

CONTENTS

Preface	v
Introduction	vii
1. What Is Osteoporosis?	1
2. BMUS—The Microcrack Fixers	3
i. Strains, Microcracks, Macrocracks and Molecular Screams	3
ii. Calling the Diggers	19
iii. The Arrival at the Work Site	24
iv. Osteoclasts and the Dead Bone Puzzle	26
v. The Fillers	26
vi. The Decline and Fall of Bone Strength and BMU Efficiency but a Rise in Remodeling Rate and Cortical Porosity with Age	39
3. Menopause and Bone Loss	42
i. Leptin, Fat, Brains and Bones	42
ii. How Does an Estrogen Loss Cause a Bone-Wasting Osteoclast Population Explosion?	50
iii. How to Stop (or at Least Slow) Menopausal Bone Loss	55
4. The Amazing Bone-Anabolic PTHs	60
i. Anabolics—The Answers to the Osteoporotics' Prayers	60
ii. The Ancient Origins of PTH and Its Receptor	60
iii. PTHs-Induce Bone Growth and Fracture Mending in Non-Human Animals	64
iv. PTHs-Induced Bone Growth in Humans	73
v. Rat versus Human—Problems for Extrapolation and Prediction ...	84
5. How Might PTHs Stimulate Bone Growth?	85
i. The Starter Gun: The PTHR1 Receptor	85
ii. What Signal Bullets Switch on the Bone-Making Machine?	97
iii. PTHs Speak To Bones with Two-Pronged Forked Tongues— One Prong Says Make It!	102
iv. PTHs Speak To Bones with Two-Pronged Forked Tongues— The Other Prong Says Remove It!	140
v. How an Odd Couple—PTHrP and an Indian Hedgehog Build Bones	149
vi. A Brief PTHrP-Sponsored Side-Trip to the Skin	157
vii. PTHs and Rheumatoid Arthritis	159
viii. PTHs and Cancer—A Concern with All Growth Stimulators	160
ix. A Possible Threat	164
x. PTHrP, PTHR1 Receptors and Stroke	166
xi. Grand Summary	167
6. The Clinical Prospects of the Invincible PTHs	168

7. OGP—The Osteogenic Growth Peptide	172
8. The Statins	174
i. Animal Studies	175
ii. Osteogenic Mechanism	176
iii. Human Studies	180
iv. Statins and Alzheimer’s Disease	183
v. Statins’ Clinical Prospects	185
9. Surface Signaling Steroids—Real Anabolics or Pseudo-Anabolics?	187
i. Vitamin Ds	187
ii. Unisex Steroids	188
10. Strontium, Calcium’s Big Brother	190
11. Afterword	193
References	195
Index	257