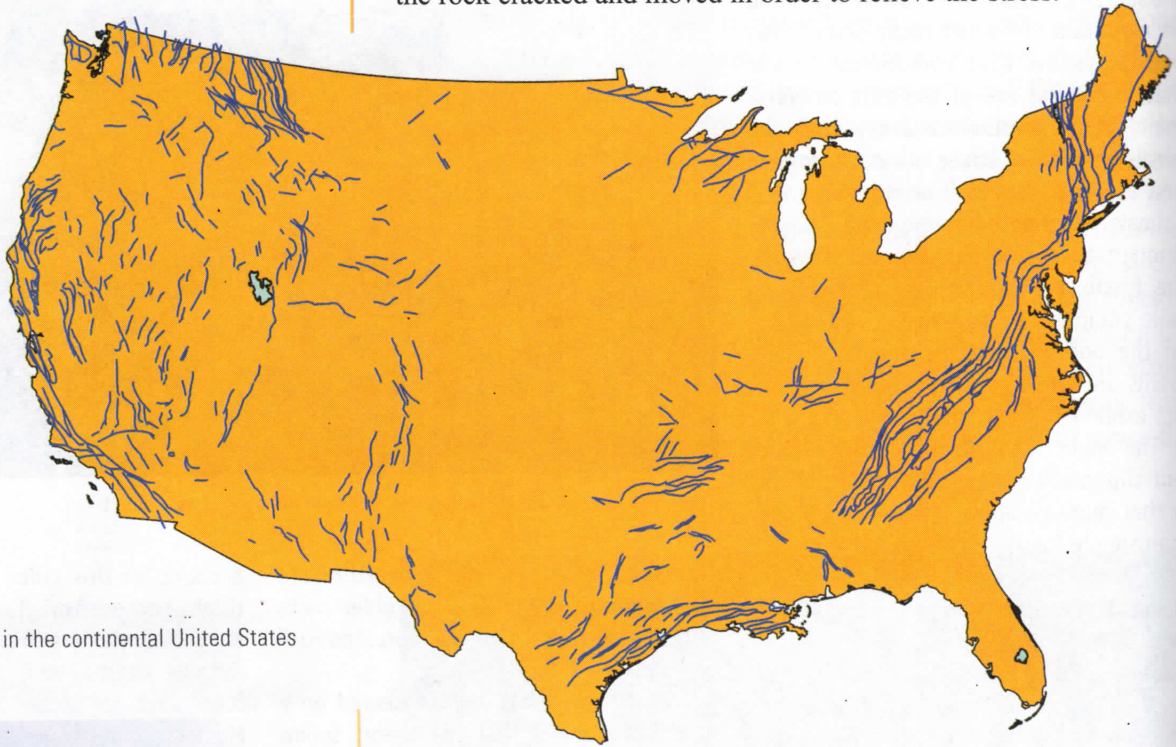


16.9 Fault-Block Mountains

Some mountains formed when large sections of the crust moved along cracks in the rock. A **joint** is a large crack in a rock along which no movement (slippage) has occurred. A crack along which there has been slippage is a **fault**. A fault was caused by a force applied against a rock that caused stress the rock could not relieve by bending; thus, the rock cracked and moved in order to relieve the stress.



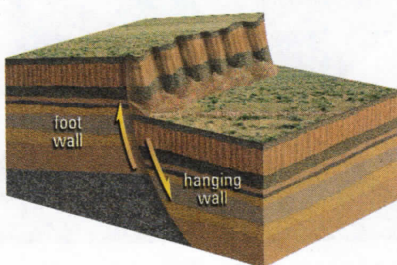
16-15 Major faults in the continental United States

The hanging wall of a fault is the wall on the upper side of the sloping fault line. The footwall is on the underside of the fault. The rock units may move in almost any direction relative to each other across the face of the fault.

