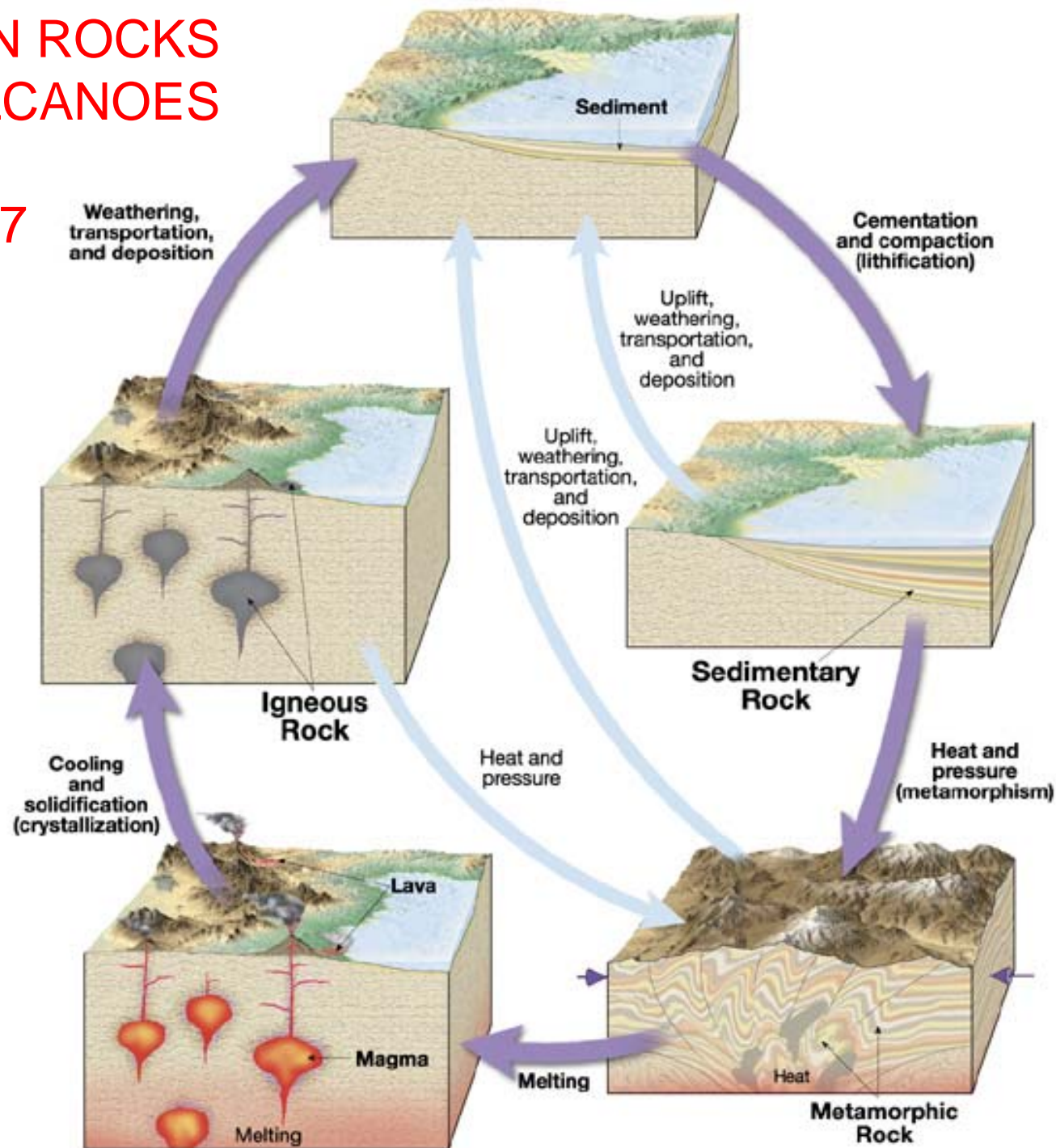


MORE ON ROCKS AND VOLCANOES

LESSON 7



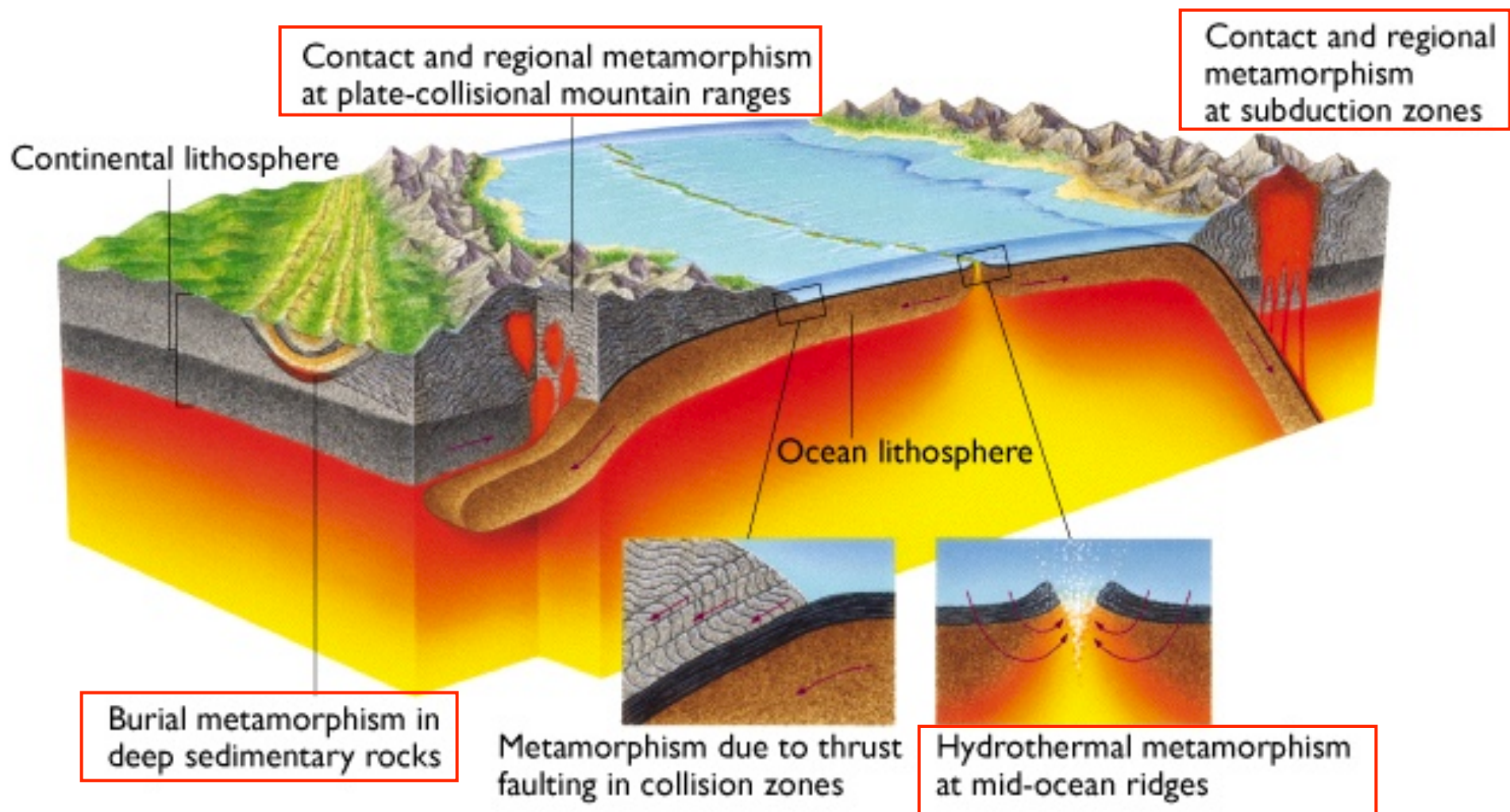
Metamorphism

From "meta" = change
and "morph" = shape

The transformation of rocks
at high temperatures and
pressures.

