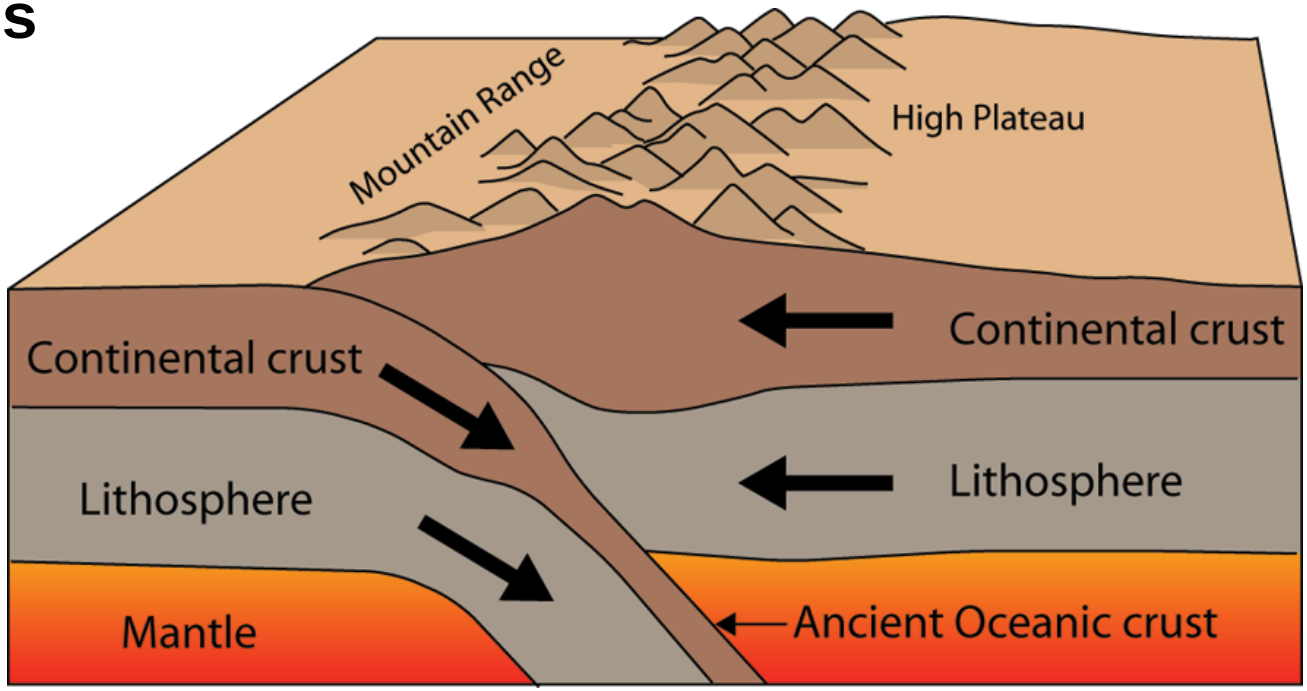
What is Orogeny?

