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The theory of complex dynamics, whose roots lie in 19th-century studies of the iteration of complex function conducted by Konigs, Schröder, and others, flourished remarkably during the first half of the 20th century, when many of the central ideas and techniques of the subject developed. This book by Alexander, Iavernaro, and Rosa paints a robust picture of the field of complex dynamics between 1906 and 1942 through detailed discussions of the work of Fatou, Julia, Siegel, and several others.

A recurrent theme of the authors' treatment is the center problem in complex dynamics. They present its complete history during this period and, in so doing, bring out analogies between complex dynamics and the study of differential equations, in particular, the problem of stability in Hamiltonian systems. Among these analogies are the use of iteration and problems involving small divisors which the authors examine in the work of Poincaré and others, linking them to complex dynamics, principally via the work of Samuel Lattès, in the early 1900s, and Jürgen Moser, in the 1960s.

Many details will be new to the reader, such as a history of Lattès functions (functions whose Julia set equals the Riemann sphere), complex dynamics in the United States around the time of World War I, a survey of complex dynamics around the world in the 1920s and 1930s, a discussion of the dynamical programs of Fatou and Julia during the 1920s, and biographical material on several key figures. The book contains graphical renderings of many of the mathematical objects the authors discuss, including some of the intriguing fractals Fatou and Julia studied, and concludes with several appendices by current researchers in complex dynamics which collectively attest to the impact of the work of Fatou, Julia, and others upon the present-day study.