3 kinds: regional (burial),
contact, hydrothermal

Metamorphism at Plate Margins

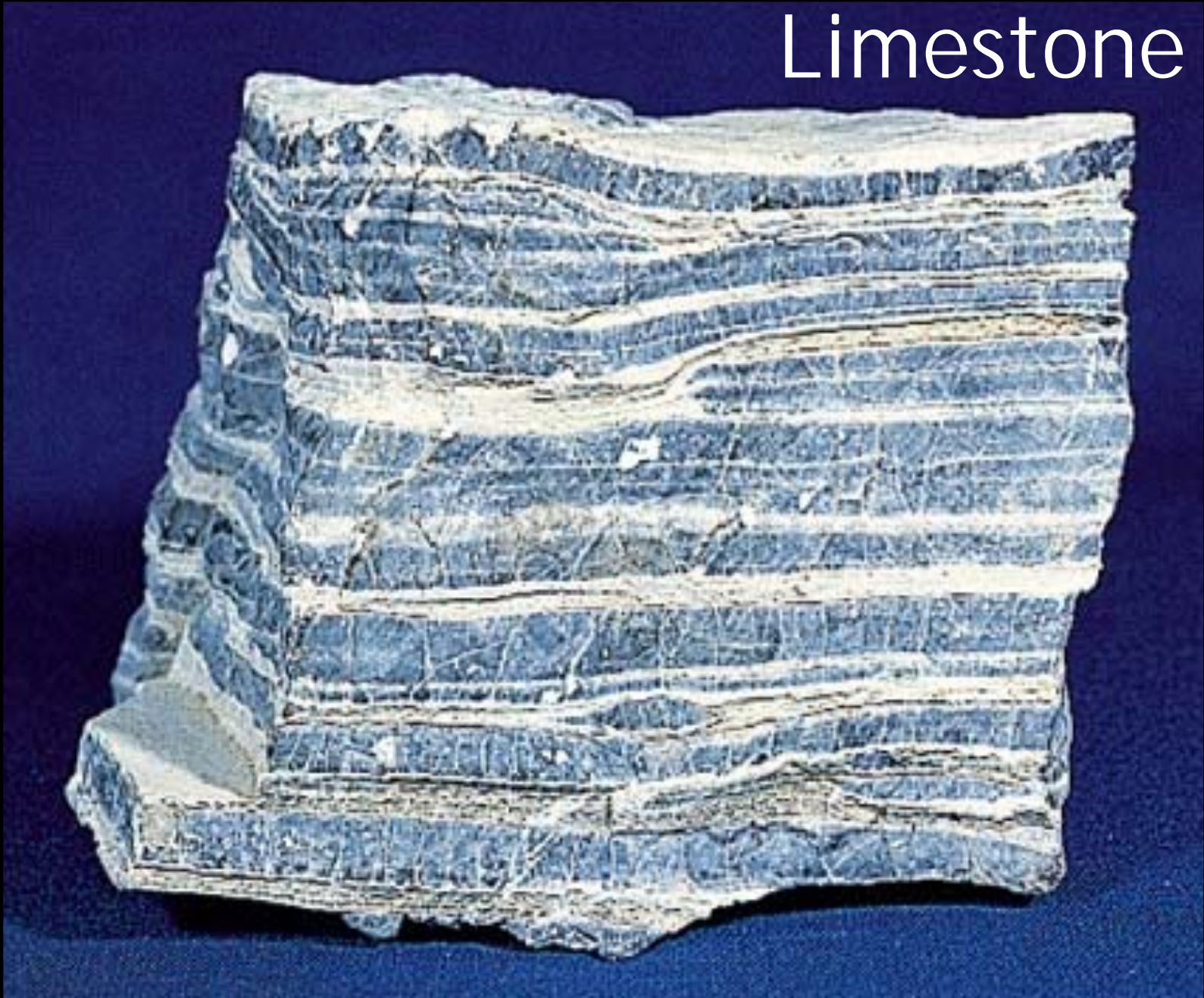


Metamorphism leads to changes in:

1) Rock Texture

2) Mineralogy

Limestone





Marble

Sandstone



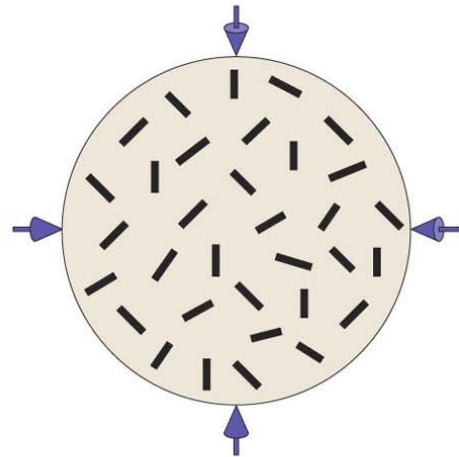
(b)



Quartzite

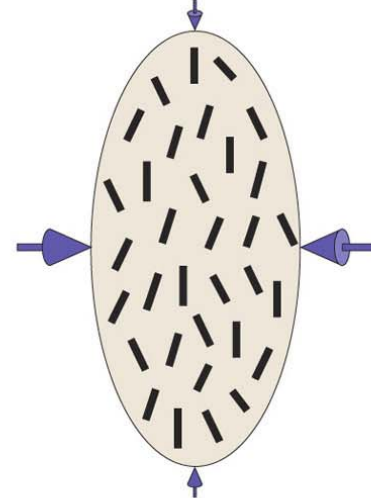


Development of foliation



A.

Before metamorphism
(Uniform stress)



B.

After metamorphism
(Differential stress)





