been those of omission, and common to most authors. Of the high value of the work as a text-book of public health there can be no question; and we hope that Mr. Blyth's manual will be in the hands, not only of students, but of all those whose calling is sanitary science.

J. H. E. BROCK.

OUR BOOK SHELF.

Lehrbuch der Zoologie für Studirende und Lehrer. Von Dr. J. E. V. Boas. Mit 378 Abbildungen. (Jena: Gustav Fischer, 1890.)

THIS newly published manual of zoology is a translation of the author's work, which was published in Danish in 1888. It is written from the modern standpoint, dwelling rather on the embryological and structural details of the forms of animal life, and using the scheme of classification as a subject of secondary importance. While the present volume is based on the author's previous work, it is no mere translation; not only is there a quite new chapter added under the heading of "Biology," in which the distribution of animals on land, sea, and fresh water, parasitism, non-locomotory animals, and such like subjects are briefly discussed, but changes have been made in the species of animal forms selected for illustration when those previously selected would not have been easily attainable by the German student. New figures have been introduced, and the work has generally been revised. The author warmly thanks Prof. Spengel, of Giessen, for much help rendered in the revision of the translation, German not being Dr. Boas's mother tongue. The first portion of this manual treats of the cells and tissues, the various organs or systems, development, and phylogeny, and includes the chapter above-mentioned on biology, and on the distribution of animals in space and time. The special portion treats of the classes of animals, from the Protozoa to Mammalia. Certain groups, the position of which is uncertain, are treated as "appendages" to the larger ones, such as the Sponges to the Cœlenterates, the Tunicates to the Vertebrates, &c. Possibly, from the student point of view, this is going too far afield. Another point that struck us in a perusal of this volume was the absence of all references to the work of others in the field of zoology. We are very far from suggesting that it would be desirable to refer, in a necessarily compressed statement of facts, to the first discoverer of, or recorder of, the same; but there have been some epoch-making discoveries, such as have revolutionized our ideas of development, structure, and classification, and we think it a good plan to let the student know the names of the authors of these, as we fancy that, by doing so, the facts are all the more impressed upon his mind. In some few cases we would even go further, and, by telling the student where to look for further details, try and interest him in bibliography. It may be as well to add that in an indirect way this reference to the labours of others is, in a few instances, made in this volume, for some of the illustrations are inscribed as "after Allmann, Huxley, Weismann, Sars," &c.

The great majority of the figures are well selected, and the volume of nearly six hundred pages is published in a style worthy of the firm which introduced Balfour's "Comparative Embryology" to the German student, and that has introduced to us the works of the Hertwigs, Kölliker, Lang, Weismann, and others.

A Pocket-book of Electrical Rules and Tables. Seventh Edition. By John Munro, C.E., and Andrew Jamieson, M.Inst.C.E., F.R.S.E. (London: Charles Griffin and Co., 1891.)

THE rapid progress made in the application of electricity for various purposes makes it necessary for every engineer to carry about with him some book to which he may refer. The present work has for some time been a boon to many, and its value has been increased by the improvements in the new edition. Among several additions by which the book is enriched is an article on telephony, by J. D. Miller. Not the least important item is the admirable and well-arranged index, which in a work of this kind is so essential.

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 intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

"Modern Views of Electricity"—Volta's so-called Contact Force.

DR. LODGE'S treatment of this subject at pp. 107–114 of his book presents at first certain difficulties. It is in the hope that he or some of his numerous readers may give a fuller explanation that I communicate them to NATURE.

We are told (p. 112) that a piece of isolated zinc has potential 1·8 volts below that of the surrounding air. This, it is said, is owing to the affinity of zinc for oxygen, and to the fact that atoms of oxygen combining with the zinc bring with them negative electricity. But (p. 110) the zinc cannot thus combine with many atoms, receiving their charges, without becoming so negatively charged as to repel oxygen atoms electrically as much as it attracts them chemically. This, indeed, may be considered as the state of equilibrium which is instantaneously attained.

In this passage Dr. Lodge does not explain how the oxygen atoms come by their negative charge. We can understand how they come to have it in electrolysis, to which we are told to compare the Volta phenomena. In case of electrolysis, oxygen atoms, seeking to combine with zinc, have first to dissolve partnership with atoms of hydrogen, and the condition of that dissolution of partnership is that oxygen goes away with a negative, and hydrogen with the corresponding positive charge. But in air atoms of oxygen exist only in combination with other like atoms, forming molecules of oxygen. And unless these molecules are negatively charged, it is difficult to see why on their dissolution the atoms combining with zinc are charged negatively.

We are told further (p. 110) that when metallic contact is made between zinc and copper, a rush occurs of positive electricity from copper to zinc, and of negative from zinc to copper, bringing both metals to a common potential 1·3 volts below the surrounding air. If that be so, the equilibrium which we said was attained in the case of the zinc is destroyed. The zinc, having by this rush been deprived of part of its negative charge, it can no longer be true that it "repels oxygen atoms electrically as much as it attracts them chemically." We should expect that a further combination of oxygen with zinc would take place, renewing the negative charge on the zinc, and causing a further rush of positive electricity from the copper. In fact, the conditions of equilibrium, when copper and zinc are in contact, seem to be unexplained.

Again, to explain the Thomson experiment with the aluminium needle (p. 111), Dr. Lodge says that the air near a couple of zinc and copper plates in contact is in a state of electrostatic strain, being at higher potential near the zinc than near the copper. But why should this be so if the two metals are at a common potential? And is it not inconsistent with the statement that the two metals are at a common potential 1·3 volts below the surrounding air?

S. H. BURBURY.

WITH much pleasure do I reply to Mr. Burbury's questions concerning the Volta effect, but must refer him to my memoir on the subject, "Seat of E.M.F. in Voltaic Pile," published by Messrs. Taylor and Francis, for the complete statement and argument, of which only a brief and picturesque summary is given in "Modern Views."

(1) The difficulty which Mr. Burbury mentions concerning the electric charge of gas atoms is a very real one, but it is not a difficulty peculiar to Voltaic doctrine; and, however it is to be accounted for, the fact that gas atoms are charged seems well