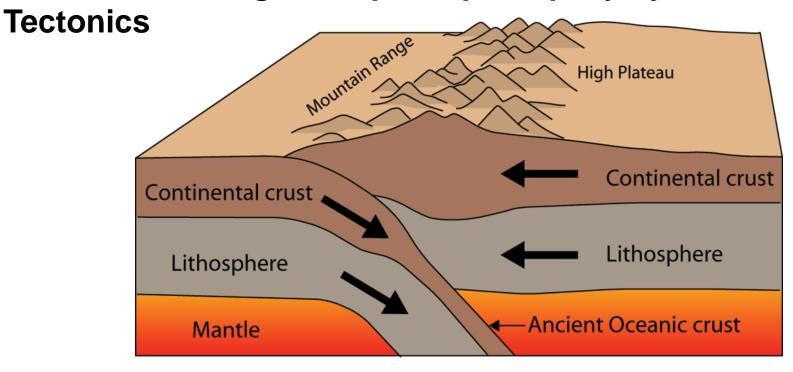
What is Orogeny?

Essentially mountain-building process driven by Plate Tectonics

Mountain-building takes place principally by Collisional



An ideal example is the Himalaya

Anatomy of continents

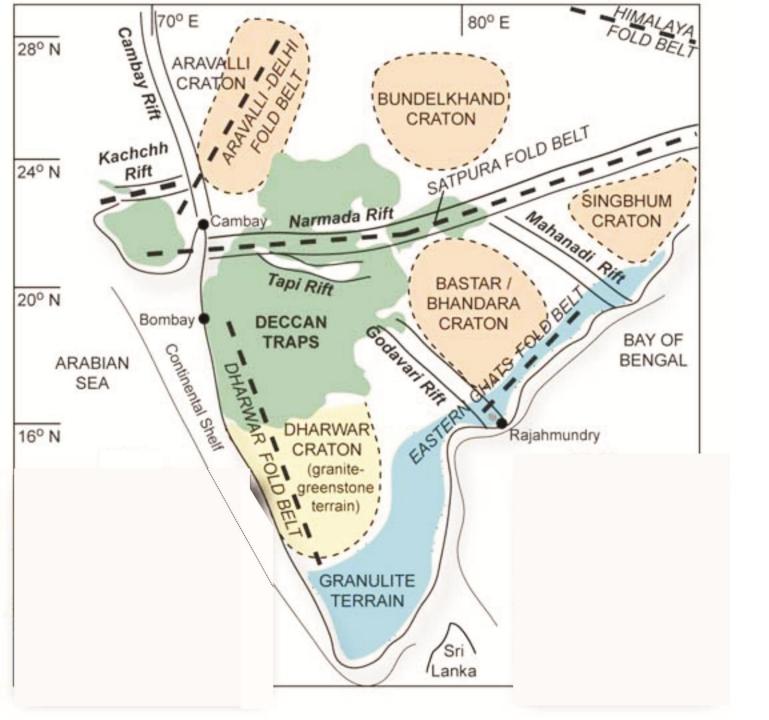
Continents consist of:

- 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

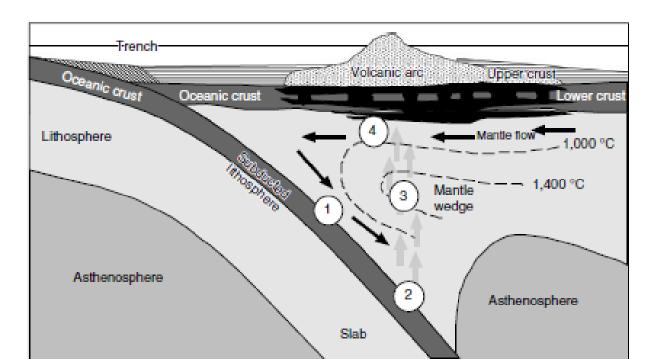
How continents grow?

