

Notes

Vignette images are referenced in the index in **bold font** with a letter following the page number as follows:

a — artistic renderings

d — diagrams

m — maps

p — photographs

The same page number accompanying an image typically references a related caption.

Numbers

20 fps = 13.5 mph, 168

39-Mile volcanic field, **163m**, **167d**, 195, **195m**

1000 km³ = 240 m³, 165

2400°F, 192

A

Academy of Natural Sciences (Philadelphia, PA), 148

Adirondack Mountains, 4

Agate Fossil Beds National Monument, 31

Ajax Mine, 188

Allosaurus, 149, 265, 274, 275

alluvial fans

Ancestral Front Range and, 71–72, **72p**, 75, **75m**, 230, **230d**

in Death Valley, **73p**
explanation of, 72

Fountain Formation and, 72, **72p**, 75, **75m**, **230d**

in Horseshoe Park, 49–50

man-made dams and, 49–50

at West Spanish Peak, 288, **288p**

alluvium, 82, 83, 85, **85d**, 86–88, **88p**. *see also*

Nussbaum alluvium

alpine lakes, 52, **52p**

Alpine Visitor Center (Rocky Mountain NP), 53

Alvarez, Luis (physicist), 296–297

Alvarez, Walter (geologist), 296–297

Alvarez hypothesis, 296–298, 301

American Eagles Mine, 185, 187, **187p**

American Eagles Overlook, 185, 187, **187p**, 190, **190p**

American Museum of Natural History, 265

“America the Beautiful,” 199

Amphicoelias, 268

Ancestral Front Range

alluvial fans and, 71–72, **72p**, 75, **75m**, **230d**

artist’s rendition of, 135, **135a**, 228

current evidence of, 134

Eldorado Canyon and, 72–74

Fountain Formation and, 133–134, 228

Glen Eyrie Member and, 229

quartzite and, 76

two mountainous islands of, 230, **230d**

uplift and, 75, **75m**

Ancestral Rockies

Ancestral Front Range within, 72–74

Ancestral Uncompahgre range within, 74, **75m**

artist’s rendition of, 133, **133a**, 234

climate change and, 5–6

climate of, 231

erosion of, 136

Garden of the Gods and, 234

geologic history and, 5–6, 7

ice ages and, 5

plate tectonics and, 5, 21

uplift and, 75, **75m**, 230–231, 233

Ancestral Uncompahgre range, 74, **75m**

Ancient Colorado, 145

Ancient Denvers, 145

ankylosaurs, 271–273, **272p**

Antero Formation, 182–183

apatosaurs, 152–153, 157, 270–271

Apatosaurus, 149, 152, 153, **153p**, 270. *see also*

Brontosaurus

Arapahoe conglomerate, **119d**, 123, **123p**

Arapahoe Formation, 111, 121–122, 124

arc-continent collisions. *see* volcanic arcs

arêtes, 45, **46d**, **46p**

Argo Mill, 94, **94m**, 103–107, **104p**

Argo Tunnel, 105–106, **106p**, 108

Argo Water Treatment Plant, 107

Arikaree Formation, 27, **27d**, 28–32, **29p**, **30d**, **32p**

Arkansas River valley, 262–264, **263m**

Arnold, Philip (prospector), 11

arrastra, 107

asteroid collisions with Earth, 6–7, 14, 117, 250, 294,

294a. *see also* clay of the K-T boundary; K-T

boundary

asthenosphere, 96–97, 98, **98d**, 165

A-type granite, 203–206, **204d**, **204m**

B

badlands, **244m**, 245, 247

Badlands National Park, 31

Baikal Rift, 210, **211m**

Balanced Rock, 226, **226m**, 228–231, **229p**

Balog, James (geologist, photographer), 60, **60p**

Barr Trail, 198

basalt. *see also* Ignimbrite Flare-up; volcanoes; Wall Mountain tuff

East Africa’s Rift Valley and, 204

explanation of, 97

