Index

Acupuncture, 262
Africa, in Korean maps, 282, 283, 284
Agriculture, 4, 11, 157
and meteorology, 107, 109, 111, 120, 122-123
Alchemical preparations, 264, 265.
See also Elixirs of immortality
Alchemy, 256, 258, 260, 261-262, 263, 264-265
Alcohol, 261, 278
Aleni, Giulio, 301, 305
Alexandria, 282
Alloys, 182, 245, 247-252, 253
American continent, 305
Amethyst, 138
An Ch' o-in (armillary clockmaker, 1760), 72
An Chung-t'ae (armillary clockmaker, maker, 1704), 71
An Hyǒn (governor of Kyǒngsang Province, 1550), 215
An Kuk-pin (astronomer, 1742), 29, 85, 88
An Myǒng-sol (translator, 1745), 85
An t'ien (cosmographical theory), 12
An t'ien lun, 12
Ancestor worship, 261
Anemoscope (p'unggijuk), 123
Angle measurement instrument. See Yangdolli
Antimony, 256
Antimony oxide, 256
Aoyama Sadao, 282, 284
Arabia, 305
Arabic astronomy, 18, 49, 82, 94
Arabic calendars, 80
Arabic cartography, 277, 282, 286
Arabic clepsydras and astronomical clocks, 58, 62, 71
Arabic drugs, 259
Arabic mechanical toys, 162
Arabic medicine, 261
Arabic merchants, 235, 278
Arabic numerals, 51
Archimedes, 148
Archimedes screw, 156
Architecture, 4, 9
Arima Seiko, 192, 202
Aristotelian-Ptolemaic cosmology, 18
Arms, government control of, 184, 190
Armillary clocks. See Clocks
Armillary spheres, 12, 16-17, 19, 21,
33, 35, 38, 41, 61-62, 73
of the Sejong era, 65-68
in Song I-yǒng's clock, 70
Armored car, 188, 198
Arms and armor, 239, 241, 243
Arrows, 187
flaming, 186
tube-launched, 183
Arsenic, 253, 256-257
Arsenic oxide, 256
Arsenic powder, 254
Arsenic stone, 254, 256
Artificial channels, 162
Artillery and artillerymen, 191, 199, 202
Artisans, 179, 253, 254. See also
Craftsmen
Koryǒ, 3, 252
of Silla, 2
Ash, and gunpowder making, 271, 272
Ash-blowing refining methods, 246n.36
Astrolabe, 73
Astrology, 11, 78, 96, 98, 100, 105, 108
Astronomical books, printing of, 181
Astronomical calculations, 74-75, 95, 96
Astronomical clocks. See Clocks
Astronomical instruments, 15, 37, 38, 39-40, 46-47, 66-67, 68, 72-77
Astronomical observations, 2, 11, 21
methods of, 95
officials in charge of, 37, 101-105
rotation system of, 106
Astronomical observatories, 33-42
in Japan, 24, 36
and mapmaking, 293
open-dome type, 33, 35
private, 41-42
Astronomical records, 93-98
reliability of, 97
Astronomy and astronomers, 4, 7,
11-106, 273, 298, 307
decline of, 83
government organization of, 106
Western. See Western astronomy
Atmospheric measurements, 126
Atmospheric moisture, 122
Augury. See Divination
Aurora, 127-128
Automata, 161–162
Automatic time signal devices, 58, 60, 62, 63, 70
Azimuth, 50n.83, 73

Bamboo, and papermaking, 260
Bamboo measures, 132
Barges. See Cargo barges
Barometer, 126–127
Barometric measurements, 126
Battles, 228
Battleships. See Warships
Bear gall, 260
Beeswax, 176, 179, 181–182
Bells
in automatic clepsydra, 56, 58, 59, 61–62
bronze, 174, 238, 251
Buddhist, 2, 189
casting of, 248, 251
paktong, 253
in the Posingak, 63–64
to tell the hours at night, 92–93
Belts with pendants, 139
Benzoin, 260
Big Dipper, 141
Blacksmiths, 241
Blast furnace, 174
Board of Rites, 289
Board of Taxation, 108, 109, 110, 111, 136, 244
Board of Works (Kongjo), 132, 134
Boats, of animal skin, 148
Book of Changes, 145
Books, and printing technology, 176, 182
Borneo camphor, 260
Bow, rocket-launching, 192
Brahe, Tycho, 17–18, 29
Brass, 248–249, 251, 252, 253, 254
Brassware, 153, 252
Braziers, 141
Bridges
arched (honggyo), 228, 229, 230
girdner (hyonggyo), 228, 230
pontoon (chuggyo), 228, 230
Bronze, 1, 193, 236, 248–249, 251
addition of zinc to, 250, 251
chemical analysis of, 249
classification of, 248–249
copper-tin, 251–252
demand for, 240
printing type, 252
Bronze age, 232
Bronze casting, 174
Bronze coins, 174
Bronze daggers, 233, 249, 250
Bronze mirrors, 25, 233, 238, 239, 250
Chinese, 249
Bronze standard measures, 131, 136
Bronze trays, used in casting technique, 173, 176, 181
Bronze wares, 250, 252
Buckets, 157, 158
Buddhism, 168, 169, 170, 257–258, 259, 279, 281, 285
Buddhist art, 221, 223–224, 226, 237–238
Buddhist cave temple, 2
Buddhist images, 237, 244–245
gilt bronze, 234
gold-plated, 237–238
Buddhist scriptures, 3, 169, 173, 266
Buddhist temples, 64–65, 189
Building, and prungsu theory, 279, 280
Building materials, 227
Building repair projects, 227–228
Building technology, 226–228
Bullets, 188, 191
Buoyancy, 148
Bureau of Astronomy, 4, 26, 28, 32, 37, 38, 41, 56, 67, 82, 85, 95, 98, 105, 107, 145, 147, 163, 298, 299, 303
officials, 105–106
and rainfall measurement, 110, 111, 112, 115, 117, 118
Bureau of Divination, 105
Bureau of the Grand Astrologer, 105
Bureau of Military Training, 195
Bureau of State Records, 289
Bureau of Weaponry, 187, 193
Burning-lens, 77, 137
Calendars
Arabic, 80
Ch’iro, 78
Ch’ônse (Thousand-year), 85, 86
Hsuan-ming, 78, 79, 80
Kyonhaeng, 78
Lin-te, 78
Manse (Ten-thousand-year), 86
in native Korean alphabet, 82, 83
Calendars (continued)

Packchung, 85
Shih-hsien, 18, 60, 63, 68, 83, 84, 85, 86, 95-96, 114
Sinch’an, 78
Sipchong, 78
Susi (Shou-shih li), 37, 78-79, 80, 81, 87
Ta-t’ung, 79, 81, 82, 83
T’aecil, 78
Tung’gap, 78
Western, 86
Yuan-chia, 78

Calendrical science, 2, 11, 15, 17, 45, 56, 77-86, 94, 105
Calomel, 255
Camphor, 260
Cannon, 189, 191-192, 193, 195, 198-199
Caste iron, 193
ch’onja type, 191, 193
“great commander,” 187, 191, 201
mobile, 202
on warships, 218
Western, 205, 206
Cannonballs, 201
Canoes, 148, 207
Canton, 56
Cardinal points, 35
Cargo barge, 210-211, 214, 215
Cartography. See Maps
Carts, 150
Cassini, J. D., 84
Castiron, 242
Casting techniques, 237, 249, 251.
See also Type casting
Castles, 226-228, 230
Catalan map, 284
Cave temples, 1, 2
Celadon ceramics. See Ceramics
Celestial globes, 28, 38, 41-42, 50, 66-67
Celestial planispheres. See Star maps
Celestial spheres, theory of, 18
Ceramics, 4, 9, 152-153
bronze age, 233
celadon, 3, 7
comb, 149
“gray,” 1
Japanese, 152
Sung, 3
tiles, 169
“Chacigo,” 101

