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Richard Parncutt

Harmony: A Psychoacoustical Approach

With 22 Figures

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To the pacifists

Preface

My first encounter with the theory of harmony was during my last year at school (1975). This fascinating system of rules crystallized the intuitive knowledge of harmony I had acquired from years of piano playing, and facilitated memorization, transcription, arrangement and composition. For the next five years, I studied music (piano) and science (physics) at the University of Melbourne. This "strange combination" started me wondering about the *origins* of those music theory "rules". To what extent were they determined or influenced by physics? mathematics? physiology? conditioning?

In 1981, the supervisor of my honours project in musical acoustics, Neville Fletcher, showed me an article entitled "Pitch, consonance, and harmony", by a certain Ernst Terhardt of the Technical University of Munich. By that stage, I had devoured a considerable amount of (largely unsatisfactory) material on the nature and origins of harmony, which enabled me to recognize the significance of Terhardt's article. But it was not until I arrived in Munich the following year (on Terhardt's invitation) that I began to appreciate the consequences of his "psychoacoustical" approach for the theory of harmony. That is what this book is about.

The book presents Terhardt's work against the broad context of music perception research, past and present. Music perception is a multidisciplinary mixture of physics, psychology and music. Where different theoretical approaches appear contradictory, I try to show instead that they complement and enrich one another. Readers are assumed to be acquainted with basic principles of harmony, acoustics (including spectral analysis), and computer modelling.

The book is based on my Ph.D. thesis, which was submitted in 1986 at the University of New England, Armidale NSW, Australia. I am indebted to my supervisors, Neville Fletcher (Physics), Catherine Ellis (Music) and William Noble (Psychology), for their active interest, informed criticism and general guidance; to Gerhard Stoll and David Heap, for helping to set up the experiments; to my Ph.D. examiners, Howard Pollard (Physics, University of New South Wales), Alan Costall (Psychology, University of Southampton) and Jeff Pressing (Music, La Trobe University), for helpful suggestions, criticism and encouragement; and to Neil Buckland, for music-oriented comments.

The theoretical content of the book was influenced and inspired by conversations with staff of the Institute of Electroacoustics, TU Munich, and with academics and students met at conferences and visited during and after my Ph.D. Special thanks to Juan Roederer for organizing the Workshops on the

Physics and Neuropsychology of Music at Ossiach, Austria, which I attended in 1983 and 1985.

Most of all I would like to thank Ernst Terhardt, for his hospitality, approachability and critical guidance during my stay in Munich in 1982–1983. I hope with this book to bring his work to the attention of a wider public, and thereby to contribute to the demystification of the harmonic conventions of Western music.

Armidale, May 1988 *Richard Parncutt*

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