

OUR BOOK SHELF

Elementi di Fisica. Vol. IV., Elettività e Magnetismo.
By Prof. Antonio Ròiti. (Florence, 1883.)

SURELY, and not slowly, the views of Thomson, Maxwell, and the modern electricians generally are finding acceptance throughout the Continent. The absolutely unanimous acceptance of the British Association's system of electrical units since the indorsement of that system by the Paris Congress of 1881 has proved the immense gain to the electrical world of having a uniform means of expressing electrical quantities, and has compelled electricians not only to read but to comprehend the writings of the pioneers of this most important reform. The work now before us for review, though professing to be but a text-book for use in the lyceums and schools of Italy, gives ample evidence that its author, Prof. Ròiti, of the Royal Institute of Higher Studies in Florence, is not only abreast of all the latest developments of electricity, but that he has mastered the theory also. Few text-books of its size have we seen that will compare favourably with Prof. Ròiti's little volume of 356 duodecimo pages. The faults which have been hitherto so conspicuous in most of the Continental text-books on electricity are in this work conspicuously absent. As an example we may refer to the author's treatment of the relation between the capacities, potentials, and charges of similar conductors. The elementary theory of the magnetic shell and that of the mutual potential of two magnetic shells are neatly expounded in pages 131 to 133. The absolute electrometer and the quadrant electrometer of Sir W. Thomson are both described, and illustrative figures given. The system of absolute and derived (C.G.S.) units, and that of the practical units of electric quantities based upon them, are explained at length on pages 204-5. There is a short chapter on the electric light, and another on electric motors, in which the *anello elettromagnetico di Pacinotti* is described, the author remarking with emphasis that it contained the germ of almost all the machines by which the marvellous strides recently made in the applications of electricity have been achieved. The experiments of Deprez at Paris on the electric transmission of power, and the economic questions involved are also touched upon. Crookes's researches on "radiant matter" are mentioned and illustrated. Amongst points of novelty may be mentioned Pellat's method of measuring the electromotive force due to polarisation, which has not yet, we believe, found its way into any English text-book. Two points of criticism we have to offer in conclusion. The first is that the author defines electric *tension* as identical with the electric *force*, equal to 4π times the surface density of the charge, instead of defining it, in the sense of Faraday and Maxwell, as the stress on the dielectric, which is proportional to the square of the surface density, and therefore proportional also to the square of the electric force or electromotive intensity at the point of the surface considered. The only other complaint we have to make of the work—and this does not detract greatly from its value—is that the author does not acknowledge the sources from which some of his descriptions and cuts are taken. S. P. T.

Dr. H. G. Bronn's Klassen und Ordnungen des Thier-Reichs, wissenschaftlich dargestellt in Wort und Bild.
Erster Band, Protozoa. Neu bearbeitet von Dr. O. Bütschli. (Leipzig and Heidelberg: C. F. Winter, 1880-83.)

THE first nineteen parts of this new edition of vol. i. of Dr. Bronn's well known and important work on the classes and orders of animals, nearly completing the volume, prove that Prof. Bütschli has spared no pains to keep it up to the most modern investigations of the Protozoa. In no one division of the animal kingdom has observation gone so hand in hand with discovery as in this, the lowest

of her classes. Glancing at the portion treating of the Gregarinida, what strides have been made in our knowledge of these forms within the last ten years. Adopting Leuckart's titles for the class of Sporozoa, under which are the sub-classes Gregarinida, Coccidia, Myxosporidia, and Sarcosporidia, we find 137 pages and eight plates crowded with figures devoted to a sketch of the characteristics of the class with diagnoses of the genera and the number of species, and references to the places where fuller details of these latter will be found. The illustrations are clear and effective, and copied from every available source. The bibliography appears to be well to date, and this volume when complete will be an indispensable handbook for the student of the lower forms of animal life.

LETTERS TO THE EDITOR

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[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 insure the appearance even of communications containing interesting and novel facts.]

"Elevation and Subsidence"

THE view that the glacial subsidence was due to the pressure of the accumulating land ice, has been accompanied with the corollary that subsequent elevation was due to the removal of this pressure by the melting of the ice; but though I think the first is true, the corollary is not so, in England at least.

In my memoir "On the Newer Pliocene Period in England" (*Quart. Journ. Geol. Soc.* for 1880, p. 457, and 1882, p. 667), I have endeavoured to show how the inclination of this country changed during the progress of the major glaciation, and the flow of the land ice from the mountain districts to the sea altered in accordance therewith, as well as pointed out (p. 709) the connection of this change of inclination with the accumulation of the land ice on the mountain districts; but I have also traced in detail in it how the east side of England rose to an extent that brought Norfolk and Suffolk from a submergence of more than 300 feet to their present level at least, and Essex proportionately so, while the land ice continued to push over the sea-bed of sand and gravel, as this rose into land, covering it with its moraine, until by this rise the easterly movement of the ice was arrested, while the west and south of England still remained to a great extent submerged. Since that memoir was published, Mr. David has in the same journal described the glacial clay which represents the moraine of the Welsh land ice in East Glamorganshire, itself *uncovered* by any marine deposit, as covering beds of stratified sand and gravel, which, from their containing many chalk flints, can be only the bottom of the antecedent sea, as low down as 80 feet above Ordnance datum. When this is compared with the evidence of more than 1300 feet of submergence afforded by the shell bearing gravels of North Wales; of 700 feet afforded by the Gloucestershire gravels to the east; and of between 500 and 600 feet afforded by the gravels of Devon to the south of Glamorganshire, it becomes evident that the amount of rise which took place in the west of England before the land ice began to retreat was even greater than in East Anglia. It is to subterranean movements engendered by this pressure, and not to its removal, that the rise in England seems to me to have been due; and I have given several sections in this memoir in illustration of the abrupt and violent character of the upthrows connected with it.

Although in this memoir I remarked upon the coincidence of the westerly increment in the great submergence with the augmenting quantity of the land ice on Cumberland, Westmoreland, and Wales, as the major glaciation went on, yet this coincidence between augmenting land ice and submergence is, I now see, more complete than had then occurred to me; for though I described the evidences that show the passage from the Crag to the glacial marine beds of Norfolk and Suffolk to have been accompanied by a northerly subsidence which submerged the valley of the Crag river, in the north of the former county, while the other extremity of its estuary (in East Suffolk) was elevated, so that islands formed of Crag beds came there into