Chagyöngnu. See Clepsydras, with automatic time-signal apparatus
Changok pilam, 163
Chamun arsenal, 188
Chang Chung-ch’ing (medical writer), 260
Chang Heng (Chinese astronomer and mathematician, c. A.D. 100), 12, 14, 15, 61, 67
Chang Su-hsun (Sung astronomer), 62
Chang Yong-sil (designer of the chagyöngnu, Sejong era), 46, 57, 59, 60, 62, 66, 71, 180
Changch’ung Park, Seoul, 119, 120
Changdok Palace
ammunition clock, 71
astronomical observatory in, 40
clepsydras, 59, 60
K’unm’on bridge in, 230
rain gauge, 115, 118, 119
wind gauge stand, 123
Ch’anggyöng Palace
astronomical observatory, 40
bronze amm unition sphere, 72
Okch’ on bridge at, 230
Ch’anggyöngwön zoological garden, 40
Ch’ungsön. See “Spear vessel”
Ch’angwön, 253
Ch’ao-hsiien fu, 241, 248
Ch’ao-hsien t’u (Map of Korea), 274-275
Charts
astral. See Star maps
navigational. See Navigational charts
Chega yöksangjip, 13
Chejöng Pavilion, amm unition clock, 71
Cheju Island, 104, 287, 293, 294, 308
Chi’en Cho (Chinese astronomer, A.D. 310), 22n.30, 24, 31
Ch’eng ho ching shih cheng lei pei yung pen-ts’ao, 261
Ch’i ch’i t’u shuo, 159
Chi-ho yuan-pen, 310n.88
Chi Sin-wön (astronomer), 26
Chibong yusöd, 263, 264
“Chido yusöd,” 310-311
Ch’ien chin fang, 258, 262
Ch’ien Han shu, 297
Ch’ien p’ing i shuo, 50
Chigu chöno, 305
Chigu chönhudo, 504
<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chigu chōnyō</td>
<td>86, 315</td>
</tr>
<tr>
<td>Chih fang wai chi</td>
<td>304, 305</td>
</tr>
<tr>
<td>Ch’ih tao nan pei tsung hsing t’u</td>
<td>28</td>
</tr>
<tr>
<td>Chikashige Masumi</td>
<td>249</td>
</tr>
<tr>
<td>Ch’ilbo bridge</td>
<td>229</td>
</tr>
<tr>
<td>Ch’ilchi sword</td>
<td>1</td>
</tr>
<tr>
<td>Ch’ilchong paekchung</td>
<td>85</td>
</tr>
<tr>
<td>Ch’ilchong sech’o</td>
<td>85-86</td>
</tr>
<tr>
<td>Ch’ilchongsan</td>
<td>80, 82</td>
</tr>
<tr>
<td>Chin China</td>
<td>150, 202</td>
</tr>
<tr>
<td>Chin Li (1939)</td>
<td>132</td>
</tr>
<tr>
<td>Chin shu</td>
<td>15, 31, 61</td>
</tr>
<tr>
<td>Chin Tartars</td>
<td>174</td>
</tr>
<tr>
<td>China</td>
<td>See also under names of Chinese dynasties</td>
</tr>
<tr>
<td>Korea’s relationship with</td>
<td>185</td>
</tr>
<tr>
<td>maps of</td>
<td>277</td>
</tr>
<tr>
<td>visits of Korean astronomers to</td>
<td>83-84, 85</td>
</tr>
<tr>
<td>Chindu Island battle</td>
<td>186</td>
</tr>
<tr>
<td>Chindok, Queen (r. 647 AD)</td>
<td>148</td>
</tr>
<tr>
<td>Chinese geographical works</td>
<td>277</td>
</tr>
<tr>
<td>Chinese medicine, influence on Korean medicine</td>
<td>259-260, 261</td>
</tr>
<tr>
<td>Chinese merchants</td>
<td>255</td>
</tr>
<tr>
<td>Chinese papermaking</td>
<td>267, 268</td>
</tr>
<tr>
<td>Chinese saltpeter manufacture</td>
<td>272</td>
</tr>
<tr>
<td>Ch’ing China</td>
<td>5, 6, 68, 77, 83, 84, 114, 206</td>
</tr>
<tr>
<td>Ch’ing Chin (monk and cartographer, 1329–1392)</td>
<td>282</td>
</tr>
<tr>
<td>Ch’ing yundo</td>
<td>147</td>
</tr>
<tr>
<td>Chingbiko</td>
<td>202, 205</td>
</tr>
<tr>
<td>Chinhan</td>
<td>236</td>
</tr>
<tr>
<td>Chinhung, King (540–575)</td>
<td>257</td>
</tr>
<tr>
<td>Chinp’o battle</td>
<td>186</td>
</tr>
<tr>
<td>Chiri soewang geomantic theory</td>
<td>279</td>
</tr>
<tr>
<td>Ch’iryo calendar</td>
<td>78</td>
</tr>
<tr>
<td>Chiso</td>
<td>See Office of Papermaking</td>
</tr>
<tr>
<td>Chiu T’ang shu</td>
<td>157, 273</td>
</tr>
<tr>
<td>Ch’iung t’ien (vast heaven) theory</td>
<td>12</td>
</tr>
<tr>
<td>Chödoku temple</td>
<td>288</td>
</tr>
<tr>
<td>Ch’oe Chi-wŏn (Taoist)</td>
<td>258</td>
</tr>
<tr>
<td>Ch’oe Hae-san (Supervisor of the Bureau of Weaponry, 1409)</td>
<td>187, 188, 269</td>
</tr>
<tr>
<td>Ch’oe Han-gi (astronomer and geographer, 1803-1879)</td>
<td>86, 305, 315</td>
</tr>
<tr>
<td>Ch’oe Mu-sŏn (c. 1375)</td>
<td>186, 187, 269</td>
</tr>
<tr>
<td>Ch’oe Pu</td>
<td>157</td>
</tr>
<tr>
<td>Ch’oe Sang-su</td>
<td>148-149</td>
</tr>
<tr>
<td>Ch’oe Se-jŏng (court official, 1534)</td>
<td>59</td>
</tr>
<tr>
<td>Ch’oe Sŏng-ji (astronomer, c. 1280)</td>
<td>79</td>
</tr>
<tr>
<td>Ch’oe Yu-ji (armillary clockmaker, 1657)</td>
<td>68</td>
</tr>
<tr>
<td>Ch’oe Yung (astronomer)</td>
<td>26</td>
</tr>
<tr>
<td>Choji (the official gazette)</td>
<td>117</td>
</tr>
<tr>
<td>Chojoiso</td>
<td>See Paper Manufactory</td>
</tr>
<tr>
<td>Chŏlla province</td>
<td>190, 191, 230, 241, 290, 295</td>
</tr>
<tr>
<td>Chŏlla Yanggwang Province</td>
<td>124</td>
</tr>
<tr>
<td>Ch’omasŏn (utility vessel)</td>
<td>210</td>
</tr>
<tr>
<td>Chŏmsŏngdae observatory</td>
<td>1-2, 15, 33, 35-36, 97</td>
</tr>
<tr>
<td>Chŏn Ik-kyŏng (1502)</td>
<td>157</td>
</tr>
<tr>
<td>Chŏn Un-sang (ship designer, 1740)</td>
<td>220</td>
</tr>
<tr>
<td>Chŏn Yun-gwŏn (astronomer)</td>
<td>26</td>
</tr>
<tr>
<td>Ch’ŏnbyŏn t’angnok</td>
<td>98</td>
</tr>
<tr>
<td>Chŏnch’ŏn River</td>
<td>191</td>
</tr>
<tr>
<td>Chŏnch’ŏn-gyo</td>
<td>228, 229</td>
</tr>
<tr>
<td>Chŏng Chi-gŏm (courtier of King Chŏngjo)</td>
<td>119</td>
</tr>
<tr>
<td>Chŏng Ch’o (astronomer, 1437)</td>
<td>36, 66, 77, 80</td>
</tr>
<tr>
<td>Chŏng Ch’ŏk (scientist, 1434)</td>
<td>180, 294, 295, 306, 307, 309</td>
</tr>
<tr>
<td>Chŏng Ch’ol-cho (cartographer)</td>
<td>310</td>
</tr>
<tr>
<td>Chŏng Ham-ji (scholar, 1442)</td>
<td>80</td>
</tr>
<tr>
<td>Chŏng In-ji (astronomer, 1433)</td>
<td>66, 67, 80, 309</td>
</tr>
<tr>
<td>Chŏng Sang-gi (scholar, 1687-1752)</td>
<td>307-309, 310</td>
</tr>
<tr>
<td>Chŏng Ta-wŏn (astronomer, fl. 1631)</td>
<td>17, 77, 162, 163, 304</td>
</tr>
<tr>
<td>Chŏng Yag-yŏng (1762-1836)</td>
<td>158–159, 298</td>
</tr>
<tr>
<td>Chŏng Yong-t’ack (1908)</td>
<td>86</td>
</tr>
<tr>
<td>Ch’ongdol</td>
<td>308</td>
</tr>
<tr>
<td>Ch’onggudo</td>
<td>309-310, 313, 314</td>
</tr>
<tr>
<td>Ch’onggyech’ŏn stream</td>
<td>110-111, 114, 120</td>
</tr>
<tr>
<td>Chŏngjo, King, 11, 85, 91, 117-119</td>
<td></td>
</tr>
<tr>
<td>Chŏngjo sillok</td>
<td>118, 126, 230</td>
</tr>
<tr>
<td>Chŏngjong, King (r. 1036-1046)</td>
<td>170</td>
</tr>
<tr>
<td>Ch’ongt’ong t’angnok</td>
<td>193, 195, 270</td>
</tr>
<tr>
<td>Ch’ongun (Dark Cloud) bridge</td>
<td>229</td>
</tr>
<tr>
<td>Ch’ŏnha ch’ŏngdo</td>
<td>284, 285</td>
</tr>
<tr>
<td>Ch’ŏnha yŏjido</td>
<td>284</td>
</tr>
<tr>
<td>Ch’ŏnhado</td>
<td>285</td>
</tr>
<tr>
<td>Chŏnhamsa. See Office of Shipbuilding</td>
<td></td>
</tr>
<tr>
<td>Chŏnhang Temple, bronze bell of</td>
<td>238</td>
</tr>
</tbody>
</table>
Index

Chŏnju, latitude of, 104
Chŏnmin (social class), 5n.4
Chŏnsang yŏlch’a punyajido, 12, 26, 114
Ch’ŏnse (Thousand-year), calendar, 85, 86
Chopsticks, 248
Chorye gich’ŏk (measure of length), 134
Chŏsen igakushi oyobi sitsubyŏshi, 9
Chŏsen kagakushi, 8
Chosŏn chŏn’do, 314
Chosŏn sacho’al saryo, 160n.71
Chou era, astronomy, 13
Chou hou pei chi fang, 257
Chou Kung Ts’e Ying T’ai (Chou Kung’s Tower for the Measurement of the Sun’s Shadow), 36
Chou pi book, 12, 15
Chu Mu, 277
Chu Ssu-pen (fourteenth-century cartographer), 274, 282, 283
Chuch’ŏk (measure of length), 151, 152, 154, 156
Chuch’ŏn (cosmological theory), 15, 16
Chuch’ŏn todŏl, 16
Chugyo chŏlnok, 230
Chuhae sujŏng, 42
Chuhae sujŏng, 131, 132, 134, 135, 136
Chuch’ŏn, 134, 135, 136
Chuhae sujŏng, 15
Chungin (social class), 5n.4
Chungjong, King, 63, 199, 244
Chungjong sillok, 113, 127
Ch’ungsŏn, Crown Prince, 79
Ch’ungsŏn, King (r. 1309–1313), 79, 131
Chungmok, 26
Chungsu Ta Ming li, 82
Chungsu taemyŏngyŏk chŏngmyo ilsiwŏlsik karyŏng, 82
Chuansu’yŏng (first commander’s flagship), 218
Chinnabar, 254, 255, 260, 263
Civil engineering, 221
Civil service examinations, 259
Class system, 5
Clepsydra Board. See Nukakchŏn
Clepsydras, 37, 68, 88
with automatic time-signal apparatus, 57–60
first reference to, in Korea, 52
inflow type, 53
jade, 60–62
Japanese, 53
night (kyŏngnu), 56
officials in charge of, 56
portable, 64, 148
terms for, 52
of the late Yi dynasty, 62–64
Clock manufacturing, 163
Clocks
armillary, 67, 68–72
astronomical, 16, 19, 60, 62, 67, 72, 114, 163, 166
waterwheel driven, 67, 68–69, 70
with lead weights, 70, 72
incense, 64–65
pendulum, 70, 166
mechanical, 41
public, 47
striking, 162–166
Su Sung’s, 67, 70
water clocks. See Clepsydras
Western striking, 69, 70
Cloth measure, 113, 117, 131, 135, 136
Clothing material, 149
Clouds, 127, 129
and weather forecasting, 120, 121, 122
Coastal freighters, 211
Coins
bronze, 174
casting of, 240, 248
iron, 289
minting of, 174
silver, 239
“Cold iron” (elixir), 265
Cold-storage boat, 144
Comb ceramics. See Ceramics
Comets, 35, 95–97, 98, 100
Community, preconditions for the formation of, 300
Compass, 48, 49, 50, 145–147
geomantic (yundo), 147
portable, 147
Confucian philosophy, 5, 281
Constellations. See Stars
Coordinates, plotting of, 50
Copernicus, 20
Copper, 239, 241, 248, 252, 253
color of, 253
demand for, 240
poisonous vapor of, 253
refining, 240, 241, 247
shortage of, 189, 193
smelting, 189, 193, 199
Copper alloys, 182, 248-252, 253
Copper crystal, 260
Copper mines. See Mining
Copper seals, 168-169
Corrosive sublimate, 255
Cosmology
Aristotelian-Ptolemaic, 18
of ancient China, 12-13
Tycho's, 17-18
Western, 86
“Cow bezoar” (bovine bilestones), 259, 260
Craftsmen, 4-5, 241, 247. See also
Artisans
papermaking, 267
Cranes, 158-160
Crossbow, 189
Crossbow battery, 228
Crowns, of gold, 237
Crystals, 138, 139
Cupellation, 245
“Curved jewels,” 152-153

