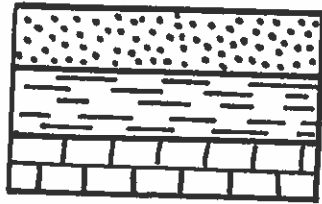


The Dynamic Crust

I. EVIDENCE OF CRUSTAL CHANGES

- A. Deformed Rock Structure – sedimentary strata normally form in a horizontal position. Any change from the horizontal position is evidence of minor crustal change.



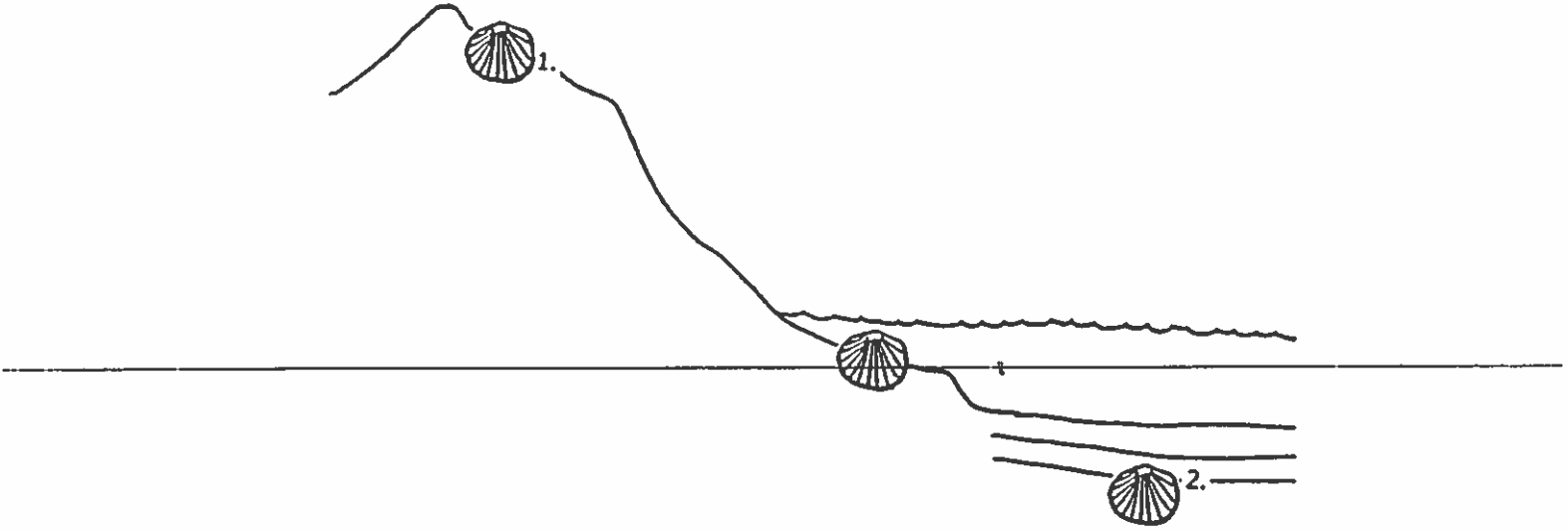
Normal undisturbed layers
(no motion)

1.

2.

3.

B. Fossil Evidence



1. Marine fossils found at high elevations suggest _____.
2. Shallow water marine fossils found at great ocean depths suggest _____.

II. PLATE TECTONICS

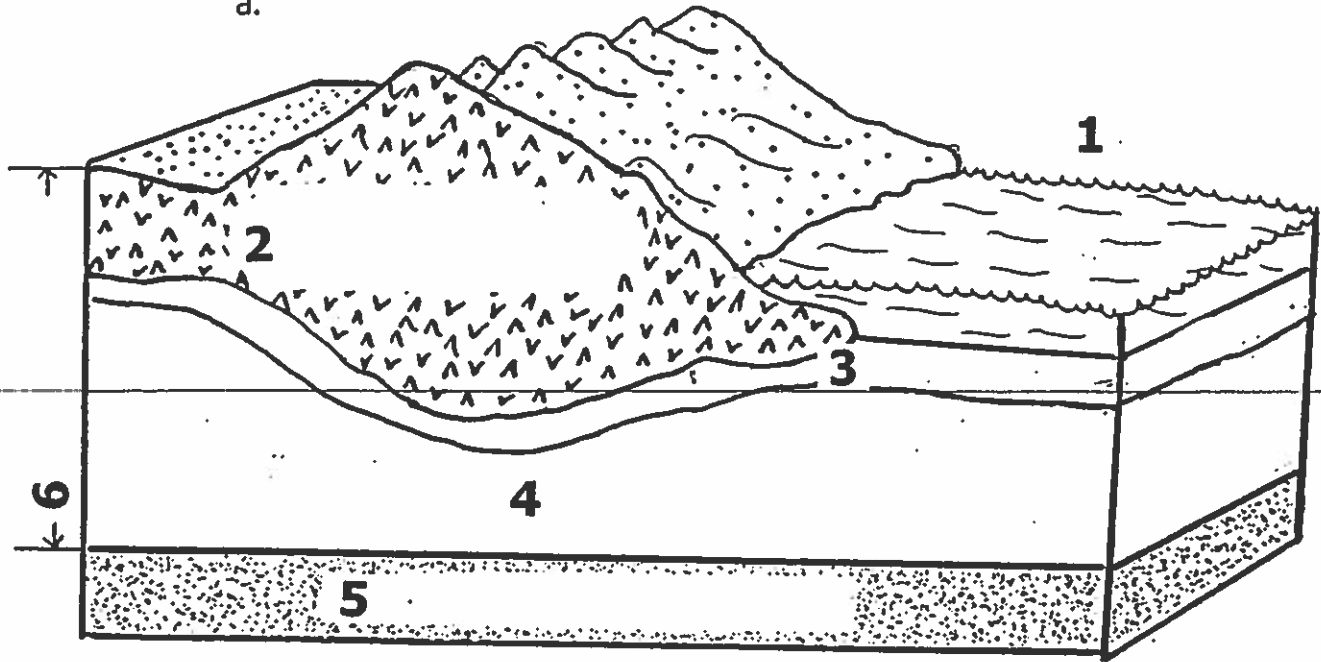
A. Earth's Structure

1. Earth's Interior

<p>1. <input style="width: 100%;" type="text"/></p> <p style="text-align: right;">_____ km thick</p> <p style="text-align: right;">Density _____ g/cm³</p>	
<p>2. <input style="width: 100%;" type="text"/></p> <p style="text-align: right;">_____ km thick</p> <p style="text-align: right;">Density _____ g/cm³</p>	
<p>3. <input style="width: 100%;" type="text"/></p> <p style="text-align: right;">_____ km thick</p> <p style="text-align: right;">Density _____ g/cm³</p>	
<p>4. <input style="width: 100%;" type="text"/></p> <p style="text-align: right;">_____ km thick</p> <p style="text-align: right;">Density _____ g/cm³</p>	

2. Earth's Surface

a.



- b. Density of: 1. ocean (water) _____
 2. granite (continental crust) _____
 3. basalt (ocean crust) _____
 4. rigid upper mantle } _____
 5. asthenosphere } _____
- c. Lithosphere = _____ + _____
- d. _____ the plasticlike layer below the lithosphere in Earth's mantle.
- e. Thickness of: 2. Continental Crust _____
 3. Ocean Crust _____

B. Theory of Continental Drift

1. _____ - proposed the theory of Continental Drift in the early 1900's.
2. He proposed that approx. 200 mya, all the continents existed as one large land mass which he called _____



Alfred Wegener (1880-1930)

3. Evidence for Continental Drift

- ① Coastline of the continents – for example, the east coast of _____ fits well with the west coast of _____ - like pieces of a giant _____.



