

CONTENTS

Foreword by Roald Hoffmann vii

Introduction 3

CHAPTER 1 Heavy, Superheavy... *Quo Vadis?* 8

Paul J. Karol

CHAPTER 2 Nuclear Lattice Model and the Electronic
Configuration of the Chemical Elements 43

Jozsef Garai

CHAPTER 3 Amateurs and Professionals in Chemistry: The Case
of the Periodic System 66

Philip J. Stewart

CHAPTER 4 The Periodic System: A Mathematical Approach 80

Guillermo Restrepo

CHAPTER 5 The "Chemical Mechanics" of the Periodic Table 104

Arnout Ceulemans and Pieter Thyssen

CHAPTER 6 The Grand Periodic Function 122

Jan C. A. Boeyens

CHAPTER 7 What Elements Belong in Group 3 of the Periodic
Table? 140

Eric R. Scerri and William Parsons

CHAPTER 8 The Periodic Table Retrieved from Density
Functional Theory Based Concepts: The Electron
Density, the Shape Function and the Linear Response
Function 152

Paul Geerlings

CHAPTER 9 Resemiotization of Periodicity: A Social Semiotic
Perspective 177

Yu Liu

CHAPTER 10 Organizing the Transition Metals 195

Geoff Rayner-Canham

CHAPTER 11 The Earth Scientist's Periodic Table of the Elements
and Their Ions: A New Periodic Table Founded on
Non-Traditional Concepts 206

L. Bruce Railsback

CHAPTER 12 The Origin of Mendeleev's Discovery of the Periodic
System 219

Masanori Kaji

CHAPTER 13 Richard Abegg and the Periodic Table 245

William B. Jensen

CHAPTER 14 The Chemist as Philosopher: D. I. Mendeleev's
"The Unit" and "Worldview" 266

Michael D. Gordin

CHAPTER 15 The Philosophical Importance of the Periodic
Table 279

Mark Weinstein

Index 305