Daggers, 233, 249, 250
Darani scripture, 167, 168, 169
Day and night, divisions of, 87-88
Daylight time, 50n.83
Deer antler (drug), 260, 263
Diamond Mountains, 95
Diaz, Emmanuel, 17
Dietary regimens, 265
Dikes, 157
Directorate of Gunpowder Manufacturing, 188
Disasters, prediction of. See Omens
Divination, 107-108, 273, 279
Diviner’s board, 144-145
Dōan (Japanese monk and cartographer, 1453), 288
Double-cylinder force pump. See Pumps
Double-hour system, 50-51, 87

Drought, 108, 109, 111, 118, 154, 157, 158
Drugs, 260, 261, 278
animal, 260, 261, 262
gold in, 257, 259
herbal, 259, 260, 261, 262
immortality. See Elixir of immortality
manufacturing techniques, 260
mercury compounds in, 255
mineral, 259, 260, 261, 262
for sexual intercourse, 259
silver in, 259
Drum and gong, hours told by, 93
Dynamics, 148-149

Earrings, of gold, 237
Earth
as center of the universe, 21
sphericity of, 18-19, 20-21
annual revolution of, 20-21
rotation of, 18-19, 20-21
Earth model, in armillary sphere, 70
Earth jars, used in making rafts, 148, 207
Earthquakes, 125-126
Eclipses, 21, 29, 41, 80, 82, 84, 86, 93-96
punishment for failure to predict, 94, 95
records of, 93-94, 95, 96
Ecliptic, 14, 16, 26, 86
Eighty Thousand Scriptures, 169n.71, 170
Elecampane, 260
Elixirs of immortality, 257, 258, 262, 263-264
Elliptic motion, theory of, 85
Empiricism, 122
and craftsmen, 4-5
Engineering. See Civil engineering
Ephemerides, 78
Epicycles, theory of, 82
Epilcsy, 263
Equator, 14, 16, 26, 86
Equatorial torquetrum. See Kanū
Equinoxes, 15-16, 35, 88, 92
Escapements
pendulum, 70, 166
verge and foliot, 166
Europe
astronomical observations in, 97
cartography, 284, 286
European culture. See Western culture
European science. See Western science
Europeans, interest in Korean culture, 8
Excavations, 250–251, 266
Explosive powder, 206. See also Gunpowder
Explosives, 185–186, 187, 188, 189, 190, 193

Fa chieh an li t'u, 286
Fan, 150, 152
Fang I-chih (Chinese scholar), 140
Fang yü ch'i yoo, 313
Fang yü sheng lan, 277, 291, 292
Farmers, 241, 266
Farming
and irrigation, 154, 157, 158
and rainfall, 107, 113, 120
and wind, 123
Farming implements, 241
Forging calvers, 201, 205
Fire making, by lenses, 138
"Fire pearl" (hwaju), 136–137
"Fire vehicle" (hwach'e), 188, 198–199
Firearms, 184–186
casting of, 239, 240
eyi Dynasty, 187–193
heavy, 191, 199, 201–202
kinds of, 187
names of, 190–191, 195, 198, 201
portable types, 191, 199–200, 206
transformed from defensive to destructive use, 188
Firecrackers, 187, 190
Fireplaces, 141
Firing practice, 190, 191
Firing range, 189, 193, 195
Fishing vessels, 211, 212
Five Elements, 16
Five Planets, 96, 126
Flagship (t'ongje yöng), 216
Flamsteeed, J., 84
Floating gourds. See Gourds
Floats, 148
Floor furnace refining method, 247
Floor heating, 140–141
Fog, 107, 121, 127, 128, 129
Föhn phenomenon, 123
Folding fan, 150, 152
Folk tales, 263, 265

Food storage, 142, 143
Foreign relations, of the Yi Dynasty, 185
Fortnightly periods, 88–92
Fortune telling, 144–145
Four Elements theory, 86
Frost, 107, 121, 127, 128, 129
Furnaces, for metal refining, 246, 247, 253
Fuses, of explosive shells, 202

Gearing, applied to mills, 156
Geography, 4, 86, 105, 106, 273–315
based on p'ungsŭ theory, 278–280, 290
Geoheliocentric cosmology, 17–18
Geology, 105, 145, 147, 278–280, 298, 300, 301
and political events, 280
Geometric design, 223
Gilding, 254
Ginseng, 259, 263
Glass, 138, 139
Glue
as drug, 260
and gunpowder making, 271
Gnomon, 38, 45, 50
Gnomon shadow observations, 15, 35
Gobi desert, 282
Gold, 236, 237, 238–239
classification of, 245
in medicines, 257, 259
mining. See Mining
refining of, 245
as tribute, 240, 241, 243
Gold amalgam, 254
Gold leaf, 237, 245
Gourds, 207
Government monopoly, and mining, 243
Graduated scale, 38, 45
Grain, husking or polishing of, 156
Grass, and papermaking, 269
"Great commander" cannon. See Cannon
Greek sundials, 49
Grenades, 192
Grinding mills, 154
Gun barrels, 188
Gunpowder, 186, 188, 192, 269–272
Guns. See Cannon
Gutenberg, Johann, 180
Gyōki zu, 288
Gypsum, 260
Ha Yön (governor of Kyŏngsang Province, 1425), 289
Hae-dong cheguk ch’ŏngdo, 287, 288
Hae-dong chegukki, 285, 286–288
Hae-dong iŏk, 264
Hae-dong yŏksa, 298
Haegolŏn (seabird, war vessel), 220
Haein temple, 170
Haeju, latitude of, 104
Haejwa chŏndo, 314
Hai-kio t’u chih, 305
Hail, 128
Halla, Mt., 104, 293
Haloes, 100–101, 108, 120, 121, 125, 126
Hamgil province, 290, 294
Hamgyŏng province, 239, 243, 296, 307, 308
Hamhŭng, latitude of, 104
Han Chi’i-yun (geographer), 298
Han China, 1, 42, 45, 130, 152, 233
astronomy, 14
clepsydras, 53
mirrors, 239
pumps, 156
Han Pack-kyŏm (1552–1615), 129, 297
Han River, 110, 114, 144, 213
Han shu, 31
Han Wi-haeng (astronomer, 1062), 78
Handlooms, 150
Han’guk kwahak kisula, 9
Han’guk ŭihaek munhwag taeyŏnp’yo, 9
Han’guk ŭihaek palch’ŏne taehan kumi mit sŏnanbang ŭihaekūi yŏnghyang, 9
Han’guk ŭihaeksa, 9
Hansŏng. See Seoul
Harmonics, 15
Heat, application and preservation of, 140–149
Heat-preserving bottle, 141
Hech’o (Silla monk and traveler), 274
Hellenistic Orient, 137
Hemp, 149
paper, 266, 267
Hideyoshi invasion, 4, 40, 47, 49, 60, 64, 68, 83, 113, 114, 153, 198, 219, 243, 244, 285, 299
Ho Ch’eng-t’ien (astronomer, Liu Sung era), 15
Ho Ch’un (physician, sixteenth century), 262, 263, 264
Ho Wŏn (Court Astronomer, 1705), 84, 163
Hodolometer carriage, 294
Hojo. See Board of Taxation
Honam, 123
Hong-ch’ŏn chŏndo, 29
Hong Chi’ŏn-yun (astronomer, 1657), 68
Hong I-soŏ, 8
Hong Man-sŏn, 120
Hong Tae-yong (astronomer, 1731–1783), 18, 20, 21, 41–42, 72
Hong Yang-han (cartographer, 1757), 307
Hongi Island, 308
Hongmungwan. See Office of Special Counselors
Hongmungwan map, 284, 285
Hongmungwan, armillary clock in, 67
Honi kangni yŏktae kuktojido, 282, 283–284, 293
Honmyŏji Temple, 285
Honshû, 285
Horse dung, and making of salt peter, 270
Horyuji Temple, Nara, 239
Hosŏ, 123
Hot floor system. See Floor heating system
Hot springs, 125
Hou Han shu, 61, 297
Hours, system of, 86–93
Hsi-yang hsin-fa li shu, 17, 18
Hsi Yun-hsing (Yuan astronomer), 56
Hsin i hsiang fa yao, 62
Hsin t’ien (diurnal revolution) theory, 12
Hsing t’u (star map), 31
Hsŭ Ching (emissary to Korea, 1123), 209
Hsŭ Kuang-chi (fl. 1631 to 1634), 17
Hsŭ Mou-te. See Pereira, Andrew
Hsuan-chuang (602–664), 277
Hsuan-ho feng shih Kao-li t’u ching, 209
Hsuan-ming calendar, 78, 79, 80
Hsŭan yeh (cosmographical theory), 12
Huang-ti chen ching, 260
Huang-ti nei ching, 260–263
Index

Huang t'ing ching, 264
Hüksan island, 308
Hulyonyonggam, See Bureau of Military Training
Hüngyönggak-ki, 60
Hun i, 67
Hun kai t'ung hsien i shuo, 50
Hun t'ien (celestial sphere) theory, 12–15, 16, 18
Hun t'ien i, 14
Hüngwang Temple, golden tower of, 238
Hunter, D., 268
Huyghens, C., 166
Hwach'a, See “Fire vehicle”
Hwahongmun (Suwön castle arched gate), 230
Hwang Su-sin, 295
Hwang Yëp (cartographer), 310
Hwang Yun-gil (emissary to Japan, 1589), 205, 206
Hwangdo ch'ong-söngdo, 31
Hwangdo nambuk yang-ch'ong-söngdo, 29, 31
Hwangguk ch'i-p'üngdo, 295
Hwanghace province, 190, 241, 243, 251, 290, 294
Hwangjhaech'ok (measure of length), 134, 135
Hwangjigwan (pitchpipe), 132
Hwangnyeong Temple, 36, 130, 136
Hwanyöngi, 315
Hwasöng sŏngyŏk aigwe, 159, 160, 228
Hwat'ong To-gam (Office of Explosives Handling), 186
Hwayak Kamjoch'ong, See Directorate of Gunpowder Manufacturing
Hyangyak chesaeng chipsôngbang, 261
Hyangyak chipsôngbang, 261
Hyangyak kugāppang, 260
Hyangyak ponch'o, 261
Hyalidric trip-hammers, 152
Hyemyöng Bridge, sundials on, 47
Hyojong, King (r. 1650–1659), 18, 63, 68, 96, 114, 138
Hyŏnjong, King (eleventh century), 169
Hyŏnjong, King (r. 1664), 19, 47, 71
Hyŏnjong sillok, 163
“Hyŏngpoppji.” See Koryosa “Hyŏngpoppji”