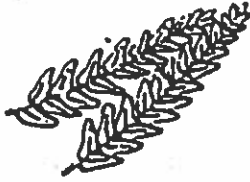
- ② Fossil Clues – certain fossils of ancient life forms are found on widely separated continents. Mesosaurus –



It was a small freshwater reptile. It's fossils are found in _____ and _____.

Map Key

Glossopteris --



It was an ancient seed-fern (with very large heavy seeds). It's fossils are found in _____

3. Rock Clues

a. The _____ Mountains of the eastern US are geologically similar to the mountains in Greenland and western Europe, which include the Caledonian Mountains of Scotland.



b. Structure, age, and mineral content of rocks are similar on the coasts of eastern _____ and western _____.



4. Climate Clues

a. Coal, which forms from plants that grow in warm swampy environments, is found today in the colder climates of _____ and _____.



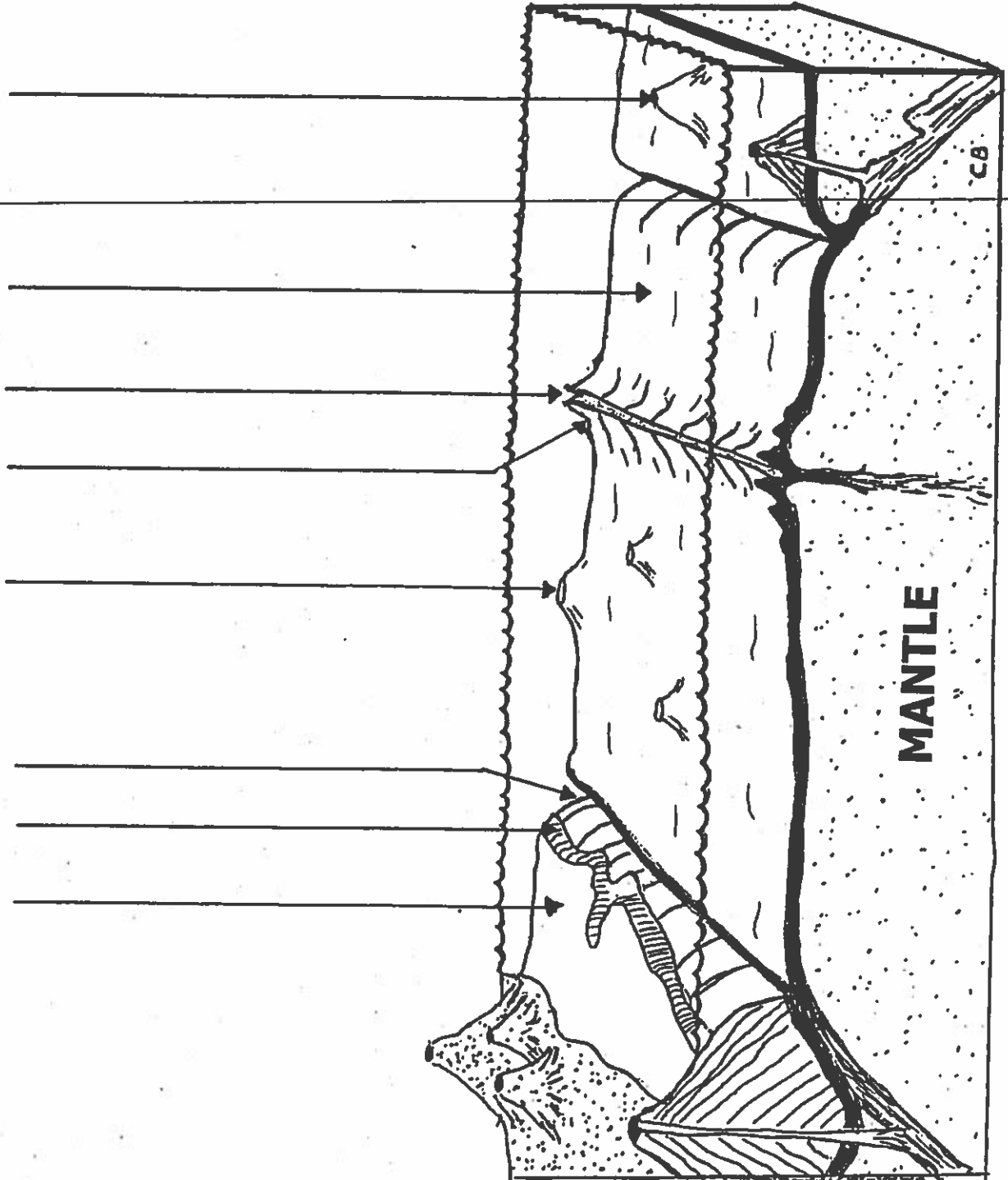
b. Coral Limestone, containing the remains of coral, which once lived in warm seas, is found today in northern latitudes such as _____.



c. Ancient rocks of the same age near the equator in South America, South Africa and other southern landmasses show evidence of glaciation.



C. Theory of Sea Floor Spreading
1. Topography of the Ocean Floor



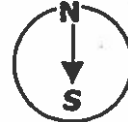
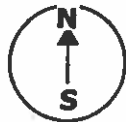
2. Evidence of Sea Floor Spreading

1. Age Evidence – As the distance from the ocean ridge _____,
the age of the rock _____.



2. Magnetic Evidence (Paleomagnetism) – magnetic clues from the iron-bearing basalt rock of the ocean floor supports the theory of seafloor spreading.

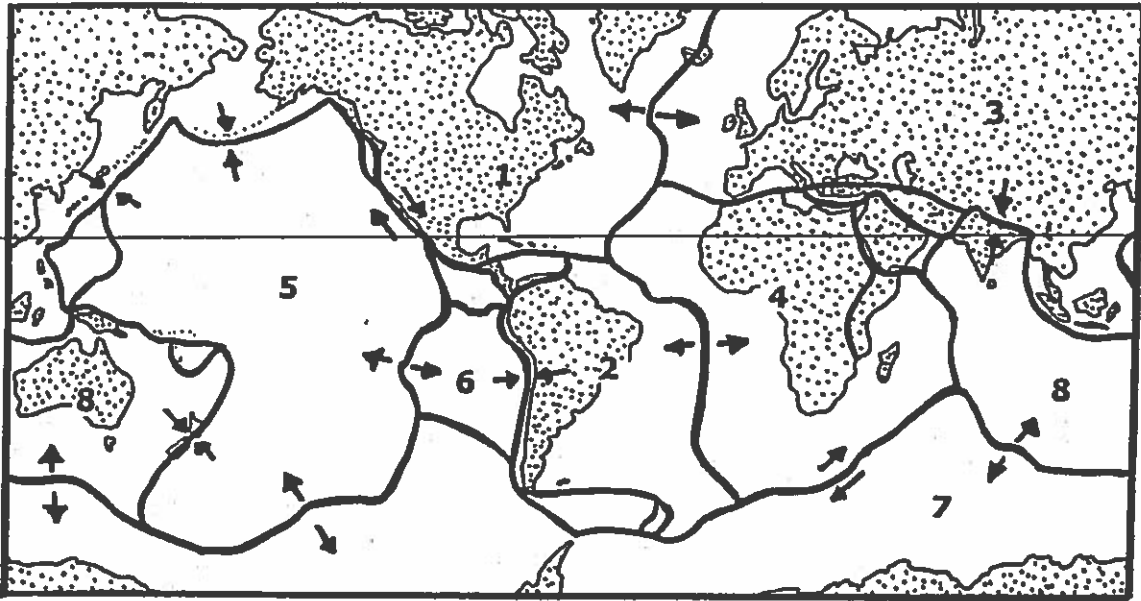
KEY



C. The Theory of Sea Floor Spreading

1. The theory of Plate Tectonics states that Earth's

_____ (crust + upper mantle) is divided into sections called _____.



Key To Major Plates

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

2. Plate Motion – The theory of Plate Tectonics states that these lithospheric plates are in motion and “float” or ride on the _____.

