After a discussion of other particular examples a few pages are devoted to a more minute classification of transcendental singularities.

Chapter IV considers the singular points of Briot and Bouquet. The equation which has singularities of this type is connected with the equation above by introducing a parameter μ which put equal to zero gives equation (2) and put equal to unity gives the equation under consideration. By allowing μ to vary, the intimate relation between the singularities of equation (2) and those of Briot and Bouquet is established.

Chapter V discusses some of the relations which exist between the singularities of the same equation.

The volume closes with a note of fifty pages by Painlevé: "On the differential equations of the first order whose general integral has only a finite number of branches."

C. L. E. MOORE.

Sur les premiers Principes des Sciences mathématiques. Par P. WORMS DE ROMILLY. Paris, A. Hermann, 1908. 8vo. 51 pp. 2.50 fr.

THIS essay undertakes to give an account of the recent work on the foundations of mathematics. The author concludes that the only branch of mathematics completely applicable to natural phenomena is arithmetic, since it depends solely upon the numeration of objects, and makes no hypothesis regarding their nature. Geometry, on the other hand, imposes upon them certain purely ideal hypotheses which indeed may differ so as to produce at least three systems of geometry, the system which nature is built upon being possibly that of Euclid, possibly otherwise. The contrast drawn here between the external validity of arithmetic as over against that of geometry is a little difficult to reconcile with the explanations devoted by the author to the varying systems of axioms on which arithmetic may be based. In fact he distinctly speaks of diverse systems of numeration. We might inquire, for example, are objects subject to the archimedean axiom or not?

A disproportionate amount of space is devoted to the setting forth of some seven foundations upon which geometry may be based, and not quite so much to mechanics. The reason for this is the underlying thesis which the author seeks to prove. He examines the different modes of grounding geometry and concludes they are all à priori and inapplicable to real objects until certain other unprovable results of intuition are brought into play. Exactly what an external object consists of aside from its being a projection of an internal idea is not shown. And if the world as we conceive it is merely a projection of that which is wholly mental, then why so much struggling to prove the geometrical character of the world as we geometrize it? Or on the other hand, why such a certainty of its arithmetic as we arithmetize it?

The definition given by C. S. Peirce for mathematics has not been surpassed: "The study of ideal constructions (often applicable to real problems), and the discovery thereby of relations between the parts of these constructions before unknown." This implies the rôle of logic and of intuition in the architecture of this vast structure. And in a projection of two figures is A the projection of B, or B of A? Is the world framed according to the architecture or the architecture according to the world? Qui sait!

JAMES BYRNIE SHAW.

Taschenbuch für Mathematiker und Physiker. 1909. Von FELIX AUERBACH. Leipzig, Teubner. 1909. xliv + 450 pp. 6 Marks.

THIS little pocket manual initiates a series of year books to be issued by the firm publishing it. They are to be congratulated upon their enterprise in furnishing the mathematical public what it has long needed. The engineer has his Trautwine, Kent, Kidder, or Foster, but so far the mathematician has had only collections of integrals, or small collections of trigonometric formulas. This volume, on thin but opaque paper, with typography which is delightfully clear, contains not only an excellent summary of the whole field of mathematics, but also a resumé of mechanics, physics, and physical chemistry. One is much surprised and pleased at the amount of valuable material compressed into so small a space, yet so easily found. The chief formulas and definitions are to be found here for arithmetic, algebra, group theory, combinatory analysis, determinants, series, differential calculus, integral calculus, definite integrals, calculus of variations, differential equations, transformation groups, functions of a real variable, functions of a complex variable, gamma function, elliptic integrals and functions; principles of geometry, topology, planimetry, stereometry, goniometry, plane trigonometry, spherical trigonometry; coordinate