

the subject to mere exercises in algebra and geometry; the former is the only process for advancing true knowledge. It is unfortunately the mathematician's transformer that figures so largely in the present volume. The subject of iron testing, the magnetic qualities of iron, its selection, and the effects of use on it for transformer cores, though fundamental matters of principle in the case of the real transformer, are not so much as mentioned, in spite of all that has been lately done in this matter. The avoidance of eddy current losses in the copper circuits and frames, the effect of magnetic leakage in causing such copper eddy current losses, the processes of ventilating large transformers, and the real difficulties of insulation, and the specialities of design for various purposes, are not named. The practical man, looking for approved principles of design in the case of the transformer, asks for the bread of practical experience; he is here presented with the stones of an artificial theory.

OUR BOOK SHELF.

Mechanics for Beginners. By Linnæus Cumming, M.A. Pp. viii + 247. (London: Rivington, Percival, and Co., 1896.)

TWENTY years ago a Committee of the British Association recommended that the school teaching of physics should begin with a course of elementary mechanics, treated from an experimental point of view, and the opinion expressed in the Physics Section of the Association this year was in support of that view. Mr. Cumming has for some years been endeavouring to act upon the recommendation in the science classes of Rugby School, and the present book contains the course which his experience has proved to be the most suitable for beginners.

The book does not begin with dynamics, for though Mr. Cumming recognises the scientific advantages which this subject offers to the study of mechanics, he has found it too abstract for young students. Statics lends itself to experimental treatment, and is able to appeal directly to the convictions and interests of boys beginning the study of science. The first part of the book is, therefore, devoted to this branch of the subject, dynamics being treated in the second part, and hydrostatics in the third.

Teachers and students who are familiar with the author's books on electricity and heat, will know the character of his work. The present volume is thoroughly practical, is very clearly illustrated, and will doubtless find its way into many schools. It shows how mechanics may be experimentally taught in schools, and the principles demonstrated with simple apparatus; it thus contains the elements of a sound scientific education.

We regret to note the absence of an index, for no text-book is complete without one.

Hints on Elementary Physiology. By Florence A. Haig-Brown. Pp. xii + 121; 20 illustrations. (London: J. and A. Churchill, 1896.)

THESE "Hints" are based upon notes taken by the authoress and her sister while attending lectures and demonstrations given to probationers at St. Thomas's Hospital. They will be found helpful as a means of giving a general idea of the functions of the various parts of our bodies; and nurses who read them will acquire knowledge which will lead to the intelligent performance of duties.

LETTERS TO THE EDITOR.

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The Utility of Specific Characters.

I AM anxious to avoid prolonging this discussion, but I should like to say a word in answer to Prof. Pearson and Mr. Cunningham. The letters of these gentlemen may lead some readers to infer that I have only just recognised the hypothetical nature of the law of growth of crabs assumed in the report of last year, to which reference has been made. I wish, therefore, to point out that the hypothetical nature of this assumption is recognised in the report itself (*Rev. Soc. Proc.*, vol. lvii. pp. 367-368), and in the remarks which accompany it (*ibid.*, pp. 381-382).

So far as I remember, this point was dwelt upon by at least one speaker in the discussion which followed the reading of the report: and the fact that I have spent the whole of my spare time, since the report was read, in an endeavour to ascertain the actual law of growth, is evidence that I have not been blind to its importance.

I must ask Prof. Pearson's leave to postpone a discussion of the actual law of growth until I have worked out the results of all my observations.

As for Prof. Pearson's second point—that correlations may arise by chance—I altogether fail to follow him; and the data which he gives concerning his hypothetical breed of cows, do not seem to me sufficient to serve as the basis of further discussion.

W. F. R. WELDON.

University College, London, October 3.

An Error Corrected.

WE regret to have to acknowledge a mistake which we have made in a communication to the Paris Académie des Sciences, reproduced in NATURE of Aug. 27. It refers to the densities of helium; it does not affect the experimental results, nor the conclusion that helium has been split into two portions of unequal density; but it affects the figures assigned to these densities. The hypothetical case was stated that a mixture of four volumes of oxygen and one volume of hydrogen would diffuse in equal times, and *therefore could not be separated*. This conclusion is of course wholly wrong, and likewise in consequence the densities calculated for helium on a similar supposition. The densities of the two fractions of helium are therefore those found experimentally, viz. 1.874 and 2.133. It is right to observe that these figures stand for densities calculated from the observed rates of diffusion, and not from direct weighings.

WILLIAM RAMSAY.

J. NORMAN COLLIE.

University College, London, October 1.

The Departure of the Swallows.

I DO not know whether the eccentric behaviour of the swallows this year is of sufficient interest to justify me in troubling you with a letter. I am not the only person in this part of the world whose attention it has attracted.

Everybody is familiar with the spectacle of large assemblages of swallows immediately preceding their total disappearance; usually, I think, in early October. This year great multitudes were assembled here on September 1; both flying about this house, and at perch on rails and telegraph wires. On the two next days only one or two were visible, and on the two days succeeding none at all. I concluded that they had antedated their departure by a month, although in this locality the steady sunshine and dryness had not then ceased; but on Sept. 6 large numbers appeared, to disappear again the next morning. Since then their action, or the action of *some* swallows, has varied nearly in accordance with the twelve days' account which is appended. Yesterday (September 30) none were visible, nor are any to-day. But there has been no large assemblage immediately previous.

If you pay any attention at all to these remarks, please to