Essentially mountain-building process driven by Plate Tectonics

Mountain-building takes place principally by Collisional Tectonics



An ideal example is the Himalaya

Anatomy of continents

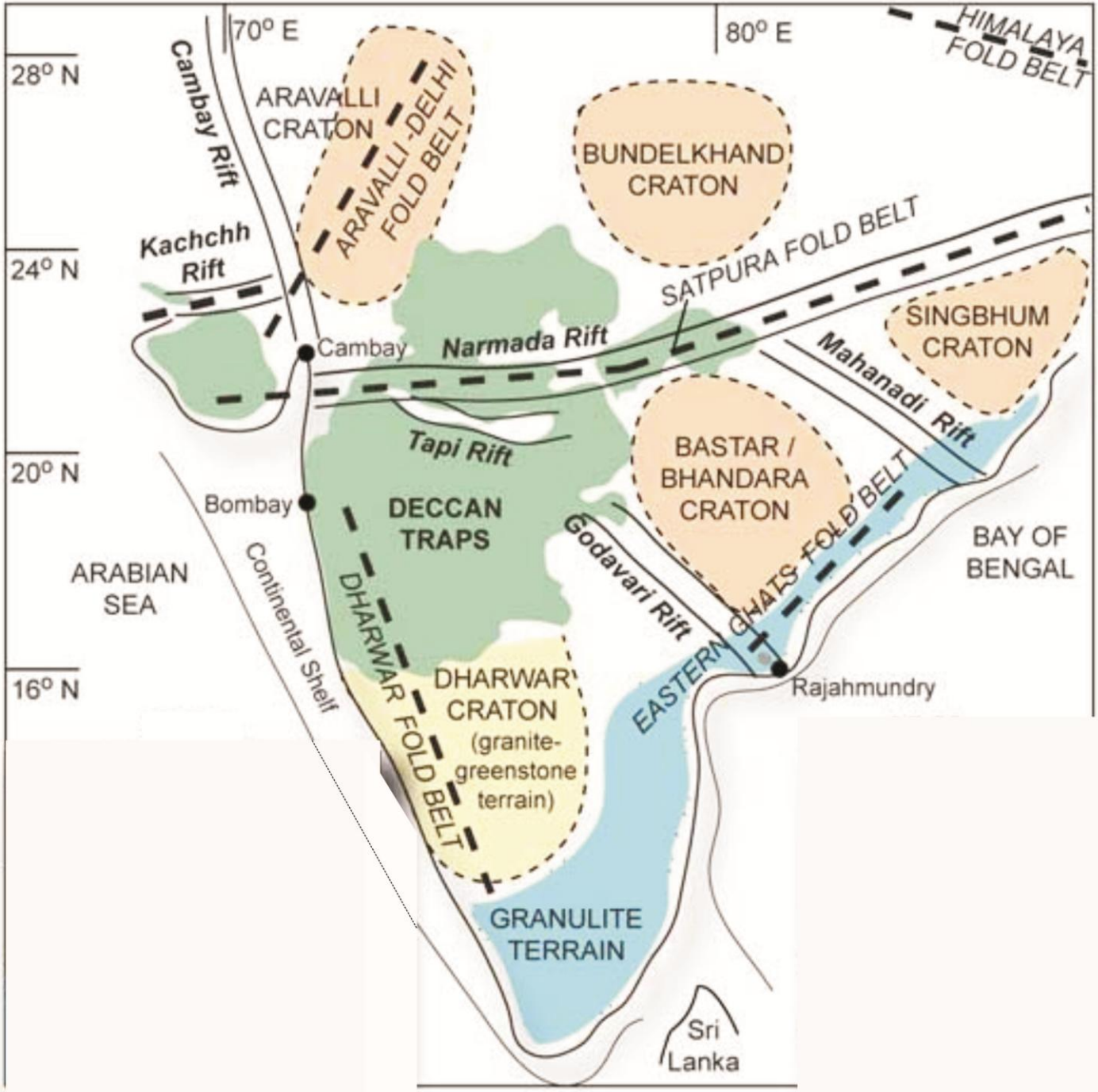
Continents consist of:

1. **Cratons: Stable part consisting of old rocks**
2. **Fold Belts: Both old (was tectonically active) and young (tectonically active in present day)**

Cratons are further divided into:

A. **Shield: Where older igneous/metamorphic rocks are exposed (>2500 Million years)**
B. **Platform: Old sedimentary rocks are exposed (usually 1000-1800 Million years old)**

Orogeny: Mountain building process
(Remember Convergent Plate Boundaries)