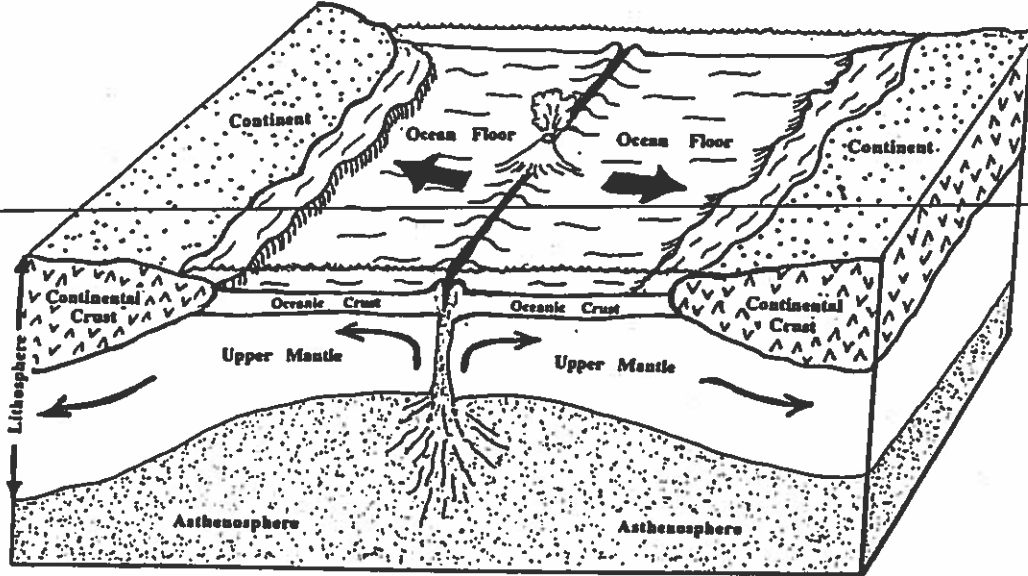
3. Direction of Plate Movement – The movement and interaction of tectonics plates creates 3 types of plate boundaries: the arrows on the tectonic map (page 8) show the relative motion.

