

living zooids of this remarkable group of Hydroids. It was *M. nodosa*, occurring at Tahiti, that afforded Prof. Moseley the material for his brilliant confirmation of the observations of L. Agassiz. Twelve plates, the figures on which are beautifully executed by Mr. H. Gawan, accompany this Report.

The concluding Report in this volume is by Prof. Sir William Turner, being on the Human Crania, &c., collected during the cruise. This forms Part 2, being on the bones of the skeleton, and is an Essay on the Comparative Osteology of those Races of Men whose bones are described in the Report, for it incorporates the study not only of the material collected during the cruise of the *Challenger*, but that brought together by the authors' eminent predecessors in the Chair of Anatomy in the University of Edinburgh.

Just a century ago Camper pointed out some of the differences existing between the pelvis of a Negro and a European, and since then a vast amount of information on the subject has been accumulated, and so far as the races described in this Report are concerned, it has been exhaustively treated by Sir W. Turner. He classifies the pelvis into three groups: dolichopellic, with a brim index above 95; mesatipellic, with a brim index from 90 to 95; and platypellic, with index below 90. As to the race and age characters of the pelvis, the details, however interesting, are too technical to be abstracted. In reference to the question of how far the mode of life may act as modifying the transverse diameter of the pelvic brim, we may add that the expression "to sit on one's hunkers," would be readily understood in the North of Ireland, where it is an attitude strictly forbidden to young people. In the section treating of the spinal column, the subjects of peculiarities of individual vertebrae and the lumbar curve are investigated; and in another section the scapula, inferior and superior extremities, are examined. In a concluding section we have a general summary, and an appendix to the first part of the memoir on the "Human Crania," in which some additional details are given of some crania from Australia, the Sandwich Islands, New Guinea, and Fuegia. An index to both parts also accompanies this Report, which is illustrated by three plates of the pelves of different races.

The greater portion of the manuscript of these two large volumes was handed to the editor between July 1885 and July 1886, and the editor is to be congratulated on the successful manner in which this immense amount of scientific matter has been seen through the press.

ELEMENTARY DYNAMICS

Lessons in Elementary Dynamics. Arranged by H. G. Madan, M.A., Assistant Master in Eton College. Pp. 180. (Edinburgh: W. and R. Chambers, 1886.)

IN this little book the author has provided teachers of elementary mechanics with a rich storehouse of materials for experimental demonstrations, although the work is not quite satisfactory in some other respects. His endeavour has been to explain some of the properties of matter, Newton's laws of motion, and the modern conceptions of energy and work, in such a manner as involves only the most elementary knowledge of mathematics. Thus symbolical reasoning and formulæ

are dispensed with, and nothing assumed beyond a knowledge of arithmetic and a little easy geometry. There is a successful attempt made to arouse a real interest in the subject by continual reference to phenomena of every-day life, and especially by illustrations drawn from the sports and games of the pupils. In some cases detailed instructions are given for performing the experiments. These are valuable, and similar aid might with advantage be provided in many other instances.

The author is of opinion that mechanics ought to have the first place in a boy's scientific education. This position would be strengthened, if some series of simple experiments, to be performed by the pupils themselves, were provided, and regarded as essential.

Some expressions, such as "above," "below," "on the same level," which are usually left undefined, have their exact scientific meaning pointed out. On the other hand, there is occasionally looseness and confusion in the use of technical terms. For example, in Section 103 we read: "Momentum is the term used to express the *force* with which anything is moving." In Section 159 we have the accurate statement that, by finding the momentum of a body, we learn what *impulse* has been applied to it: here the accepted expression for the time-integral of a force is used, but we do not notice any definition of the word "impulse"; and the exposition of the second law of motion appears vague in consequence. Similarly, the *force* exerted in throwing a cricket-ball is spoken of in Section 156, where the time-integral of the force is in question.

Section 302 is devoted to the "exact valuation of the energy in a moving body," and the usual expression— $\text{energy} = \frac{1}{2}(\text{mass} \times \text{velocity}^2)$ —is obtained, but by a process which is at least startling. Witness these statements:—"If the work could be done *in an instant*, the energy would be exactly expressed by the product of the mass \times velocity²;" and again, "The whole amount of work which a moving body can do in the time during which its motion is being stopped will correspond to the *average* or *mean* amount of energy between that which it has at the beginning of the time and that which it has at the end of the time." *Unde, quo veni?*

After the preceding, it is a small matter to refer to Section 311, where this statement occurs: "The motion of the pendulum is an accelerated motion, and, as in all other uniformly accelerated motions, the spaces described are as the squares of the times." Here, of course the reasoning is fallacious; and, although the proof intended is sound, it involves the doctrine of limits, and wants development. It is surely better at this stage of the pupil's progress to rely on the experiments in Section 312.

There is an appendix on the metric system, and, in conclusion, a dozen pages of questions and exercises on the several chapters of the book. A. R. W.

OUR BOOK SHELF

Food-Grains of India. By A. H. Church, M.A. (London: Chapman and Hall, 1886.)

A WELL-WRITTEN, well-illustrated, and well-turned-out volume. Its thinness only enhances its elegance. Its illustrations, by Mr. G. W. Ruffles, are charming, clear,