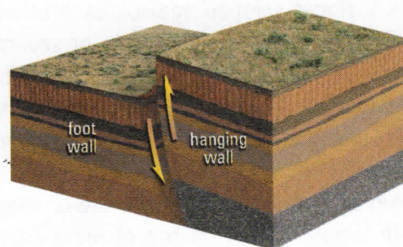
16.10 Kinds of Geologic Faults

Geologists have identified several kinds of faults that describe the relative movement of the bodies of rock on either side of the fault. Assume that the tilt of the fault plane, or its *dip*, is not vertical, as in Figure 16-16. If the body of rock under the fault rises in relation to the rock above the fault (which could actually have dropped), then the fault is called a **normal fault** (figure A). If the opposite motion occurs, so that the body of rock above the fault rises in relation to the other body, then the fault is called a **reverse fault** (figure B). This is particularly true if the fault's angle is more than 45° from the horizontal. If the reverse fault's angle is less than 45° , it is called a **thrust fault**. Finally, if the only motion along the fault is horizontal, then the fault is called a **strike-slip fault** (figure C). The *strike* of a fault is the direction of a horizontal line drawn on the face of the fault. The famous San Andreas fault is a strike-slip fault.

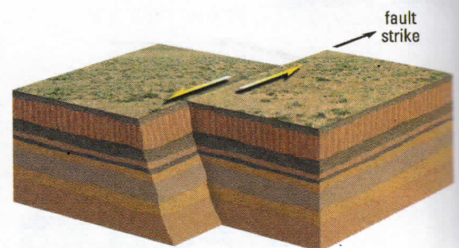
16-16 A normal fault (A), a reverse fault (B), and a strike-slip or transform fault (C)



A. Normal fault

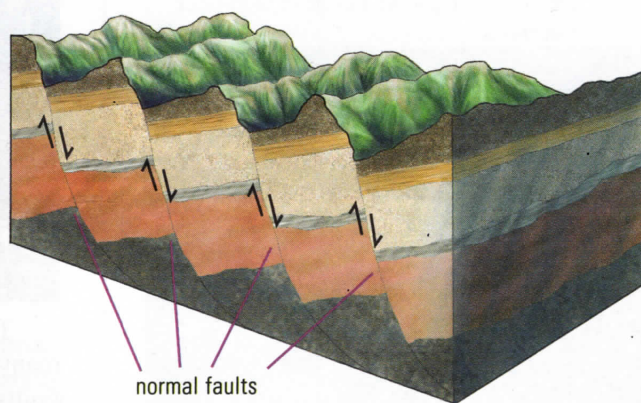


B. Reverse fault



C. Strike-slip (transform) fault

Faulting plays an important role in the **fault-block mountain**, a mountain bounded by one or more normal faults. The Sierra Nevada in California is a classic example of this type. It shows a normal fault in which the surface on the west side of the fault has risen above the level of the surrounding country. This raised block of material is enormous, measuring about 120 km (75 mi) from west



16-17 The Sierra Nevada (left) is made of fault-block mountains. Fault-block mountains are bounded by at least one fault. A landmass on one side of the fault rises above the landmass on the other side (right). It is by no means necessary that the process took millions of years.

to east and about 640 km (400 mi) from north to south. The eastern end has been pushed upward about 3 km (2 mi). Various forces have acted to cut the block into separate mountains having gentle western slopes and steep cliffs on the east. California's highest peak, Mount Whitney, is part of this range.

16-1

NOTABLE MOUNTAINS

Mountain	Location	Height (m)	Year climbed	Notes of interest
Mt. Everest	Nepal/Tibet	8848	1953	highest mountain in the world
Aconcagua	Argentina	6962	1897	tallest mountain in the Western Hemisphere
Mount McKinley	Alaska	6194	1913	tallest mountain in North America
Mount Logan	Yukon Territory	5959	1925	tallest mountain in Canada; one of the most massive mountains in the world, still growing
Kilimanjaro	Tanzania	5895	1889	highest mountain in Africa, formerly snow-capped year round despite proximity to the equator
Mount Elbrus	Republic of Georgia	5642	1874	highest mountain in Europe, extinct volcano
Ararat	Turkey	5165	1829	first major modern climb; a possible site of Noah's ark
Vinson Massif	Antarctica	4897	1966	highest mountain in Antarctica
Matterhorn	Switzerland/Italy	4478	1865	major climb of its sheer cliffs ended the golden age of mountaineering in the Alps
Mount Whitney	California	4418	1873	highest mountain in the lower 48 states
Fuji	Japan	3776	663 (by tradition)	highest mountain in Japan; Shinto and Buddhist religions consider it sacred
Olympus	Greece	2917	1913 (first recorded)	highest mountain in Greece; legendary home of the Greek gods
Sinai	Egypt	2637	Early	name of the peak where Moses received the Law
Mont Kosciuszko	Australia	2228	1834	highest mountain in Australia