

In conclusion, your attention is directed to a set of curves which has been plotted to show the relation between the temperature and the energy radiated in the various wave-lengths of light for incandescent black bodies. Various temperatures are assumed, and curves calculated, showing the energy radiated at each wave-length. The visible spectrum is defined by the vertical broken lines marked red and blue. The exceedingly small proportion of the total energy which is radiated within the limit of the visible spectrum even at a temperature as high as 3500°C. , is startling enough. We are, apparently, at the present only on the border of possibilities.

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NEW BOOKS.

THE PRINCIPLES OF CHEMISTRY. By D. MENDELÉEFF. Third English edition, translated from the Russian (seventh edition) by George Ramensky. Edited by Thomas H. Pope. Longmans, Green & Co. 2 vols. 1190 pp. Price, \$10.00.

The third edition of this standard work is a more important revision than its predecessor. The author assures us that "the additions and alterations have, in many instances, cost as much labor as the original compilation." Additions to fact are numerous, among the more noteworthy of which, the liquefaction of gases, the rare atmospheric elements, and the subject of radioactivity, are treated in some detail; but the theoretical portions of the book have acquired a preponderating interest, since they are evidently to be regarded as a final statement of the author's views. His own words are: "In carefully preparing this edition, I have not lost sight of the fact that I am hardly likely to publish another, and I have, therefore, in many instances spoken more definitely than formerly." Many of these views have already been published singly, but this is the first time they have appeared together as parts of one whole.

The periodic system is enlarged by the addition of a zero group (of zero valence) embracing helium and the rare gases of the air. Regarding former discrepancies in the periodic table, Mendeléeff reaffirms his belief that the order I-Te, Ni-Co, K-Ar will eventually be reversed. The position of the rare earths is still problematic. Brauner, who contributes a chapter on the subject, presents his view, previously published elsewhere, that these elements taken together form a division occupying a single space in the table, sustaining a relation similar to the elements of Group VIII.

Mendeléeff's views of solutions have not **changed**, but his

objections to present theories are stated with greater distinctness. While he recognizes the great fertility of Arrhenius' hypothesis, he says: "The return of electrochemism which is so evident in the supporters of the hypothesis of electrolytic dissociation, and the notion of a splitting up of atoms into electrons, in my opinion only complicate and in no way explain so real a matter as the chemical change of substances." His call for a theory which accounts for the chemical process of solution will find a ready response, yet his own conception as before fails to fit the facts in any such detailed way as to carry conviction.

In more than one place, the author takes occasion to assert emphatically his disbelief in a primary matter, however strongly some of his own discoveries would seem to point in that direction. "The more I have thought on the nature of the chemical elements, the more decidedly have I turned away from the classical notion of a primary matter, and the hope of attaining the desired end by a study of electrical and optical phenomena."

Perhaps the most remarkable thing in the book is Mendeléeff's attempt to identify the ether with the lightest of all gases and the first member of the zero group, of enormous molecular velocity, molecular size correspondingly minute, and devoid of combining power. Inasmuch as this conception is largely the result of extrapolation over a long range, the conclusions are correspondingly hazardous. Minor errors in a work of this character scarcely deserve a place in a review of this scope.

EUGENE T. ALLEN.

COURS DE CHIMIE. A L'USAGE DES ETUDIANTS DU P. C. N. PAR R. DE FORCRAND. Paris : Gauthier-Villars. 1905. Vol. I, 325 pp. Vol. II, 317 pp. Price, 10 Francs.

In these volumes the author presents a course in chemistry, that he proposes to teach in one year, allowing three lessons to each week. Forty-eight pages in the first volume suffice for a discussion of general principles, laws, etc.; then follows a systematic treatment of the *metalloids* and *metals*. Organic chemistry occupies two-thirds of the second volume, while the remaining 100 pages give an outline of analytical chemistry.

This work may be of value to the special class of students for which it was written, but for general use it leaves much to be desired. Certainly many teachers will object to a discussion of general principles before any of the simple facts of chemical action