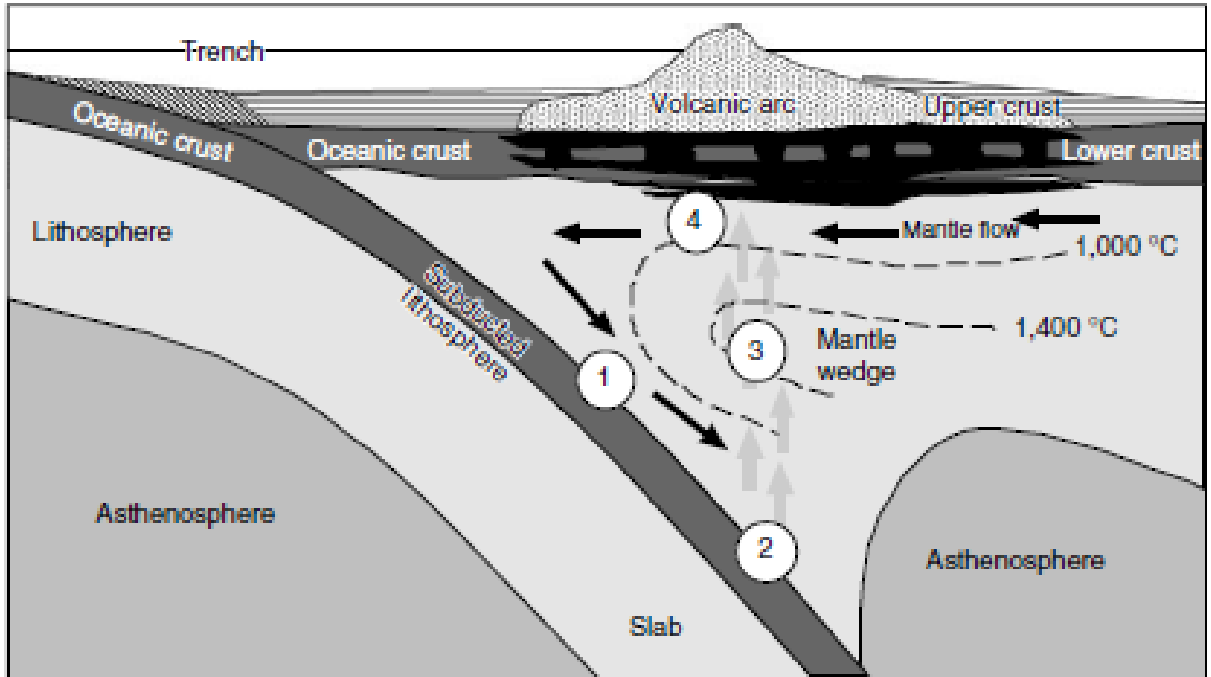
Tectonic divisions of India

How continents grow?

1. Magmatic Addition

a. Subduction of oceanic plate beneath a continental plate- melting of the subducted plate & melting in the upper mantle wedge above the subducted plate due to transfer of water from the subducting plate- production of acidic to intermediate magmas that add to the prexisting continental plate- example Andes

b. Subduction of oceanic plate beneath oceanic plate- formation of mafic-intermediate-acidic magmas constituting island arcs (e.g. Japan, Philipines). Island arcs can merge into thick continental crust. Island arcs can accrete to continental m



b. Crustal growth through intraplate magmatism

Examples include continental flood basalts (our Deccan Traps) , which are not directly related to subduction. Because of the size, these are called Large Igneous Province (LIP). The sites are called Mantle Hotspots- very large amount of magma In a short period of time, lot of melting in the mantle- plumes?

c. Crustal growth at rifted margins- rifts in continents (East African Rift)- magmatism from the mantle to form new crust

