

treating of municipal government in the chief countries of Continental Europe, and if we could be assured of a third volume, prepared with equal care and accuracy, 'On Municipal Governments in the United States, or how not to do it,' it would be, as Artemus expressed it, 'a sweet boon.' Meantime, let Mr. Shaw's first volume be made a subject of special study by the younger professional men in this country, for the time is near at hand when they will be compelled to take some definite line of action with regard to our own cities, each of which presents its own peculiar problems, but problems upon which much light is thrown by the experiences of our transatlantic brothers.

J. S. B.

Theoretical Chemistry. By PROFESSOR W. NERNST, Ph. D., University of Göttingen, translated by PROFESSOR C. S. PALMER, Ph. D., University of Colorado. Macmillan & Co. Pp. 697. Price \$5.00.

It has long been evident that the treatment of the physical side of chemistry, in text-books avowedly devoted to chemical theory, is not satisfactory. In the present work *Physical Chemistry* is the main object in hand, and, correspondingly, chemical theory proper is relegated to a subordinate position. The treatment of purely chemical topics is clear and suggestive, but brief, and occasionally inadequate. Thus the discussion of the stereochemistry of nitrogen is confined to the mere statement of the views of Hantzsch and Werner, with not even the barest mention of the difficulties and exceptions which have led many to regard the spatial conception, so far as it applies to nitrogen, as prematurely developed.

But insufficiency of this kind is to be expected whenever the attempt is made to cover the whole field of chemical and physico-chemical theory within the limits of the same work, and it would be unfair to criticise Professor Nernst's book adversely

on the ground of inadequate treatment of purely chemical topics which, presumably, were introduced simply for the sake of completeness. We pass, therefore, to the main subject.

For some time a work has been needed which would give concisely the remarkable results of the new *Physical Chemistry*, and this want Professor Nernst's work is well fitted to meet. The material is well selected, the sections are well proportioned, the facts are accurately and concisely stated, and the translation has been faithfully made, too faithfully perhaps, by one who is evidently well fitted, on the scientific side, for the task.

It may not be out of place to express the opinion that the almost complete abandonment of the historical method which characterizes Professor Nernst's work is a mistake, even in so small a volume. This is particularly plain in the account of the doctrine of electrolytic dissociation. One who reads the fascinating chapter 'Geschichte der Electrochemie' in Ostwald's 'Lehrbuch der Allgemeinen Chemie,' Vol. I., part II., observes this concept vaguely adumbrated in the minds of Grotthus and Daniell, sees it implicitly present in the remarkable views of Clausius, and finally recognizes it freed from all obscurity in the papers of Arrhenius. In Nernst, on the contrary, one is introduced to the doctrine fully formed, and, looking about him in some bewilderment to ascertain its source, discovers an incomplete justification for its existence in the behavior of aqueous salt solutions.

The student who desires to devote himself specially to *Physical Chemistry* may read the book with profit, but he would do better, having acquired the necessary physical, mathematical and chemical preparation, to go directly to Ostwald's 'Lehrbuch'; to those who wish simply to obtain a broad view of the present state of the science the work will be decidedly acceptable, and this will be its chief function.

It is not pleasant to be obliged to record the complete failure of Professor Palmer's attempt to 'make the sound German speak good English.' The 'sound German' seems to be unusually refractory in his hands, and frequently refuses not only to 'speak good English,' but also to speak any kind of intelligible English at all.

An unpleasant appearance is given to the pages by the translator's unfortunate practice of introducing phrases from the original, sometimes directly, sometimes in curiously infelicitous translation. Thus, in the section in which the applications of the first law of heat to chemical reactions are discussed we read, to express thermal evolution or absorption, either 'Wärmetönung,' which is clear enough, but out of place, or 'heat toning,' a phrase which one struggles vainly to comprehend. Thus he replaces the word element by the remarkable expression 'ground-stuff.' He advocates the introduction of the term 'Knall gas,' and employs it faithfully himself. Rarely the translation attains to complete unintelligibility, *e. g.*, on page 149:

"The choice of a suitable hypothesis to be advanced can be easily made, now or never, in the case before us."

It must be admitted that Professor Palmer's English is by no means pleasant reading. Those with any feeling for the right use of language will be incessantly irritated by it, and even others will be not infrequently annoyed by the unnecessary difficulties which it introduces.

The defects of the translation are undoubtedly serious. But for this there is much compensation. It is plain that the translator has followed the wonderful development of the new science faithfully, and his own comprehension of the subject is evident on every page. The student who will forgive the obvious defects, which, after all, concern rather the appearance than the substance, and give to the book an earnest,

thoughtful reading, can not fail to derive from it a large amount of valuable information.

ROBERT H. BRADBURY.

Proceedings of the Society for the Promotion of Engineering Education, Vol II., Brooklyn Meeting, 1894. Edited by Professors Swain, Baker and Johnson. 8vo, pp. viii., 292. \$2.50.

This excellent collection of interesting and helpful papers is issued to the members of the Society; but, as we understand from an inserted slip, copies may be obtained from the Secretary, Professor J. B. Johnson, of Washington University, St. Louis, at the regular price paid by members. The volume is well made up, and its contents justify a good form of make-up. The book contains the usual statement of the objects of the Society, the rules, and the lists of officers and members, followed by the complete papers of the the meeting of 1894. The Society was organized in Chicago in 1893, and its next meeting, at Brooklyn, is that here given record. Its membership, already about 160, includes probably the majority of the recognized leaders among representatives of the department of education to which it belongs. The discussions are mainly on subjects of immediate interest to the teachers in the professional engineering schools, and are necessarily of great importance to them and their pupils, though perhaps less attractive to the average reader than are discussions of educational matters generally. The requirements for admission, the character and designation of the degrees properly conferred, the teachers and the text-books, methods and extent of shop and laboratory work, and forms of curricula suitable to this special work, are the main topics, and they are well and dispassionately treated. The volume is full of useful and instructive matter.

R. H. T.