I hsiang chih, 31, 32
I-hsueh ju-men, 269–270
Ice, 121, 142–144
Ice-storage houses, 142–144
Iceboxes, 144
Iki island, 282, 287
Ilbon pon'gukto, 287
Ilsong chŏngsi˘˘ (instrument for determining time by sun and stars), 73
Ilsŏngnok (Daily records for royal introspection), 117
Im Sa-hong (1499), 297
Images, See Buddhist images
Imamura Tomo, 209
Immortality, 257, 258, 263–265
drugs, See Elixirs of immortality
Immortals, See Taoist immortals
Innyugak (Waterside Pavilion), 130
Incense, 278
Incense burners, 238, 239
Incense clocks, See Clocks
Incense sticks, 64–65
Inch'on Meteorological Station, 98, 119
India, 137, 274, 275, 305
medicine, 259
papermaking, 269
Indicator rods (clepsydra), 88, 91
Indochina, 282
Injo, King (r. c. 1631), 17, 114
Injo sillok, 113, 114, 162
Ink, 173–174, 181
Ink sticks, 173, 174
Inlay technique, 3
Innovation, lack of societal pressures for, 5
Iron Age, 149, 226
Iron balls, as missiles, 186, 191
Japanese, 233
Iron casting, 192–193
Iron coins, 239
Iron metallurgy, 1, 233, 236, 242
Iron mining, See Mining
Iron nails, in shipbuilding, 212–213
Iron plate, for use in shipbuilding, 219–220
Iron powder, 260
Iron resources, 237, 239
Iron smelting, 193
Ironclad ships, 220
Irrigation, 107, 154, 157
Ise, Japan, 255
368  Index

Kabin printing type. See Printing types
Kaesŏng. See Songdo
Kaesŏng castle. See Songak castle
Kage Island, 308

Kai t'ien (round-heaven, square-earth theory), 12–14, 16, 24, 33
Kakch'ŏ tomb, 23
“Kaksŏn tobon,” 221
Kang Hi-an, 295
Kang Hi-maeng (meteorologist, 1424–1483), 122, 123, 292
Kang I-jung (astronomical clockmaker, fl. 1809–1830), 72
Kang I-o (astronomical clockmaker, fl. 1809–1830), 72
Kang Kŏn (sundial maker, nineteenth century), 48
Kang Po (writer, 1314), 79
Kang Yun (sundial maker, nineteenth century), 48, 50
Kanggego (A study on the frontier), 298
Kanghwa Island, 41, 95, 104, 170, 175, 230, 293
Kangwŏn province, 190, 290
Kanlûi (equatorial torquetrum), 72–73
Kanlûidae (equatorial torquetrum observation platform), 38–41, 72, 73
Kapchopob (shipbuilding method), 213
Katayama Ryûzô, 123
Katô Kiyomasa, 285
Katsumoto Sueji, 291
Kaya, Mt., 258
Kemi type. See Printing types
Keng-sang Ch’u (legendary Taoist), 263
Kepler, J., 85
Khitan invasions, 3, 169
Ki concept, 100
Kickwheel, 153
Kim Cha-su (astronomer), 26
Kim Chi (maker of firearms, 1583), 200
Kim Chi-nam (1654), 270–271
Kim Chin-yŏ (artist), 304
Kim Chŏng (astronomer, 1062), 78
Kim Chŏng-ho (astronomer, 1834), 31, 304–305, 309–310, 313–314, 315
Kim Chong-ik (1497), 293, 297
Kim Chŏng-ŭi (compass maker), 147

Islamic. See Arabic
Isokokami Shrine. Tenri, 236

Jackwork, 61, 62
Jade, 153
Jade clepsydra. See Clepsydras
Jamal al-Din, 282
astronomical observatories, 24, 36, 97
bridges, 228
calendrical science, 78
casting techniques, 237
clepsydras, 53
clocks, 65, 162, 166
defeat of, 8
firearms, 200, 205, 206
imports and exports, 236, 244
invasions and attacks from, 4, 41, 114, 136, 162, 182, 185, 187, 191, 200, 202, 206, 208, 216, 220
iron culture of, 233
maps, 282, 283, 284, 285, 288, 305
medicine, 259
papermaking, 267, 268
pottery, 152
printing, 169, 173
pumps, 156–157
shipbuilding, 208, 212, 213, 219–220
trade, 208
weights and measures, 130
Japanese merchants, 255
Japanese pirates, 190, 211, 216, 286
Jen Ch’ao (cartographer, 1607), 286
Jeon Sang-woon, 9
Jesuits, 17–18, 19, 21, 86, 114, 159
Junks, 208, 218
Jupiter (planet), 21, 29
Jürchhen barbarians, 192, 193, 208, 209, 215
Jürchhen technicians, 242

Kabin printing type. See Printing types
Kaesŏng. See Songdo
Kaesŏng castle. See Songak castle
Kage Island, 308
Kim Chung-bo (1492), 255
Kim Hu (astronomer), 26
Kim Ik-ch'ŏng (printer), 179
Kim Ing-nyŏm (astrologer, 1622–1674), 98
Kim Ka-gi (mid-ninth century), 258
Kim Kam-bul (silver refiner, 1503), 243, 246
Kim Kŏm-dong (silver refiner, 1503), 243, 246
Kim Kye-t'ak (armillary clock repairer, 1777), 72
Kim Mun-p'yŏ (astronomer), 15–16
Kim Pin (astronomer, 1437), 46, 57–58, 59, 66, 180
Kim Pu-sik (geographer, 1145), 52, 277
Kim Sa-hyŏng (cartographer, c. 1399), 282, 288
Kim Sang-p'ŏm (astronomer, 1652), 68, 83
Kim Sŏk-che (astronomer, 1437), 95
Kim Sŏng-mun (astronomer, probably eighteenth century), 18, 19
Kim Sŏng-su, 71
Kim Sŏng-t'ak (astronomer, 1062), 78
Kim Sun-go (shipbuilder, 1550), 215
Kim T'ae-sŏ (astronomer, 1742), 29, 77, 85
Kim Tae-sŏng (prime minister, 751), 223
Kim 'am (scholar, 1442), 80, 82
Kim T'oe (astronomer), 26
Kim Ton (astronomer, 1437), 46, 58, 60, 62, 180
Kim Tŏng-myŏng (astronomer, 1218), 78
Kim Tu-jong, 9
Kim Yang-sŏn, 304
Kim Yong (astronomer), 88
Kim Yong-sŏp, 157
Kim Yu (1467), 295
Kim Yu-sin (General, 647 A.D.), 148
Kim Yuk (astronomer, 1646), 17, 18, 68, 83, 163
Kimhae area, 152
Kimhae culture, 236
Kimhae earthenware, 1
Kites, 148–149
Kiujje tungnok, 113
Ko hsiang hsin shu, 73
Ko Hung (alchemist, 283–343), 254, 257, 258
Kodŏk Wangson (professor of calendrical science, 554), 24, 78
Kögler, Ignatius (Jesuit astronomer), 29, 84, 85, 305
Kogok ("curved jewels"), 152–153
Koguryŏ, 42, 45, 104, 152
astronomical observatory, 36
Buddhist image at, 237
calendrical science, 78
castles, 226
Chinese Taoists in, 257
comets and novas, 96
eclipses, 93–94
fall of, 22
fog in, 128
map of, 273
paper, 266
shipbuilding, 207–208
star maps, 22–23, 26, 28
tombs. See Tombs
weights and measures, 130
wind observations, 123
Kojong, King, 94, 131
Komiatsu, 249
Kongjo. See Board of Works
Kongju, latitude of, 104
Kongo Museum, 119
Kongmin, King (1370), 79
Kongna iron mine, 236
Kŏnsang konyôdo, 303–304
Kŏnsangdo (star chart), 29
Konyô chôndo, 304
Korea
liberation, 98
representation of, in maps, 305
Korean-Japanese relations, 286, 288
"Korean Studies of Natural Science" (Hong), 8
Korean War, 1950–1953, 98, 304
Koryŏ era, 7, 25, 53, 107, 126, 154
armillary sphere, 66
astronomy, 11, 13, 25, 94, 97
calendars, 78–79
copper alloys, 251, 252
earthquakes, 125
eclipses, 94
firearms, 186
folding fans, 150, 152
government organization, 105
heating systems, 141
incense sticks, 65
Koryŏ era (continued)
maps, 274–278
medicine, 239–261
metal handicrafts, 238–239, 241–245
mirrors, 138
paper, 266
printing, 169, 170, 173, 174
pumps, 156
rainfall measurement, 108
shipbuilding, 208–211, 215
technology, 2–3
weights and measures, 131, 132
wind observations, 123–124, 125
Koryŏ, fall of, 280
Koryŏ astronomical observatory, 36–37, 39
Koryŏ Illyŏk, 78
Koryŏ Sosongyoŏ, 78
Koryŏ University, Seoul, 71
Koryŏsa, 7, 24, 53, 56, 94, 97, 100, 130–131, 154, 185, 187, 208, 238, 248, 253, 254, 277, 278, 295
Koryŏsa "Hyŏngpŏpji," 131
Koryŏsa "Sikhwaji," 131
Kuan Ising T'ai (Star Observation Platform), 38, 52
Kuan shu k'o lou t'u, 64
Kuang yü t'u, 274–275, 283
Kublai Khan, 78
Kujin ch'iŏnch'uryŏngǔi (astronomical instrument), 77
Kukcho ore sŏrje, 195
Kukcho yŏksanggo, 63
Kŭnch'o Bridge, 93, 230
Kumsan temple, bronze incense burner at, 230
Kŭmyang ch'amnik, 122
K'un-lun, Mt., 285
K'un yŏ ch'ūan t'u, 304
K'un yŏ t'u shuo, 305
K'un yŏ wan kuo ch'ūan t'u, 301, 304
Kŭnch'o, King, 236
Kung'igam. See Bureau of Weaponry
Kungnaesŏng, 226
Kuo Shou-ching (Yuan astronomer), 47, 49, 52, 72, 73, 78, 83
K'uo ti chih, 274, 277
Kusŏn. See Turtle ship
Kwahak kisulsa, 10
Kwallûk (astronomer, 602), 24, 78
Kwanch'ŏndae (Celestial Observation Platform), 39
Kwanghwa-bang, 38, 40, 41

