

complete. It forms the best monograph on the subject yet written. The origin of petroleum is so treated as to present the various theories put forward to account for its occurrence; necessarily, no authoritative decision can be given on this very debatable question. Concerning the occurrence of sulphur in the petroleum from Ohio and Canada, those interested would do well to supplement the bare mention of the fact here given by reference to the July number of the *Journal* of the Franklin Institute, where C. F. Mabery gives an account in which the subject is treated as its importance requires. Warren is stated by Mr. Redwood to have isolated hydrocarbons of the C_nH_{2n} series, termed naphthenes by Markownikoff. Mr. Mabery shows that the Ohio and Canadian petroleum do not yield the naphthenes of Markownikoff and Ogloblin, but give hydrocarbons of the C_nH_{2n+2} series of similar boiling points. This writer also proves conclusively the presence of benzene, toluene, and xylenes in these petroleum.

The manufacture of shale oil gives yet another instance of the application of continuous processes; the text contains very lucid descriptions of these, well and sufficiently illustrated. Few of the general public can have any adequate conception of the number and variety of lamps in existence for use with oils. An exhaustive account is given of these, and the advantages or disadvantages characteristic of the main types of oil-lamps are dwelt upon at sufficient length to enable an intelligent judgment to be formed as to the suitability of any particular lamp for the work required from it.

The Section on safety-lamps, with which this volume concludes, has been contributed by D. A. Louis, in conjunction with Boverton Redwood. It gives by no means the least interesting reading. Although the excellent account of the lamp-indication of fire-damp is highly technical, and calculated to be eminently useful to specialists, the general reader will find no difficulty in grasping the principles involved, and will much appreciate the clearness with which this important subject is treated.

It may be hoped that the high standard exhibited in this volume will be maintained in volume iii., announced as to appear shortly. The editors are certainly to be congratulated on the excellent production now before us.

W. T.

OUR BOOK SHELF.

Science Readers. By Vincent T. Murché. Book iv. Pp. 216. (London: Macmillan and Co., 1895.)

THE conversational method of instruction, which used to be so general in school books, is not one that leads to pleasant memories. Mr. Murché has created two boy prodigies in his "Science Readers," and they ask and answer questions of a teacher whose laudable ambition is to elicit and impart all kinds of scientific knowledge upon every suitable or unsuitable occasion. We reverence that teacher for his patience and for his ability to find texts in everything. The pity of it is, that lessons given in this way on all and sundry topics lack the quality which lies at the base of all true scientific knowledge, viz. the orderly arrangement of facts. A lesson on solids, liquids, and gases precedes one on our bones, another on gravity precedes a lesson on vertebrates and invertebrates. A lesson on the classification of invertebrates is wedged between two on hydrostatic pressure,

and so on throughout the book. Possibly the variety is introduced to charm the youthful mind, but it is not a desirable attribute of the book; for the method must result in the acquisition of unconnected information, and such knowledge has little to commend it. In the matter of illustration, and simplicity of language, the book leaves little to be desired.

A Garden of Pleasure. By E. V. B. Pp. 220. (London: Elliot Stock, 1895.)

A FEW chapters fresh with the fragrance of common country flowers, and breathing the life of "lustrous woodland." Here and there the authoress lapses into sentiment, but, taken as a whole, her language is attractive in its simplicity. The changes that go on in organic nature from month to month are drawn with careful touch, and many students of botany would derive benefit from the contemplation of the sketches.

LETTERS TO THE EDITOR.

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The "4026.5" Line and D_3 .

MAY I call attention to the fact that the line at 4026.5, now recognised as belonging to the spectrum of helium, and conspicuous in the Orion stars, is also prominent in the spectrum of the solar chromosphere. Although not given in the catalogue of chromosphere lines (which dates from 1872), it was observed and published as long ago as 1883 (*Am. Jour. Sci. and Art.*, November 1883), in connection with another line at 4092, seen at the same time. Since then the 4026 line has been observed repeatedly, and might be given a place in the catalogue with a relative frequency of about 15, and a brightness of 3 or 4. Like the other helium lines it has no dark analogue in the ordinary solar spectrum. The 4092 line falls upon a strong double line shown upon Rowland's map, but I am not sure to which of the two components it belongs; it is faint, and seldom seen.

While D_3 rarely appears as a dark line upon the solar spectrum, yet in the course of over twenty years I am able to count up a considerable number of instances; certainly not less than twenty or thirty. The phenomenon occurs usually in the penumbral region of an active sun-spot, which in its nucleus reverses the lines of hydrogen, magnesium, and sodium, and sometimes D_3 itself. By a slight motion of the telescope as one passes away from the nucleus, it crosses regions where D_3 appears as a smoky shade: on page 130 of "The Sun" I have figured a typical case.

I have not yet been fortunate enough to see the duplicity of D_3 myself, but Prof. Reed has observed it on several occasions. Hanover, N.H., August 26. C. A. YOUNG.

On the Temperature Variation of the Thermal Conductivity of Rocks.

NATURE reproduces the results obtained by Lord Kelvin, P.R.S., and J. R. Erskine Murray, a paper read at the Royal Society, May 30, "On the Temperature Variation of the Thermal Conductivity of Rocks." These gentlemen arrived at the following results: "(§ 13). . . that for slate with lines of fluor parallel to cleavage planes, the mean conductivity in the range from 123° C. to 202° C. is 91 per cent. of the mean conductivity in the range from 50° C. to 123° C., and for granite the mean conductivity in the range from 145° C. to 214° C. is 88 per cent. of the mean conductivity in the range from 81° C. to 145° C."

These results are so widely different from those I obtained by another method, and which Lord Kelvin had the kindness to publish in NATURE, March 7, 1895, p. 439, that I must be allowed to introduce here a word of objection.

It seems to me that details of experimental dispositions are important enough, and should be trustworthy. It is however, not opportune to discuss them minutely now.

The experimenters based their work on the case of Fourier's