

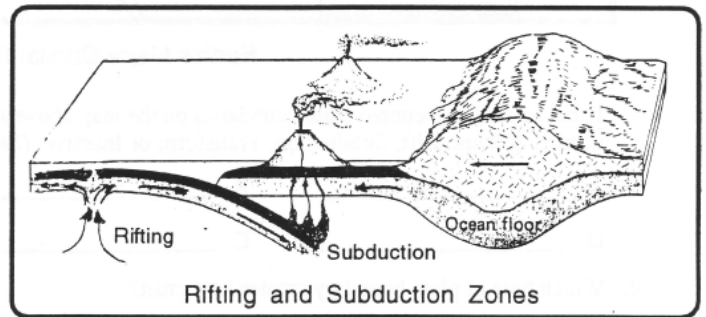
# PLATE DYNAMICS

The regions where the Earth's plates meet are belts of active geologic changes, including earthquakes, volcanic eruptions, and tectonic building. Geologists recognize four types of plate boundaries.

1. **Rift** boundaries occur where two plates are pulling apart as a new crust is created. The mid-ocean ridges and continental rift valleys, like the Dead Sea valley in the holy land, and the Great Rift Valley of Africa, are examples of rift zones. The nation of Iceland is now being pulled apart by rifting.
2. **Subduction** zones occur where plates collide and one plate (usually an oceanic plate) is diving beneath another. In the oceans, subduction zones are usually found at the deep ocean trenches. And, as one landmass collides with another, the collision can pile up great mountain ranges. The Himalayan Mountains are a prime example, where the Indian landmass is colliding with Asia.
3. At **transform** (or rational) boundaries, one plate slides past another. The San Andreas Fault that runs from Baja California northward past San Francisco is a well known example of a transform plate boundary. The western edge of California is slowly moving northward along the San Andreas Fault.
4. **Inactive** interfaces are places where there is little or no relative motion of the plates. Some geologists consider the Red Sea, between Africa and Saudi Arabia, to be a temporarily inactive plate boundary.

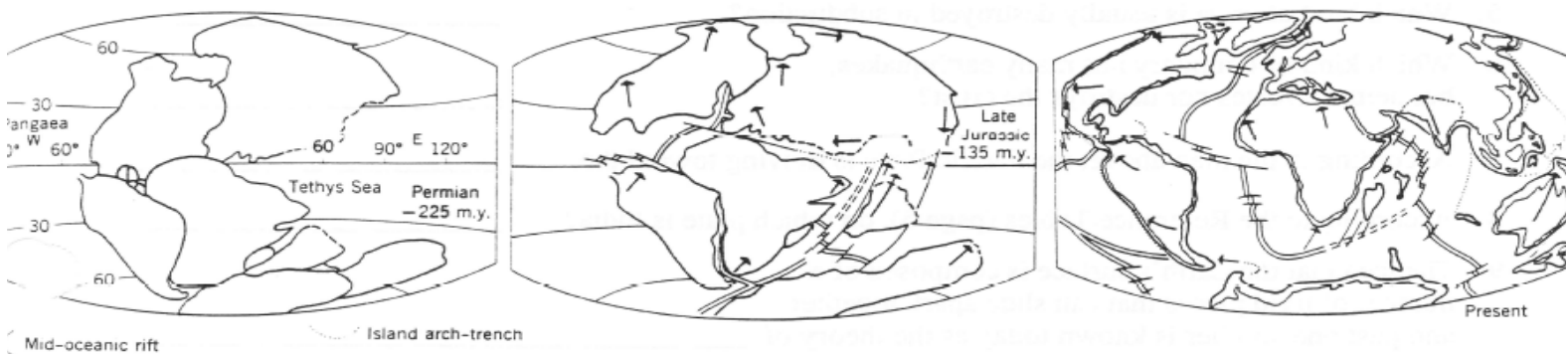
Actually, most plate boundaries show a mixture of these relative motions of separation, convergence, and slippage.

This diagram shows a profile of a diverging rift and a nearby converging subduction zone. Where geologists can locate ancient plate boundaries they often find associated mineral deposits, like the copper ores of Cyprus.