2. Continental accretion

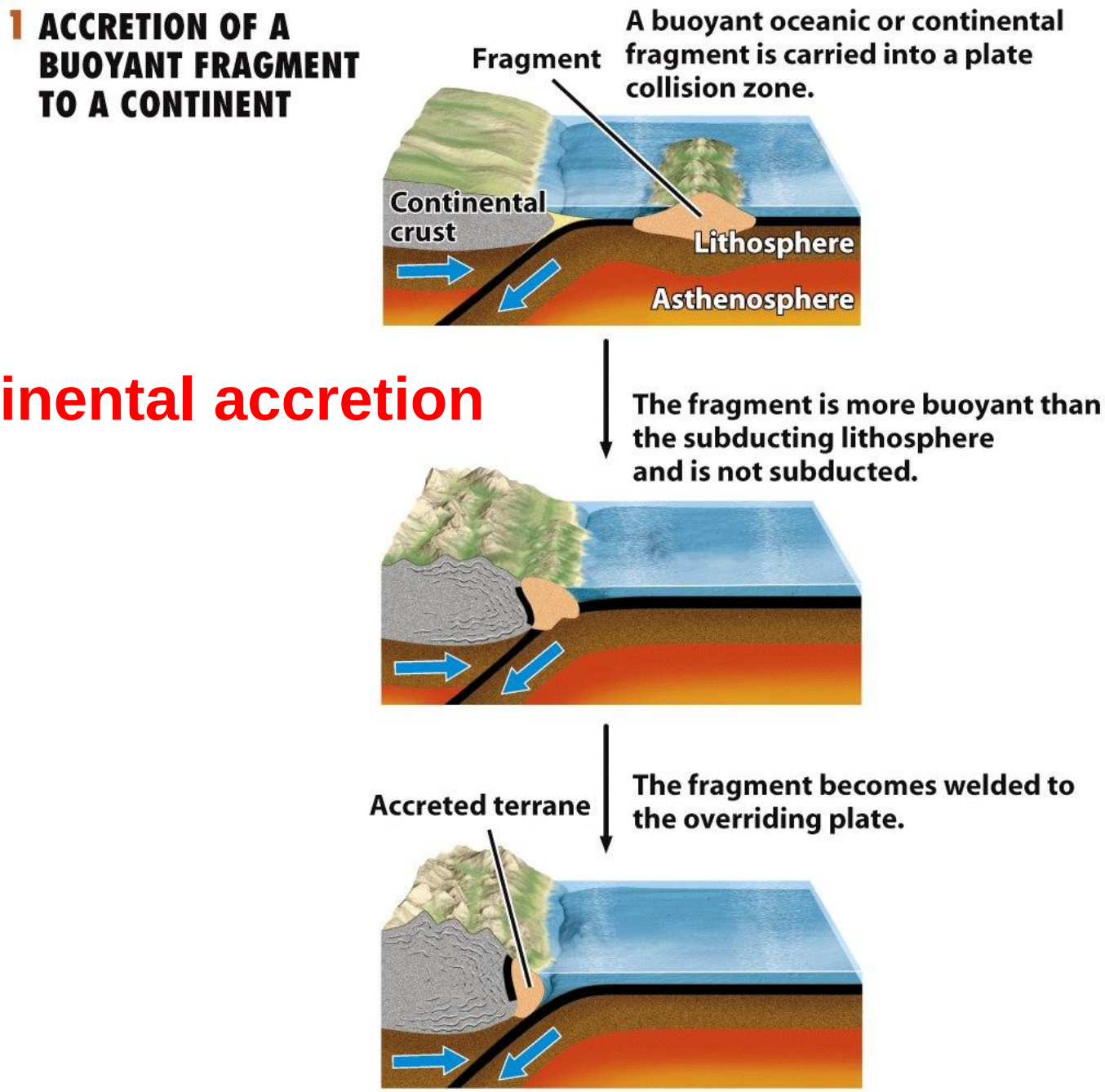


Figure 10-12 part 1
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2 ACCRETION OF AN ISLAND ARC TO A CONTINENT

