any subject, but has presented the same "in what I thought the clearest way, sometimes adopting one person's view in one part of the subject, another's view in another part, and, perhaps, my own in still another part."

While this method of procedure unquestionably endows the book with an individuality all its own, the wisdom of adopting such a course, especially in a book intended for 'self-instruction * * * as well as for class-room use,' may well be gravely questioned.

The language employed is, as a rule, clear and to the point, if, at times, unconventional. In some instances, however, the author's meaning is not readily gathered from his statements. Thus, note the second sentence of the following paragraph (p. 61): "There is another way of getting at the molecular weight, which we shall merely state. The theoretical relations are too physical to justify attention in this book." The calculus is freely used in the discussion and elucidation of formulæ and equations; the numerous problems and examples found throughout the book form a valuable feature. Typography and paper are excellent.

The author certainly does not lack confidence in his own judgment and evidently has the courage of his convictions. Thus he says (p. 177): "But in chemical action we meet only heat, light, electricity, mechanical energy or some other well-known energy. So the assumption of chemical energy is strictly gratuitous and not to be advised at all."

The kinetic theory of gases seems to have incurred his special displeasure. He writes (p. 20): "The kinetic theory is a troublesome thing and is becoming an object of ridicule. It has never directed the chemist to any new discovery or idea, unless it may be Van der Waal's theory, and that would probably have come any way." And again (p. 22), in referring to Van der Waal's theory: "Originally derived from the kinetic theory of gases, it has nevertheless none of the absurdities of that theory and will not fall with it."

Contrast with this the words of Sir William Thomson on the same theory ('Popular Lectures and Addresses,' Nature Series, Vol. I., p. 226): "A little later we have Daniel Bernouillis' promulgation of what we now accept as a surest article of scientific faith—the kinetic theory of gases."

Evidently the views of Lord Kelvin will have to undergo a radical change if they are to conform to those of our author.

Ferdinand G. Wiechmann.

Bibliography of the Metals of the Platinum Group, 1748–1896. James Lewis Howe. Published by the Smithsonian Institution. 1897. Pp. 318.

Professor Jas. Lewis Howe, whose initials are familiar to all who read the well selected 'Notes on Inorganic Chemistry' contributed to Science, has placed chemists under a debt of gratitude by a carefully edited volume with the above title. It forms an index to the literature of platinum, palladium, iridium, rhodium, osmium and ruthenium from 1748 to 1896; so extensive is this literature that the list of references occupies no less than 266 closely printed octavo pages. The plan is a slight modification in style of that first followed in the 'Index to the Literature of Uranium,' printed in 1870 by the present writer. Professor Howe has taken great pains to make the work complete at every point; he gives the titles of the one hundred periodicals examined, indicating by asterisks the complete sets, and at the end of the book a classified subject-index and an alphabetical author-index fill over fifty pages. In a series of references to articles dealing with a given topic the reference to the original paper is placed first. So thoroughly has the author ransacked chemical literature that he has probably overlooked very few references to the metals named. Chloroplatinates of organic bases are considered only in the case of those early formed.

To facilitate the use of the indexes the number of each title includes the year; the abbreviations used are chiefly those recommended in 1887 by the Committee on Indexing Chemical Literature of the American Association for the Advancement of Science; and the spelling of chemical terms conforms to the rules adopted in 1892 by the same Association.

For the publication of this valuable bibliography the chemical world is indebted to the Smithsonian Institution; it forms No. 1,084 of the Smithsonian Miscellaneous Collections.

Inspection of the volume enables one to form some idea of the relative activity in chemistry at different periods; in 1792 there were three papers published on the subjects included; in 1840 there were 14 papers; in 1860, 22 papers, and in 1892 there were no less than 68 papers. These numbers do not include abstracts and reproductions of original publications.

It is also interesting to note the relative frequency of the occurrence of the names of certain chemists; thus J. W. Döbereiner published 43 papers between the years 1814 and 1845; his great contemporary Berzelius, 25 papers between 1812 and 1847; H. St. Clair Deville, a generation later, published 31 papers (1852–1882), and S. M. Jörgensen has published 27 papers between 1867 and 1896, his activity being still productive. Of course, the number of the papers does not indicate the relative importance of the discoveries; W. H. Wollaston, for example, published only nine papers, but his influence on the chemistry of platinum has been notable.

The volume is clearly printed and seems to be quite free from typographical errors; Edmonde Fremy's name, however, appears as Frémy throughout the work, but Fremy never used the accent on the first vowel in his name.

Howe's 'Bibliography of Platinum' will be a necessity to every working chemist and to every scientific library.

H. CARRINGTON BOLTON.

The Development of the Frog's Egg. An Introduction to Experimental Embryology. By THOMAS HUNT MORGAN, PH.D., Professor of Biology, Bryn Mawr College. New York and London, The Macmillan Company. Pp. xi + 192. Price, $1.60.

As the first attempt to present a connected account of the development of any animal from the standpoint of the new experimental school of morphologists, Professor Morgan's book on the development of the frog will be received with much interest. The time is ripe for a summary of the experimental work on the early stages of development, showing what has and what has not been accomplished by this much discussed method of investigation. Professor Morgan gives us an account of the embryology of the frog, laying especial weight 'on the results of experimental work, in the belief that the evidence from this source is the most instructive for an interpretation of the development.' We shall hope, therefore, in its perusal to learn how much has been accomplished in making clear the course of events in the embryology of a single animal by means of experiment. The egg of the frog has become the classical object for this sort of research, so that a more favorable choice of subject for this purpose could not be made.

The scope of the work is not confined, however, to results achieved by experiment. The book undertakes to give a 'continuous account of the development, as far as that is possible, from the time when the egg is forming to the moment when the young tadpole issues from the jelly membranes,' drawing upon both descriptive accounts of the normal development and experimental work to make it complete. The sub-title, however, makes us justly expect that the experimental results will form the chief aim of the book.

After a half-page introduction on the egg laying and copulation of the frog, Professor Morgan opens his account in Chapter I. with a discussion of the formation of the sex-cells, followed in Chapter II. by a description of the processes of egg laying, formation of the polar bodies and fertilization. With Chapter III. we enter upon the first account of experimental work, a short *résumé* of the researches of Pflüger, Born and others upon cross-fertilization in the Amphibia.

Chapter IV. treats of the normal cleavage of the frog's egg, with the variations met with under natural conditions. The question is proposed: What determines the plane of cleavage in the unsegmented egg? Roux's contention that this is determined by the plane of apposition of the two pronuclei is stated, but the actual determining factor is held to be still in doubt, with the evidence rather against Roux's view. Further discussion of this question is reserved for a later chapter. As to the factors determining the form and arrangement of the cleaving cells, the author discusses here only the surface tension theory, again reserving, according to a plan which can hardly be said to conduce to unity other supposed factors