Mathematics of Relativity; *Lecture Notes.* By G. Y. Rainich. Ann Arbor, Edwards Brothers, 1932. i+67 pp.

As those who have had the pleasure of hearing Professor Rainich lecture would expect, this set of mimeographed lecture notes is very stimulating, original, and interesting. Vectors and tensors are first introduced in terms of cartesian coordinates in euclidean space of three dimensions, and the tensor form of Euler's hydrodynamical equations and of Maxwell's equations is quickly arrived at. Then follows a chapter on four-dimensional euclidean geometry and an account of an axiomatic, non-coordinate, basis for tensor analysis. This basis, which is largely due to the author, is very important and furnishes a method for the introduction of coordinates. The theory of special relativity with its most important implications is given in Chapter 3. Chapter 4 is devoted to curved space and general (Gaussian) coordinates and an adequate account of the curvature tensor, normal coordinates, etc. is given. Chapter 5 furnishes the best concise account we have seen of general relativity and the three fundamental tests—motion of a planet, bending of a ray of light, and shift of spectral lines. We hope very much that the author will be encouraged to amplify (and supply with adequate references) these notes in a printed volume.

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Lehrbuch der Funktionentheorie. By Ludwig Bieberbach. Volume II, *Moderne Funktionentheorie.* 2d edition. Berlin and Leipzig, B. G. Teubner, 1931. vi+370 pp.

It suffices to compare this treatise with any one published ten years ago or earlier to conceive the tremendous change and progress achieved by the theory of functions of a complex variable during recent years. The questions whose treatment occupied chapters in earlier publications, are given here but few pages, or even are entirely eliminated to be replaced by scores of new problems, methods, and results. The following list of contents hardly can give an adequate idea of the variety of material contained in the *Lehrbuch* of Bieberbach. Chapter 1 (83 pp.) is devoted to the discussion of the classical problem of conformal mapping of simply-connected domains; the interior problem is treated as well as the problem of the correspondence of the boundaries. Brief indications concerning the problem of conformal mapping of multiply-connected domains are given. At the end of the chapter fundamental properties of univalent ("schlichte") functions are exposed, including "Flächensatz," "Verzerrungssatz," and Littlewood's estimates for the coefficients of the power series expansion of a univalent function. Chapter 2 (20 pp.) contains a discussion of indispensable properties of the modular function. Chapter 3 (56 pp.) gives an exposition of fundamental results of the theory of analytic functions bounded in the unit circle, and of its various generalizations. Here we find Schwarz's lemma and its generalizations and modifications (Lindelöf's principle, theorems of Julia and Löwner), Jensen-Nevanlinna's formula and its applications, Schur's method of the determination of the power series expansion of a bounded function, Fatou's theorem, generalizations of Vitali's theorem (theorems of F. and M. Riesz, Khintchine, Ostrowski). Chapter 4 (56 pp.) treats of the uniformisation problem. Problems connected with Picard's theorem are discussed