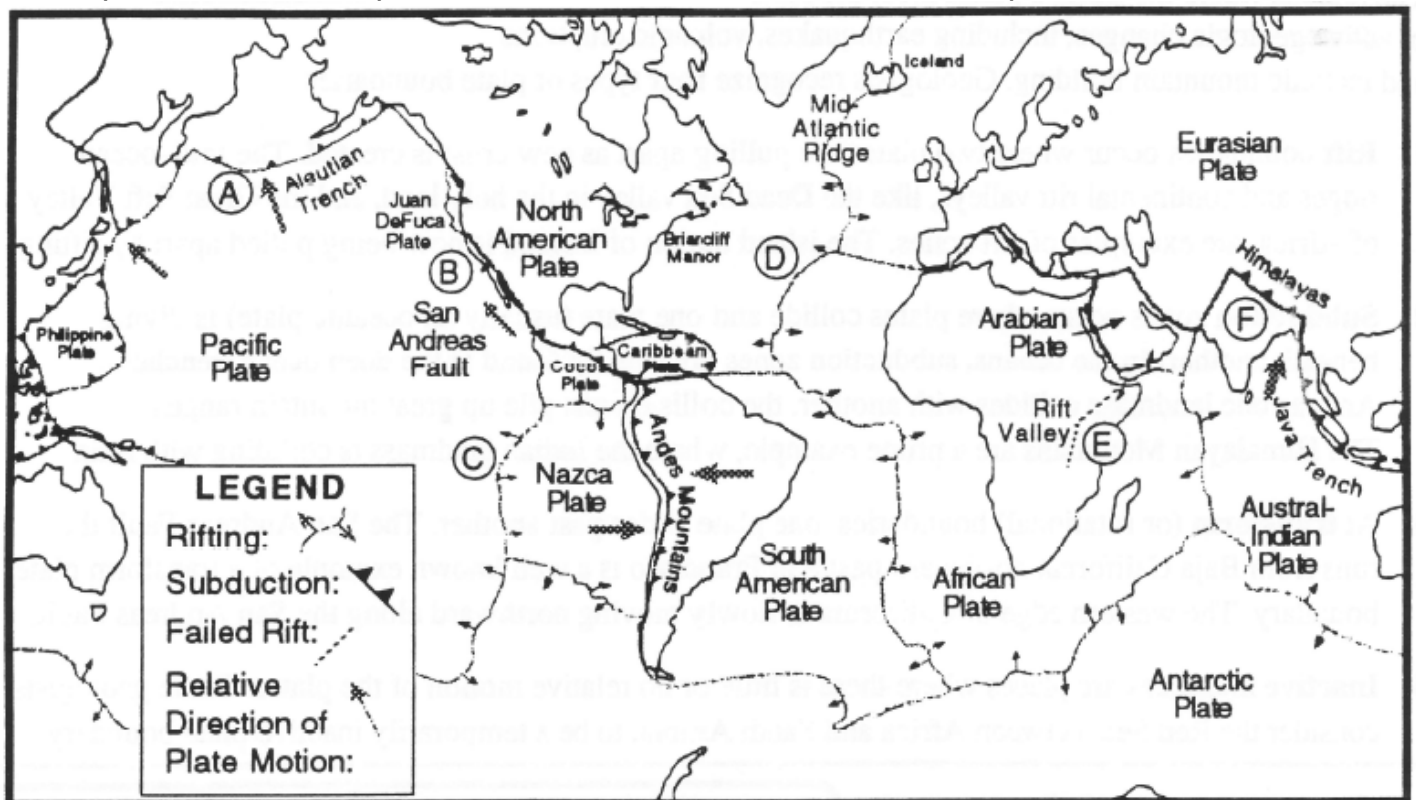


The series of maps below show our reconstruction of motion of Earth's plates for the past 225 million years. This sequence also shows the birth of two of the world's largest oceans, the

\_\_\_\_\_ Ocean and the \_\_\_\_\_ Ocean.



This map is a modern interpretation of the relative motions at Earth's plates



Earth's Major Crustal Plates

- Label each of the lettered plate boundaries on the map above according to the relative motion that is occurring there: Rift, Subduction, Transform or Inactive. (See the map key for symbol)  
 A. \_\_\_\_\_ B. \_\_\_\_\_ C. \_\_\_\_\_  
 D. \_\_\_\_\_ E. \_\_\_\_\_ F. \_\_\_\_\_
- Which type of plate boundary creates new crust?  
 \_\_\_\_\_
- What kind of crust is nearly always created at a rift zone?  
 \_\_\_\_\_
- Which kind of plate boundary destroys part of the crust?  
 \_\_\_\_\_
- Which kind of crust is usually destroyed in subduction?  
 \_\_\_\_\_
- Which kind of boundary has many earthquakes, but neither creates nor destroys the crust?  
 \_\_\_\_\_
- According to the map above, the Pacific Plate is moving toward the...  
 \_\_\_\_\_
- According to Reference Tables (page 5), on which plate is India?  
 \_\_\_\_\_
- The idea that the Earth's surface is composed of a number of rigid pieces that can slide apart, together and past one another is known today as the theory of \_\_\_\_\_