BRIEF MENTION

Moderne Algebra. By B. L. van der Waerden. Vol. 1, 3d. ed. Springer, Berlin, 1950. 8+292 pp.

Modern algebra. By B. L. van der Waerden. Vol. 1. Trans. by Fred Blum. New York, Ungar, 1949. 12+264 pp. $5.50.

Modern algebra. By B. L. van der Waerden. Vol. 2, Trans. by T. J. Benac. New York, Ungar, 1950. 9+222 pp. $5.00.

Volume 1 of the third German edition of this basic text remains in essence the same as in the previous editions. Sections 42 and 60 have been dropped from the second edition; some simplifications and fuller explanations have been introduced in the definitions of polynomials and norms and traces; some exercises are modified or replaced by new ones. But there are two major changes: (1) the reintroduction of the axiom of choice, well-ordering, and transfinite induction (as in the first edition) with the resulting elimination of denumerability hypotheses for the existence of algebraic closures and real closed fields and finiteness hypotheses in the Steinitz theory of extension fields; (2) an expansion of the theory of valuations with more detail on valuations of algebraic extensions (in particular of the rational field) and the addition of three sections on valuations of function fields.

The two volumes in English are a translation of the second German edition (1937) with the exception of some additions and revisions by the author in vol. 1 on the subjects of polynomials (as in the German edition treated above) and valuations of algebraic number fields. The translation of vol. 2 is very readable. Unfortunately the translation of vol. 1 suffers from clumsiness of English style, some literal translations of German terms where standard English terms would be preferable or necessary, occasional inconsistencies, and some simple errors. The reader would be warned especially about chap. 10 which is full of too literal translations, particularly the erroneous use of "perfect" for "complete"—and this error is not made consistently. In any case, van der Waerden is now available to the student who reads only English, though he will miss some of the lucidity in vol. 1.

DANIEL ZELINSKY

Généralités sur les probabilités. Éléments aléatoires. By Maurice Fréchet. 2d ed., rev. and enlarged, with a note by P. Lévy. Paris, Gauthier-Villars, 1950. 16+355 pp.

The second edition of this book is essentially the same as the first [reviewed in Bull. Amer. Math. Soc. vol. 43 (1937) pp. 602–603] aside from more complete treatments of a few points and a new chapter outlining the theory of abstract valued random variables. Although it lacks a systematic and unifying approach, the book remains a useful source book, containing valuable material on many parts of probability theory.

J. L. DOOB

An introduction to the calculus of variations. By C. Fox. Oxford University Press, 1950. 8+271 pp. $4.50.

This book is designed as a text for undergraduate students. It includes a large number of examples, and devotes Chapters 5, 6, and 7 to applications to mechanics, relativity, and elasticity. Unfortunately it is not written so as to give the student clear ideas about the calculus of variations. Much of it is phrased in the language of pre-Weierstrassian days. A basic difficulty is the author's failure to define what is meant by a weak relative extreme. This leads him to state proofs of sufficient conditions for such extrema which are quite unsatisfactory. An instance of the author's methods of reasoning may be quoted from page 32, where he deduces the equation $f_{y'} = \int_{x_1}^{x} f_y dx + c$ by integrating $d/dx(f_{y'}) = f_y$, and so concludes that $f_{y'}$ must be continuous along an extremizing curve. In Chapter 2, Jacobi's transformation of the second variation is carried out without assuming that the required solution of the Jacobi equation does not vanish on the interval (x_1, x_2). On p. 64 and at other places, the author shows ignorance of the conditions for a quadratic form to be definite. His discussion of multiple integrals is exceedingly vague, and can be of no possible use to the students. In particular the Jacobi condition is not properly stated. Reference is made to conjugate curves, with a suggestion of analogy with conjugate points, but no clear statement. In the discussion of isoperimetric problems, there is no proof of the multiplier rule, and there are lacunae in the discussion of the multiplier rule for the problem of Lagrange. Most of the references are to Forsyth's *Calculus of variations*. (Cf. the review of Forsyth's book by G. A. Bliss, Bull. Amer. Math. Soc. vol. 34 (1928) p. 512.)

L. M. GRAVES

The meaning of relativity. By Albert Einstein. 3d ed., rev. Princeton University Press, 1950. 4+165 pp. $2.50.

The first edition (1923) was reviewed in this Bulletin, vol. 30, p. 71. The second edition (1945) contained an additional appendix discussing certain advances since 1921, and the third edition added a