

removing the thermometer from the calorimeter during the introduction of a hot body, though the calorimeter is weighed to 0.1 gram. The use of a thermometer as a stirrer is scarcely to be commended, except it be from the manufacturer's point of view.

(2) This is a well-arranged and concise presentation of the facts of physical science and of the accepted principles underlying them. It deals first with mechanics, hydrostatics, molecular phenomena, and sound; then with heat, magnetism, current electricity, and electrostatics; it gives an account of radio-activity and the electron theory; and finally treats of light and radiation in general. In each of these branches there are few subjects or experimental methods to which some reference is not made, and it is surprising to find so much information in a book of the size. It would not be fair to describe it as a mere compilation of facts, as it gives accounts of current theories and usually the "reason why" for any statement. But these are necessarily so concise and brief that beginners, and many who could scarcely be termed beginners, though they might learn the facts, would scarcely appreciate the reasoning or form an adequate conception of the theories and the relation of facts to them. Anyone with considerable previous knowledge of the subject who is looking for an account of the present state of physical science will find it here given in a sound, clear way; and the book should be of value to honour students, if read as an introduction to those in which theories are more fully dealt with. The authors frequently point out the necessity for this, but the difficulties connected with theories or their incompleteness are not sufficiently presented. There is so much apparent plain-sailing that it is to be feared that too many will think that the book contains enough for them. However, the authors' warnings may, and lecturers should be able to, prevent students making this mistake.

The book is intended to be read along with the "Manual of Physical Measurements," by the same authors, to which students are referred for details regarding experiments.

Numerous references to original papers are given.

#### OUR BOOK SHELF.

*Elements of Agriculture: a Text-book prepared under the Authority of the Royal Agricultural Society of England, by the late Dr. W. Fream. Eighth edition, Edited by Prof. J. R. Ainsworth-Davis. Pp. xiv+692. (London: John Murray, 1911.) Price 5s. net.*

WHILE British agriculture is, by common consent, at least as highly developed as any system that can be found in any other country, it has by no means a copious modern literature. Among the comparatively small number of text-books on the subject one by Dr. Fream has for many years stood pre-eminent, and has, indeed, become a traditional part of our agricultural education. The book might have defects, and it was undeniably out of date in many places, but it had served for generations of students, and must therefore have merit. And further, as time went on, no competitors arose, so that it has remained in possession of the field.

To revise even a small agricultural text-book is not a task to be lightly undertaken. The professor of agriculture is very unreasonably expected to be an

authority on botany, chemistry, geology, physiology, and "other sciences underlying the production of crops and live stock and the cultivation of the soil." But to so experienced an editor as Principal Ainsworth-Davis these difficulties are not serious, and the revision of the separate chapters appears, so far as one man can judge, to have been satisfactorily accomplished. It would have added to the interest of the book, and enabled the discriminating teacher to evaluate the different sections, if an indication could have been given showing who was the reviser in each case.

It is, however, a very difficult matter to piece new material into old and make the whole into a coherent story. Thus in the chapter on "Soil" p. 15 tells the old tale and p. 17 the new. "Clay," on p. 15, is used in the rather indefinite sense in which Schübler used it in 1838, which meaning it retained until Warington in 1900 introduced the newer and more definite conception from America. "Clay" on p. 17 is something altogether different; the word is here used in the modern sense of material the particles of which are below a certain arbitrary size; hence the numbers on p. 15 are wholly inconsistent with the use of the word on p. 17. A sandy loam, for instance, does not contain more than about 10 per cent. of what is now called clay, although on the old view it might contain 40 per cent. Probably no soil contains more than 45 per cent. of clay in the modern sense, and yet in the old days (and on p. 15) certain soils were said to contain 95 per cent. Difficulties of this kind, however, are almost inevitable with words that have changed their meaning, or, still worse, as in the present case, taken on an additional meaning.

A remarkable feature of the book is its cheapness. The book runs to 700 pages, is well illustrated, printed on good paper, and nicely bound, and yet only costs 5s. It is therefore within the reach of the agricultural student (who is not naturally a book buyer), and may reasonably look for a long lease of life. Principal Davis has certainly made it once more the best British text-book on agriculture. E. J. R.

*Annual Report of Recent Advances in Pharmaceutical Chemistry and Therapeutics. Vol. xxiv., pp. 419. (Darmstadt and London: E. Merck, 1911.) Price 1s. 6d.*

THIS work is a very complete summary of researches carried out during the year 1910 in therapeutics, and, to a less degree, in the chemistry of drugs. Full and interesting accounts of the cacodylates and of kephir from their introduction into therapeutics occupy a considerable part of the volume. From the references to arsacetin and atoxyl the latter appears to have certain advantages over the former, especially in cases of trypanosomiasis. Messerschmidt's benzidine test for blood is discussed in detail, and seems to have value as a negative rather than as a positive test. Light is thrown upon the mode of action of chrysoarobin in skin diseases by Unna and Goldsetz's observation of its oxidation on the skin to oxychrysoarobin and chrysoaloxin. The introduction into the German pharmacopœia of the formaldehyde sulphuric acid test for chloroform is commended, although admittedly the nature of the impurities excluded by it are not known. In view of the fatal effects that are from time to time reported of the use of chloroform as an anæsthetic, it is essential that stringent tests to ensure its purity should be adopted. The report should prove especially valuable to medical practitioners and to pharmacists, as it contains in readily available form abstracts from journals, many not easily accessible, relating to the constitution and action more particularly of modern synthetic remedies.

HENRY G. GREENISH.