

Contents

1	Our Experience of the Sky and Star Knowledge	1
	The Human Experience of the Sky	2
	Beginnings	3
	Moon	5
	Mercury	10
	Venus	13
	Sun	17
	Sun Lore	20
	Mars	21
	Jupiter	24
	Saturn	27
	The Stars	28
	References	32
2	A World of Constellations in the Night Sky	33
	A Tour of Constellations North and South	34
	Arctic Skies and the Northern Circumpolar Stars	35
	Ursa Major or “The Big Dipper”	36
	Northern Circumpolar Sky from Around the World	38
	European Circumpolar Constellations	38
	The Circumpolar Sky from Ancient China	42
	Star Maps for World Constellations: Northern Hemisphere	44
	Northern Constellations from Around the World	45
	Chinese Constellations and Asterisms	45
	Northern Circumpolar Sky from Around the World	46
	The Arctic Inuit Sky	46
	The Equatorial Sky	49
	The Equatorial Sky from Around the World	50
	Equatorial Constellations from the European Tradition	50
	The Equatorial Sky from Around the World	65
	The Hawaiian and Polynesian Sky	65
	Equatorial Sky from Around the World	69
	The Navajo Sky	69
	The Chumash Sky	71
	The Southern Sky	74

The Southern Sky from Around the World	74
Star Maps for World Constellations: Southern Hemisphere.	74
The Aboriginal Australian Sky	76
The Incan Andean Sky	81
References.	84
3 Creation Stories from Around the World	87
European Creation Stories	90
Mythic Greek Creation and Cosmology.	90
Norse Creation and Cosmology	91
Celtic Stories.	93
Egyptian Creation Stories	95
Hindu Creation Stories	97
Mesopotamian Creation Stories	99
Australian Creation Stories	102
Creation Stories from the Americas	103
Mayan Creation	104
Aztec Creation	106
Hopi and Pueblo Creation.	106
Chumash Creation	108
Inuit Creation	108
Further Native American Creation Tales	109
References.	111
4 World Systems: Models of the Universe Throughout Time	113
Cosmology of the Egyptians.	114
Babylonian Cosmology.	116
Greek Cosmology	118
Thales and the Milesian School	118
Heraclitus	121
Xenophanes.	121
Empedocles.	122
Pythagoras.	122
The Cosmologies of Plato, Aristotle, and Ptolemy.	124
Aristotle	126
Ptolemy.	128
Norse Cosmology	129
Chinese Cosmology	130
Kai Thien (“Heavenly Canopy”) Cosmology.	131
Hun Thien (“Hen’s Egg”) Cosmology	133
Hsuan Yeh (“Empty Space”) Cosmology.	133
Hindu and Buddhist Cosmology.	134
Buddhist Cosmology	135
Hindu Cosmology.	135
Mayan Cosmology	137
The Quiche Classical Maya Cosmology.	138
Incan Cosmology	139
Native American Cosmology	140
Hopi and Pueblo Cosmology	140

Navajo Cosmology	141
Chumash Native American Cosmology	142
Inuit Cosmology	143
African Cosmologies	145
Dogon Cosmology	146
References	146
5 Stars that Bind: Civilization, Calendars, and the Sky	149
Lunar Calendars and Timekeeping	150
Neolithic Calendars	150
Solar/Lunar Calendars	151
The Babylonian Calendar	151
Egyptian Timekeeping	152
The Ancient Hebrew Calendar	154
The Islamic Calendar	156
The Hawaiian Calendar	157
The Zuni Calendar	158
Native American and Tribal Seasonal Calendars	158
The Chumash Seasonal Calendar	160
The Inuit Seasonal Star Calendar	162
Development of the Greek Calendar	164
Roman Timekeeping	165
Sidereal Lunar and Planetary Calendars	167
The Incan Sidereal Year	167
Hindu Naksatras and Lunar Calendars	168
The Chinese Calendar and Zodiac	171
The Long Run: Cosmic Celestial Timekeeping of the Eons	175
Mayan Calendars and the Cycles of the Universe	175
The Kin	176
The Tzolkin	176
The Haab	177
The Calendar Round	178
The Katun and Baktun	180
The Long Count and Cycles of the Universe	181
Hindu Ages and the Mahayugas	182
References	183
6 Modern Timekeeping and the Development of the Science of Time	185
Shadow Clocks and Sundials	186
The Earliest 24-h Clocks: The Clepsydra	188
The Antikythera Mechanism	190
Mechanical Clocks from Europe	192
Pendulum Clocks	193
Clocks for Navigation	195
The Modern Science of Time	197
Electronic and Atomic Clocks	197
Solar Time or Atomic Time?	199
Leap Seconds	199

