

Contents

List of Illustrations • xi

Preface • xv

- 1 SCIENCE BEFORE THE GREEKS • i
 What Is Science? • 1
 Prehistoric Attitudes toward Nature • 3
 The Beginnings of Science in Egypt and Mesopotamia • 12
- 2 THE GREEKS AND THE COSMOS • 21
 The World of Homer and Hesiod • 21
 The First Greek Philosophers • 25
 The Milesians and the Question of Underlying Reality • 27
 The Question of Change • 32
 The Problem of Knowledge • 33
 Plato's World of Forms • 34
 Plato's Cosmology • 38
 The Achievement of Early Greek Philosophy • 43
- 3 ARISTOTLE'S PHILOSOPHY OF NATURE • 45
 Life and Works • 45
 Metaphysics and Epistemology • 46
 Nature and Change • 49
 Cosmology • 52
 Motion, Terrestrial and Celestial • 56
 Aristotle as a Biologist • 60
 Aristotle's Achievement • 65
- 4 HELLENISTIC NATURAL PHILOSOPHY • 67
 Schools and Education • 67
 The Lyceum after Aristotle • 73
 Epicureans and Stoics • 76

5	THE MATHEMATICAL SCIENCES IN ANTIQUITY • 82
	The Application of Mathematics to Nature • 82
	Greek Mathematics • 83
	Early Greek Astronomy • 86
	Cosmological Developments • 95
	Hellenistic Planetary Astronomy • 98
	The Science of Optics • 105
	The Science of Weights • 109
6	GREEK AND ROMAN MEDICINE • 111
	Early Greek Medicine • 111
	Hippocratic Medicine • 113
	Hellenistic Anatomy and Physiology • 119
	Hellenistic Medical Sects • 122
	Galen and the Culmination of Hellenistic Medicine • 124
7	ROMAN AND EARLY MEDIEVAL SCIENCE • 132
	Greeks and Romans • 132
	Popularizers and Encyclopedists • 136
	Translations • 146
	The Role of Christianity • 148
	Roman and Early Medieval Education • 150
	Two Early Medieval Natural Philosophers • 157
	Learning and Science in the Greek East • 158
8	ISLAMIC SCIENCE • 163
	Eastward Diffusion of Greek Science • 163
	The Birth, Expansion, and Hellenization of Islam • 166
	Translation of Greek Science into Arabic • 169
	Islamic Reception and Appropriation of Greek Science • 173
	The Islamic Scientific Achievement • 176
	The Fate of Islamic Science • 189
9	THE REVIVAL OF LEARNING IN THE WEST • 193
	The Middle Ages • 193
	Carolingian Reforms • 194
	The Schools of the Eleventh and Twelfth Centuries • 203
	Natural Philosophy in the Twelfth-Century Schools • 209
	The Translation Movement • 215
	The Rise of Universities • 218
10	THE RECOVERY AND ASSIMILATION OF GREEK AND ISLAMIC SCIENCE • 225
	The New Learning • 225
	Aristotle in the University Curriculum • 226

Points of Conflict • 228
Resolution: Science as Handmaiden • 233
Radical Aristotelianism and the Condemnations of 1270 and 1277 • 243
The Relations of Philosophy and Theology After 1277 • 249
11 THE MEDIEVAL COSMOS • 254
The Structure of the Cosmos • 254
Mathematical Astronomy • 261
Astrology • 270
The Surface of the Earth • 277
12 THE PHYSICS OF THE SUBLUNAR REGION • 286
Matter, Form, and Substance • 286
Combination and Mixture • 288
Alchemy • 290
Change and Motion • 295
The Nature of Motion • 297
Mathematical Description of Motion • 299
The Dynamics of Local Motion • 306
Quantification of Dynamics • 309
The Science of Optics • 313
13 MEDIEVAL MEDICINE AND NATURAL HISTORY • 321
The Medical Tradition of the Early Middle Ages • 321
The Transformation of Western Medicine • 329
Medical Practitioners • 330
Medicine in the Universities • 333
Disease, Diagnosis, Prognosis, and Therapy • 335
Anatomy and Surgery • 343
Development of the Hospital • 348
Natural History • 351
14 THE LEGACY OF ANCIENT AND MEDIEVAL SCIENCE • 357
The Continuity Question • 357
Candidates for Revolutionary Status • 359
The Scientific Revolution • 364
<i>Notes</i> • 369
<i>Bibliography</i> • 413
<i>Index</i> • 463