Kwansanggamt. See Bureau of Astronomy
Kwansanggamt ilgi, 98
Kwasŏn. See "Spear vessel"
Kwŏn Ch'ún (geographical compiler, 1422), 289
Kwŏn Chung-hwa (astronomer), 26
Kwŏn Kŭn (astronomer, 1395), 12–13, 15, 22, 26, 176–177, 282
Kyŏngbok Palace, 71
archives, 98
astronomical observatory in, 38, 39, 40–41
clepsydras, 56, 58, 60, 62
Kyŏnggi province, 123, 290, 295, 308
Kyŏngguk taejon, 105, 117, 134, 136, 144, 212
Kyŏnghui Palace
armillary clocks, 71
astronomical observatory, 40
rain gauge, 115, 118
wind gauge stand, 123
Kyŏngja printing type. See Printing types
Kyŏngju
aurora, 127
ice storage system at, 144
Kyŏngju Museum, 237
Kyŏngju Ch'ŏmsŏngdae observatory. See Ch'ŏmsŏngdae observatory
Kyŏngnu (night clepsydra). See Clepsydras
Kyŏnggo wŏllyŏk (astronomical handbook), 82
Kyŏngsang province, 190, 241, 253, 289, 290, 295
Kyŏngsang-do chiriji, 289
Kyŏngsang-do sokch'an chiriji, 291, 292
Kyŏngsisŏ (Marketing Control Office), 132
Kyonhaeng calendar, 78
Kyŏntsangŏn (China-bound vessels), 208
Kyosik ch'ubopŏp, 95
Kyosik tonggwae, 82
Kyŏsŏgwan (Office of Bibliography), 184
Kyŏlhyŏng (surveying instrument), 295–296
Kyushū area (Japan), 153, 287
Laborers, 227, 241, 243
Lamp-black, 174
Lamps, 139
Lanterns, used for time measurement, 65
Later Chou China, 248
Later Han China, Korean emissaries to, 207-208
Lathe, 153
Latitude, 85, 86, 103-104
Lauffer, B., 137
Lead, 243, 247, 249, 251, 255, 256
Lead acetate, 256, 260
Lead mining. See Mining
Length measurements, 130, 131, 134
Lenses, 137-139
Lever, 152
Li ch'i, 158
Li Chih-tao (astronomer, fl. 1631-1634), 17, 50, 301
Li ch'i yüeh ling, 13
Li hsiaung k'ao ch'eng, 84, 85
Li hsiaung k'ao ch'eng hou pien, 85
Li Shih-chen, 248
Li Shun-feng, 24
Li T'ai (T'ang geographer), 274
Li-t'ai ti-wang hun-i ch'iang-li t'u, 282
Li T'ien-ching (Ming astronomer), 49
Li Tse-min (cartographer), 282, 283
Li Yuan, 186
Liang i hsuan lan t'u, 302-303
Liang Ling-tsan (eighth-century astronomer), 62
Liaotung, 233, 273, 282
Lightning, 121, 127, 128
Lime, 260
Lin-te calendar, 78
Ling, Emperor (Later Han), 13
Litharge, 256
Liu Chi, 79
Lo Hung-hsien (Ming cartographer), 274, 283
Lo-lang, 1, 42, 130, 152, 233, 236
Lo-lang tombs, 144, 150
Lodestone, 144, 145
Log canoes. See Canoes
Longevity, 258, 259, 264
Lü T's'ai (T'ang astronomer), 53
Lunar mansions, 15, 23, 26, 50n.83
Machine crossbow, 189
Maeng Sa-song (geographical compiler, 1422), 289

“Magic mirror,” 139-140
Magnet, 144
Magnetic needle, 145-146
Magnetism, 144-147
Magnetite, 260
Magnifying glass, 139
Maitreya, bronze statue of, 227
Majon (later Sup’yo) Bridge. See Sup’yo Bridge
Makino, and papermaking, 268
Man and natural conditions, relationship between, 301
Manbusan. See Mechanical toys
Manchu dynasty, 83
Manchu invasions, 100, 114, 187, 299
Mani, Mt., 41, 95, 104, 293
Manse (Ten-thousand year) calendar, 86
Map key, 310
Map of the Three Kingdoms, 275
Maps accuracy of, 294, 295, 296, 305, 307, 308, 313, 314
Chinese, 280, 282, 283
containing the two hemispheres, 304-305
enlargement and reduction of, 310n.88
Japanese. See Japan
of Liaotung, 273
provincial, 296
by M. Ricci. See Ricci
scale, 307-309, 313, 314
showing outline of Korea, 274
Sinocentric, 284, 301, 305
watercolor, 273
Western. See Western maps
wheel, 284, 286
wood-block, 284, 285, 314
world, 282, 284-286, 288, 293, 301-305
Marketing Control Office, 134-135
Masts, 208-209
Mathematical tables, 79
Mathematics, 42, 67, 83
Measures. See Weights and measures
Mechanical clocks. See Clocks
Mechanical toys, 161-162
Medical jurisprudence, 257
Medical schools, 259
Medicine, 4, 257, 278
as an academic discipline, 259, 261
and Taoism, 257-259
Medicine (continued)
traditional, 256, 259, 260
Medicines. See Drugs
Mei Ku-ch'eng (astronomer, 1723), 84, 85
Mei Wen-ting (astronomer, 1633–1721), 74
Mental training, 262, 263
Merchants, 255, 278
Mercury (mineral), 126, 254–255, 263, 278
Mercury amalgam, 237–238
Meridian, 86
Metallic fonts (printing), 183
Metalworkers, 252, 253, 254
Metalworking technology, 1, 2, 174, 190, 252
Chinese, 283
Meteor showers, 101
Meteorites, 101
Meteorological observations, 37, 105
Meteorology, 4, 7, 56, 106, 107
Meteors, 96, 101
Metonic cycle, 16
Metrology, 130
Microscopes, 138, 139
Miki Sakae, 9
“Mile-counting drum carriage.” See
Hodometer carriage
Milestones, 294
Military technology, backwardness
of, in Korea, 185
Mills
operated by gear trains, 156
water, 153–155
wheel-driven, 154–156
Ming China, 17, 79, 82, 152, 162, 191, 202, 211, 240
emissary to, 185
fall of, 100
Ming map, 285
Ming ships, 188
Mining, and miners, 241
copper, 189, 192–193, 241, 242, 244
desuetude of, 241, 243
gold, 239, 240, 241, 242
iron, 236, 240, 241, 243
lead, 240, 241, 243
seasonal labor and, 211, 243
silver, 239, 240, 241, 242, 244
tax rate, 243
Minium, 256, 260
Minusinsk, 233
Mirrors, 137–138, 139–140, 218, 252
bronze, 25, 233, 238, 239, 249, 250
Missionaries, 8
Mist, and weather forecasting, 121
Molds
sand, 175
sandstone, 233
wax, 233, 237
wooden, 169
Mongol invasions, 3, 37, 170, 175
Mongols, 131
Moon, 22–23
angular measures for, 50n.83
motions of, 16, 21, 80, 82, 84, 86, 94
sphericity of, 18, 20
waxing and waning of, 29
and weather forecasting, 121
Mortars, 201
wan'gu, 188–189, 190, 193
Moslems, 278
Mountains, depicted in maps, 280,
311n.90, 313–314
Movable metal type. See Printing
type
Moxibustion, 262
Mu, King (602), 24
Mugwort, and gunpowder making.
271
Mukden. See Shenyang
Mulberry shrub, 200, 267–268
Mulle (rotary machine), 149
Multiple rocket launcher, 192
Mun Kae (craftsman, 1566), 217
Munhôn pigo, 127, 295, 313
Munhôn pigo “Sangvigo,” 18
Munjong. King (r. 1017–1083), 37,
110, 131, 171, 173, 198–199, 202,
260
Munjong sillok, 198
Munmu, King (r. 661–680), 169
Munsu Temple, 33
Munwôn yônghwa, 182
Murals. See Paintings
Mushrooms, 255, 258
Musk, 260
Muskets, 200, 205–206
Myôngjong period, 62, 190, 215
Myôngjong sillok, 126
Myôngnamnu munjip, 86

Na Hùng-yu (geographer, mid-four-
teenth century), 275
Na Kyŏng-jŏk (armillary clock maker, 1760), 72
Na Tae-yong (shipbuilding expert, 1591), 216, 218, 220
Naebinggo (Palace Ice Storage), 143
Naegak (Royal Library), 98, 117
Naep'yon (Inner Part). See Ch'il-ch'ŏngsan
Naktong River, 233
Nam Che (cartographer), 288
Nam Kŭp, 178
Nam Pyŏng-ch'ŏl (eighteenth-century astronomer), 50, 65, 77
Nam Pyŏng-gil (astronomer, 1860), 31, 32, 86
Nam Sang-gil (inventor, c. 1850), 74
Namhansanseong, 228
Namaen Hill, 41, 63
Nangnang. See Lo-lang
National Museum of Korea, 207, 237
Naval warfare, 205, 215
Navigational charts, 273, 297
Nedthan, Joseph, 10, 162, 284
New Bronze Age, 149
Nickel, 252–253
Night-watch system, 58, 63, 87–88
Nihon shokki, 236
Nile River, 282
Niwa temple, 288
No Chung-ye (c. 1433), 261
No Sa-sin (geographical compiler, 1481), 292–293
No Ul-chun (astronomer), 26
Nongsugak Pavilion, 41
Noria, 156
North Pole, 13, 14, 16, 26
Noryangjin ford, Seoul, 230
Novas, 96, 97
Nugak-pahsa (clepsydra professor), 53
Nugakchŏn (Clespydra Board), 52, 53, 104
Nŭngch'ŏn, 295
Nusu t'ongūi, 88, 91
O Yun-bu (astronomer), 24
Observations
astronomical. See Astronomical observators
and mapmaking, 293–294, 296
Och'ŭng̣ap pagoda, Paekche, 223
Oep'yŏn. See Ch'ilch'ŏngsan
Office of Bibliography, 184
Office of Explosives Handling, 186
Office of the Observatory, 105
Office of Papermaking, 266
Office of Royal Decrees, 293
Office of Shipbuilding, 208, 213
Office of Special Counselors, 284, 292
Office of Typewounding, 210
Office of Weights and Measures, 115
Ogawa Takuji, 282
Oil, used in making ink, 174
Oju sójong pangmul kabyŏn, 138, 148, 245, 251, 252, 255
Okch'ŏn bridge, 220
Okinawa, 278
Oksu-dong. See Tunop'o
Omens, 96, 98, 100, 101, 108, 125, 127, 148
On dol. See Floor heating
Ongnu. See Clepsydras, jade
Optics, 136–140
Ornamental and ceremonial bronzes, 250
Oyster lime, and papermaking, 267
Paddle-wheel vessels, 214–215
Paegun Mountain, 41
Packche, 14, 15, 24, 45, 53, 130, 152, 210, 236, 273
astronomers and astronomical observations, 36, 53, 104
calendarical science, 78
casting techniques, 237
comet and novas, 96
eclipses, 93
emissary to China, 208
observatory, 36
pagoda, 223
wind observations, 123
Packchung calendar, 85
"Packkwanji," 56
Packtu, Mt., 104, 293, 294
Packun (White Cloud) bridge, 229
Paintings, in Koguryŏ tombs, 14, 150, 154, 223, 254, 258
Paints, 255
Pak Cha-ch'ŏng (Minister of Works, 1411), 240
Pak Chi-wŏn (astronomer, 1783), 18, 20, 21, 22
Pak Min-hŏn (astronomer, 1554), 62
Pak Sŏ-sueng (emissary to Japan, 1429), 156
Pak Son (1546), 282
Pak Ton-ji (1401), 282, 288
Index

