[1], and by Preuss [2]. These both contain a wider variety of functions over a somewhat greater range of arguments but they are much briefer. Interpolation is consequently often a major difficulty in these tables, whereas interpolation is relatively easy in the present tables. This can be illustrated roughly by a comparison of the numbers of pages: 230 in Kotani, 305 in Preuss (2 vols.), and 1224 in the volume under review.

A number of research groups interested in quantum chemistry have access to their own high-speed computers, and the present tables will probably not be used much by them except to check out new codes, but a large number of workers whose computational aids are limited, for the most part, to desk calculators will be very happy to see this book. The authors and publisher are to be commended for their efforts in making these tables available.

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1. M. KOTANI, A. AMEMIYA, E. ISHIGURO & T. KIMURA, *Table of Molecular Integrals*, Maruzen Co., Ltd., Tokyo, 1955.
2. H. PREUSS, *Integraltafeln zur Quantenchemie*, Springer-Verlag, Berlin, vol. I, 1956, vol. II, 1957.

37[X].—L. IVAN EPSTEIN, *Nomography*, Interscience Publishers, Inc., New York, 1958, x + 134 p., 24 cm. Price $4.50.

The contents are: Ch. I, Determinants; Ch. II, Nomograms; Ch. III, Projective Transformations; Ch. IV, Matrix Multiplication; Ch. V, More Than Three Variables; Ch. VI, Empirical Nomography; Ch. VII, Kellogg's Method; Ch. VIII, Nonprojective Transformations; Bibliography and Index.

According to the preface, Chs. I, II, III, V, and VI form an elementary text, for which only a knowledge of the elements of analytical geometry is required. Omission of Ch. IV, it is said, will not cause a loss of continuity. For Chs. VII and VIII, a knowledge of calculus is expected. The book attempts, according to the author, to fulfill a need for a book which "combines the discussion and methods of construction with a thorough presentation of the underlying theory", as well as to "make the presentation mathematically rigorous insofar as this could be done on a relatively elementary level".

The book has much to recommend it. The figures are good and the prose in nost instances is lucid. The idea of presenting the notion of projective transformations from the "geometrical" point of view first seems to have merit, and useful descriptive terms such as shear and stretch assist in this endeavor. The entire approach to the subject is from the "determinant" point of view, which is desirable. Furthermore, the necessary properties of determinants and matrices are included (Chs. I and IV) for the benefit of the reader unfamiliar with them. In addition, the author does not hesitate to make the natural extension of using the word nomograph as a verb.

On the other hand, there are errors in the book. These are mathematical, pedagogical, grammatical or typographical.

Among the mathematical errors may be mentioned the definition of linearly related functions (p. 93), and some of its consequences. The statement of Theorem

7.1 ("A set of functions of a single variable are linearly related if and only if their wronskian vanishes") shows that the author intended to define what are usually called linearly dependent functions, since Theorem 7.1 would be true if the word "related" were replaced by "dependent," but is *not* true for the definition given, namely, "we shall say that four functions $f_1(x), f_2(x), f_3(x), f_4(x)$ are linearly related if there exist four *nonzero* [emphasis supplied by the reviewer] quantities c_1, c_2, c_3, c_4 independent of x such that $c_1f_1 + c_2f_2 + c_3f_3 + c_4f_4 = 0$". The word *nonzero* should, of course, be replaced by the phrase *not all zero*. Incidentally, "Wronskian" is usually capitalized.

Neither in Ch. VIII nor elsewhere was the reviewer able to discover the author's definition of the phrase "nonprojective transformation". Yet Ch. VIII, based largely on a paper by Gronwall (ref. 5 in the bibliography), has the phrase as its title. The reviewer was also unable to discover the phrase anywhere in Gronwall's paper, from which Theorem 8.1 (concerned with nonprojective transformation) is stated to have been taken.

The reviewer suggests that a worked example involving at least one scale with a curved support would have been appropriate for Ch. II. On p. 23, for equation (2.25) it would have been better to define the units in which the various physical quantities are measured. On p. 83, "antiparallel" should be defined. The reviewer doubts that a reader with merely a knowledge of the calculus would be able (as seems to be implied in the preface) to understand adequately the material of Chapters VII and VIII, even if these chapters were error-free. It is also suggested that too much may have been left as an exercise for the reader in several places.

In conclusion, the reviewer suggests that the unsophisticated reader follow the suggestion made in the preface that Chs. I, II, III, V, and VI form an elementary text. Ch. IV seems to be relatively elementary also. The sophisticated reader should go to the original papers of Kellogg and Gronwall, on which Chapters VII and VIII are respectively based.

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38[X].—ALEXANDER S. LEVENS, *Nomography*, 2nd edition, John Wiley & Sons, New York, 1959, vii + 296 p., 25 cm. Price $8.50.

Professor Levens' *Nomography* is judged by this reviewer to be an excellent elementary textbook. It reflects the author's mastery of pedagogic technique. This work should lead the student to more than the acquisition of a theoretical knowledge of nomography—it should enable him to become a skilled and experienced nomographer. To develop the requisite skill, the text abounds with realistic problems, taken in many cases from practical engineering or physical situations.

The geometric approach in this book is both simple and direct. Perhaps some will find the text overly simple in parts, with too many explicit steps. However, it is likely that most students will appreciate its clarity and ease of reading.

After a brief introduction and a careful discussion of functional scales, the author divides the study into various nomogram types, which are taken up serially. The geometry of each general type is thoroughly discussed and fully illustrated with a detailed application. The geometric approach in this text is considered to