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★Karl Löwner and his student Lipman Bers—pre-war Prague mathematicians.

Heritage of European Mathematics.

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This book is devoted to two distinguished mathematicians, Karl (Charles) Loewner and Lipman Bers, both refugees from Czechoslovakia in the time before and at the beginning of World War II. Loewner spent the first part of his career in Berlin and Prague and emigrated to the USA in 1939, where he changed his name to Charles Loewner. After his doctorate Bers emigrated to France in 1938 and later to the USA. The authors focus their study on the time before the emigration of both mathematicians. Based on extensive archival research and on various published material they want to reveal “how the academic milieu and the development of science was strongly interwoven with the political situation and the prevailing attitudes in society”. Most of the archival material as well as some information and pictures from family members, Loewner’s colleagues and friends is published in the book for the first time. The authors present in particular a wealth of details about Loewner’s life, his school time, his first steps in his career at university as well as the dramatic and difficult situation of his late emigration in October 1939. They put it in a broader historical context but the reader has to follow the references given in the notes to get a good and well-balanced impression of the special political background, the scientific climate, etc. Loewner’s further life in the USA is sketched in a few pages only. His scientific life and his mathematical results have already been stressed in the biographical part of the book.

The following chapters cover the scientific achievements of Loewner, focused again on the time before World War II. The authors give a thorough and extensive analysis of these publications, beginning with Loewner’s articles in geometric function theory and on matrix functions. This analysis includes a discussion of the mathematical background of Loewner’s research and the impact as well as the further development of his results. In his articles about univalent functions Loewner developed his parametric method and introduced the differential equation named after him. Both became highly appreciated and formed a fundamental source of further deep research up to the present. As is well known, Loewner’s equation played a decisive role in the proof of the Bieberbach conjecture by L. de Branges in 1984. Moreover, his differential equation found an unexpected application in the theory of stochastic processes at the end of the 20th century. His legacy was acknowledged by naming a conformal invariant stochastic process to be “Schramm-Loewner evolution” (SLE). Further methods based on SLE found in turn interesting and important applications in physics and were mentioned in the citations of two Fields medalists (Werner (2006) and Smirnov (2010)). In his paper about monotone matrix functions Loewner revealed notably surprising relations between matrix theory, real and complex analysis and interpolation by rational functions. The article gave impetus to the development of various mathematical disciplines and found applications in physics and engineering too. The authors point out Loewner’s efforts to establish a theory of volume such that measurable sets form a ring as a third important area of his investigations. This theory remained incomplete.

The first part of the book is composed of six chapters containing the bibliography of Loewner and lists of his reviews, the lecture courses and seminars respectively attended or delivered by him, his doctoral students at the German University in Prague and his

lectures to the mathematical community of various associations like the Mathematisches Kränzchen (Prague) or the Berlin Mathematical Society. Except for the bibliography all other compilations are restricted to the pre-war period.

The authors treat the life and work of Bers in the second, much shorter part of the book. They begin again with the biographical material followed by an analysis of Bers' dissertation on potential theory. After a sketch of the historical background by quotes from Bers himself and from two obituaries, the authors summarize the content of the dissertation and present a facsimile of Bers' report on the dissertation as well as its translation including a short commentary. The book ends with two short letters including recollections of Loewner's daughter Marian and of Bers' daughter Ruth respectively. A name and a subject index help the reader to access the multiplicity of information of this readable book.

*Karl-Heinz Schlote*

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