PLATE BOUNDARIES	MOVEMENT	ARROWS ON MAP

4. Types of Plate Boundaries

A. Divergent Plate Boundaries - _____

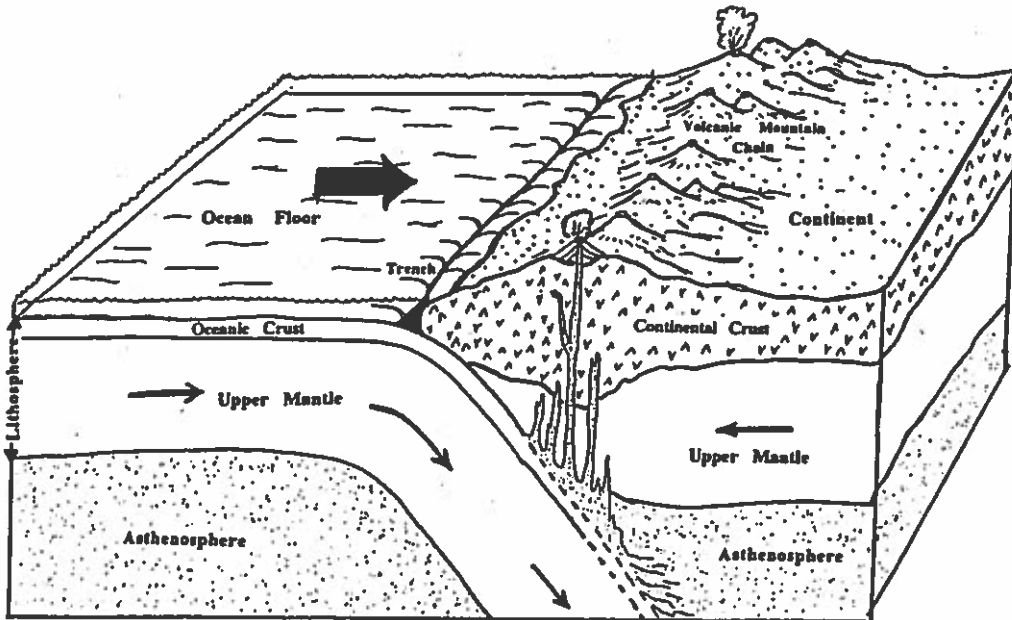
1. Ocean (example) - _____



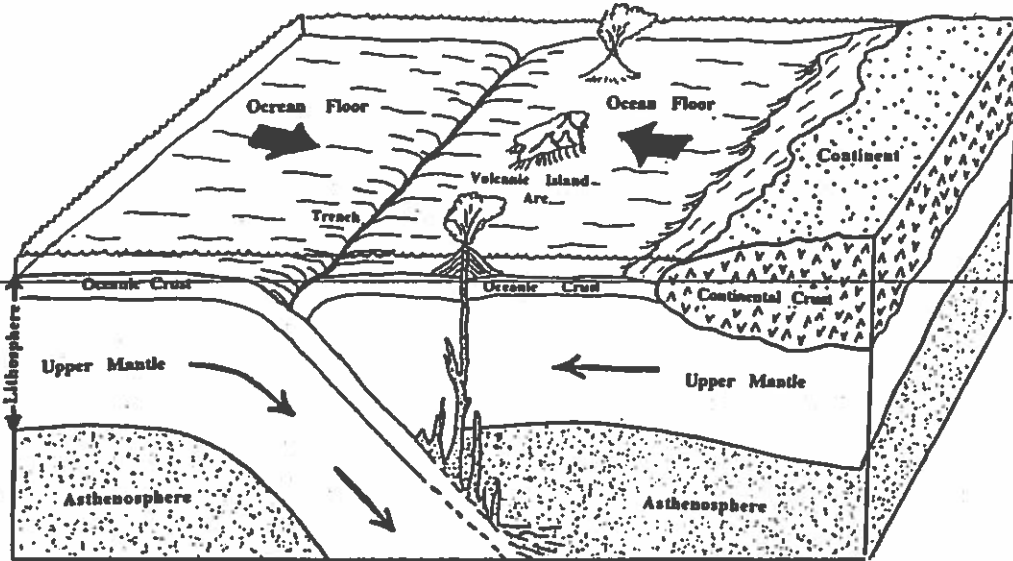
2. Continental (example) - _____

B. Convergent Plate Boundaries - _____

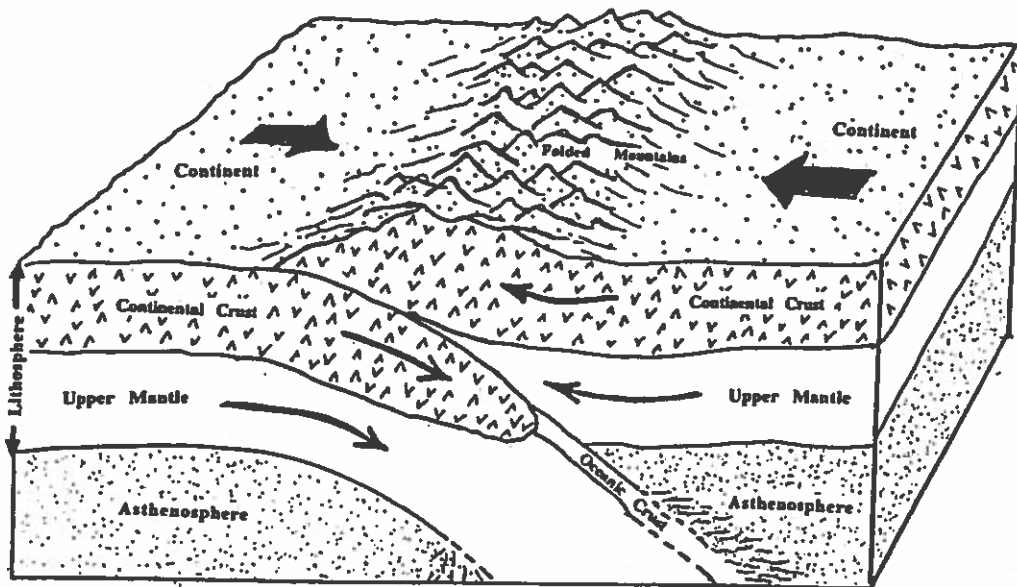
1. Oceanic-Continental (example) - _____



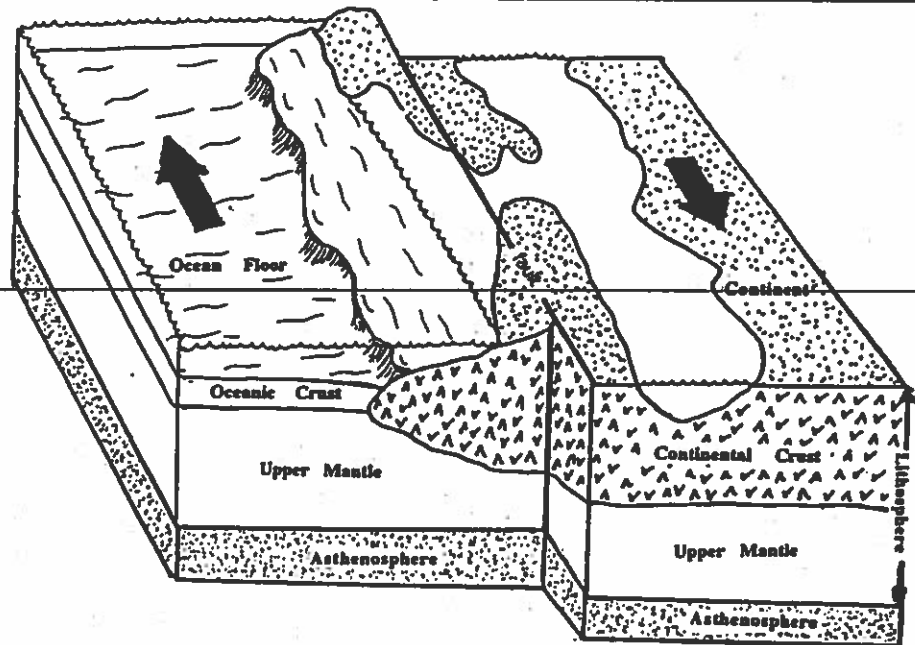
2. Oceanic-Oceanic (example) - _____



3. Continental-Continental (example) - _____

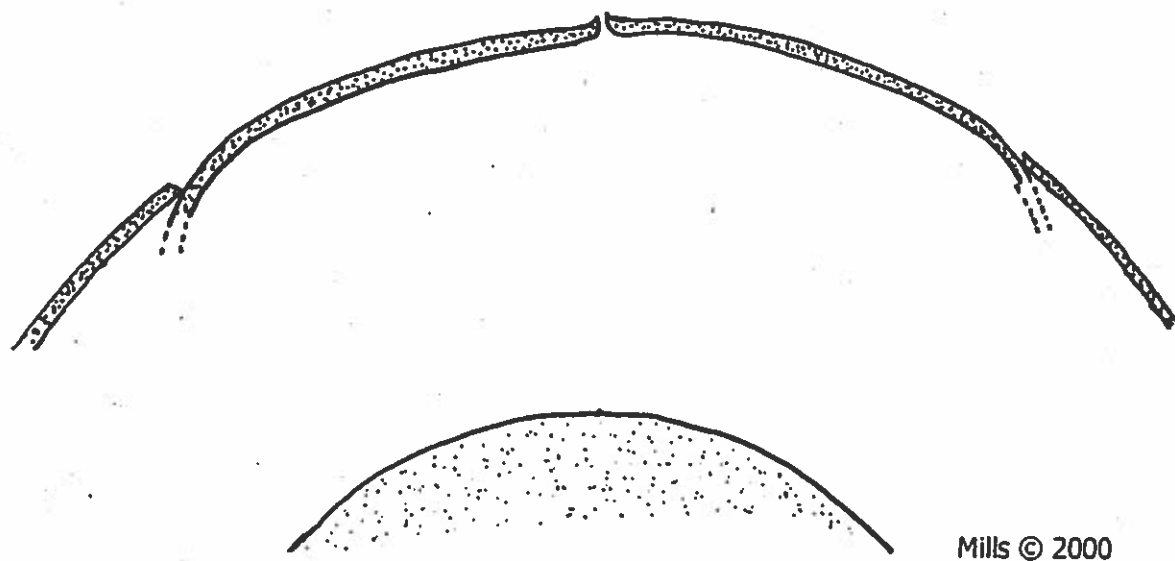


c. Transform Plate Boundaries (example) - _____



5. _____ = the driving force beneath plate tectonics

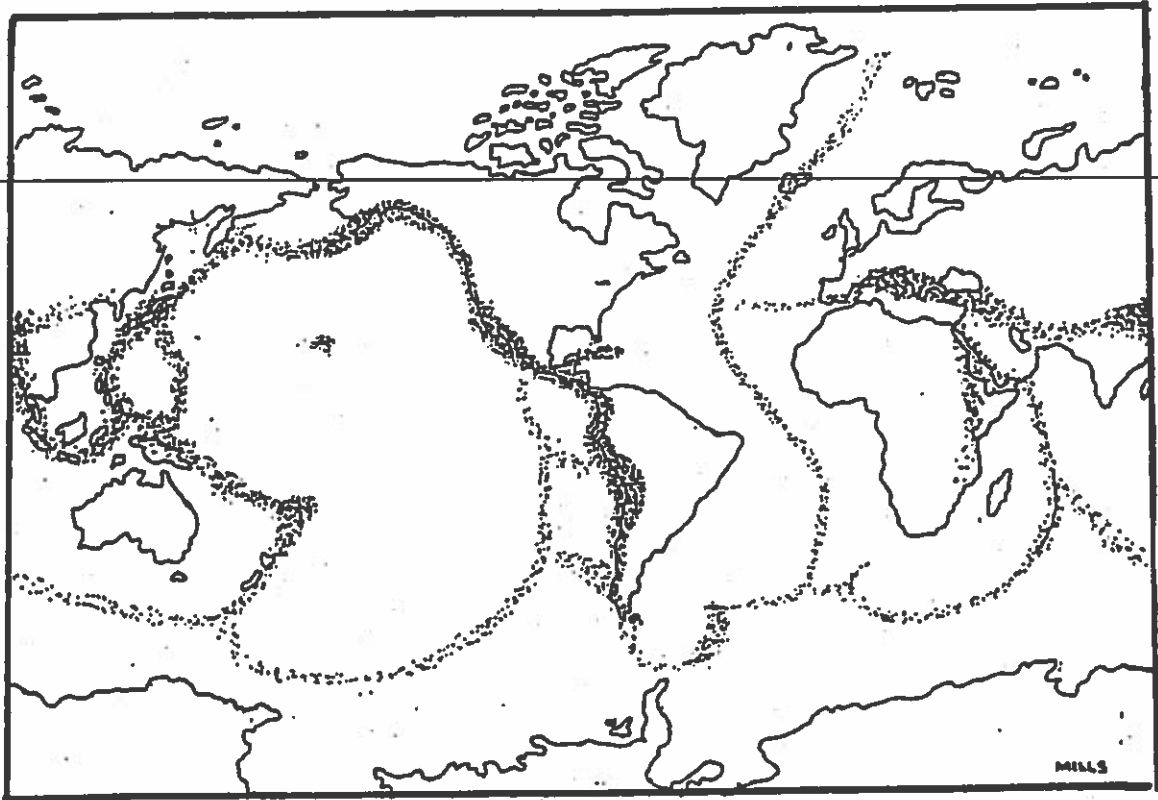
Hot _____ dense material form deep within Earth's mantle rises. When this material cools near the surface, it becomes _____ dense and sinks. The resulting convective flow of this material in the mantle _____ lithospheric plates across the surface of Earth.



