Joseph C. Pitt

Doing Philosophy of Technology

Essays in a Pragmatist Spirit

4y Springer

Contents

Part I Society, Ethics and Values

1 Human Beings as Technological Artifacts . . . 3
1.1 John Dewey and the Aims of Education . . . 4
1.2 The Design Process . . . 5
1.3 Students as Self-Designers . . . 6
1.4 Active Versus Passive, Redux . . . 7

2 Technology and the Objectivity of Values . . . 11
2.1 Introduction . . . 11
2.2 Types of Judgments . . . 13
2.3 Epistemic Values as Objective Values . . . 14
2.4 Problems with Ethics . . . 17
2.5 The Methodology of Technological Decision-Making . . . 19
References . . . 21

3 Anticipating the Unknown . . . 23
3.1 Introduction . . . 23
3.2 Pragmatism . . . 24
3.3 Ethics . . . 25
3.4 Philosophy and Pragmatism . . . 27
3.5 The Law of Unintended Consequences (LUC) . . . 29
3.6 Way of Going and the Good Life . . . 30
3.7 Common Sense Pragmatism . . . 31
3.8 Common Sense Pragmatism as an Ethical Theory . . . 31
3.9 Common Sense Pragmatism, Ethics, and Nanotechnology . . . 33
3.10 A Different Approach . . . 34
References . . . 38

4 Don't Talk to Me . . . 39

Part II Methodological Issues

5 Against the Perennial . . . 45
5.1 Continents . . . 45
5.2 Tectonics . . . 46

5.3 Meaning . . . 49
References . . . 53

6 Philosophical Methodology, Technologies, and the Transformation of Knowledge . . . 55
6.1 Introduction . . . 55
6.2 What's Wrong with the Philosophy of Technology? . . . 56
6.3 The Aim of Philosophy . . . 56
6.4 Changing Knowledge . . . 58
6.5 Galileo and Mathematics . . . 60
6.6 Galileo and the Telescope . . . 63
6.7 Space and Beyond . . . 64
6.8 Standard Conditions . . . 68
6.9 Conclusions . . . 68
References . . . 71

7 Working the Natural/Artificial Distinction . . . 73
References . . . 83

8 Discovery, Telescopes, and Progress . . . 85
8.1 Introduction . . . 85
8.2 Discovery . . . 87
8.3 Definitions . . . 88
8.4 Galileo and the Telescope . . . 90
8.5 Sicilian Realism and Technological Infrastructures . . . 93
References . . . 94

.9 Explaining Change in Science . . . 95
References . . . 101

10 The Dilemma of Case Studies . . . 103
References . . . 110

11 Technological Explanation . . . 111
11.1 Relevance . . . 112
11.2 Technological Versus Scientific Explanation . . . 112
11.2.1 The DN Theory . . . 113
11.2.2 Other Theories of Explanation . . . 114
11.3 Questions and Internal and External Audiences . . . 116
11.4 Terminology . . . 117
11.5 Systems . . . 117
11.5.1 System and Design . . . 120
11.5.2 System and Function . . . 121
11.5.3 System and Structure . . . 121
11.6 The Social . . . 123
11.7 Explaining Failures . . . 124
11.7.1 The Challenger Example . . . 125
11.7.2 The 2000 US Presidential Election Example . . . 126
11.7.3 The Ladbroke Grove Railroad Crash Example . . . 126

11.8 Conclusions and Objections . . . 127
11.9 Failure, Success, and Symmetry . . . 127
References . . . 129

Part III Design and Engineering

12 Successful Design in Engineering and Architecture . . . 133
12.1 Engineering Design . . . 133
12.2 Architectural Design . . . 135
12.3 The Role of Creativity . . . 138
12.4 Creativity and Freedom . . . 141
12.5 Engineering and Creativity . . . 141
12.6 Conclusion: Architectural Failures and Successes . . . 143
References . . . 146

13 Design Criteria in Architecture . . . 147
13.1 Introduction . . . 147
13.2 Architectural Design and Philosophy of Technology . . . 148
13.3 James and Common Sense . . . 149
13.4 A Common Sense Proposal . . . 150
13.5 Common Sense Design . . . 152
13.6 Conclusion - Graves Reconsidered and the Mystery of the Guggenheim Finally Solved . . . 153
References . . . 155

14 Philosophy, Engineering, and the Sciences . . . 157
References . . . 163

15 What Engineers Know . . . 165
15.1 A Pragmatic Theory of Knowledge . . . 166
15.2 Scientific Knowledge . . . 166
15.3 Engineering Knowledge . . . 168
15.4 Philosophical Problems . . . 172
References . . . 174

16 Design Mistakes . . . 175
References . . . 186

Part IV Nano

17 The Epistemology of the Very Small . . . 189
17.1 Introduction . . . 189
17.2 Seeing the Unobservable . . . 189
17.3 The Role of Metaphor . . . 190
17.4 Learning to See Through Microscopes . . . 191
17.5 Learning to See with Electron Microscopes . . . 193
17.6 The Nano Scale and Nano Technology . . . 195
References . . . 197

18 When Is an Image Not an Image? 199
References 206

19 Small Talk: Nanotechnology and Metaphor 207
19.1 Introduction 207
19.2 An Example of an Early Use of Metaphor to Facilitate Theory Change 208
19.3 NANO - Do Mixed Metaphors and a Lot of Mathematics Constitute a Proof? 210
References 214

Index **215**