

## CONTENTS

<i>Acknowledgments</i>	v
<b>Introduction: Infinities in a Grain of Sand</b>	1
<b>1. A Case of Misdirection</b>	5
Political Hijacking	6
The Temporary End of Sustainable Industrial Development	10
The Planet Goes Nano	11
<b>2. The Incredible Shrinking Chip</b>	15
A Mythical Speech	15
The Giants of Miniaturization	17
From Electron to Electronics	19
Enter Gordon Moore	20
A Needle Upright on a Football Pitch	23
The First Limits to Miniaturization	24
Contagious Miniaturization	25
Welcome to the Quantum World	27
Pardon Me, Did You Say “Mesoscopic”?	30
The Electronics of Tomorrow	33
The Guiding Thread	35
<b>3. Staying at the Bottom</b>	37
Birth of the Molecule	38
So How Big is a Molecule?	40
Maxwell’s Demon	41
How to Connect a Molecule	43
Man Moves Atom	45
And Yet It Moves!	48
The First Experiments in Nanophysics	50

The Mechanics of a Molecule	52
The Advantage of Staying at the Bottom	54
<b>4. Monumentalization</b>	<b>57</b>
The Advent of Molecule Devices	59
A Wire ...	59
An Amperimeter ...	61
And a Cantilever	63
Molecule Machines	64
Calculating Molecules	66
Quantum Computing Molecules	67
Molecular Factories	68
Bigger and Bigger?	69
The Retreat to Nanomaterials	70
<b>5. Nannobacteria</b>	<b>73</b>
Ripples from a Meteorite	74
Surrounded by Nanoaliens	76
The Missing Link	77
The Molecular Fabrication of Life	78
The Lessons of Mother Nature	81
<b>6. Who's Afraid of Nanotechnologies?</b>	<b>83</b>
AMOs: Atomically Modified Organisms	84
Another Threat on the Horizon: Nanomaterials	85
Electronic Spies	88
On the Road to Nanomedicine?	91
Potential Military Applications	94
Where Next?	94
In Search of Common Sense	96
<b>Appendix I: A Short History of Microscopy</b>	<b>99</b>
X-Ray Diffraction	100
Copper Phthalocyanine in Pictures	102

The Birth of Electron Microscopy	104
The Scanning Tunneling Microscope	105
<b>Appendix II: Trials and Tribulations of a Prefix</b>	<b>109</b>
<b>Bibliography</b>	<b>115</b>
Works by Multiple Authors	115
Other References	116