Shale

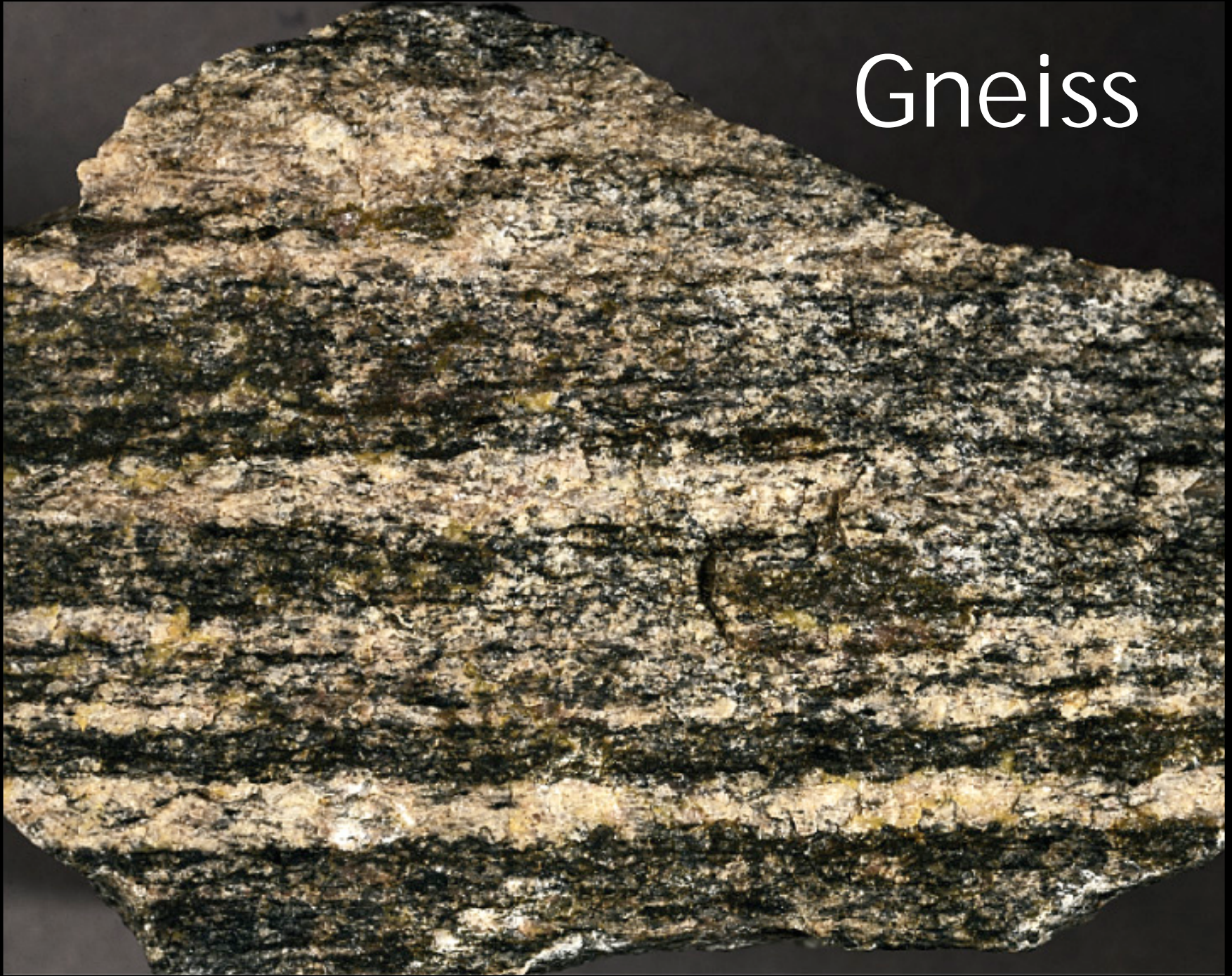
Slate



Schist



Gneiss

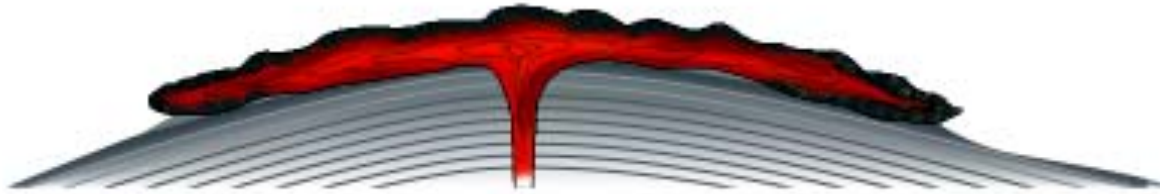




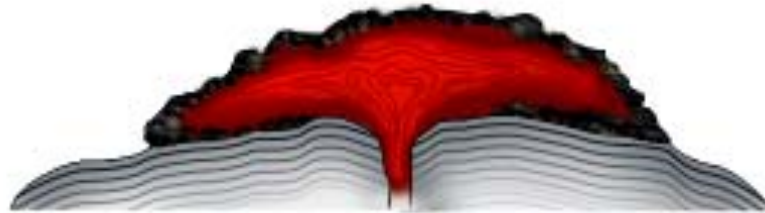
Runny Basalt - Shield Volcano

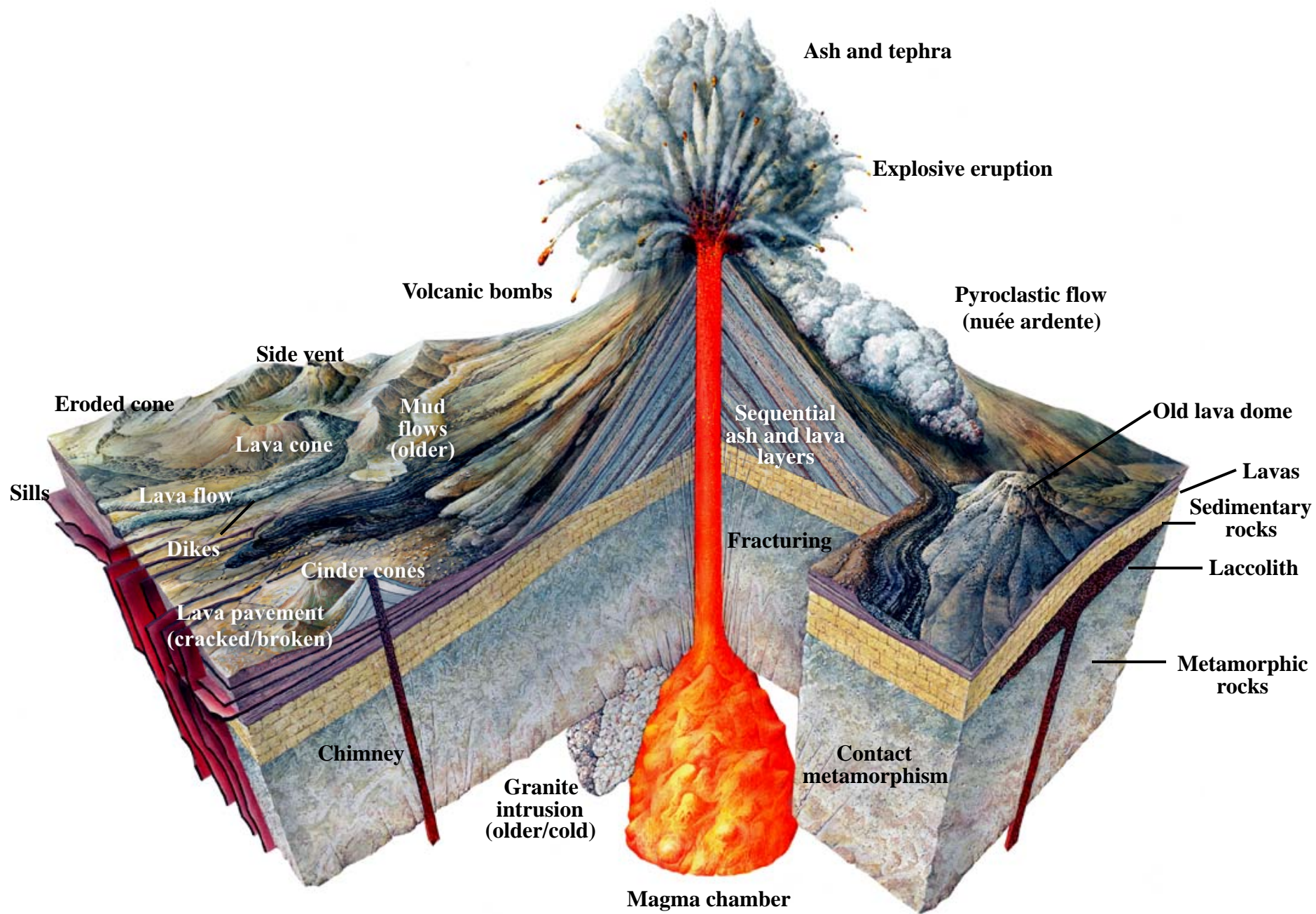


