Notes on differential geometry, by Noel J. Hicks. D. Van Nostrand, Princeton, New Jersey, 1965. vi + 183 pages. $2.98.

This is a modern introduction to the theory of manifolds and connections, and the applications of these concepts to the study of classical differential geometry of submanifolds, especially surfaces in a 3-dimensional Euclidean space.

The materials are arranged in a way that one may choose to teach only the first three chapters in a course at the junior level, or the first six chapters for one semester course in differential geometry at the senior level. The entire book which contains ten chapters can be covered in a full year introductory graduate course.

It consists of the following chapters: 1. Manifolds. 2. Hypersurfaces in R^n. 3. Surfaces in R^3. 4. Tensors and forms. 5. Connections (classical and bundle approach). 6. Riemannian manifolds and submanifolds. 7. Operators on forms and integration. 8. Gauss - Bonnet theory and rigidity. 9. Existence theory. 10. Topics in Riemannian Geometry (including: First and second variation formulae, the Morse Index Theorem, Manifolds with constant Riemannian curvature, manifolds with non-positive curvature).

To the reviewer's opinion this book provides a solid understanding of the basic concepts of differential geometry.

H.A. Eliopoulos, University of Windsor

Définition des fonctions eulériennes par des équations fonctionelles, by Jean Anastassiadis. Mémor. Sci. Math., Fasc. CLVI. Gauthier-Villars et Cie, Éditeur-Imprimeur, Paris, 1964. v + 77 pages. 16 F.

The content of this interesting and very useful booklet could be approximately described as more or less the convex hull of papers of the author [Bull. Sci. Math. (2) 76 (1952), 148-160; ibid. (2) 81 (1957), 78-87; ibid. (2) 81 (1957), 116-118; ibid. (2) 83 (1959), 24-32; C.R. Acad. Sci. Paris 250 (1960), 2663-2665; ibid. 252 (1961), 55-56; ibid. 253 (1961), 2446-2447]. of P. Montel [ibid. 251 (1960), 2111-2113]; of E. Artin [Einführung in die Theorie der Gammafunktion, Teubner, Leipzig, 1931] and of W. Krull [Math. Nachr. 1 (1948), 365-376; ibid. 2 (1949), 251-262] the latter are summarized in an appendix.

The well-chosen and fulfilled aim of the author is not only to characterize the gamma- and beta-functions by equations of finite differences and conditions of logarithmic convexity, monotony, semi-convexity or semi-monotony, but also to deduce many of the properties of these functions from these equations and conditions (and not from the explicit forms). A few further generalizations are also given.

{The reviewer thinks that on p. 3, line 2, f should be assumed to be bounded; on p. 23, line 9 from the bottom, $e^{-(n+1)}t$ has to be replaced by $e^{-(n+1)t}$; that the statement at the end of p. 26 might be made clearer by referring to $\lim_{n\to\infty} g(n) = 0$; and that it might have been pointed out where in the proof of Theorem 12.2 (pages 43-44) condition III was used, since it really is a condition for the existence of functions satisfying I-II. }

J. Aczél, University of Waterloo

Estimation theory, by Ralph Deutsch. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1965. xiv + 269 pages. $9.75.

The author covers a fairly wide range of topics from both classical and modern estimation theory. Among the former are the method of least squares, linear and nonlinear estimation, recursive estimators, and method of maximum likelihood. The major topics presented in the latter category are the Wiener-Hopf theory for linear estimation, the differential equation techniques associated with the method of Kalman and Bucy, and decision theory.

From the Preface: "Only formal and heuristic mathematics are used in most arguments. Rigorous justifications and theorems for the same points are usually left for augmented reading in the referenced technical literature." Fortunately the author has supplied a good bibliography carefully keyed to the text. With enough supplementary material from the references or other sources, the book may serve as the basis for a graduate course. It should prove useful as a reference to workers in a wide variety of fields, especially in relating the classical methods to more recent developments. A background in probability, statistics, and linear algebra is assumed.

H. Kaufman, McGill University

Modern university calculus, by Bell, Blum, Lewis and Rosenblatt. Holden-Day 1966. lxix + 905 pages. $12.95.

This volume is described as the second part of "Modern Calculus", the first part being presumably the same authors' "Introduction to the calculus". It is greatly concerned with mathematical rigor, and the authors explain their concern with some cogency in the introduction that their goal is not to show that calculus is difficult, but "to provide the student with powerful tools and results".

Explanations are clear, even where clarity requires lengthiness; and the price paid for this is bulk: the book contains over 900 pages, and the core of the calculus (differentiation and integration) is not reached until page 266. In fact, the book could well be described as a text-book