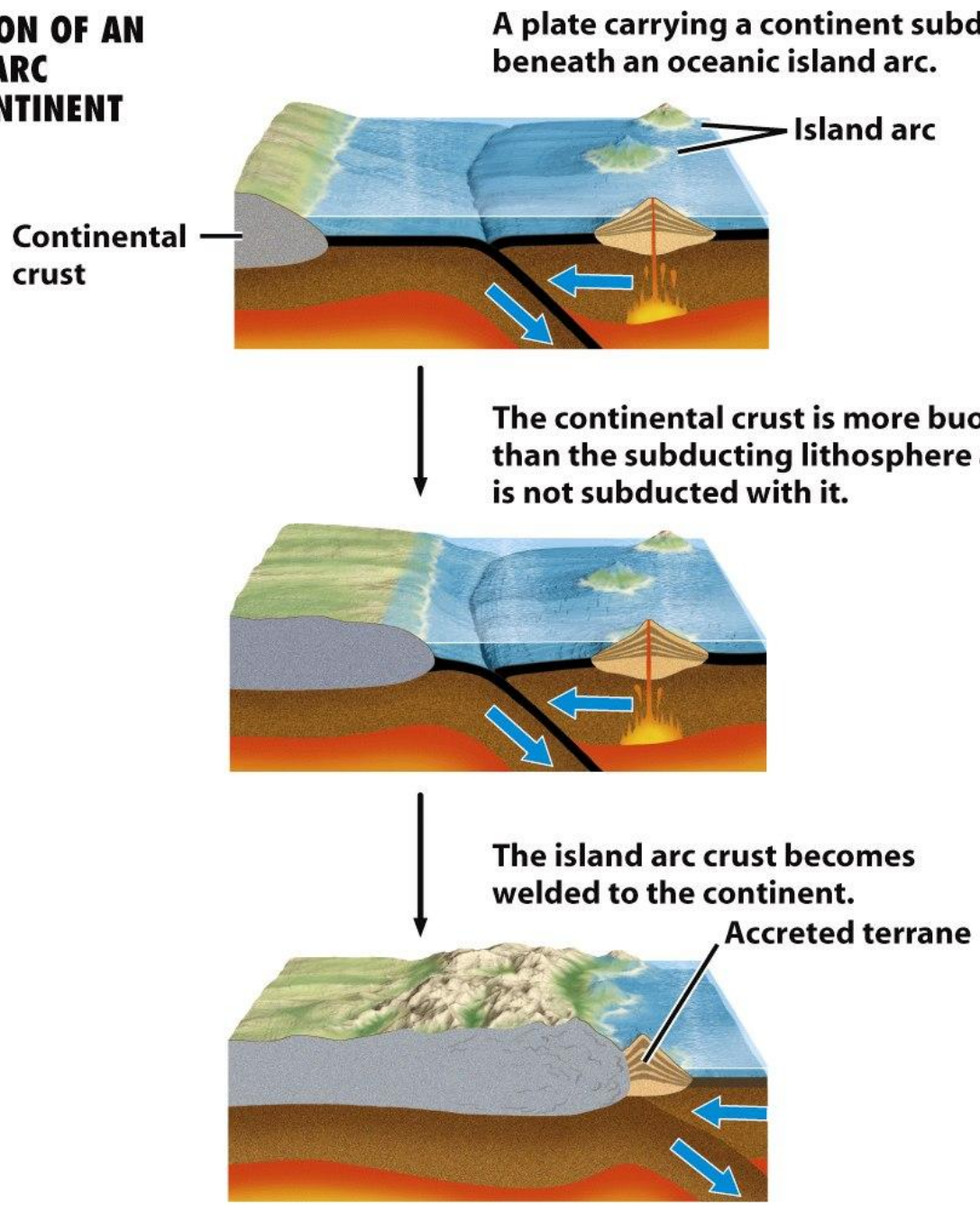

Figure 10-12 part 2
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3 ACCRETION ALONG A TRANSFORM FAULT

