

## PREFACE TO THE SECOND EDITION

There was no question of “updating” this book nearly thirty years after it was first published—in 1980, volume 100 in the *Studies in Logic* series of North Holland. The only completely rewritten sections are 6F, which gives a proof of the determinacy of Borel sets (a version of Martin’s second proof not available in 1980) and 7F, where the question of how much choice is needed (especially) to prove Borel determinacy is examined. There is also a new, brief section 3I on the *relativization* method of proof, which has baffled some of the not-so-logically minded readers. Beyond that, the main improvements over the first edition are that

- this one has many fewer errors (I hope);
- the bibliography has been completed and expanded with a small selection of relevant, more recent publications;
- and many passages have been rewritten.

(It has been said that the most basic instinct in man is not for food or sex but to edit someone else’s writing—and the urge to edit one’s own writing is, apparently, even stronger.)

There have been two major developments in Descriptive Set Theory since 1980 which have fundamentally changed the subject.

One is the establishment of a robust connection between determinacy hypotheses, large cardinal axioms and inner model theory, starting with Martin and Steel [1988] and Woodin [1988], to such an extent that one cannot now understand any of these parts of set theory without also understanding the others. I have added some “forward references” to these developments when they touch on questions that were formulated in the book.

The other is the explosion in applications of Descriptive Set Theory to other parts of mathematics, cf. Kechris [1995]. This area really took off with Harrington, Kechris, and Louveau [1990] which (with the work that followed it) established the study of definable equivalence relations on Polish spaces as a subject of its own, with deep connections to classical mathematics. It was not possible to point to this work in this revision, especially as the basic result in Silver [1980] was not (for some reason) included in the original.

Many of the notions and techniques introduced in this book have been used heavily in these developments, notably scales and the application of effective methods to the “classical” theory. Some of it has become obsolete, of course; but I do not believe that its self-contained, foundationally motivated and unified introduction to the effective theory and the consequences of determinacy hypotheses has been duplicated.

I am grateful to all those who have sent me comments and corrections, including (from the incomplete records that I have) Ben Miller, Mike Brady, Vassilis Gregoriades,

Tonny Hurkens, Aleko Kechris, Tony Martin, Itay Neeman, Richard Shore and John Steel. I am especially grateful to Christos Kapoutsis who set the manuscript in beautiful L<sup>A</sup>T<sub>E</sub>X several years ago—and I apologize to him that it took me so long to do my part and finish the job.

Paleo Faliro, Greece

July 29, 2008