- basalt (*continued*)
 Himalayas and, 211
 magma content of, 281
 Mid-Continent Rift and, 209, **209m**
 Table Mountains and, 122, **122d**, 144–145
- Bates, Katherine Lee (English professor), 199, 200–201
- batholiths
 directions to, 201, **201m**
 discussion of, 4, 200–203, 206
 formation of, 210
 of the Front Range, 162
 geometry of, 206
 gravity and, 207
 kimberlite fields and, 20
 of Mt. Evans, 103, 104, **104p**
- Bear Canyon Creek (Boulder), 81
- Bear Creek Canyon Park, **226m**, 227, 241
- Beaver Ponds, 38
- becquerels, 92
- bee fly (*Lesquereux Edwards*), 179, **179p**
- Benton Formation, 140, **141p**, **148d**
- Berra, Yogi (baseball player), 77
- Berthoud orogeny, 4
- Bighorn Basin (WY), 252, 253
- Bighorn Mountain (Rocky Mountain NP), 44, 45
- “Big Stump” at Lake Florissant, 176, **176p**
- Big Thompson Canyon, 56, **56m**, 57, 59–61
- Big Thompson Flood (July 31, 1976)
 boulders deposited from, 61, **61p**
 devastation from, 60, **60p**
 flash flooding tendencies and, 9
 heroic efforts of people and, 61–62, **62p**
 movement of boulders and, 169
 The Narrows and, 58, **58p**
 story of, 57–65
- Big Thompson River valley (Rocky Mountain NP), 48, 57
- “Bone Wars,” 6, 148–149, 152, 267–268
- Boulder Canyon, 64
- Boulder County Justice Center, 64
- Boulder Creek, 64
- boulders, 61, **61p**, 124–125. *see also named conglomerates; named features*
- Bridge Canyon Overlook (Castlewood Canyon SP), 166
- “Brontosaur Bulges” interpretive site, 151, 152
- Brontosaurus*, 149, 152, 153, 270, 271, **271p**. *see also Apatosaurus*
- brontotheres, 163
- Brule Formation, 31
- Buffalo Bill gravesite, 110, **110m**, 112
- Bull Lake glacial episode, 41, 43, 47–48
- Bureau of Land Management (BLM), 273
- C**
- Cable, Rufus (surveyor), 227–228
- Caborca (Sonora, Mexico), 206
- Caborca granite, 209, **209m**
- Cache la Poudre River, 53, 55, 59
- Camarasaurus*, 265, 268, 269, 270
- Camarasaurus supremus*, 275
- “Cambrian explosion,” 213–214
- Caprock conglomerate, 176, **176d**
- carbonaceous chondrite, 302
- Castle Rock conglomerate
 artist’s rendition of, 166, **166a**
 clasts inside of, 168, **168p**
 cliff of, 164, **164p**
 crossbeds in, 167, **167p**
 directions to, 160–161, **160m**
 discussion of, 161–170
 flooding and, 76–77, 166, **166a**
 outcrop area of, 163, **163m**
 rivers and, 167, **167d**
- Castle Rock rainforest, 250, 303–304
- Castlewood Canyon, 166, 169
- Castlewood Canyon State Park, 160–161, **160m**
- cautions for exploring features, vi–vii
- Cave of the Winds
 directions to, 212–213, **212m**
 discussion of, 213–225
 limestone at, 219–221, 222, **222d**, 223, **223p**, 224, **224p**
 map of passages for, 222, **222m**
 sequence of rock units at, 216, **216d**
 stalactites of, 223, **223p**
 tour of, 221–223
- Ceratosaurus*, 274
- Chalk Bluffs/Ciffs, 28, **29m**
- Cheyenne Line, 21–22, **22d**, **22m**, **101m**, **261d**, **261m**
- Cheyenne Mountain (Colorado Springs), 228, **228p**, 237
- Chicken Park
 diamonds and, 13, 15–17, **16p**, 18, 19, 22
 directions to, 10, **10m**
 distinguishing kimberlite at, 17, **17p**
 kimberlite locations and, 13, **13m**
 plate tectonics and, 20
 prospecting at, 23
- Chicxulub Crater (Mexico), 301–302