Pak Yŏn (astronomer, 1433), 66
Pak Yŏng (astronomer, 1554), 62
Paktong, 252-254, 256
Pa'altodo (eight-foot gnomon), 15
Pa'alto chiriji, 291-292, 293, 296, 297, 298
Pa'alto ch'ŏngdo, 283, 296
"Pa'alto ch'ongnon." Part of the T'aeungniji, q.v.
Pa'alto pundoch'o, 307, 308
Pa'altodo, 274, 283, 293, 296
Pao p'u tsu nei p'ien, 258
Paper, 173
Chosŏn (Korean), 266
exported to China, 173
hemp, 266, 267
mulberry, 266, 267-268
rice-straw, 267
"white hammered," 265-266
Paper Manufactory (Chojiso), 266
Papermaking, 265-269
Japanese, 267
private, 266
Parhelia, 125
Passenger ships, 211
Patrol craft, 209
P'ei Hsiu (Chinese scholar, 224-271), 313
Peking (Yenching), 83, 84, 85, 96, 163, 282
Peking observatory, 42
Pelekinoon sundial, 49
Pen-ts'ai ch'ing chi chu, 257
Pen-ts'ai k'ang mu, 248, 262
Pen-ts'ai yen i, 146
Pendulum, 70, 166
Peppcr, 278
Pereira, Andrew, 84, 85
Persia, drugs, 259
Persian bronze (brass), 248
Pharmacology, 259, 261
Physiological disciplines, 263, 264
Pi Sheng (printing technician, eleventh century), 176
Pien han ch'uan, 150
Pig iron, 193
Pirates, 190, 192, 193, 208, 209, 211, 215, 216, 286
Pisŏgak (Secretariat Library), 170
Pitchpipes, 132, 134
Planets, 80
distance from the earth, 29
motions of, 82, 83, 84, 86, 96

Planispheres. See Star maps
Plating technique, 254
P'obaekch'ŏk. See Cloth measure
Poisons, 257
Polar altitude, measurement of, 102-103
Polestar, 15
altitude at Seoul, 114
P'olyo-ŭp, arched bridge at, 230
Ponglŏk Temple, Great Bell of, 238
Pongsan-gun, excavations at, 251
Pongsŏn Temple, Kyŏnggi Province, 304
Pong'yŏkto, 273
Pontoon bridges. See Bridges
Pŏpch'u Temple, 29
Portuguese calivcrs. See Feringi calivcrs
Poru Pavilion, clepsydras, 59, 68
Porugak-ki, 58
Poringk, bell in the, 63-64
P'o'sŏkch'ŏng (Pavilion), 162
Posŏng-gun, 230
Postal stations, 274
Pot pump. See Pumps
Potter's wheel, 149, 152-153
Pottery. See Ceramics
Power, sources of, 156
Practical learning (sirhak), 5-6, 298
Prayers for the dead, 258
ritual, 126
Precipitation, measurement of, 4, 110, 111
Prescriptions, 260, 262-263
Printing, of Buddhist books, 266
Printing press, 178, 180
Printing technology, 3, 9, 167-184
Printing types, 181-182
bronze, 3, 175, 178, 182, 239, 240, 252
Kabin, 179-180, 181, 182
Kemi, 3, 175-176, 178
Kyŏngja, 179-180
manufacturing of, 175
metallic, 8, 175, 174, 175, 176, 266
movable, 3n.3, 173, 176, 180, 182, 239, 266
private, 184
Pyŏngja, 182
small and large, 180, 182
Sulsin, 182
wood-block, 170, 174, 176
Index

Printing types (continued)
wooden, 175, 182
Private management, and mining, 243, 244
Projectiles, 201
Provincial surveys, 289, 290-291, 292, 294
Ptolemaic system, 29, 82
Pu 'tien ko (The song of the sky pacers), 31, 32
Pulguk Temple, 167, 168, 223, 229
Pulleys, 158-160
Pumpkins, as floats, 148
Pumps
double-cylinder forcepump, 156
foot-pedal, 156, 158
hand-operated, 157
pot, 156-157
rotary waterpump, 156
square-pallet chain, 156
waterwheel-operated, 158
Western, 156
P’ungsu geomantic theory, 278-281, 298, 299
P’ungsun’gi, 129
P’yoch’ung temple, bronze incense burner at, 239
Py’on I-chung, 198
Py’on Kye-ryang (editor, 1414), 288, 289
P’yöngan province, 190, 241, 243, 290, 294, 296, 307
P’yöngduryang Togam (Supervisorate of Weights and Measures), 131-132
P’yöngja printing type. See Printing types
P’yöngjödsn. See Cargo barges
P’yöngsiso. See Marketing Control Office
P’yöngyang, 123
astronomical observatory, 36
latitude of, 104
Quern, 149, 155

Radiant-heating system. See Floor heating
Rafts, 148, 207
Rainbows, 121, 125, 127
“white.” See “White rainbows”
Rainfall, 4, 109, 128, 157
forecasting of, 107, 120-122
frequency of observations, 117-118
measurement of, 107, 109, 111-120
Ramming of enemy vessels, 209, 215, 218
Realgar, 260, 263
Realm of Immortality, 257n.68
Rectangular grid system, 313
Refining methods, 241, 242, 243, 245-257, 253-254
Chinese, 244
Reki hakase (calendar professor), 53
Reliefs, in the Sôkkuram grotto, 223-224
Residence, choosing place of, 300-301
Revolving axle, 150, 152
Rho, James (Lo Ya-ku, Jesuit, 1631), 17, 21
Ricci, Matteo, 18
maps by, 284, 301-304
Rice-straw papers, 267
Rice wine, 261
Ritual food offerings, 143
Ritual prayers, 126
Rivers, depicted in maps, 311n.90
Roads, 274
Rockets, 186, 187, 191, 193, 201
iron-fletched, 188
multiple launcher for, 192, 199
Rököku hakase (clepsydra professor), 53
Roman Empire, 137
Rome, drugs, 259
Room-heating system, 140-141
Rotary tools, 149
Rotary water pumps. See Pumps
Rotating-earth theory, 18-19, 20-22
Round-heaven, square-earth theory. See Ka’t’ien
Royal Asiatic Society, 8
Royal Secretariat. See Sôngjöngwôn
Russia, 305
Ryöoku University, Kyoto, 282
Ryökyûs, 286, 288, 298

Sabbatino de Ursis, 50
Sach’ondae. See Office of the Observatory
Sado (cosmological theory), 15-16
Sahara desert, 282
Sailing ships, 208
Sails, 207, 209
Sajôn ch’oong’ong (four-rocket tube launcher), 200
Salt mines, 158
Salt peter, 186, 270–272
Samdaehwan kongbu. See Three spherical bodies, cosmological theory of
Samgak, Mt., 295
astronomical observatory at, 41, 95, 104
Samguk sagi, 6, 52, 78, 93, 94, 96, 128, 130, 148, 253, 277
Samguk yusa, 6, 130, 161
“Samin ch’ongnon.” Part of the Taegnijji, q.v.
Samnang-sông castle, 230
Sam’p’o chido, 288
San kuo chih, 236
Sand molds. See Molds
Samgjông yemun, 174–175
Samgmin (social class), 5n.4
Sanggwiwôn (Royal Clothing Office), 57
Sangwôn Temple, bronze bell of, 238
Sants’acksa (organization of the Board of Works), 156
Sarton, G., 174
Sasi ch’ar’yo, 120
Sasusack. See Office of Shipbuilding
Saturn (planet), 29
Scale diagrams, in shipbuilding, 221
Scale maps. See Maps
Schall von Bell, Adam (Jesuit, 1615), 17, 28, 49, 83
Schreck, Johann (Jesuit, 1631), 17
Scientific investigation and research, 109, 110–111
and astrology, 108
stagnancy in, 114
Scroll of the darani scripture, 167
Sceytian bronze culture, 233
Sea-laver, and papermaking, 267
Seasons, change of, 85, 86
Sech’o yuhwi, 84
Second World War, 8
Segömjông, 155
Sejo, King, 95, 199, 295–296
Sejong era, 3–4, 7, 16, 28, 38, 39, 109, 216
armillary spheres and clocks, 65–72
astronomical observations, 102–104, 105, 106
building technology, 227
calendrical science, 79–80
clepsydras, 56–57, 60
eclipses, 95
firearms, 190, 191, 193
maps, 293–295
medicine, 261
mining, 240, 241–242, 243
paktong, 253
printing, 177–178, 181
pumps, 156
rainfall measurement, 113, 114, 117, 118
ships, 213
sundials, 46–49
weights and measures, 132, 134, 136
wind gauge, 123
Sejong sillok chiriiji, 128, 155, 241, 251, 290–291, 298, 309
Self-restraint, and longevity, 264
Seoul (Hansông), 7, 92–93, 96, 110, 227
altitude of polestar at, 114, 294
astronomical observatory at, 39
bridges, 228–229, 230
capital moved to, 56
city walls, 226–227
first standard clock installed in, 56
ice-storage houses at, 143
latitude of, 47, 48, 50, 52, 66, 80, 85, 95, 103–104
map of, 295
paper mill, 267
rainfall, 113, 114
stele, 26
Sericulture, 149–150
Sesame oil, 65
Sexual intercourse, 259
Shamanism, 278
Shang han lun, 260
Shells (missiles), 191, 201, 202
Shen Kua, 140
Sheng-chiao kuang–pei t‘u, 282
Shenyang (Mukden), 158
Shih-chi shih tsuan ku chin t‘ung yao, 176
Shih-hsien calendar, 16, 18, 63, 83, 84, 85, 86, 95–96, 114
Index