Thick Andesite - Stratovolcano



Thickest Rhyolite - Stratovolcano

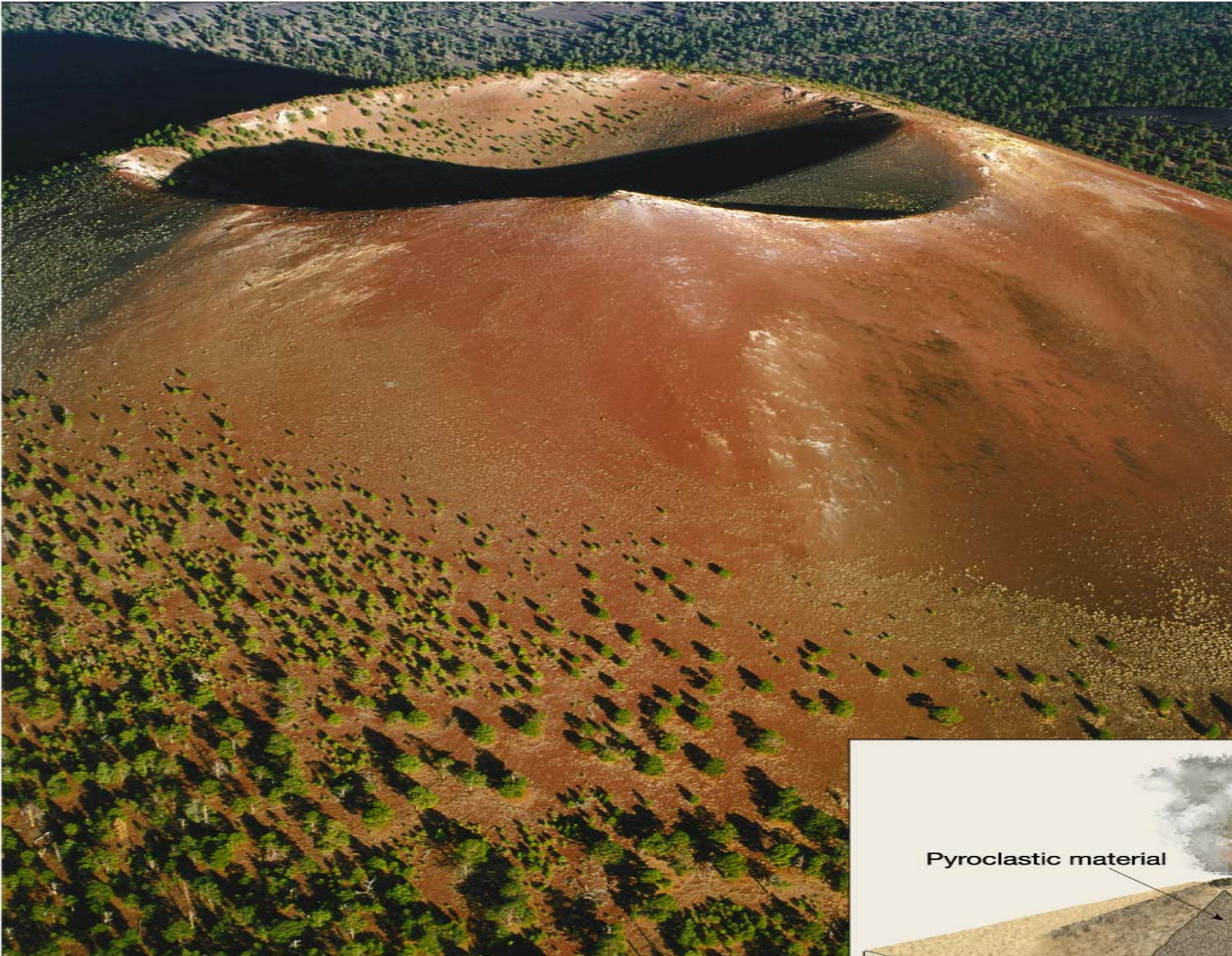






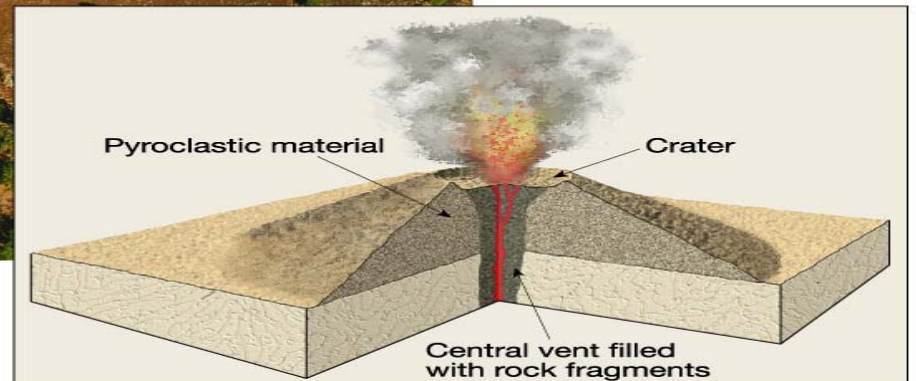
Big Island of Hawaii

Cinder Cones



Sunset Crater

Near
Flagstaff, AZ

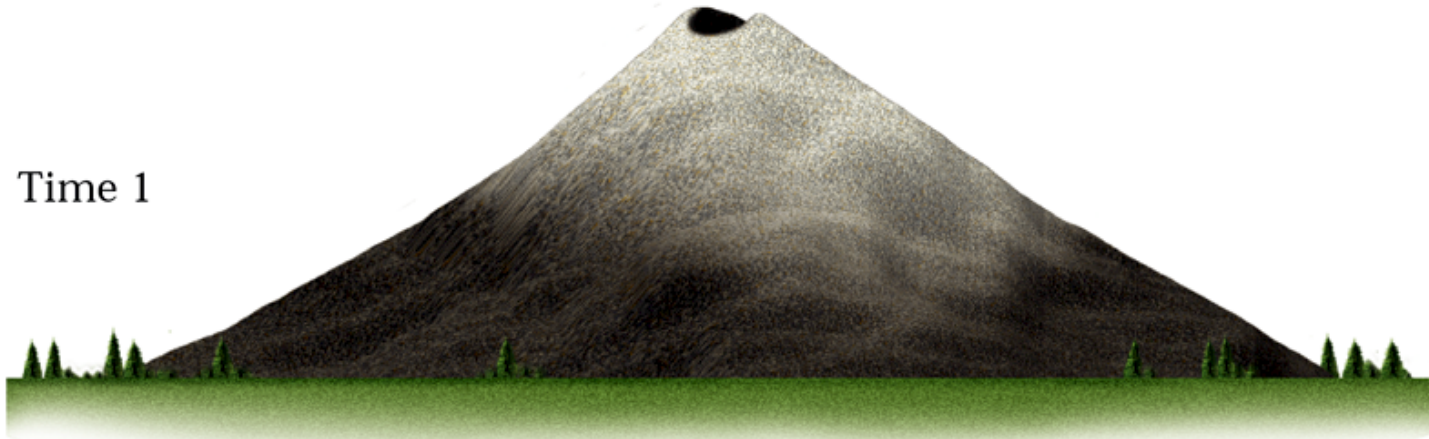