III. EARTHQUAKES

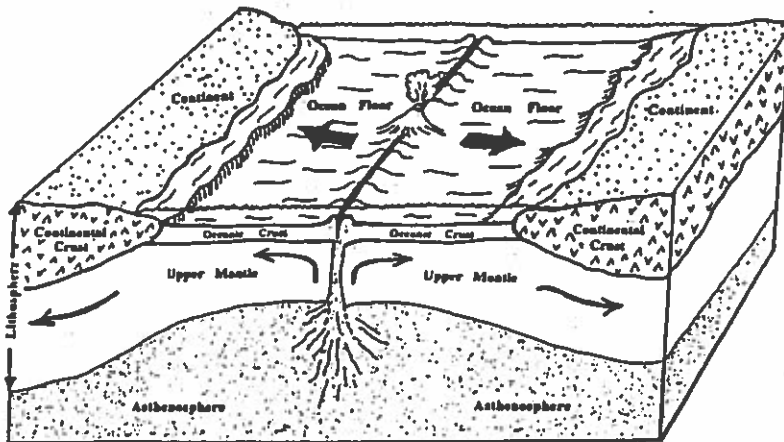
A. _____ - the branch of science that studies earthquakes.

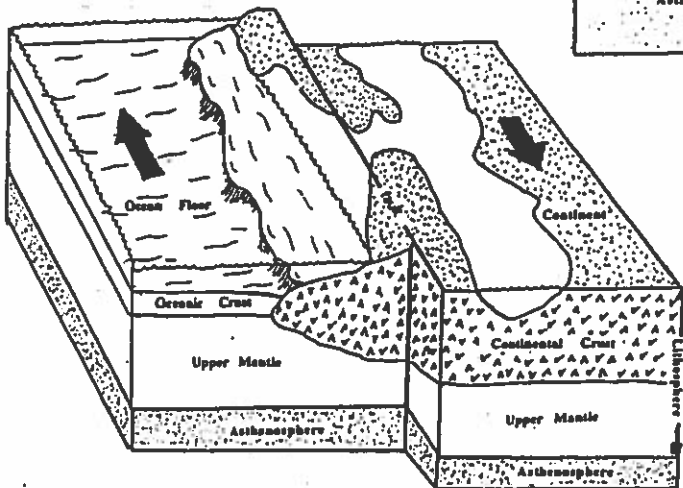
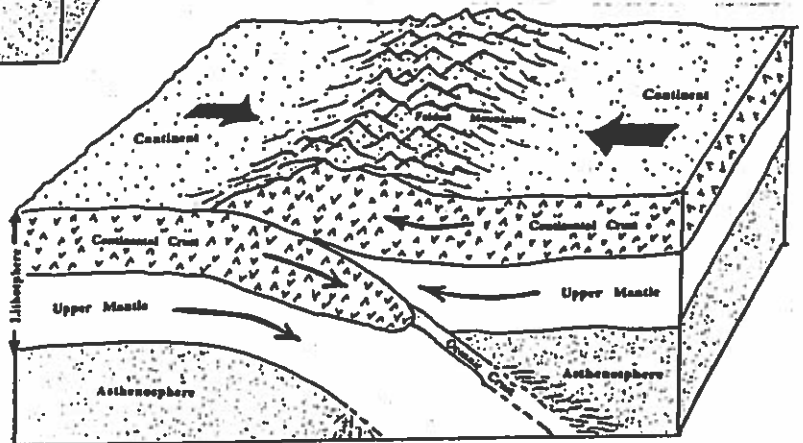
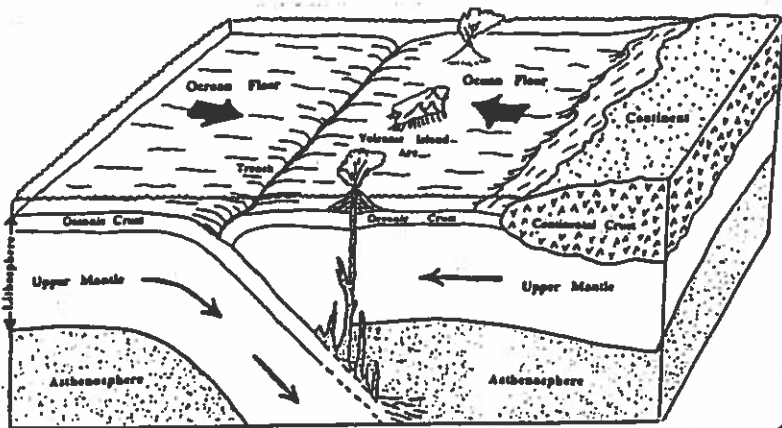
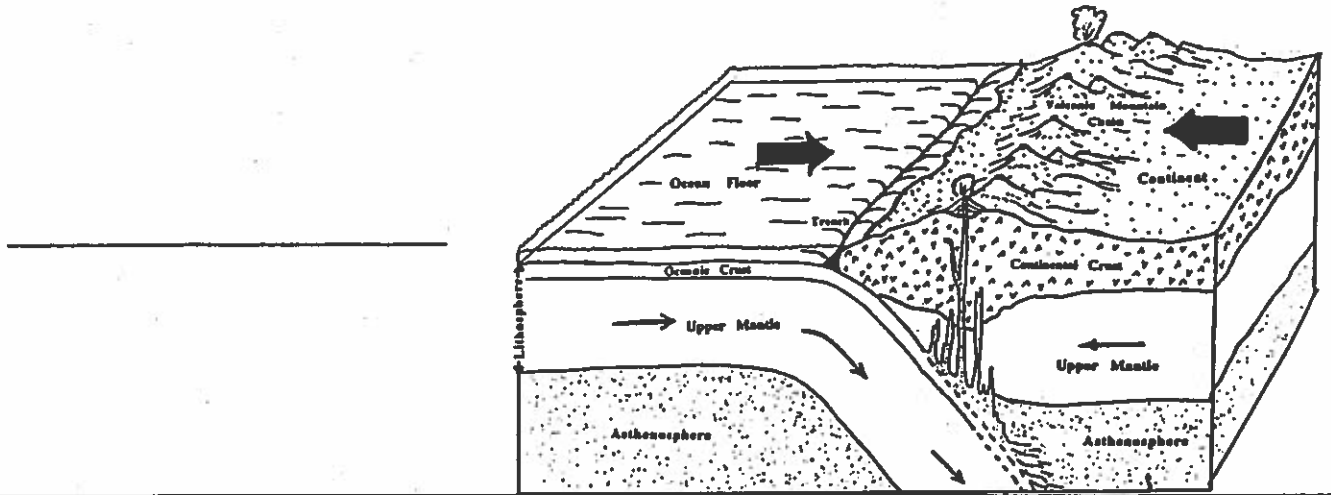
B. Earthquake Regions on Earth



