

As to the experiments which are "new and important," there is no doubt that there is one which will prove to be highly important if it can be always repeated to give the same results under conditions which bear rigid examination. The experiment is described as follows :

"Very many years ago I showed experiments with rotating discs, which proved that 'persistence' does not (at any rate, wholly) take place in the way previously supposed; in the retina, or in the individual parts sensitive, as I maintain, variably sensitive, to light and colours. In one of the experiments I refer to, a brightly coloured disc was covered by a black disc having sector-shaped openings, such as to render the entire disc area half black and half coloured. When the discs are rotated at a suitable speed, under a strong light, the entire rotating disc appears more brightly coloured than an entire disc placed near the rotating disc. Thus, the colour effect of a disc, half of which is covered by black sectors, is by rotation made equal to or greater than that of an entirely uncovered disc of the same colour."

This one experiment would have caused a good deal of anxiety to those who have been at work at the general theory of vision had they known of it. Fox Talbot, Plateau, and others would have had to amend their papers—for the "persistence of vision" would evidently not obey the law which they adopted after submitting it to such experimental proofs as they could devise. Other experiments which the author brings forward as confirmatory of the 5-colour theory, it seems to the writer can be equally well explained by the 3-sensation theory, and probably by that of Hering.

In conclusion, it seems safe to say that these two last rival theories have not been overthrown by the work under review. Both have their weak points, but the number of them has not been increased by the exponent of the 5-colour theory.

ELECTRICAL RULES AND TABLES.

A Pocket-book of Electrical Rules and Tables. By John Munro, C.E., and Andrew Jamieson, M.I.C.E., F.R.S.E., &c. Eighth Edition, Revised and Enlarged. (London : Griffin and Co., 1892.)

JUST eight years ago we reviewed the first edition of this electrical *vade mecum*. The fact that we have now to notice the eighth edition is abundant proof that it has been found of service by the electrical public. That it deserved well of those for whom it was compiled there can be no doubt. The authors have been most active in collecting information from all sources, and in extending the work so as to keep the information contained in it fairly representative of the current state of industrial electricity. Since the first edition it has been almost doubled in size, and much very important matter has thereby been added.

A special feature of the book as it now stands is the short accounts of various branches of electrical engineering which have been contributed by specialists. Such are Dr. Thompson's chapter on dynamo machinery, Mr. Kapp's account of transformers, and Prof. Ewing's sketch of magnetic measurements. These are very valuable, and add much to the authoritative character of the work as a guide to engineers more especially concerned with electric lighting and transmission of power.

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When the first edition appeared we noticed a number of points in which we thought the book required amendment. Looking over the present edition, we have been struck with the very considerable improvement which has been effected in point of precision and accuracy. But we have again met with some passages in which we fancy the work may be still further improved.

First, on p. 10, we were not able to see before, and we do not see yet, what the fact that the dimensions of resistance in electromagnetic units are those of velocity, has by itself to do with the velocity v , which is the ratio of the electromagnetic to the electrostatic unit of quantity of electricity.

At p. 15 it might have been well to mention the convergence of all the latest absolute determinations of the ohm upon something like 106.3 cms. as the length of the column of mercury, representing it according to the usual specification.

At p. 42 definitions of the pound avoirdupois and standard kilogramme are given, in which the precise temperature and pressure of the atmosphere at which the weights of the standard lumps of platinum are a pound and a kilogramme respectively are carefully specified! We should like to know why there is not a reference to the hygrometric state of the atmosphere as well!

With regard to the statement with respect to density, at p. 43, it is not usual, we think, to define density otherwise than as mass per unit of volume. It is therefore a quantity of dimensions ML^{-3} , whereas specific gravity is a mere numeric. In cases in which specific gravity and density are numerically the same, there is still this essential difference in nature between the two quantities.

Of course, the same word *density* is used in a peculiar sense, frequently, when applied to gases, and our experience shows that nothing has a more confusing effect in the mind of an elementary student of physics and chemistry than this double use of the word. It would be well to insist, as is often done by careful teachers, that it is *relative density* that is here meant, and not density in the ordinary sense.

With respect to the velocity of sound in air (p. 50) it might be as well to notice that it depends upon the temperature of the air.

At p. 127, under the heading "Impedance," impedance in its proper technical sense as $\sqrt{R^2 + n^2L^2}$ is not defined. The definition is given elsewhere in the book, but there is no clue to it in the index. In the last formula the exponential ϵ has fallen out from before its exponent. Here we might remark that in a book of this kind, where space is of great importance, and especially with such lumbering exponents as $-\frac{RT}{L_s}$ the use of the *solidus* notation would be a great improvement.

The authors will not think us inappreciative in making these remarks. In a work dealing with such a multifarious set of topics it is difficult even in several editions to completely eliminate error, and we have made these notes (and some others) in case the authors may care to make use of them. As we have said, the book is a useful and handy synopsis of electrical information of all kinds, and is very worthy to take the place which it seems is being accorded to it, of the electrical *Molesworth*.

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