Stratovolcano or Composite Cone

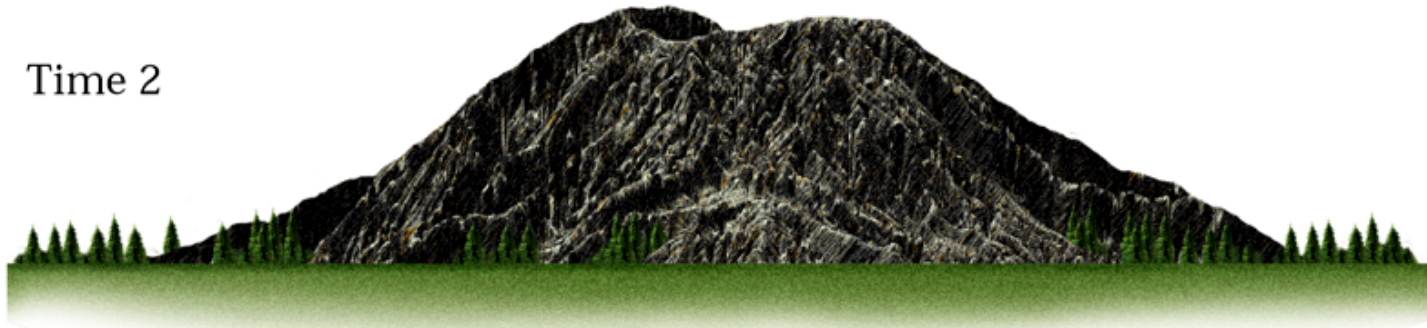
Mt. Shasta, CA



Time 1

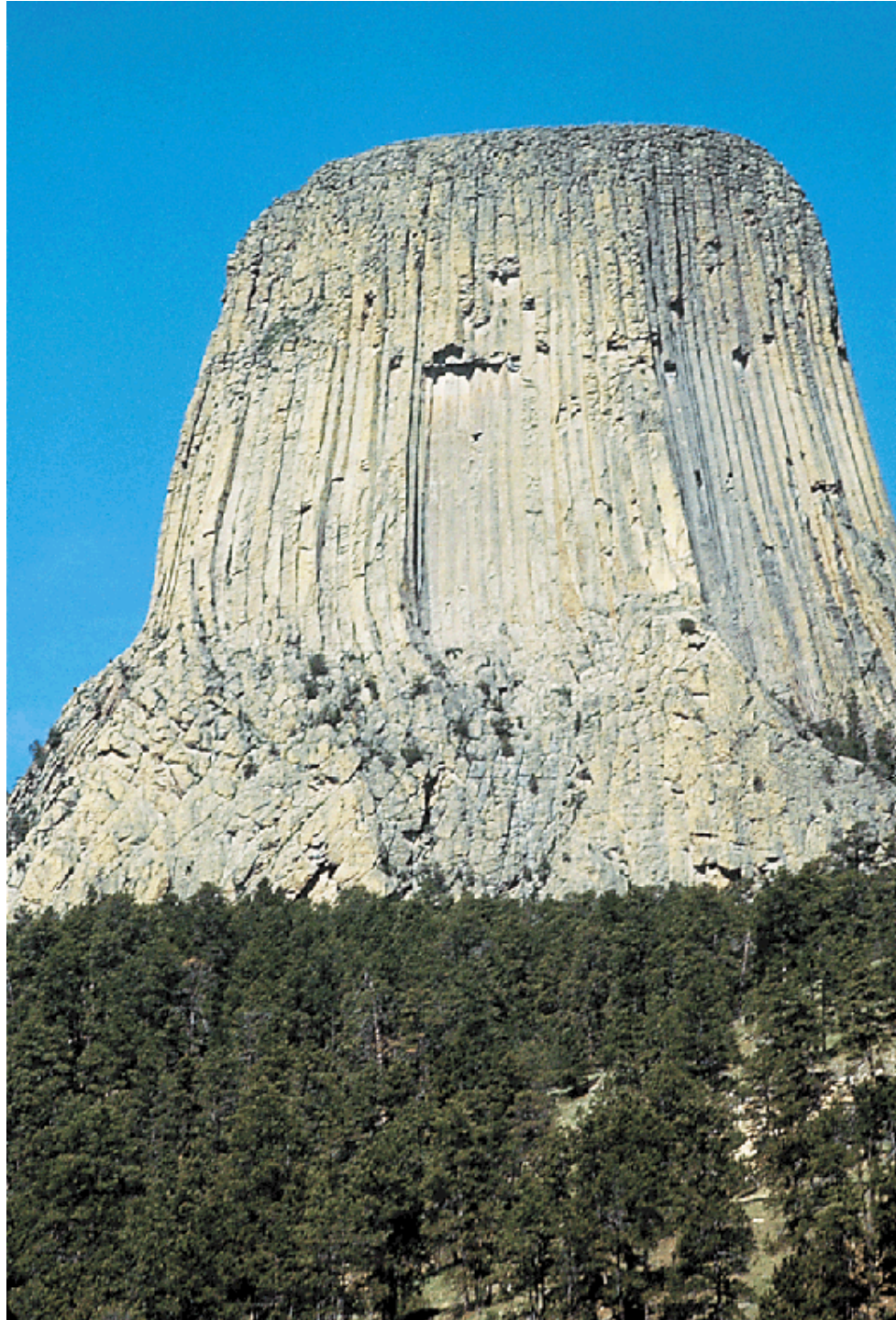


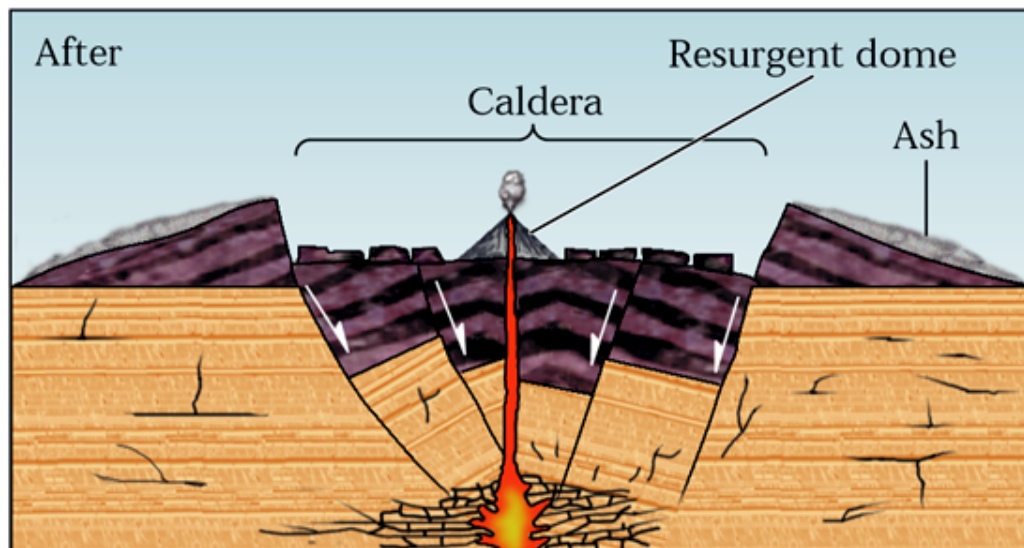
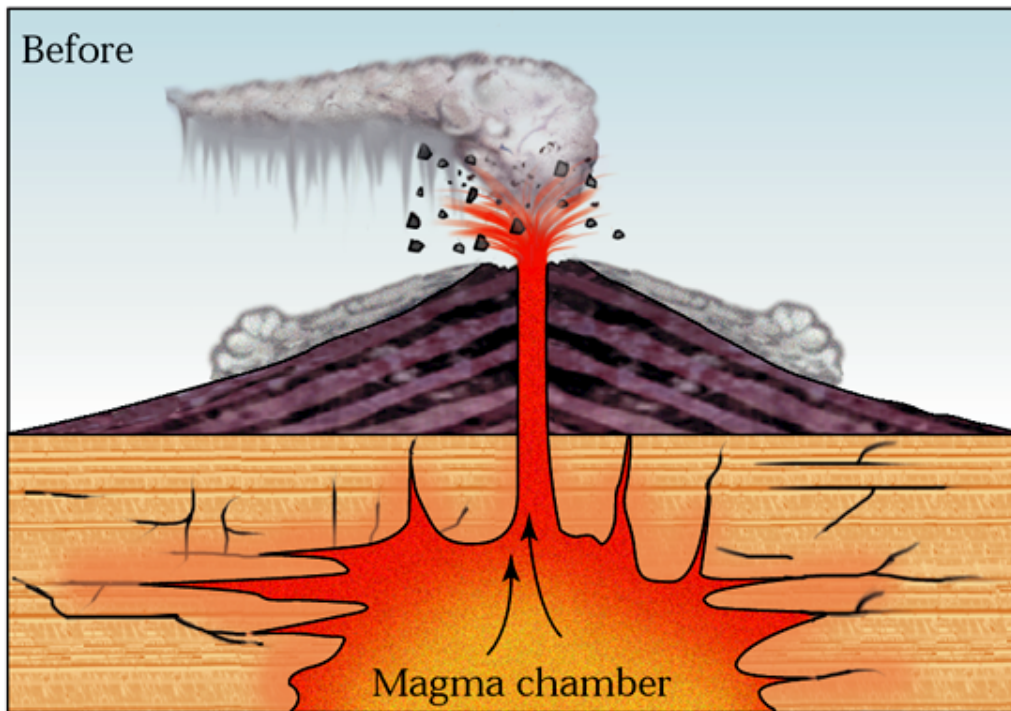
Time 2



