of these rules to the classical calculus results in a system equivalent to Lewis' system S4. A related notion for possibility is also suggested. Consider a family of systems; A is said to be possible in a system S_1 of the family in case it is provable in some stronger system of the family.

In making available in monograph form the important ideas of Gentzen, a definite need in the literature is filled. The work throughout gives meticulous attention to precise formulations and to detail in proof. It is almost entirely self-contained, and in spite of the great detail of the treatment should be of interest to the general mathematical public as well as to the specialist in foundations.

D. NELSON

Lezioni di analisi. By F. Severi and G. Scorza Dragoni. Bologna, Cesare Zuffi, 1951. Vol. 3, 6+255 pp. 2700 lire.

Volume 1 was written by the senior author alone and published by Zanichelli in 1933, it was reviewed by T. H. Hildebrandt in vol. 41, January 1935, of this Bulletin. A second edition appeared in 1938 and a third edition is in course of publication. Part 1 of volume 2 with G. Scorza Dragoni as coauthor appeared in 1943, but does not seem to have been reviewed in the Bulletin.

The present volume 3 contains a discussion of ordinary differential equations (existence and uniqueness theorem for single equations and for systems and problems in the large, mainly boundary value problems) followed by a chapter on trigonometric series and a brief discussion of the differential geometry of surfaces.

The main text gives a clear, fluent and rigorous account of the basic facts based on the Riemann integral. In each chapter, except the first, this exposition is supplemented by a section in smaller print labelled Complements and Exercises. Of exercises in our sense there are comparatively few, but the complements serve to open vistas to a multitude of more advanced questions. There is a wealth of historical material here and in the main text, over two hundred authors are quoted with dates though normally without textual references. The complement to the second chapter is particularly rich; it occupies a fourth of the book and the subject matter is kaleidoscopic. There is internal unity, however, and the brief sketches of the many topics are skilfully done. This section contains some interesting material on analytic functions of several variables and various extensions of Cauchy's theorem and Cauchy's integral to such functions. The Lebesgue integral is used in the complements. The discussion in the large in Chapter 3 takes the fixed point theorems of Brouwer and

Birkhoff-Kellogg as its point of departure. Orthogonal series, mean
convergence, Vitali's closure theorem, and Hilbert spaces are dis-
cussed briefly in the complement to Chapter 4. The last chapter ends
with a two page historical survey of differential geometry in higher
dimensions and projective differential geometry.

There are undoubtedly readers who will claim that the authors
would have given more, had they given less. To me the point of view
is refreshing and the multitude of facts make the book a treasure
house. The cover and the press work do credit to printer and pub-
lisher alike.

<div align="right">EINAR HILLE</div>

*Proceedings of a Second Symposium on Large-Scale Digital Calculating
   Machinery.* (Annals of the Computation Laboratory of Harvard
   University, Vol. 26.) Cambridge, Harvard University Press, 1951.
   38+393 pp. $8.00.

The first of the Harvard Symposia on this topic was held early in
1947, at the dedication of the Mark II Calculator. The Second Sym-
posium was held at the dedication of the Mark III Calculator, at
present in operation at the Navy Proving Ground in Dahlgren. Ses-
sions were devoted to engineering developments (which will not be
covered in this review), to numerical methods and computational
problems in various sciences. There is, in this volume, a reasonably
comprehensive survey of the field, both in the United States and in
Europe, as it was in 1949.

The most significant mathematical contribution in the present
volume is due to C. Lanczos, who, in his picturesque way, presents a
method of minimized iterations for the solution of characteristic
value problems. W. E. Milne examines various finite difference ap-
proximations to the two-dimensional Laplacian operator.

The problem of semi-automatic instruction is discussed by H. D.
Huskey and a beginning of a unified theory of computing machines
is presented by G. W. Patterson.

Most interesting are the papers describing some of the problems
which await solution. Those who are interested in handling differ-
ential equations will find enough problems in the papers by H. Fesh-
bach on nuclear physics and by R. D. O'Neal, E. T. Welmers, and
H. W. Emmons on aeronautics and aerodynamics. On the other hand,
the papers by F. Mosteller, W. W. Leontief, L. R. Tucker, and H.
Chernoff on various topics in the economic and social sciences pro-
vide ample material for those interested in the manipulation of
matrices.