Shih-hsien li fa, 49
Shikoku, 285
Shipbuilding, 207–221
Ships
for coastal navigation, 210–211, 212
commercial, 208, 211, 212
fishing, 211, 212
military. See Warships
ocean-going, 212
official, 208, 209
paddle-wheel, 214–215
passenger, 211
turtle, 212, 215–216, 218–220
Shooting stars. See Meteors
Shou-shih li. See Susi Calendar
Shun Ti (Yuan emperor), 58, 62
Shun tien, 13
Sideral year, 86
Siege weapons, 188–189
Sighting tube, 19, 41
Signal-line towers, 228
Shihon (Shih-hsien) Calendar. See
Shih-hsien calendar
Shihon kiyo, 86
“Sikhwaji.” See Koryo sa “Sikhwaji”
Sikjom cho’njiban. See Diviner’s
board
Silica glass, 189
Silk cloth, 150
Silla era, 2, 22, 33, 274
astronomy, 13, 15, 24, 35, 97
bridges, 229
calendrical science, 78
casting technique, 238
cave temple, 1, 2, 14
civil engineering, 221–230
clepsydras, 53
comet and novas, 96
eclipses, 93–94
emissary to China, 208
gold artifacts, 1
incense sticks, 65
mechanical toys, 161–162
medicine, 258–259
metal craftsmanship, 238–239
Nugakchon, 104
optics, 137, 139
paper, 265
ships, 210, 211
sundials, 42
tombs. See Tombs
wind observations, 123
wood-block printing, 168–169
Silla copper (bronze), 248
Silver, 236, 238, 239
imported from Japan, 244
mining. See Mining
refining, 243, 246
as tribute, 240, 211, 243
Silver coins, 239
Silver inlays, 239
Silver utensils, 254
Sim Yom-jo (courtier of King
Ch’ongjo), 119
Sin Chang (geographical compiler, 1422), 289
Sin Kyong-jun (writer, 1712–1781), 221, 298, 307
Sin Suk-chu (director of the Office
of Shipbuilding, 1465), 214, 286–287, 288
Sinch’an calendar, 78
Sinch’an t’alto chiriji, 289, 290, 292
Sinch’an tongguk yoji sangnam, 292–293
Sinjón chach’obang, 271, 272
Sinjón chach’ui yomch’obang, 270
Sinjúng tongguk yoji sangnam, 297
Sipch’ilsach’on kogṣmt’ongyo, 176
Sipch’ong calendar, 78
Siphon, 148
Sirhak. See Practical learning
Sleet, 127
Smelting, 236
copper, 189, 193, 199
iron, 193, 236
Smithsonite, 251, 252
Smoky quartz, 100, 138, 139
Snowfall, 121, 127, 128, 129
measurement of, 108–109
scarlet, 128
Sŏ Ho-su (armillary clock repairer, 1777), 72
Sŏ Kŏ-jŏng, 292
Sŏbinggo (West Ice Storage), 143
Sŏbuk chebŏng’gi, 306
Sŏbuk chido, 306
Sŏhŏng, 243
Sŏhyŏn, Prince (fl. 1645), 17
Soil
moisture penetration of, 108–109
and making of saltpeter, 270, 271, 272
Soju (rice wine), 261
Sok-chirigo (Further study on Korean
geography), 298
Index

Sökkat'ap pagoda, 167
Sökkuram grotto, 1, 2, 14, 221, 223–226
Söktaejön, 136
Solar system, 29
Solstices, 15, 16, 35, 87–88, 92
Sönhusó. See Office of Shipbuilding
Söndo (search for eternal life), 263
Söndök, Queen, 33, 36
Söng Chu-dök (astronomer, 1759–?), 39
Söng Chun (1501), 306
Söng Chun-dök (1570), 79
Söng Hyöng (scholar, 1439–1504), 175, 297
Song I-yöng (astronomer, 1669), 19, 21, 68–69, 70, 71, 72, 163, 166
Söng Im (geographical compiler, 1482), 292
Söng Kün (army officer, c. 1635), 270
Songkast castle, 169
Songdo (Kaesöng), 278
astronomical observatory, 36–37
polar altitude of, 102
Sönggyöng, 31, 32
Söngho sasél, 129, 298, 308
Söngjong, King (1470–1494), 242, 243, 292, 297
Söngpyöng-dong Unggi-üp, archaeological remains at, 141
Sonjahwa, 33
Sööngja, King (1568–1608), 83, 162, 199, 200, 216, 218, 243, 244, 264
Sööngjo sillok, 113, 200
Soochow planisphere, 28
Sorcery, 120
Söun'gwon. See Bureau of Astronomy
Söun'gwonji, 39, 95, 100, 101, 117, 129
"South-pointing needle," 145, 146–147
South Pole, 14, 16, 29
Soybean oil, 65
Söyu kyönnmun, 7
"Spear vessel," 215, 220
Spectacles, 138–139
Spinning wheel, 149–150
Spoons, 248, 254
Square-pallet chain pump. See Pumps
Ssu-ma Kung, stone inscription of, 132
Stainless steel, 254
Standard History of the Chin, 13
Star maps, 12, 22–28, 305
in form of a brass disc, 32
Western, transmission of, 28–32
Stars
angular measurements for, 50n.83
circumpolar, 29, 31, 32
distance from the earth, 32
fixed, 31, 32
of ill omen, 98, 100, 148
invisible, 29, 32
meridian passages of, 26, 50n.83
movements of, 16
number of, 22, 29, 31–32
position of, 26, 35
rising and setting of, 50n.83
shooting. See Meteor
sphericity of, 20
time measured by, 64
and weather forecasting, 121
Steering oars, 207, 209
Steles, of the Celestial Planisphere, 26, 28
Stone Age, 140–141, 149, 207
Stove deposit (drug), 260
Stoves, 141
Straw, and gunpowder making, 271
Streamers, to show direction of wind, 115, 123
Su Sung (astronomer, 11th century), 62, 67, 70
Su wên, section of the Hwang-ti nei ching, q.v.
Sublimation, 256
Sudzuki, O., 138
Sue pottery, 152
Sugar, 278
Sukchong, King (r. 47, 71, 88, 100, 262, 263, 268, 270, 272, 273, 275, 297)
Sulfur, 186, 190, 278
type. See Printing
Sun
angular measures for, 50n.83
ecliptic longitude of, 50n.83
movements of, 14, 15–16, 21, 80, 84, 85, 86, 94
rising and setting of, 29, 50n.83, 85, 87, 92
sphericity of, 18, 20
and weather forecasting, 120, 121
Sun Ssu-mo, 258, 262
Sundials, 37, 39, 64
Arabian, 49
Chinese, 42
Greek, 49
horizontal, 49, 50
paekkak-hwan (decimal circle), 45-46
portable, 46, 48, 49, 50-51, 52, 146
scaphe, 46-49, 50
Silla era, 42
Western, 49-52
Sung China, 2, 3, 169, 170, 173, 174, 209, 210, 239, 248, 250, 259-260, 277
Sung shih, 62
Sængja. See Firearms, portable types
Sungjön University Museum, Seoul, 303, 305
Sungjôngwön (Royal Secretariat), 98, 117
Sunrise and sunset. See Sun, rising and setting of
Sun's shadow, measurement of, 35, 38
Sunspots, 98, 100-101, 139
Supervisorate of Geomancy, 280
Sup'yo Bridge, 119, 120, 228, 229
Surveying, 293-297, 306, 308-309
Susi Calendar (Shou-shih li), 37, 78, 79, 80, 87
Susiryo ch'öphöp ipsöng, 79
Suwön Castle, 160, 228, 230
Suyang, Prince, 295
Sword, in the Isonokami Shrine, Tenri, 236-237
Syzygies, 29
T'-O maps, 286
Ta-hsueh yen-i pu-i, 215
Ta Ming i t'ung chih, 292, 297
Ta T'ang hsi yü chi, 277
Ta-t'ung calendar, 79, 80, 82, 83
Ta-t'ung li il tonggwe, 82
Ta Yuan i t'ung chih, 277
T'achokkam. See Bureau of Divination
Taedong chihi, 315
Taedong sugyöng, 298
Taedong yǒji chǒnda, 314
Taedong yǒjido, 309, 310, 313, 314
Taegu, latitude of, 104
T'aeil calendar, 78
T'aejo, King (c. 1394), 132, 212, 227, 279, 280
T'aejo sillok, 187, 226
T'aejong, King (r. 1403), 176-177, 182, 187, 212, 215, 216, 218, 239-240, 281
T'aejong sillok, 240
Taenyöng ch'ǒnhado, 284
Taengniji, 299-301
T'aesaguk. See Bureau of the Grand Astrologer
T'ai Chin-hsien. See Kögler, Ignatius
T'ai-p'ing sheng hui fang, 260, 262
T'ak Sin (1415), 215
T'akji. See Office of Weights and Measures
Talc, 260
Tanching (monk, A.D. 610), 153-154
Tan fang ching yuan, 255
Tan yao pi chueh, 255
Tanch'on, 239, 243
Tanch'on silver refining method, 246
T'ang China, 130, 161, 168, 248
Koguryö envoy to, 273
medicine, 259
mirrors, 239
royal emissaries to, 208
Taoists, 257, 258
T'ang Jo-wang. See Schall von Bell, Adam
T'ang shu, 62, 138
Tanghu ilgi, 117
Tanghu Sigangwön (Tutorial Office), 98, 117
T'ao Hung-ching (alchemist, 451-536), 254, 257, 259
Tao te ching, 257
Taoism and Taoists
and medicine, 257-259, 262-265
and the search for immortality, 263-265
Taoist immortals, 258, 263-264, 265
Taoist temples, 64
Taxes, 243, 244, 297
Technicians, 241-242
Japanese, 247
Telescopes, 77, 138, 139, 162
Telescopic views, of celestial bodies, 29
Temperature, 107, 126, 141
Temple bells, 238
Terrestrial globes, 19, 21, 282, 304
Thai envoys, 278
Three Kingdoms era, 1, 107, 126, 127, 150, 254
astronomy, 11, 22
building technology, 227
calendrical science, 77-78
clepsydras, 52-53
earthquakes, 125
geography, 273, 277
institutions for astronomical observations, 104
metal-refining methods, 245
pulleys and cranes, 158
shipbuilding, 207, 208
weights and measures, 130
Three spherical bodies, cosmological theory of, 18, 19-20
Threshing tool, 152
Thunder, 121, 127, 128
Ti li t'u, 277
Tidal waves, 128
Tides, 108, 128-129
T'ien kung k'aiwu, 246, 255, 256, 269, 270
T'ien wen lüeh, 17
Tiles, 169
Time, measurement of, 42, 105
at night, 88, 92-93
officials in charge of, 45, 53, 104
Tin, 249, 251, 252
Tires, 150
Tojung (Buddhist monk, 692), 24
Toksu Palace, 60, 63, 135
Tomb(s)
Kakcho, 23
Koguryo, 1, 14, 22-24, 150, 154, 223, 254, 258, 273
Lo-lang, 144, 150
Silla, 138, 152, 237
Three Kingdoms, 224
Unified Silla, 224
Tongdo Temple, 32
Tongguk chido, 295, 306, 309
Tongguk chiri, 297
Tongguk munhön pigo, 114, 307, 315
Tongguk taejido, 307, 308-309
Tongguk yőjí sángnum, 36, 143, 248, 255, 283, 292, 296, 297, 307, 315
Tongguk yŏkdae chehyŏn pirok, 280-281
Tonggyŏng chapgi, 136
Tongjeyŏng (flagship), 216, 218
Tongmunŏn, 275, 292
Tongnai pogam, 138, 145, 262, 264, 269
Tonics, 263
Topographical nomenclature, 277
Torago, 298
Toṣŏn (geomancer, 826-898), 278-279, 280
Touchholes, 199, 202
Transactions of the Royal Asiatic Society, 8
Transmutation of base to precious metals, 265
Treatise on Astrology. Chapter of the Koryŏsa, q.v.
Treatise on Astrology. Chapter of the Sŏng shih, q.v.
Treatise on Astrology. Chapter of the T'ang shu, q.v.
Treatise on Geography. Chapter of the Sejong sillok, q.v.
Triangulation instrument, 41, 295-296
Tribute, to China, 239, 240, 241, 243, 244
Trigonometry, 74
Trip-hammers, 152
Tripitaka, 3, 170
Troop ships. See Warships
Ts'ai Yung, 13
Ts'ai Heng (astronomer, Liang period), 15
Tsunami, 128
Tsushima island, 193, 206, 282, 287
T'u ching pen-ts'ao, 260
Tu Tsu-sheng (Yuan astronomer), 56
Tuman River, 294
Tumop'o (Oksu-dong), 143
Tung i chuan, 236
Tung Yuch (late fifteenth century), 241, 248
Tunggap calendar, 78
Tunjisan mountain, 143
Turtle ships, 212, 215-216, 218-220
Typecasting, 173, 175, 184, 239, 240
Types. See Printing types
Typesetting, 178-179
Üibang yuch'ui, 262
Üigi chip'sol, 50, 65, 77
Ullung Island, 307, 308
Index