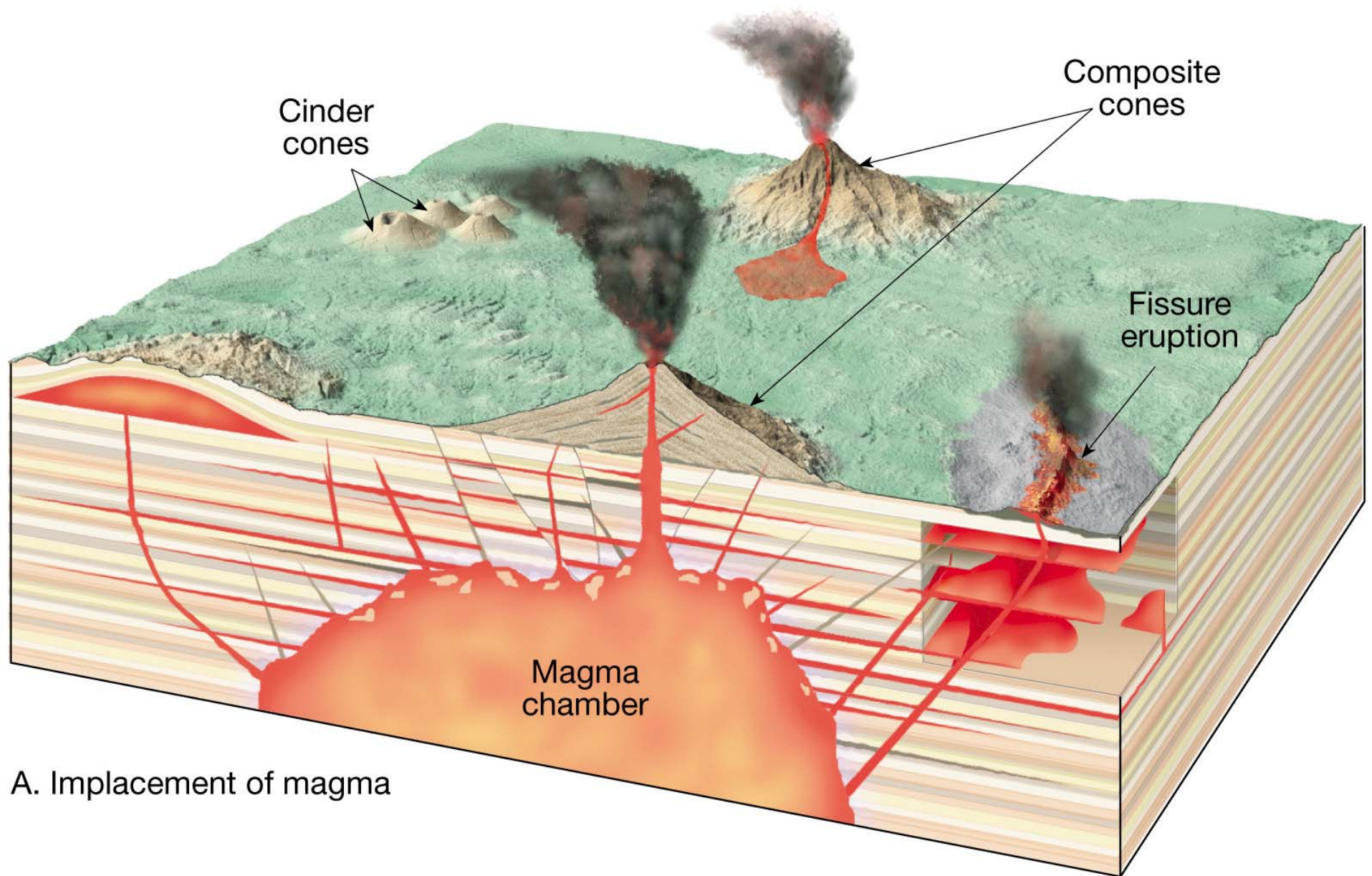
Time 3



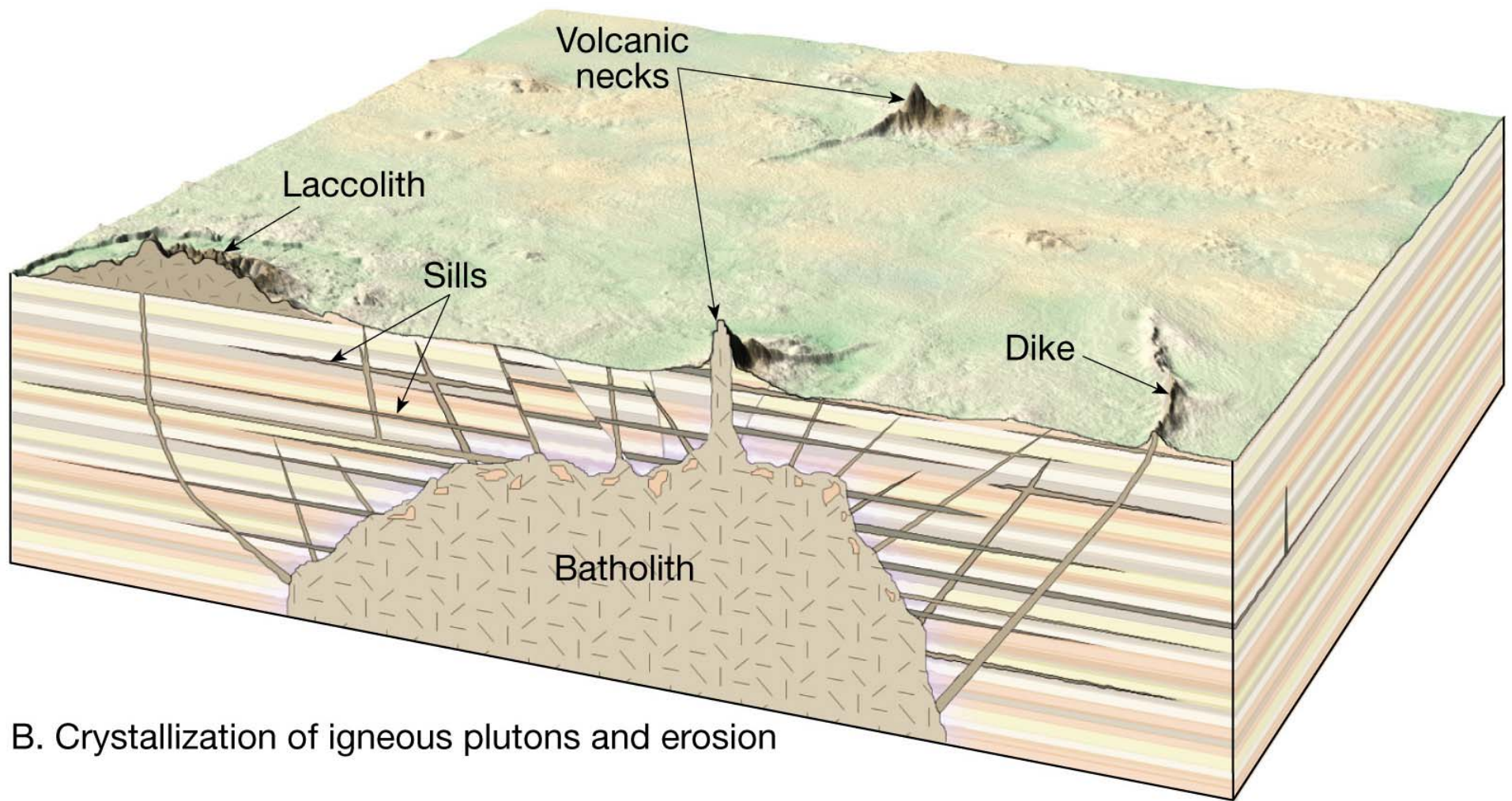




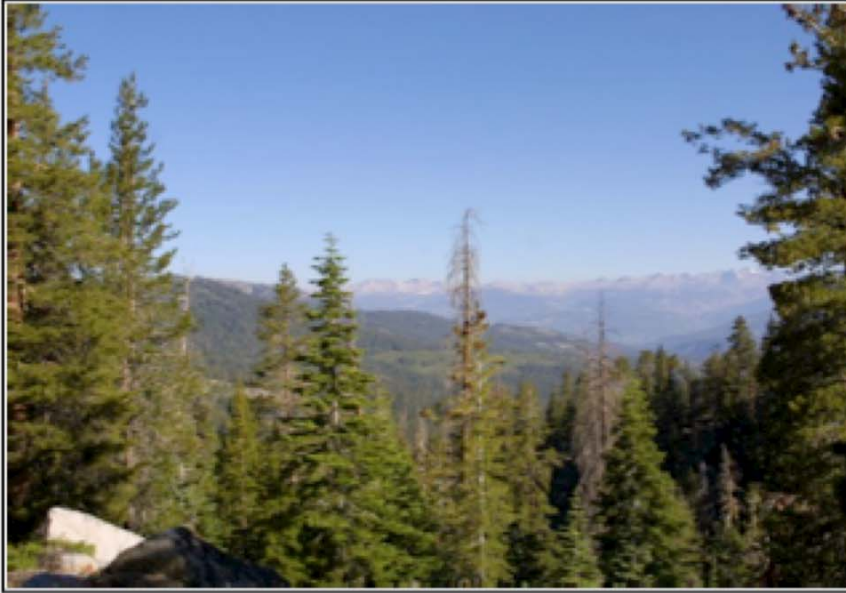




A. Impacement of magma



B. Crystallization of igneous plutons and erosion



Source; <http://public.fotki.com/rlephoto/>

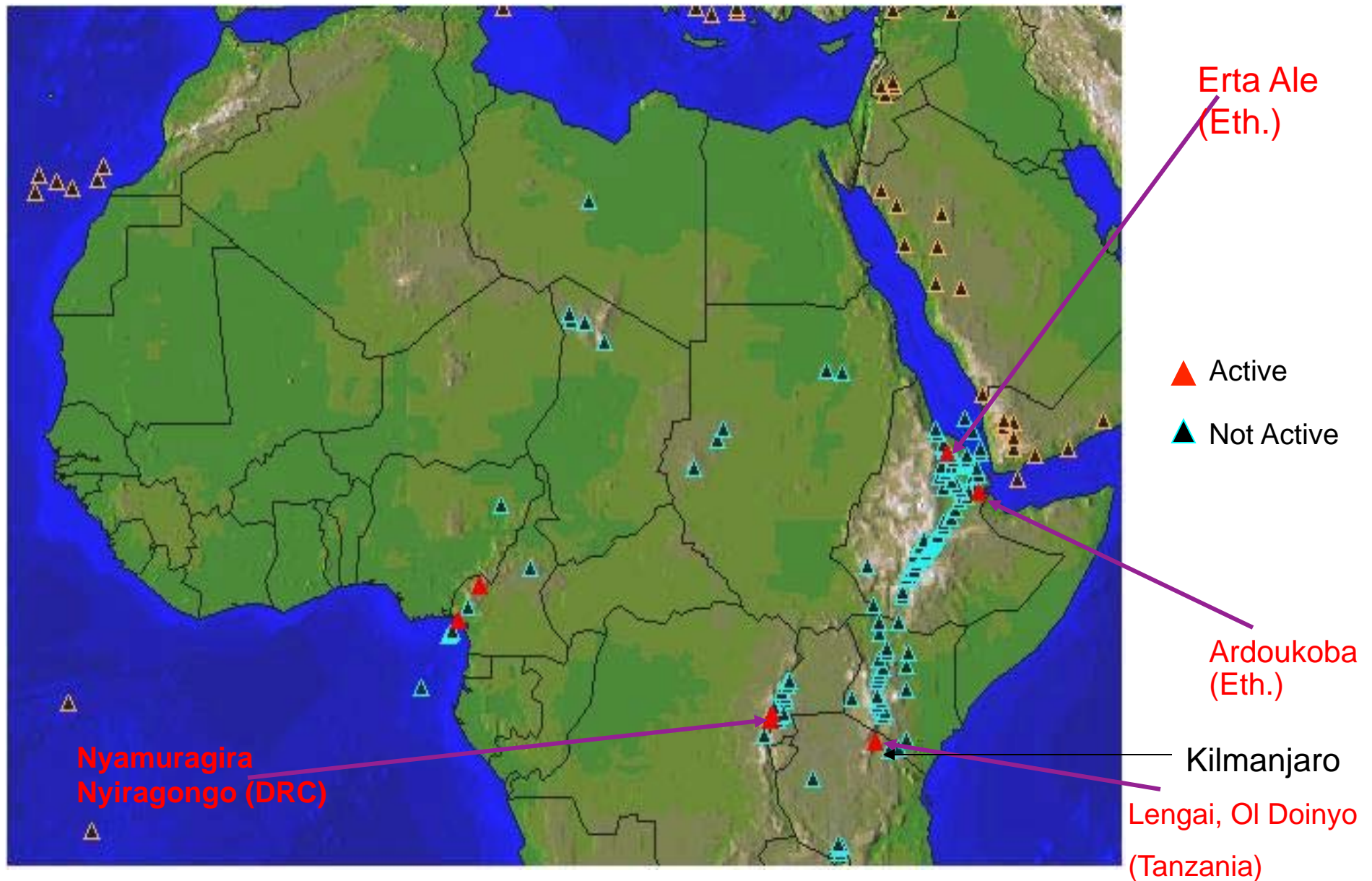


Source: <http://www.californiapictures.com/>



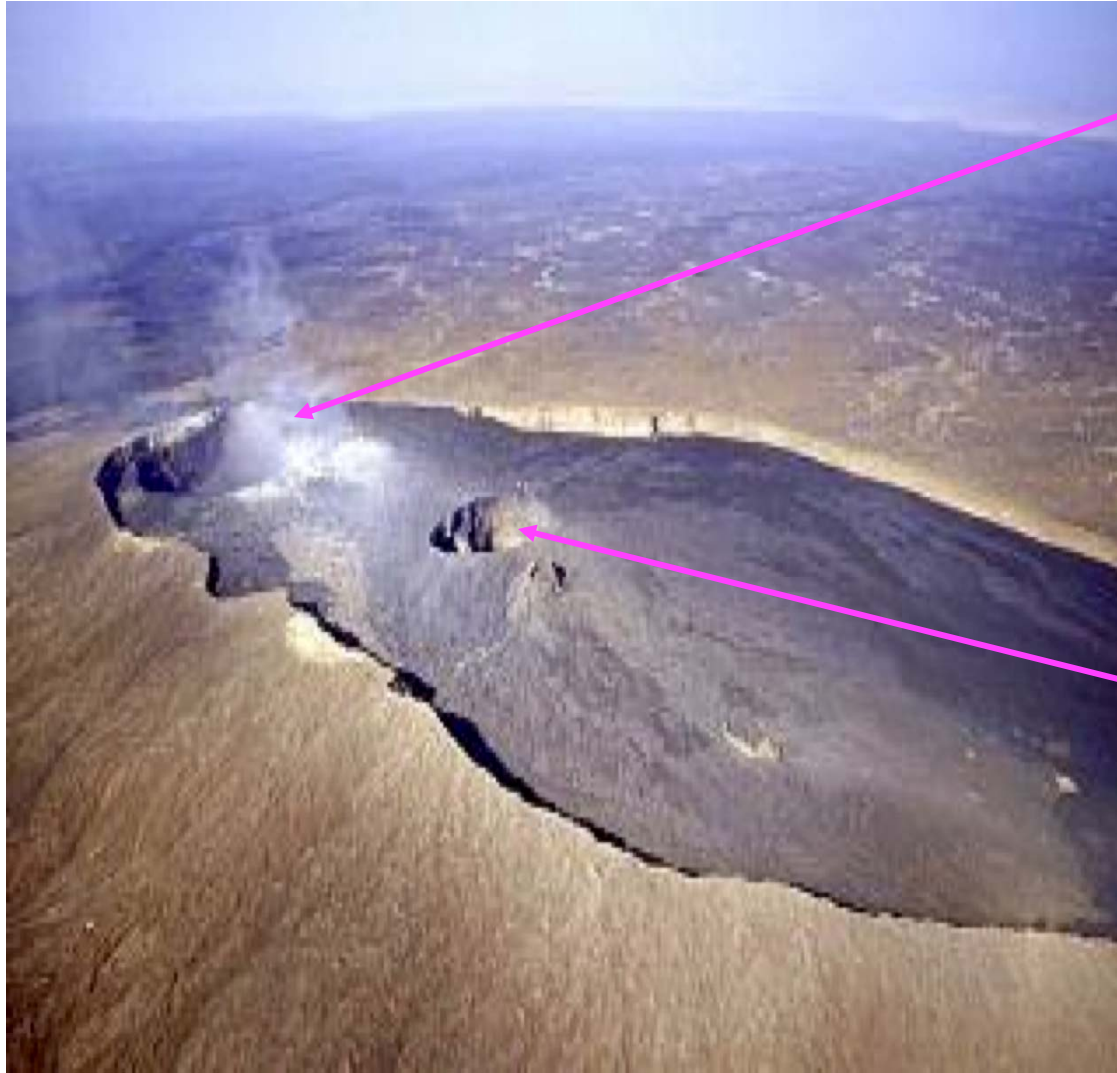
Sierra Nevada Mountains,
California

Volcanos of Africa (Triangles)



Source: <http://www.hrw.com/science/si-science/earth/tectonics/volcano/volcano/region02/index.html>

Erta Ale, Afar



The 613-m-high volcano contains a 0.7 x 1.6 km, elliptical summit crater housing steep-sided pit craters.