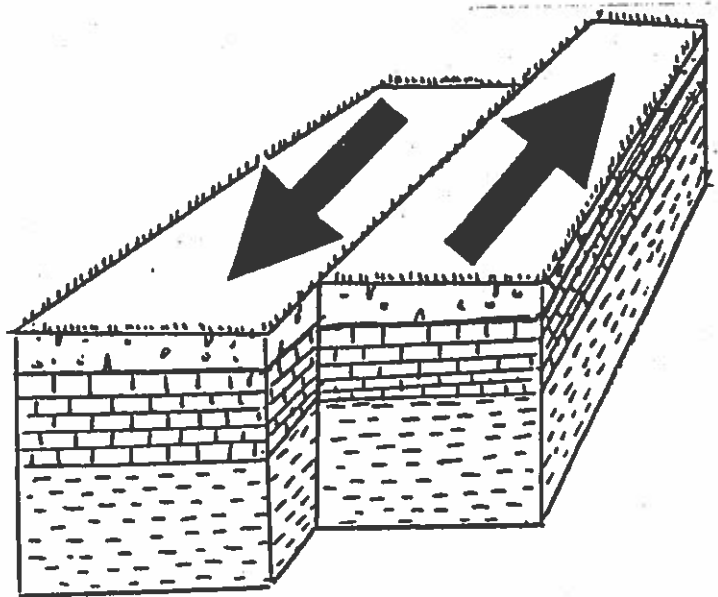
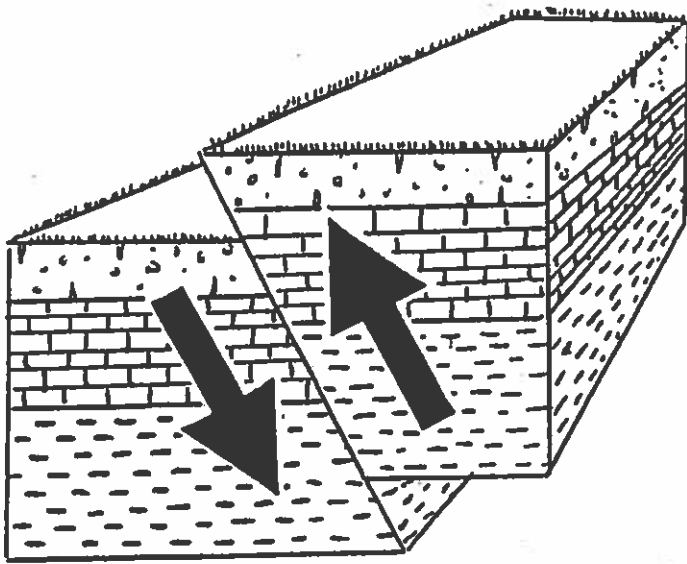
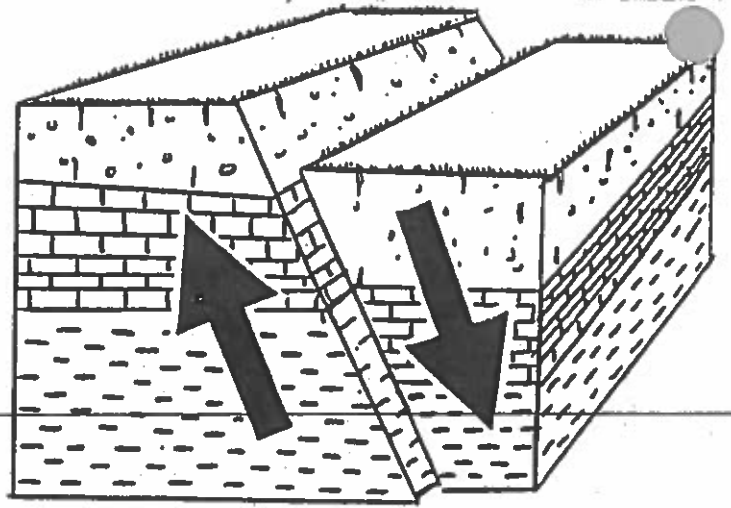
C. Causes of Earthquakes – Sudden movement of Earth's crust at plate boundaries and faults.