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 plateproduction 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

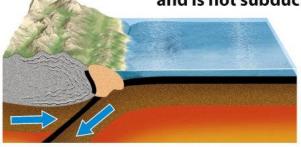
Examples include continental flood basalts (our Deccan Traps), which are not directly related to subduction. Because of the size, these are called Large Igneous Province (LIP). The sites are called Mantle Hotspots- very large amount of magma In a short period of time, lot of melting in the mantle- plumes?

c. Crustal growth at rifted margins - rifts in continents (East African Rift) - magmatism from the mantle to form new crust 1 ACCRETION OF A BUOYANT FRAGMENT TO A CONTINENT A buoyant oceanic or continental fragment is carried into a plate collision zone.



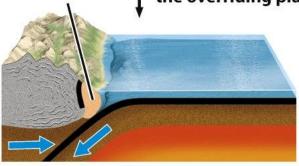
2. Continental accretion

The fragment is more buoyant than the subducting lithosphere and is not subducted.



Accreted terrane

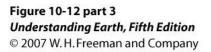
The fragment becomes welded to the overriding plate.



A plate carrying a continent subducts 2 ACCRETION OF AN beneath an oceanic island arc. **ISLAND ARC** TO A CONTINENT - Island arc Continental crust The continental crust is more buoyant than the subducting lithosphere and is not subducted with it. The island arc crust becomes welded to the continent. **Accreted terrane**

Figure 10-12 part 2
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ACCRETION ALONG Two plates slide past each other **Transform** along a transform fault. A TRANSFORM FAULT fault Terrane fragment Plate A Plate B A terrane fragment on plate B is carried along the margin of plate A. **Terrane** fragment When the fault becomes inactive, the fragment becomes welded to plate A in a position distant from its **Accreted** original position. terrane



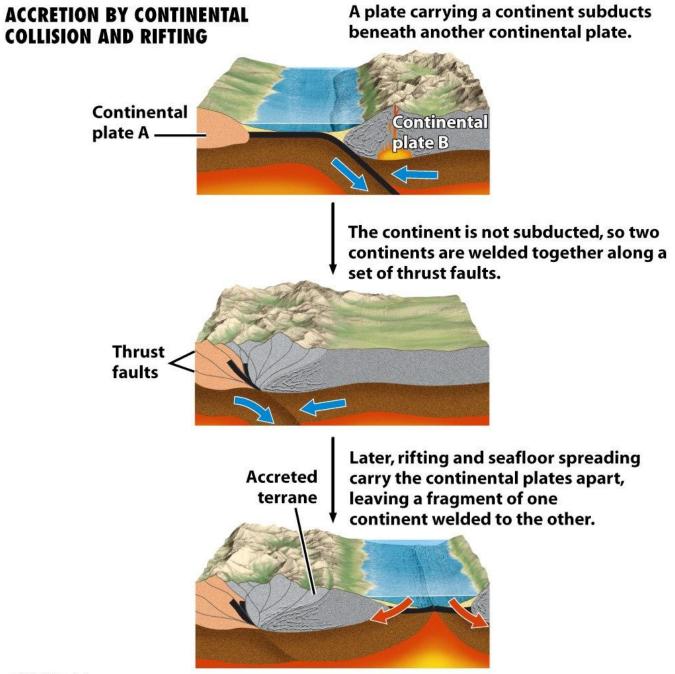
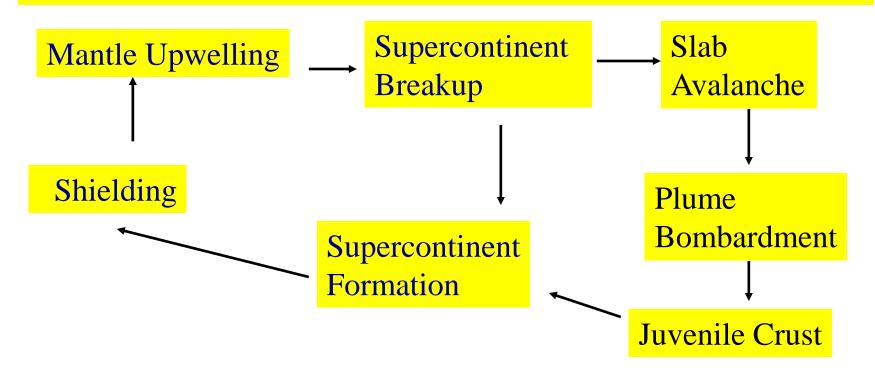


Figure 10-12 part 4

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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

