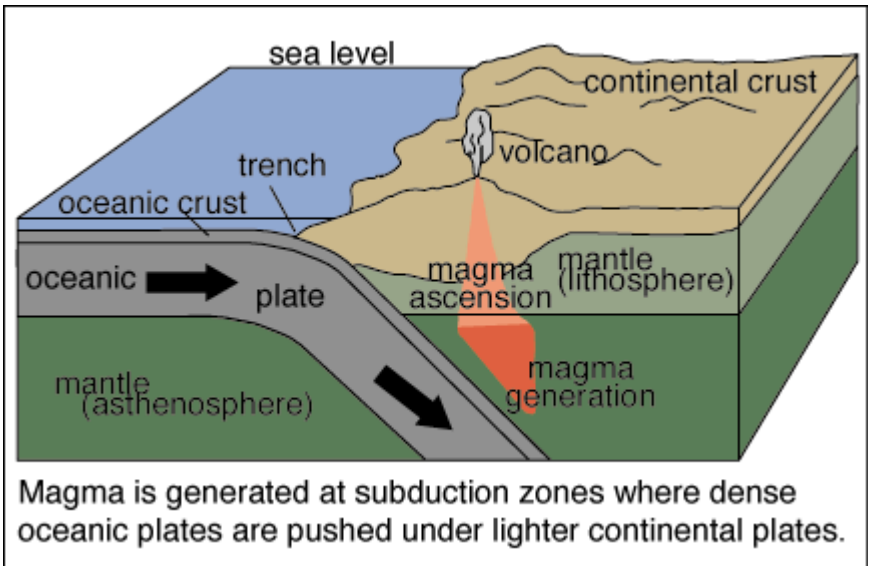
**Subduction**

If new oceanic lithosphere is created at mid-ocean ridges, where does it go? Geologists had the answer to this question before Vine and Matthews presented their hypothesis. In 1935, K. Wadati, a Japanese seismologist, showed that earthquakes occurred at greater depths towards the interior of the Asian continent. Earthquakes beneath the Pacific Ocean occurred at shallow depths. Earthquakes beneath Siberia and China occurred at greater depths. After World War II, H. Benioff observed the same distribution of earthquakes but could not offer a plausible explanation.



Magma is generated at subduction zones where dense oceanic plates are pushed under lighter continental plates.

The movement of oceanic lithosphere away from mid-ocean ridges provides an explanation. Convection cells in the mantle help carry the lithosphere away from the ridge. The lithosphere arrives at the edge of a continent, where it is subducted or sinks into the asthenosphere. Thus, oceanic lithosphere is created at mid-ocean ridges and consumed at subduction zones, areas where the lithosphere sinks into the asthenosphere. Earthquakes are generated in the rigid plate as it is subducted into the mantle. The dip of the plate under the continent accounts for the distribution of the earthquakes. Magma generated along the top of the sinking slab rises to the surface to form stratovolcanoes.

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