

Preface

These volumes contain a selection of William Feller's most important works on probability theory, mathematical biology, analysis and geometry. Feller was a prolific writer, with many groundbreaking contributions which, almost 45 years after his death, are still frequently quoted – both directly and indirectly. This abundance meant that the decision which of his more than 100 research papers should be included in these *Selecta* was not an easy task. Most of Feller's English-language research contributions have been included, and we also selected a fair share of his pre-1940 publications in German and French, six of which were translated into English for these *Selecta*. His two most cherished contributions, the definitive Feller–Lindeberg version of the *Central Limit Theorem* [Feller 1935c], and the deep *On the theory of stochastic processes* [Feller 1936c] – a companion to Kolmogorov's seminal work on stochastic processes and PDEs – are here being made accessible in English for the first time. We decided not to reprint Feller's work on measure theory, and the geometry selection contains only the fundamental *Acta Mathematica* contribution by Busemann and Feller; in fact, Feller did not continue to work in these directions, and we felt that his impact on these areas remained rather limited.

Feller is widely known for his brilliant two-volume textbook, *An Introduction to Probability Theory and Its Applications*, on which he continuously worked since the late 1940s. It is one of the few books which changed considerably from edition to edition. The observant reader of these *Selecta* will notice that in later editions Feller included many results from his (then) recent research papers. Consequently, the *Introduction to Probability Theory* is still a “modern” book, and a treat for every reader as well. For obvious reasons we could not include these books in the present selection.

The papers are arranged in chronological order: Volume 1 covers the years 1928–1950, and Volume 2 the period 1951–1971. Each volume contains additional material, of which the most important are commentaries and essays written by the leading experts in the areas covered by the *Selecta*. We are grateful to them for their willingness to spend considerable time and effort to put various aspects of Feller's work, and its afterlife, into modern perspective; Ellen Baake & Anton Wakolbinger wrote on Mathematical Biology, Hans Fischer on Foundations and the Central Limit Theorem, Masatoshi Fukushima on Diffusions and Boundaries, Niels Jacob on Functional Analysis, Ross Maller on Limit Theorems, Goran Peskir on Boundary Conditions and Erhard Scholz on Geometry. The volumes would not have the same relevance to

modern mathematical research without their incisive analyses.

Thanks are due to Springer-Verlag for undertaking the publication. The team around Catriona Byrne and Marina Reizakis was very supportive and helped the project move forward throughout the past couple of years. We are grateful to all owners of the copyrights for their cooperation, and for generously granting the reprint permissions free of charge. These days this is no longer the rule, but an exception. Only one publisher declined to help us. Thus the absence of the difficult-to-access 1938 survey paper [*Feller 1938a] on the foundations of probability theory leaves a distressing gap in these *Selecta*.

Many colleagues and friends helped us during the preparation of these volumes. We would like to thank all of them, in particular, Christian Berg, Ulrich Brehm, Jürgen Elstrodt, Tony Knapp, Heinz König, Anders Martin-Löf and Hrvoje Šikić for valuable comments. We are especially grateful to Joanne Elliott, a long-time friend, and neighbour of the Feller family for insightful conversations about Feller's life in America, and for sharing generously her vast trove of historical photographs and other materials; some are reproduced here with her permission. Several of the surviving Feller's PhD students contacted by us also expressed support for the idea of this publication. Our student Ms. Franziska Kühn (TU Dresden) helped us with the intricacies of typesetting this work in LaTeX and other administrative chores.

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René L. Schilling
Zoran Vondraček
Wojbor A. Woyczyński