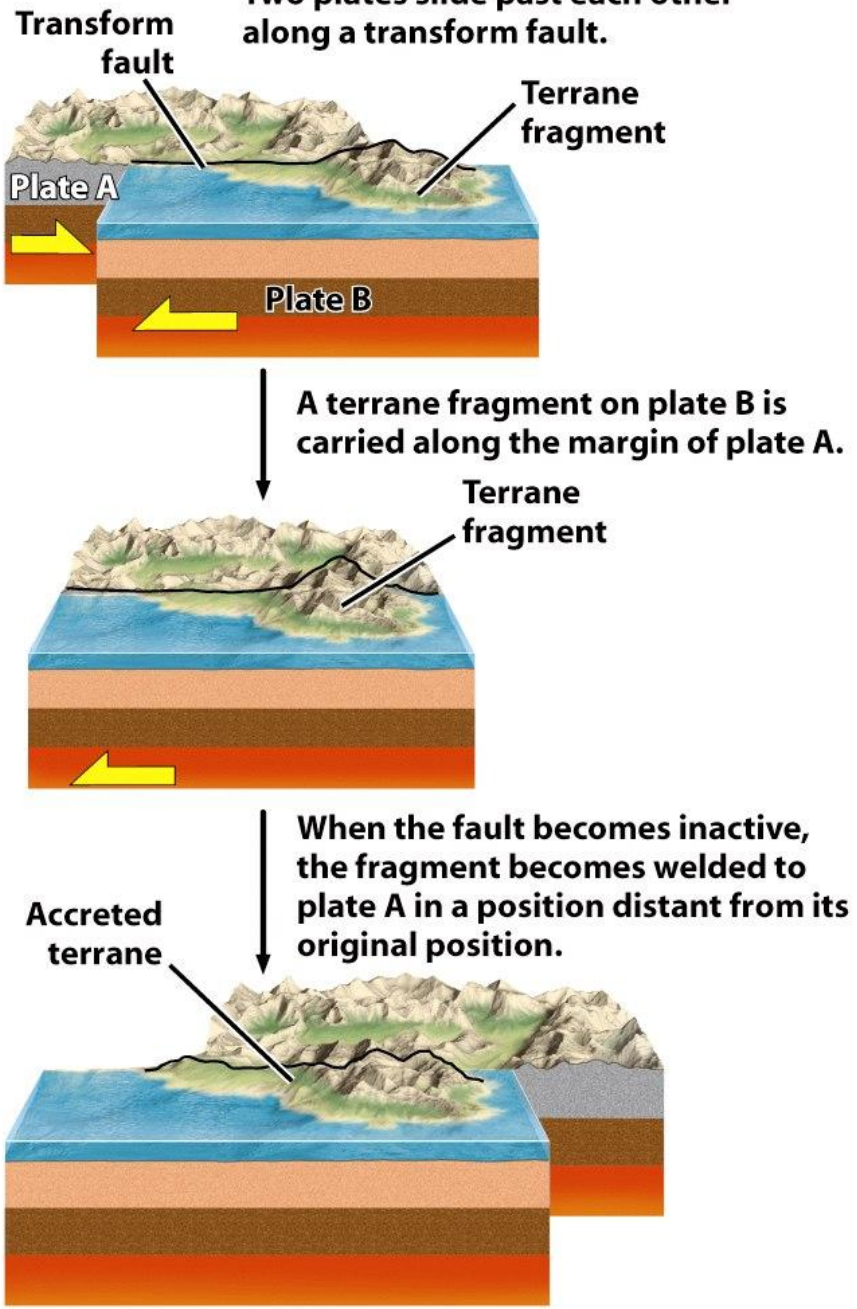

Figure 10-12 part 3
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4 ACCRETION BY CONTINENTAL COLLISION AND RIFTING

