

Preface

Lars Ahlfors's book *Lectures on Quasiconformal Mappings* was first published in 1966, and its special qualities were soon recognized. For example, a Russian translation was published in 1969, and, after seeing an early version of the notes that were the basis for Ahlfors's book, Lipman Bers, Fred Gardiner and Kra abandoned their plans to produce a book based on Bers's two-semester 1964 course at Columbia on quasiconformal mappings and Teichmüller spaces.

Ahlfors's classic continues to be widely read by graduate students and other mathematicians who are learning the foundations of the theories of quasiconformal mappings and Teichmüller spaces. It is particularly suitable for that purpose because of the elegance with which it presents the fundamentals of the theory of quasiconformal mappings. The early chapters provide precisely what is needed for the big results in Chapters V and VI. At the same time they give the reader an informative picture of how quasiconformal mappings work.

One reason for the economy of Ahlfors's presentation is that his book represents the contents of a one-semester course, given at Harvard University in the spring term of 1964. It was a remarkable achievement; in one semester he developed the theory of quasiconformal mappings from scratch, gave a self-contained treatment of Beltrami's equation (Chapter V of the book), and covered the basic properties of Teichmüller space, including the Bers embedding and the Teichmüller curve (see Chapter VI and §2 of our chapter in the appendix). Along the way, Ahlfors found time for some estimates in Chapter III B involving elliptic integrals and a treatment of an extremal problem of Teichmüller in Chapter III D that even now can be found in few other sources. The fact that quasiconformal mappings turned out to be important tools in 2 and 3-dimensional geometry, complex dynamics and value distribution theory created a new audience for a book that provides a uniquely efficient introduction to the subject. It illustrates Ahlfors's remarkable ability to get straight to the heart of the matter and present major results with a minimum set of prerequisites.

The notes on which the book is based were written by Ahlfors himself. It was his practice in advanced courses to write thorough lecture notes (in longhand, with a fountain pen), leaving them after class in a ring binder in the mathematics library reading room for the benefit of the people attending the course.

With this practice in mind, Fred Gehring invited Ahlfors to publish the spring 1964 lecture notes in the new paperback book series *Van Nostrand Mathematical Studies* that he and Paul Halmos were editing. Ahlfors, in turn, invited his recent student Earle, who had completed his graduate studies and left Harvard shortly before 1964, to edit the longhand notes and see to their typing. The published text hews close to the original notes, and of course Ahlfors checked and approved the few alterations that were suggested.

Unfortunately, *Lectures on Quasiconformal Mappings* has been out of print for many years. We are grateful to the American Mathematical Society and the Ahlfors family for making it available once again. In this new edition, the original text has been typeset in TeX but is otherwise unchanged except for correction of some misprints and slips of the pen.

A new feature of this edition is an appendix consisting of three chapters. The first is chiefly devoted to further developments in the theory of Teichmüller spaces. The second, by Shishikura, describes how quasiconformal mappings have revitalized the subject of complex dynamics. The third, by Hubbard, illustrates the role of quasiconformal mappings in Thurston's theory of hyperbolic structures on 3-manifolds. All three chapters demonstrate the continuing importance of quasiconformal mappings in many different areas.

The theory of quasiconformal mappings has itself grown dramatically since the first edition of this book appeared. These developments cannot be described in a book of modest size. Fortunately, they are reported in many sources that will be readily accessible to any reader of this book. He or she will find references to a number of these sources in the early pages of our chapter in the appendix.

We are certain that the appendix will be useful to the reader. But our deepest admiration is reserved for the 1966 Lars Ahlfors manuscript and his remarkably influential 1964 course. The fact that after 40 years the Ahlfors book is being reprinted once again is a loud and clear message to the current generation of researchers.

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