- Pangaea, 5, 6, 20, 209–210
- Parfet Clay Mining Enterprise, 114
- Pawnee Buttes, 28, **29m**
- Peabody, George (benefactor), 149
- Peabody Museum (Yale University), 148–149, 152
- pebbles. *see named features; various conglomerates*
- pediments, 82, **82d**, 83–84, **85d**, 88–89. *see also named pediments*
- Perkins Central Garden Trail, 231
- Perry Park, 203, 239
- PETM, 243, **246d**, **246p**, 248–253, **249p**, **251d**. *see also climate change; glaciers; ice ages*
- petrified features, transformation into, 176, **176d**
- Petrified Forest Loop (Florissant Fossil Beds NM), 175–177
- petroleum. *see under fossil fuels*
- Pickett brothers (cave discoverers), 214
- Picket Wire Canyonlands, 270–271
- Pierre shale
 - erosion of sedimentary layers and, **290d**
 - explanation of, 26–27
 - Fort Collins and, 28
 - Golden fault and, **119d**
 - mudstone composition of, 141
 - Rocky Flats and, 88, **88p**
 - Rocky Mountain Erosion Surface and, **27d**
 - section of The Spanish Peaks and, **287d**
 - Soapstone Prairie Natural Area and, 26, **26p**
 - Walsen Dike and, 278–279
 - in the Western Interior Seaway, 142, **142p**
- Pike, Lt. Zebulon (explorer), 199
- Pikes Peak. *see also Pikes Peak granite*
 - Castle Rock conglomerate and, **167d**
 - directions to, 198, **198m**
 - discussion of, 199–211
 - Laramide orogeny and, 162
 - plate tectonics and, 4
 - view of, 200, **200p**
- Pikes Peak Batholith
 - Dawson arkose and, 162
 - formation of, 210
 - gravity and, 207
 - makeup of, 200–202
 - map of, 201, **201m**
 - plate tectonics and, 20
- Pikes Peak Gold Rush, 93–96
- Pikes Peak granite. *see also Pikes Peak*
 - ancient continents and, 209–210
 - boulders at the summit and, 202, **202p**
 - Cave of the Winds and, **216d**, 218, **218p**
 - Florissant Formation and, **177d**
 - formation of, 203, 206, 215
- Garden of the Gods and, 229–230, **236d**, 239, 241, 242
- geographic breadth of, 200
- iron and, 225
- Laurentia and, 209, **209m**
- limestone and, 221
- Lyons Formation and, 239
- Paint Mines Interpretive Park and, 243
- plate tectonics and, 207–208
- Rodinia and, 20, 210
- Sawatch Formation and, 215
- sedimentary rocks and, 241–242
- supercontinent assembly and, 208, **208m**
- Ute Pass fault and, 221
- view of, 238, **238p**
- Pikes Peak massif, 220
- Pillmore, Charles (geologist), 298
- Pinedale glacial episode, 41, 43, 47–48
- pirate perch (*Trichophanes foliarum*), 178, 180, **180p**
- Pitch-Pinnacle beds, 182
- plate tectonics. *see also tectonic compression; volcanic arcs*
 - Ancestral Rockies and, 5
 - Chicken Park and, 20
 - continental configurations and, 209–210
 - convergent boundaries of, 97, **97p**
 - diagram of, 98, **98d**
 - Earth's crust and, 3, 98, **98d**
 - Florissant Fossil Beds National Monument and, 181–182
 - formation of North America and, **100d**
 - introduction to, vi, 1–8
 - ocean currents and, 183
 - subduction zones and, 1–3, 98–99, **98d**, **100d**, **101m**, 165, 259–260
 - suture zones and, 3, 99, **100d**, 102
 - theory of, 25, 36, 96–98, 131–132
 - uplift and, 34–35, 114, 121, 162
- Plesiosaurs*, 142
- plutons, 3, 201–202, **201m**
- Point Sublime, 255–257, 258, 259, **259p**
- Poncha Pass, **263m**
- Ponderosa loop, 175–177
- Poverty Gulch, 190
- preface, vi–vii
- preparedness for exploring features, vi–vii
- Profile Rock radial dike, 283, **283p**, 284, **284p**
- Proghorn Loop, 24, **24m**
- prospectors, 11–13, 93–96, **95p**, 185–188
- Pterosaurs*, 142
- Purdy, Sgt. Willis (Colorado State Patrol), 62, **62p**
- Purgatoire Formation, 241