Ulsan, 241, 253
Ünyang pobí geomantic theory, 279
Ünyang Sanjong Togam. See superviserate of geomancy
Ünyang sunyók geomancy, 279
Unified Silla period, 105, 107, 126
armillary sphere, 66
astronomy, 11
casting techniques, 237
clepsydras, 53
earthquakes, 125
geography, 273, 274
scientific development, 6
shipbuilding, 208
Unp’a silver mine, 244
Urine, and making of saltpeter, 270

Vapor distillation technique, 261
Venus (planet), 96
Verbiest, Ferdinand (Jesuit astronomer), 31-32, 301
Verge and foliot escapement, 166
Veritable Records of Tanjong, 295
Vermilion, 254, 255
Volcanic action, 125
Volume measurements, 130, 131, 132, 134, 135, 136

Wada Yūji (Japanese meteorologist, 1910), 7, 98
Walls, 226-228
Wan kuo ch’üan t’u, 304
Wang Chen (1314), 174
Wang Chen-to, 144
Wang Ch’ung (skeptic philosopher), 14, 144
Wang Hsi-ming (Chinese astronomer), 31
Wang Hsiang-chih (Sung geographer), 277
Wang o-Ch’önch’ukkúk chón, 274
Wang’gu. See Mortars
War, between China and the Chin Tartars, 174
Warships, 186, 188, 208-209, 210, 211, 214, 215-220
iron-plated, 219-220
kinds of, 212
size of, 208, 210
speed of, 212
troop-carrying, 214
Watanabe Yosuke, 220
Watchtowers, 228

Water mill. See Mills
Water-raising device, 152
Watermarks, 8, 110-111, 113-114, 115, 119-120
Waterways, 309
Waterwheels, 149, 153-158
Weapons. See Armaments
Weather forecasting, 120-122
Weaving, 150
Wei chih, 256
Wei Yuan, 305
Weight measurements, 130, 131, 134, 135
Weights and measures, 117, 130-136
Western astronomy, 12, 17, 18, 21, 28-32, 86
influence on Korean astronomy, 47, 50, 68
Western calendars, 86
Western clocks, 69, 70
Western cosmology, 86
Western culture, 6
Western geography, 86
Western learning, introduction of, in Korea, 4
Western maps, 301
Western paddle-wheel vessels, 215
Western science, 5
Western telescope, 77
Western world, in Korean maps, 282, 283, 284
Wheel maps. See maps
Wheels, 149-150
“White rainbows,” 125-126
Wi Paek-kyu (geographer), 315
Wind, 115
velocity and direction, 122-125
and weather forecasting, 120, 121, 122
Wind gauge, 123
Windlass, 139, 160
Windmill, 153
Wine, and ancestor worship, 261
Woljong oringhón (astronomical handbook), 82
Wön Hon, 264
Wonju, latitude of, 104
Wood-block manufacturing, 170, 172-173
Wood-block printing, 3, 167-173, 174
government projects and, 170
invention of, 167-169
of maps, 284, 285, 314
Wooden molds, 169
Wrought iron, 242
Wu Yen (Yuan scholar), 140
Wu-yin ephemerides, 78

Yalu River, 294
Yam, and papermaking, 268
Yamanouchi Yosito, 249
Yang Wón-ho (astronomer, 1062), 78
Yangban (social class), 51, 4
Yangch’onja, 281–282
Yangdo o (angle measurement instrument), 74–76
Yangdo o tosŏl, 74
Yanggŏngkyŏr (astronomical instrument), 77
Yao Hsin (Chinese astronomer, c. +260), 12
Year, length of, 16
Yejong sillok, 284
Yenching, See Peking
Yi Chang-son (firearm maker), 202
Yi Chin-bong (armillary clockmaker, 1687), 71
Yi Chŏn (metallurgist, Minister of Works, 1421), 46, 66, 178, 180, 193, 213, 242
Yi Chun-min, 264
Yi Ch’un-yŏng, 9
Yi Chung-hwan (geographer, 1690–1753), 299, 301
Yi Ch’ungmyŏng chŏnsŏ, 216, 218, 221
Yi Dynasty, 3–4, 6, 7, 12, 25
astronomical instruments, 72–77
astronomy, 11, 13, 15, 17, 18–21, 22, 29, 37, 38, 41–42
bridges, 229, 230
building technique, 226
calendrical system, 82, 84–85
clepsydras, 56, 58, 62–64
clocks, 65, 162, 166
comets, 97
earthquakes, 123, 126
eclipses, 94–95
firearms, 187–193, 195, 199–207
foreign relations, 185
geographical compendia, 288–293
maps, 273, 281–286
medicine, 261–263
metal-refining methods, 245–247
meteorology, 107–108, 129
mills, 156
printing, 3, 175, 180–181
pumps, 158
science, 7
ships, 211–221
sundials, 45, 49, 51
sunspots, 100
waterwheel, 155
wind direction observations, 123–125
Yi Haeng (1530), 297
Yi Hoc (early Yi period, cartographer), 274, 275, 282, 283, 288, 293, 296
Yi Hwang (sixteenth century), 72
Yi Ik, 129, 298, 307
Yi In-hyon (astronomer, 1062), 78
Yi Kŭk-hwa, 304
Yi Kŭk-kyun (1501), 306
Yi Kwang-ch’ŏng (1603), 302
Yi Kwang-nin, 9, 157
Yi Kyông-ch’ang (astronomer, c. 1554–1617), 15, 16
Yi Kyông-ch’ang (early nineteenth century), 129, 138–140, 245–246, 252, 253, 254, 256
Yi Min-ch’ol (physicist, 1683), 19, 21, 68–69, 71, 158
Yi Min-su (chief naval commander of Cholla province), 215
Yi Mu (cartographer, c. 1399), 282, 288
Yi Pun, 218
Yi Se-hyŏng (scientist, 1434), 180
Yi Si-hwa (armillary clockmaker, 1704), 71
Yi Sŏ (1635), 270
Yi Sung gye, 25, 26, 187
Yi Su-gwang, 263
Yi Sun (astronomer, 1525), 73
Yi Sun-ji (astronomer, 1445), 13, 67, 80, 82, 95, 180
Yi Sun-sin (Admiral), 206, 212, 216, 218–219
Yi To (Section Chief of the Bureau of Weaponry, 1409), 188
Yi Tŏk-song (armillary clock repairer, 1777), 72
Yi Tŏk-sung (1499), 297
Yi Yong hu, 304
Index

Yi Yuk, 295
Yijo nonggop kisulsa, 9
Yijo sillok, 7, 77, 95, 101, 102–103, 115, 157, 247, 255
Yijo surisa yon’gu, 9
Yin and yang, 16, 122, 278, 279
Ying-huan chih lueh, 305
Yŏamji, 221
Yŏjae ch’walyo, 315
Yŏji chŏnda, 305
Yŏkteo yosŏngnok, 98
Yŏlbam Buddhist sect, 257–258
Yoneda Miyoji, 223–224
Yŏngdong area, 123
Yŏnghŭng, 243
Yŏngjae ch’onghwa, 175
Yŏngjo, King, 11, 71, 85, 114–115, 117, 158
Yŏngjo sillok, 147
Yŏngjoch’ŏk (measures for architectural carpenters), 132, 134n.10, 136
Yŏngjong era (eighteenth century), 47
Yŏnhwa (Lotus Blossom) bridge, 229
Yŏnsan’gun ilgi, 246
Yŏrha ilgi, 18, 19
Yu Chŏn (court official, 1534), 59
Yu Hi-ik (1467), 295
Yū Hsi (Chinese astronomer, fl. +307 to +338), 12
Yu Hŭng-bal, 163
Yu Kil-chun, 7
Yu Pang-t’aek (astronomer), 26
Yū Sung (Chinese astronomer, c. +265), 12
Yu Tae-yong (sixteenth-century writer), 298
Yū ti chi sheng, 277
Yū ti chih, 277
Yū ti shan hai ch’ünan, 301
Yū ti t’u, 274, 282, 283
Yu U-ch’ang, 304
Yuan chia calendar, 78
Yuan China, 37, 38, 56, 185, 186, 239, 248, 261, 277
ships, 210
Yuan shih, 47, 72, 102
Yugu p’ungsokki, 298
Yugu p’ungt’ogi, 298
Yun Hoe (geographical compiler, 1422), 289
Yun In-yong (astronomer), 26
Yun Kun-p’yŏng (sixteenth-century army officer and alchemical expert), 264–265
Yun Kyŏl (sixteenth-century writer), 298
Yun Po (geographer, d. 1329), 277
Yun Yŏng (cartographer), 310
Yundo. See Compass, geomantic
Yungwŏn p’ilbi, 187, 195, 200, 201, 204
Zinc, 249, 250, 251, 252, 254