Another larger 1.8 x 3.1 km wide depression elongated parallel to the trend of the Erta Ale range is located to the SE of the summit and is bounded by curvilinear fault scarps on the SE side.

Erta Ale is a remote and rarely visited volcano that is known currently to have an active lava lake in its summit crater.



Source: <http://hotholes.tribe.net/photos/c0807e06-08f5-437c-a2e2-03aa5e65d2fe>



The 613 meter-high volcano contains a 0.7 x 1.6 kilometers, elliptical summit crater housing steep-sided pit craters.



Still Active: Erta Ale in 2002

Source: <http://hotholes.tribe.net/photos/5f765ebe-04cc-4ce8-8037-1a400feadc47>

OL DOINYO LENGAI, Tanzania



Source: Global Volcanism Program web site

Oldoinyo Lengai erupting



Source: <http://www.volcanodiscovery.com/volcano-tours/>

Oldoinyo Lengai: CRATER VIEW (July 26, 2004) FROM THE SUMMIT,
LOOKING NORTH



Ol Doinyo Lengai 2004



Lava flowing in a small channel.



Source: <http://www.mtsu.edu/%7Efbelton/2004videos.html>

Nyiragongo, DRC



Source: <http://news/bbc.co.uk>



Nyiragongo's lava in January 2006

(source: http://www.volcanodiscovery.com/volcano-tours/destinations/africa/zaire/nyiragongo_lava_lake/tour_details.html)



Kilimanjaro, Tanzania



Source: <http://www.peakware.com/>



Source: <http://www.disen-art.com>

KIBO



Source: <http://www.peakware.com/>



Mawenzi

Source: <http://www.ewpnet.com>

What are these volcanic features?



Source: <http://upload.wikimedia.org/wikipedia/commons/c/cb/NSource:>



Source: <http://www.peakware.com/>



Source: <http://www.ewpnet.com/>