

OUR BOOK SHELF

Fownes's Inorganic Chemistry. Edited by Henry Watts, B.A., F.R.S. Twelfth Edition. (London: Churchills.)

IN the present edition of this well-known manual the publishers have, wisely as we think, determined to divide it into two parts. In its old form the work had grown to be as unhandsome and cumbersome a volume as could be well imagined; like an overgrown yeast-cell it was obviously getting too big to hold together much longer, and many a student on his way to and from the lecture-room must have wondered, as he struggled to get the thick squat book into a comfortable carrying position, why the process of gemmation was so long delayed.

The present volume, which treats of physical and inorganic chemistry, contains a considerable amount of new matter, and may be regarded as an accurate representation of the present state of knowledge on these subjects. Among the more important additions we may mention an account of Mendeleeff's Laws of Periodicity, and a very good digest of what is known concerning the new metal gallium and its compounds; this element is associated with indium, with the probable atomic weight 68, as already

indicated by M. Mendeleeff. The position of the cerite metals is also determined in accordance with the specific-heat estimations recently made by Hillebrand. On the other hand, it may be doubted if iodine tetrachloride has any real existence, and Michaelis has proved that the reaction $3\text{PbSO}_4 + 2\text{POCl}_3 = 3\text{SO}_2\text{Cl}_2 + \text{Pb}_3\text{P}_2\text{O}_8$ is not realised in practice. On the whole, however, the work fully maintains its reputation as a faithful exponent of the state of contemporary chemical knowledge. T.

The Microscopist: a Manual of Microscopy and Compendium of the Microscopic Sciences. Third edition. By J. H. Wythe, A.M., M.D. (London: Churchill, 1877.)

IT is now some twenty-five years since the first edition of this work appeared, and as the author himself remarks in his Preface, it is no small compliment to a work of this kind that for so many years it should hold a place among works of reference, although surrounded by larger and more pretentious volumes. For this third edition the book has been entirely rewritten, the advancement of microscopical science having naturally rendered considerable enlargements necessary. Still the work retains its principal qualities as before, viz., the precise and clear language, the absence of all unnecessary verbiage, and last but not least, the excellent arrangement of the contents. Thus after a brief reference to the history and importance of microscopy, we have able descriptions of the microscope itself and its accessories, followed by general remarks on its use and the more modern methods of microscopic investigation. Then, after a short chapter on the mounting and preserving of objects, we come to well-written and richly illustrated treatises on the application of the instrument in the different sciences, each science being spoken of in turn and in a separate chapter. For the beginner this arrangement is of special value, as it enables him quickly to form a general idea of the whole domain of microscopy. Mineralogy and Geology are followed by a chapter on Microscopic Chemistry; then the author treats of Microscopic Biology, devoting a chapter to Vegetable Histology and Botany, one to Zoology, the next to Animal Histology, and the last to Practical Medicine and Pathology.

The illustrations are original to a great extent; many also are taken from the works of Carpenter, Frey, Stricker, Billroth, and Rindfleisch. The larger plates, of which there are twenty-seven, are particularly well drawn, and add greatly to the general excellence of the work.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Hog-Wallows and Prairie Mounds

JUDGING from the descriptions of these deposits, they must be nearly, if not quite, identical with those which I described in a paper on "The Ancient Glaciers North and East of Llangollen," read at the British Association, 1865. These are a series of heaps of glacial drift covering more or less completely the habitat of Cheshire Cheese, i.e., the Vale Royal itself, and the slopes which extend from it to those Welsh Mountains that are so prominently seen from Chester. These mounds vary in size and shape according to their position. They are very well defined and numerous in the valley of the Alyn, between Wrexham and Mold, where they have the form of oblong hog-back mounds usually lying parallel to each other with their longer axes (if I may use the term) nearly at right angles to the general slope of the surface. They may be counted by hundreds, and in some parts are so near together as to form a series of connected undulations. They are largest and most abundant opposite the mouths of the lateral valleys opening into the main valley of the