

# Contents

Introduction	1
1. Ancient pre-Columbian Peru, Bolivia and Mesoamerica	11
1.1 Canal systems of pre-Columbian Peru: the Chicama–Moche Intervalley Canal and the Moche intravalley irrigation system, 800–1450 CE	11
1.2 Tiwanaku raised field agriculture on the Pampa Koani, Bolivia, 600–1100 CE	84
1.3 Flood defensive systems of the Hoya Hondada aqueduct in the Jequetepeque Valley	111
1.4 The canal and terrace agricultural system of the Tiwanaku–Wari colonies in the Moquegua Valley, Peru, 300–1000 CE	124
1.5 The agricultural system of Caral—the oldest city of Peru, 3000 BCE	133
1.6 A mathematical model of hydraulic societies in Ancient Peru	151
1.7 Agricultural strategies and sustainability in pre-Columbian South America	184
1.8 The Maya Canal and agricultural system at Kaminal Juyu, Guatemala, 300 BCE–900 CE	223
1.9 Technical transfer considerations	237
2. The Ancient Middle East	244
2.1 The water supply and distribution system of the Nabataean City of Petra (Jordan), 300 BCE–300 CE	244
2.2 The inverted siphon at Aspendos, Turkey	278
2.3 The water supply and distribution system of Ephesos, Turkey	295
2.4 Water control devices in the Hellenistic city of Priene (Turkey), 300 BCE–100 CE	338
2.5 The reservoir and multiple sluice gate water release system at Roman Caesarea (Israel), 6 BCE–300 CE	350
3. Ancient South-East Asia	358
3.1 The Barays of Angkor Wat, Cambodia, 800–1432 CE	358
3.2 The irrigation and terrace rice cultivation systems of Bali, Indonesia, 1500–2005 CE	376

4. Hydraulic Engineering and Water Management Strategies of Ancient Societies	383
4.1 Old World, New World, and South-East Asian comparisons	383
5. Environmental and Climate Perspectives on New World, Old World, and South-East Asian Societies' Achievements in the Hydraulic Sciences	394
5.1 Final reflections	394
5.2 Lessons for the modern world	400
<i>Bibliography</i>	406
<i>Index</i>	421