1. Plate Boundaries



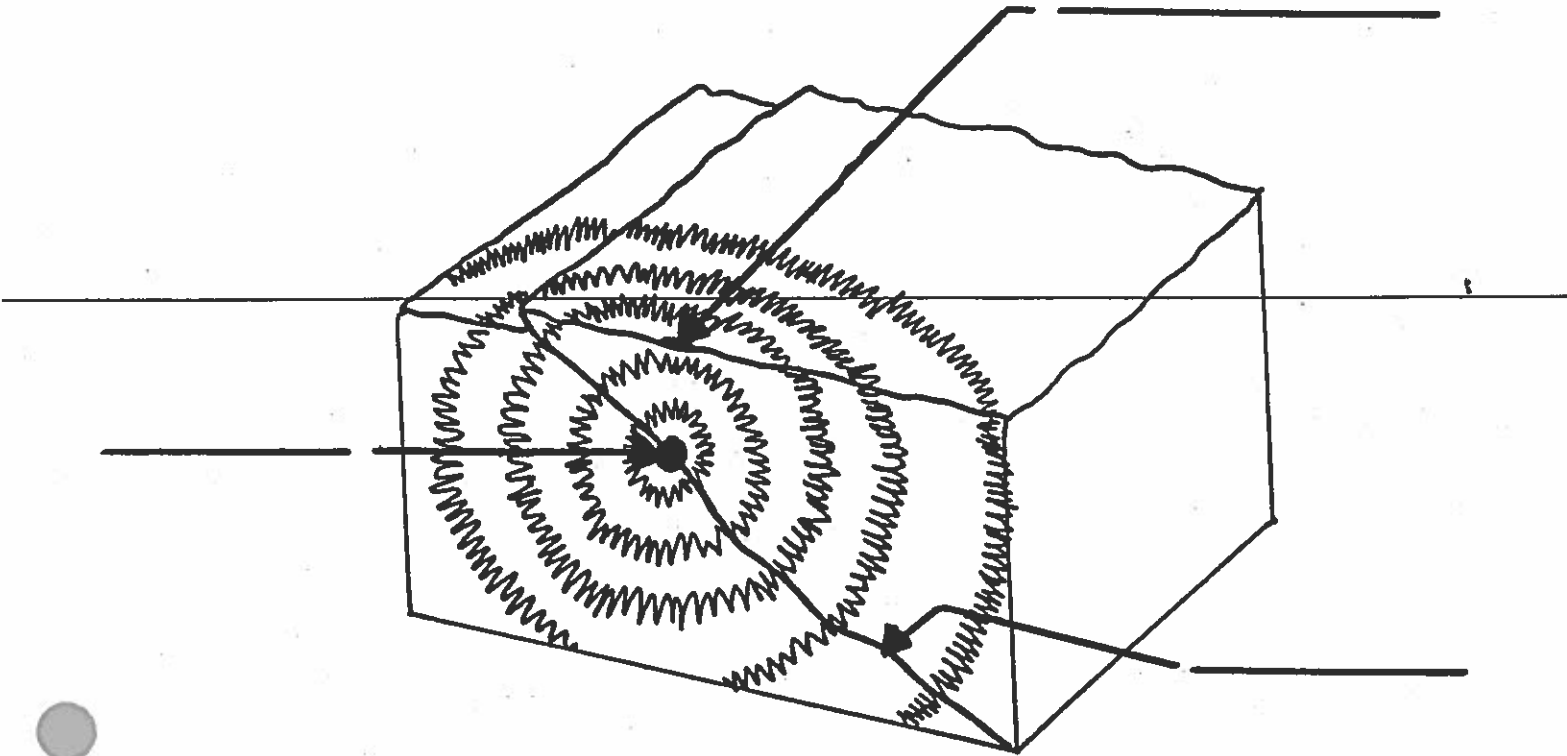


2. Faults



D. Earthquake Waves

1. origin and map location



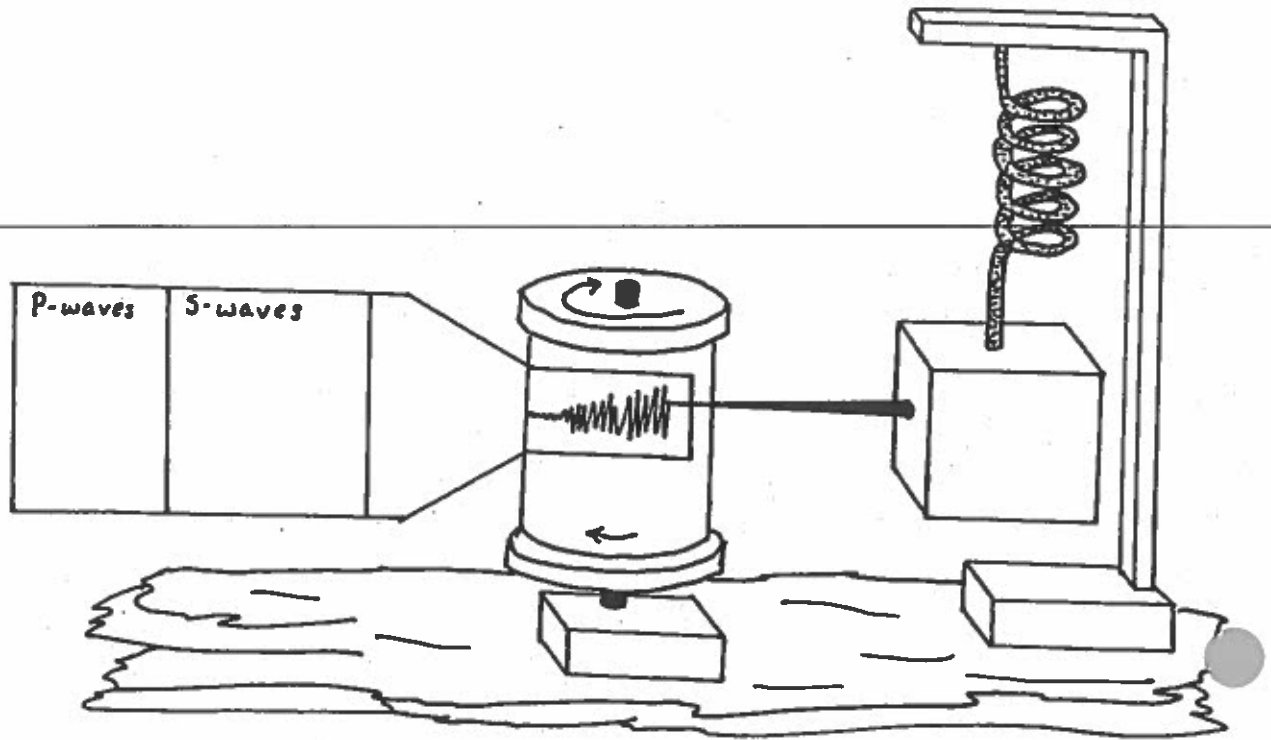
Focus = _____

Epicenter = _____

2. Types:

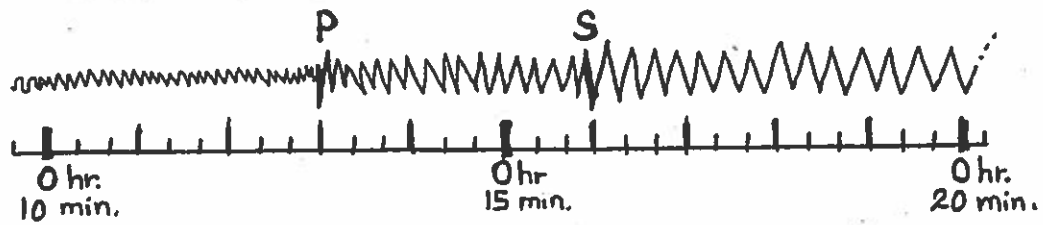
	Proper Name	Travel Speed
P waves		
S waves		

3. _____ - measures and records earthquake waves.

