

tions of the subject, with wide experience of the needs of the pupil and above all with a rare mathematical tact which here is a *sine qua non*, Professor Tanner has written a work which has afforded us a very sincere pleasure in reading and which seems to us superior to any elementary English or American book on this subject which we have yet seen.

What strikes one most noticeably is the thoroughly scientific spirit of its author, the seriousness of his purpose and the simplicity and clearness of his exposition. We believe it must be a dull pupil who is not interested by the author's quiet but fascinating style. The work is indeed a veritable little classic in this respect. The usual course of the author is to begin each new topic with an introduction which gives the reader an idea of the discussion to follow. The new notions are then presented as simply as possible and illustrated with well chosen examples. By this means the reader is put in position to see the principles involved which are now stated precisely and accompanied by correct demonstrations. Problems are abundant and frequent recapitulations and review questions emphasize the main results acquired, and serve to retain them in his memory. Scattered through the book are a goodly number of notes touching on the nicer points and which no doubt will stimulate bright students to further thought and perhaps help the teacher over some hard places.

JAMES PIERPONT.

*Annuaire pour l'An 1905, publié par le Bureau des Longitudes, Paris, Gauthier-Villars.*

In a long notice "Explication élémentaire des Marées," M. Hatt continues his article on the tides. The first part, printed in the *Annuaire* for 1904, consisted of an account of the forces producing the phenomena and the general effects produced. In the present part, the specialized effects, time and height of the tide at any particular place, are set forth with much detail. After explaining the "forced" periods of the various lunar and solar tides, the writer goes into the methods of harmonic analysis and synthesis, especially those of Darwin, by which the tide at any particular spot can be found. Although M. Hatt has not sacrificed clearness of exposition to brevity, there are pages here and there which the reader not previously instructed in the subject (and it is for such a reader that the

article is apparently written) would have difficulty in following, partly owing to the use of many technical terms, and partly to the sudden appearance of a mathematical formula. Nevertheless, the "Notice" forms a valuable addition to the very few elementary explanations of the tides which are at present available.

The present being an odd numbered year, the tables relative to physics and chemistry are omitted, in accordance with the general plan. Some additions have been made. The most interesting is a chapter devoted to meteorology. This mainly consists of a table giving mean maxima and minima temperature in various parts of the globe and two other tables relating to the temperature and barometric pressures at Paris. As usual, several of the other chapters, in particular those on geography, have been much improved with additional matter and more recent information.

ERNEST W. BROWN.

*Diagrammes et Surfaces Thermodynamiques.* Par J. W. GIBBS. Traduction de M. G. ROY. Avec une Introduction de M. B. BRUNHES. C. Naud (Scientia), Paris, 1904. 8vo. 100 pp. Price 2 Francs.

THIS little brochure forming Volume 22 of this series of scientific publications is a translation into French of the two original memoirs by J. Willard Gibbs, published in the *Transactions of the Connecticut Academy of Sciences*, Volume 2 (1873), pages 309-342 and 382-404, and accompanied by an introduction serving to interpret for the modern reader the special significance of these epoch-making memoirs, and in particular the trend of the lines of modern development at the hands of later workers in the same field.

It would be superfluous to speak here by way of review of such classic and well-known memoirs as those here translated for the benefit of the French reader. The introduction however may well merit a word, giving as it does an excellent presentation of certain collateral and introductory points, the discussion of which will be found of aid to any one reading these memoirs for the first time. A brief résumé is also given of the leading work of Duhem, Van der Waals and others who have found in these memoirs special inspiration, and have built so largely on this foundation. The introduction together with