

all; and thus we see that, in correlation to the profoundly modified fore-limb, every other part of this feathered creature has suffered changes.

The whole memoir is devoted to a detailed account of the changes which are thus brought about during this beautiful metamorphosis, the interest of which is increased by the peculiarly fascinating manner of their description, and to which in a brief notice it would be impossible to do proper justice.

OUR BOOK SHELF.

A Dictionary of Metric and other Useful Measures. By Latimer Clark. (London: E. and F. N. Spon, 1891.)

THIS dictionary will be found to be a most valuable and useful *vade-mecum* by all those who have occasion to employ metric and other physical measures. The arrangement of the tables in this form is the most convenient that could have been adopted, and for uniformity and facility of reference could hardly be excelled. One great feature, which is generally lacking in ordinary sets of tables, is the setting forth of the relations of the different metric units to each other: thus, for instance, on looking under the heading gramme-centimetre, we find its equivalent in kilogramme-metres, foot-grains, foot-pounds, joules, ergs, &c., while the latter are indexed under their respective titles. Not only have the French measures with their factors for conversion into British measures been given, but physical, electrical, and other modern units which are so numerous and indispensable.

With regard to some of the fundamental units we may mention that the value of the cubic inch of water, adopted here, is that which "was recently determined with great care by the Standards Department of the Board of Trade"; and in consequence of its being recently legalized, the values of the cubic foot, gallon, &c., have been revised. Throughout the work the logarithms of all the chief factors have been inserted, and at the end there is a short table of logarithms and anti-logarithms adapted for use with any number of figures up to five.

A Text-book of Geometrical Deduction. Book I., corresponding to Euclid, Book I. By James Blaikie and W. Thomson. (Longmans, Green, and Co., 1891.)

THIS work forms an excellent supplement to the first book of Euclid, and by its means a systematic course of training in the art of solving geometrical deductions can be obtained. The arrangement adopted is good, and of a very progressive character. The propositions are divided into sections, and each section is subdivided into three parts: in the first a deduction is worked out in full to serve as a guide to the student; deductions similar to the one already mentioned then follow, in which the figures are in each case given and such notes as are deemed necessary for a beginner. In the last part no figures or notes are added, but occasionally references are given to the propositions on which the proofs depend. The deductions in the last two parts should be written out by the student, and the proofs made to depend on the preceding propositions of Euclid. Additional parts, corresponding to the remaining books of Euclid, are in preparation, and if they are up to the standard of the present one, the series will be found generally useful.

Elementary Algebra. By W. W. Rouse Ball. "Pitt Press Mathematical Series." (Cambridge: University Press, 1890.)

IN this book all those parts of the subject which are usually termed "elementary" are dealt with. It is a sound and well-written treatise. No deviation of importance has been made in the general order of arrange-

ment that has been lately adopted, but many articles and examples which might profitably be left for a second reading have been marked with an asterisk. Permutations and combinations, the binomial theorem and the exponential theorem—subjects which are sometimes included in an elementary treatise, and sometimes excluded—have here only been lightly touched upon, and will serve as an introduction to the more detailed discussions contained in more advanced text-books. Numerous examples are interspersed in the text of each chapter, and here and there are papers and questions that have been set in various examinations. The table of contents is fuller than usual, and will enable the student to find readily any particular article to which he may wish to refer.

A Ride through Asia Minor and Armenia. By Henry C. Barkley. (London: John Murray, 1891.)

THE "ride" described in this book came off in 1878, but the author writes so brightly that only very exacting readers will complain of any lack of freshness in his narrative. His journey from Constantinople occupied ninety-six days, of which fifty-three were spent in the saddle. He rode fourteen hundred miles, the average distance done each day being about twenty-two and a half miles; and, says Mr. Barkley, "if the miserable mountain roads are taken into consideration, I think this was very fair work for a lot of ponies." Apart from the personal incidents of the journey, Mr. Barkley was interested chiefly in the character, manners, and customs of the inhabitants of the districts through which he passed; and on these subjects he records a good many acute observations. It is worth noting that he speaks in high terms of the spirit of hospitality displayed in the parts of the Turkish dominions he has visited. Of course, the Turk is most hospitable to the Turk, and the Christian to the Christian; but "it often happens that the Turk receives the Christian as his guest, and the Christian the Turk." If a respectable traveller finds a want of hospitality on the part of either Turk or Christian, Mr. Barkley cannot but think it is the traveller's own fault.

LETTERS TO THE EDITOR.

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Prof. Van der Waals on the Continuity of the Liquid and Gaseous States.

WITH regard to Mr. Bottomley's criticism, I should like to add to what Prof. Rücker has said that Prof. Van der Waals's book is not in any sense a *treatise* on the continuity of the liquid and gaseous states, but a *thesis* wherein is put forward the author's own work on which he claims a doctor's degree.

The preface explains that, in the attempt to determine the value of one of Laplace's capillary constants, the author was forced to proceed by theory, and that the course of these theoretical investigations led him to see that there must be continuity between the gaseous and liquid states. He was, in fact, led to his well-known characteristic equation for a substance in a *fluid* state, an equation in no way depending on the character of the fluidity.

This characteristic and its application are for this thesis the important things, and Prof. Van der Waals proceeds therefore to show that the results deducible from it are in complete agreement with Dr. Andrews' experiments and Prof. James Thomson's suggestions. It is not a point with him to discuss the question of continuity except as bearing on his characteristic; but this continuity is doubtless taken for the title of the thesis as being the most important deduction from his theory.

There is no question of priority: the author gives full information as to where the experiments bearing on the subject