force, and the two corresponding gravitational systems are well illustrated by problems introduced, throughout the mechanics section, among those on C.G.S. measurements.

This takes us as far as is at present, perhaps, possible in the direction of a compromise to which many teachers of physics are now looking forward—the recognition, namely, of two distinct systems of measurements only; one the C.G.S. with its derived practical system, for scientific and electrical purposes, the other the system used by engineers, and based on the units of length, time, and *force*.

Among other noteworthy features is a good set of problems on dynamos and alternating currents, another on wave and harmonic motions in connection with sound, and a third on gravitational potential in the section on work and energy. Less commendable, however, is the reference to water-levels in connection with electrical potentials. The most perfect "water analogy," and the one which, in our experience, appeals most directly to students, is that in which conductors are represented by water-filled cavities in a large block of india-rubber; it affords, indeed, almost the only means of enabling the average beginner to realise how the potential of a body or of a point in space may be altered by altering the charge on another body at a distance.

It is a pity that those problems which admit of solutions are not all supplied with them. Many are of the nature of examination questions, requiring long answers in words, and to these, naturally, no answers are given; but of the rest, not more than about three-fourths are solved.

We have noticed the following slips. The answers to Nos. 251, 759, 775, 776, 837 are either wholly or partially wrong; in No. 607 the water-worth of the dish should be given; and the headings to pp. 204 and 221 want altering. These are, however, small blemishes on an otherwise very useful work. A. P. C.

COSMIC ETHICS.

Cosmic Ethics; or, the Mathematical Theory of Evolution. By W. Cave Thomas. Pp. xxii + 296. (London: Smith, Elder, and Co., 1896.)

IN styling his book "Cosmic Ethics," Mr. Cave Thomas means to imply that not only in morals as a department of "the wider hygiene," but throughout the universe, there is but one law of rightness, that of balance, proportion, or the mean. By "mathematical evolution" he desires to signify that evolution is "the becoming of the proportioned," its goal being "the at-mean-ment of nature."

Starting from the admitted applicability of the idea of quantity throughout the concrete world, and from the progress which the sciences undoubtedly make when measurement or quantitative formulæ can be used in them, Mr. Thomas advances to an apotheosis of the average, and offers principia of the science of proportion and applications of quantification throughout the whole range of human knowledge. By somewhat elementary numerical formulæ we can determine the beau-idéal in the arts, attain to a quantitative ethic, discover that a man ought to drink neither too much nor too little, that his morning tub should not vary much in temperature from that of the human body, that the combination of great athletic and great intellectual effort leads to a break-down, and that technical and specialist education is inferior to general education.

Of the principia we may quote as an instance: "*The mean of fraction* is $\frac{1}{2}$; it is the fraction which is equally indifferent to the two extreme fractional limits of $\frac{1}{1}$ and $\frac{1}{0}$." (!) Of the exemplifications of the formulæ, we may point out that they are purely arbitrary. We ought to aim, we are told, at not diverging from the average, which is the ideal, to any extent which carries us beyond the middle third of our scale. Why not the middle fifth or seventh? There is no attempt to point out how the qualitative kind to which any particular scale is applicable is determined, and this despite of the fact that in a quotation which he makes from Reynolds—one of a constantly recurring set of quotations—that point is definitely raised.

Mr. Thomas accepts the Darwinian theory, though how the importance which that theory ascribes to "accidental variations" from type, can be reconciled with his own views as they stand, it is difficult to see. In fact, as they are here put before the reader, Mr. Thomas's doctrines will not allow of being harmonised into an intelligible system. This is the more to be regretted, as there is no doubt that an adequate elucidation of the theory of quantity, number, and measurement, would be of very great service to applied science. Nay, it is perhaps not too much to say that from the Galton system of composite photography, and from the statistical results of anthropometry, to which the author refers, conclusions of considerable value for art may be drawn. But they are not those drawn by Mr. Cave Thomas, nor to be drawn by his methods; though his considerable judgment in art and his grasp of the distinction between the organic fitness of an object for its purpose and its appositeness to human taste, make this department of his investigations the least unpromising.

His quotation of the headings of the chapters in Aristotle suggests the suspicion that Mr. Thomas has not studied that author in the Greek. Otherwise the attribution to him of a system of quantitative ethics would be, despite of the great authorities for that view, less pardonable than it is. Yet to the Greeks Mr. Thomas has chosen to go in his quasi-Pythagorean glorification of quantity. H. W. B.

OUR BOOK SHELF.

The Flora of the Alps. By Alfred W. Bennett, M.A., B.Sc., F.L.S. 2 vols., with 120 coloured plates. Pp. xxii + 165; vi + 223. (London: J. C. Nimmo, 1896.)

THE Alpine wanderer will not be very grateful to Mr. Bennett and his publishers for this new "Flora of the Alps." The net is spread widely; for, in addition to the whole Swiss flora, there are included here plants from adjacent mountain districts, and also the Pyrenees. The result is a rather cumbrous affair, and yet unsatisfying in detail. The species of each genus are enumerated with very short and sometimes rather inadequate characters, so that the identifying of specimens is not always as easy as it might be. That the book is arranged according to the system of Bentham and Hooker we may regard as a welcome innovation in Alpine floras, which have been too long wedded to the irritating Linnæan system. The