Calendar Reform: Metric Time and the World Calendar	201
The French Revolutionary Calendar.	201
The World Calendar	203
References.	204
7 Celestial Architecture: Monuments of the Sky	207
Megalithic Alignments	207
Stonehenge	207
Callanish	210
Newgrange	211
Native American Alignments and Monuments.	213
The Anasazi, Hopi, and Pueblo Kiva	213
The Navajo Hogan and Pawnee Lodge.	214
Solstice Viewing: Shadow and Light in California.	215
Mounds and Stone Circles in Native American Architecture.	217
Cahokia Mounds	219
Chaco Canyon Lunar and Solar Alignments.	220
Hovenweep Castle	223
Celestial Cities from Ancient Civilizations and their Alignments	225
Ziggurats in Mesopotamia	225
Egyptian Pyramids	226
The Kaaba in Mecca	228
Alignments of Ancient Indian Temples	230
Teotihuacan.	231
Mayan Celestial Cities	233
Venus Alignments	234
Solar Alignments.	235
The Aztec City of Tenochtitlan and Its Temple Alignment.	236
The Forbidden City of China	237
Angkor Wat.	239
Temples and the Embodiment of Cosmic Order.	242
The Pantheon of Rome	242
The Parthenon of Athens.	244
Cologne Cathedral	246
The Chola Temples of Tamil Nadu, India.	247
The Limits of Alignment.	249
Linear Geometry in Britain.	250
Star Maps from the Pyramids: The Orion Mystery.	250
The Nazca Lines	251
References.	253
8 The Archaeoastronomy of Modern Civilization.	255
The Archaeoastronomy of Modern Cities.	255
The Astronomy of Skyscrapers.	255
Alignments of Modern Cities	257
Celestial Structures of Today's Civilization	260
James Turrell: Skyspace and the Rodin Crater Project.	260
Carhenge	263
Modern Stonehenges.	264
Modern Sundials	265

The Survival of Ancient Beliefs in Modern Times	266
A Brief History of Western Astrology	267
Indian Astrology	273
Chinese Astrology	275
European Astrology from Medieval to Modern Times	278
Why Do People Believe Astrology in the Twenty-First Century?	280
References	281
9 The Development of Modern Cosmology	283
Scientific Cosmology	283
Dark Matter Experiments	287
The History of Scientific Cosmology	289
Nicholas Copernicus	289
Tycho Brahe	290
Johannes Kepler	293
Galileo Galilei	295
Isaac Newton	298
The Dawn of Astrophysics	299
William Herschel	300
Astronomical Spectroscopy	304
George Ellery Hale and the Modern Observatory	306
Edwin Hubble and the Expanding Universe	312
A Census of the Modern Universe	316
Stars	316
Star Clusters	318
“Normal” Galaxies	319
Irregular and Active Galaxies	321
Clusters of Galaxies	323
A Very Brief History of Time: Big Bang to the Present	324
References	330
10 Concluding Thoughts	333
The Concordance Cosmology	334
The Answer to the Great Questions	337
Telescopes for Mapping the Unknown	338
The Fate of the Universe from Dark Energy	341
The Accidental Universe	342
Our Origins from a Quantum Universe	343
References	344
Index	347

The Power of Stars

Penprase, B.E.

2017, XI, 350 p. 297 illus., 254 illus. in color., Hardcover

ISBN: 978-3-319-52595-2