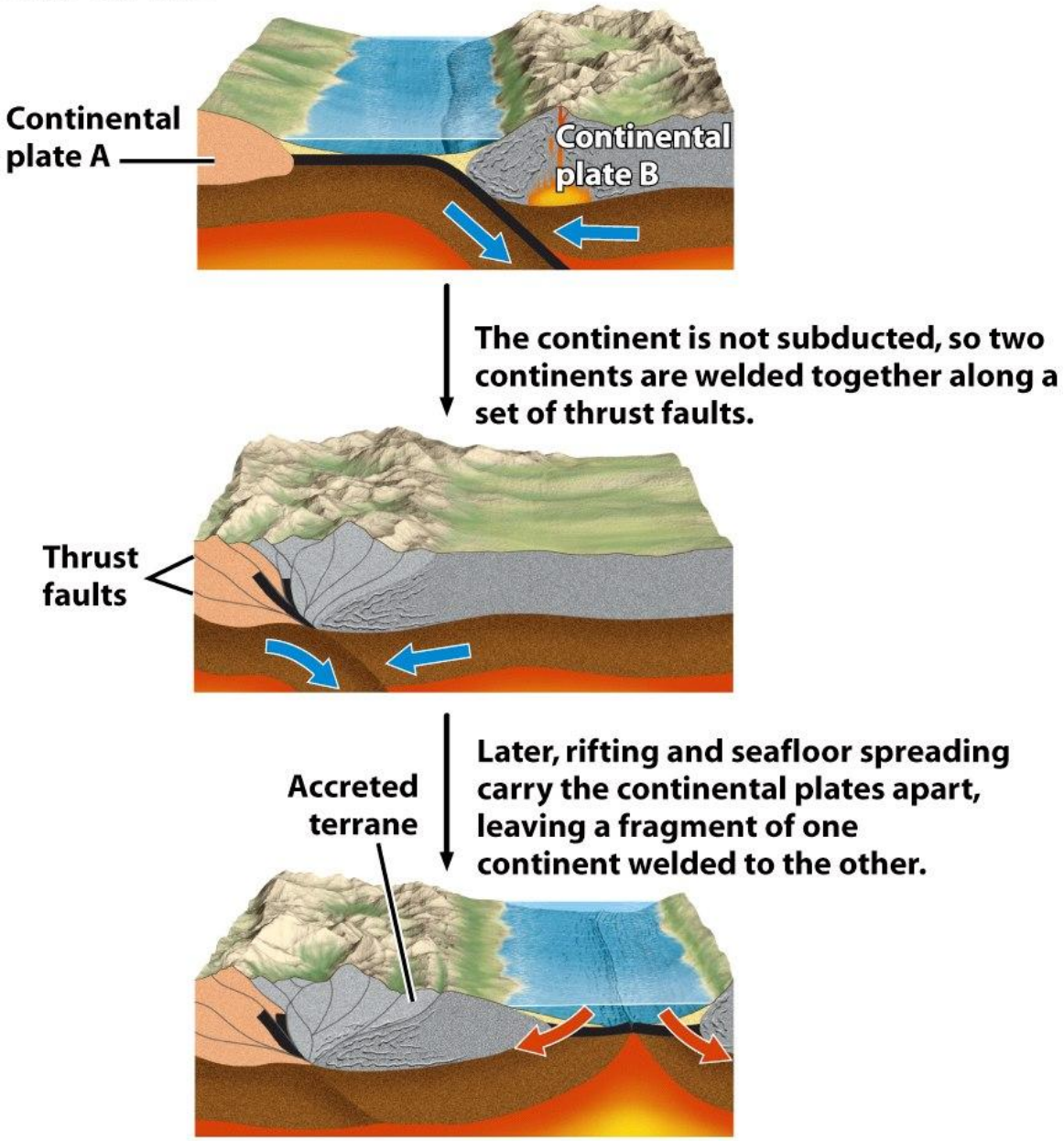

Figure 10-12 part 4
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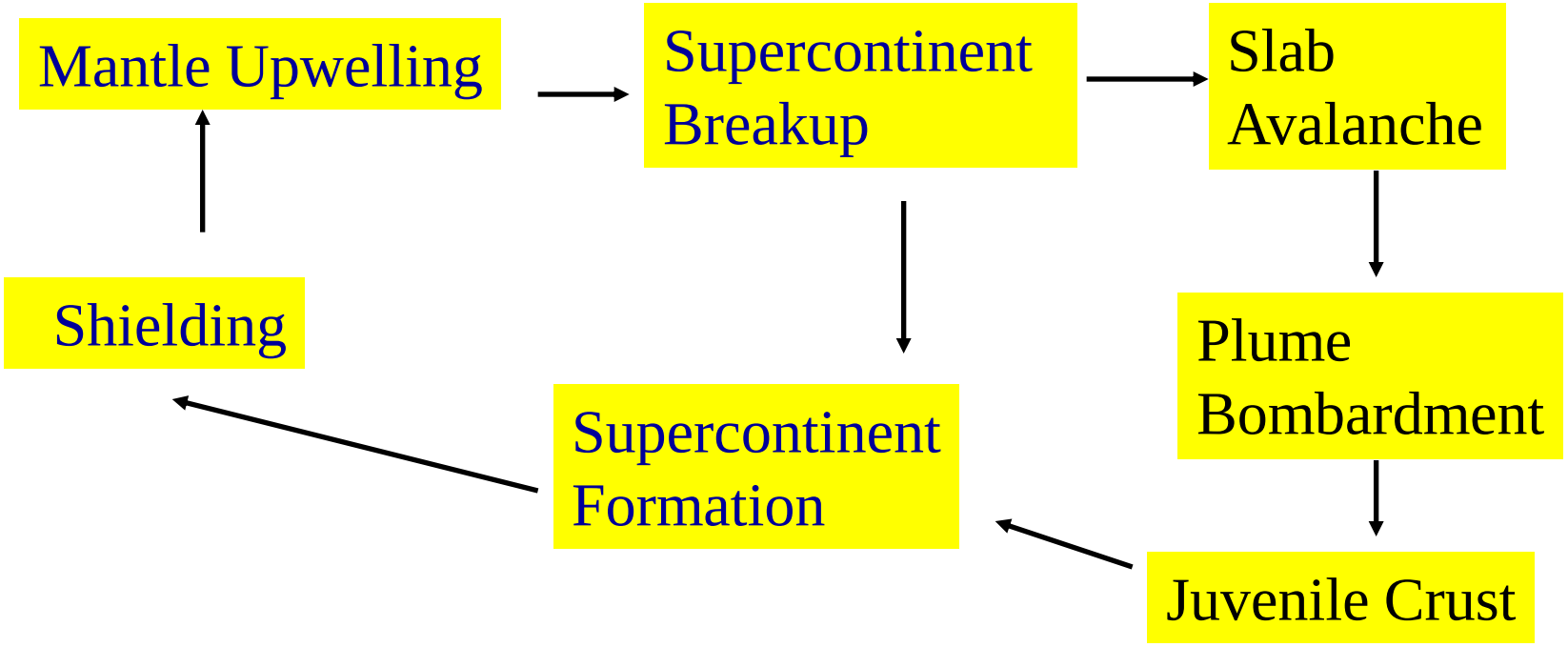
Supercontinent Cycle



Supercontinent Cycle : The Supercontinent Cycle controls all geological phenomena

History of the Continents in the last 3 billion years