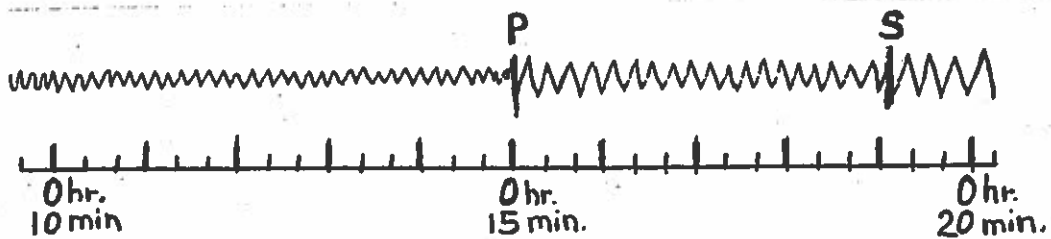


E. Locating the Epicenter of an Earthquake

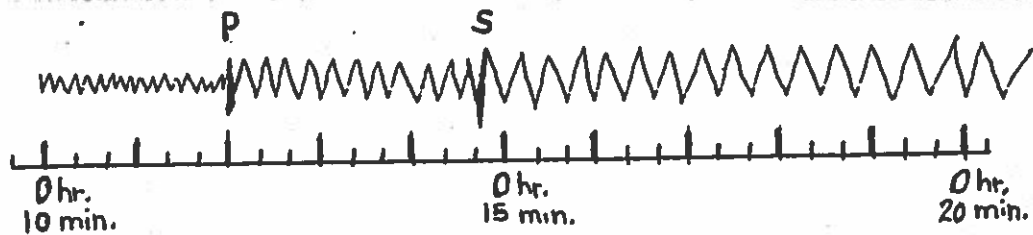
1. Houston, Texas



2. Chicago, Illinois



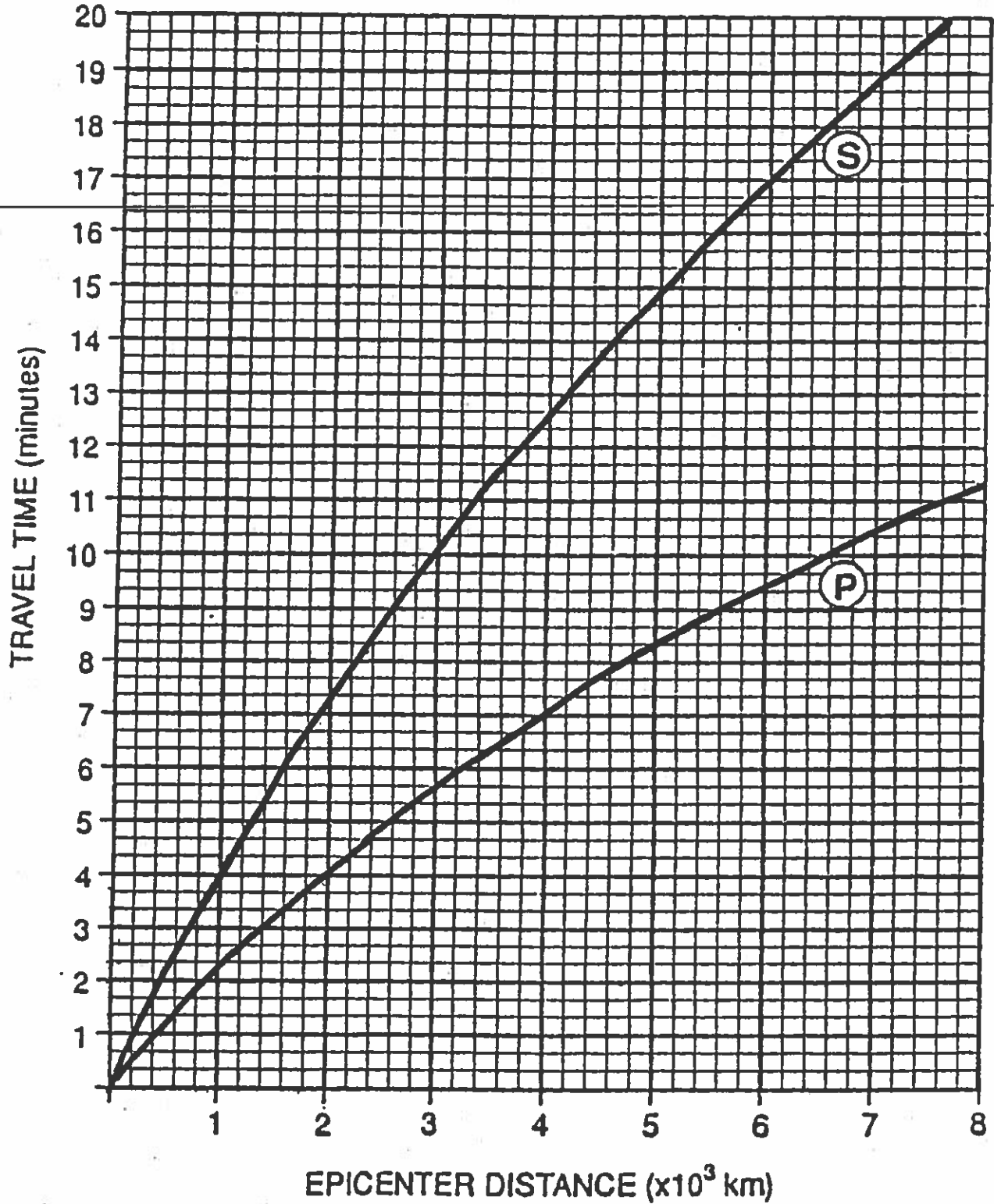
3. Seattle, Washington

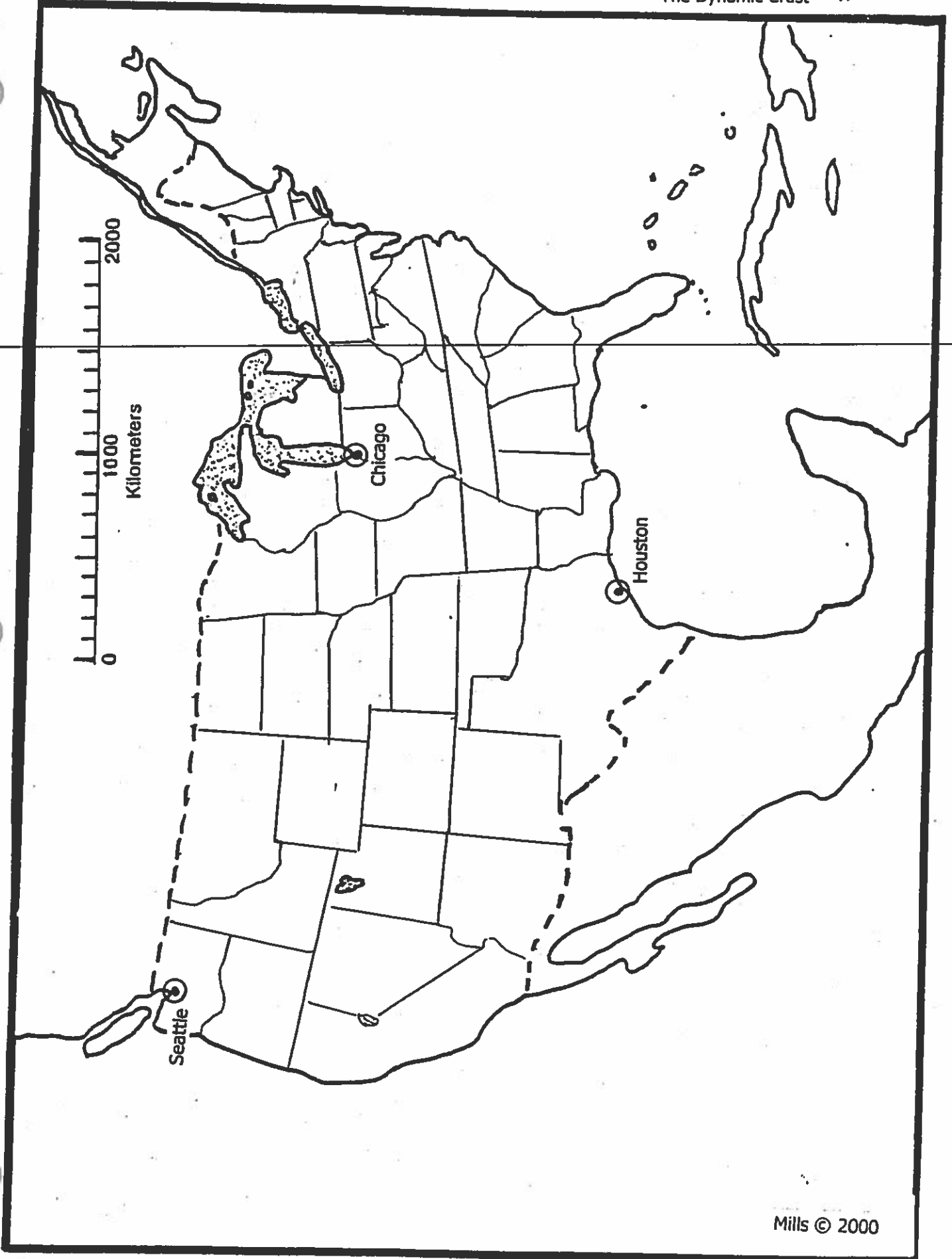


SEISMOGRAPH STATION	ARRIVAL TIME		DIFFERENCE IN ARRIVAL TIME	DISTANCE TO EPICENTER
	P-wave	S-wave		

Reference Table
Page _____

Earthquake S-wave and P-wave Travel Time



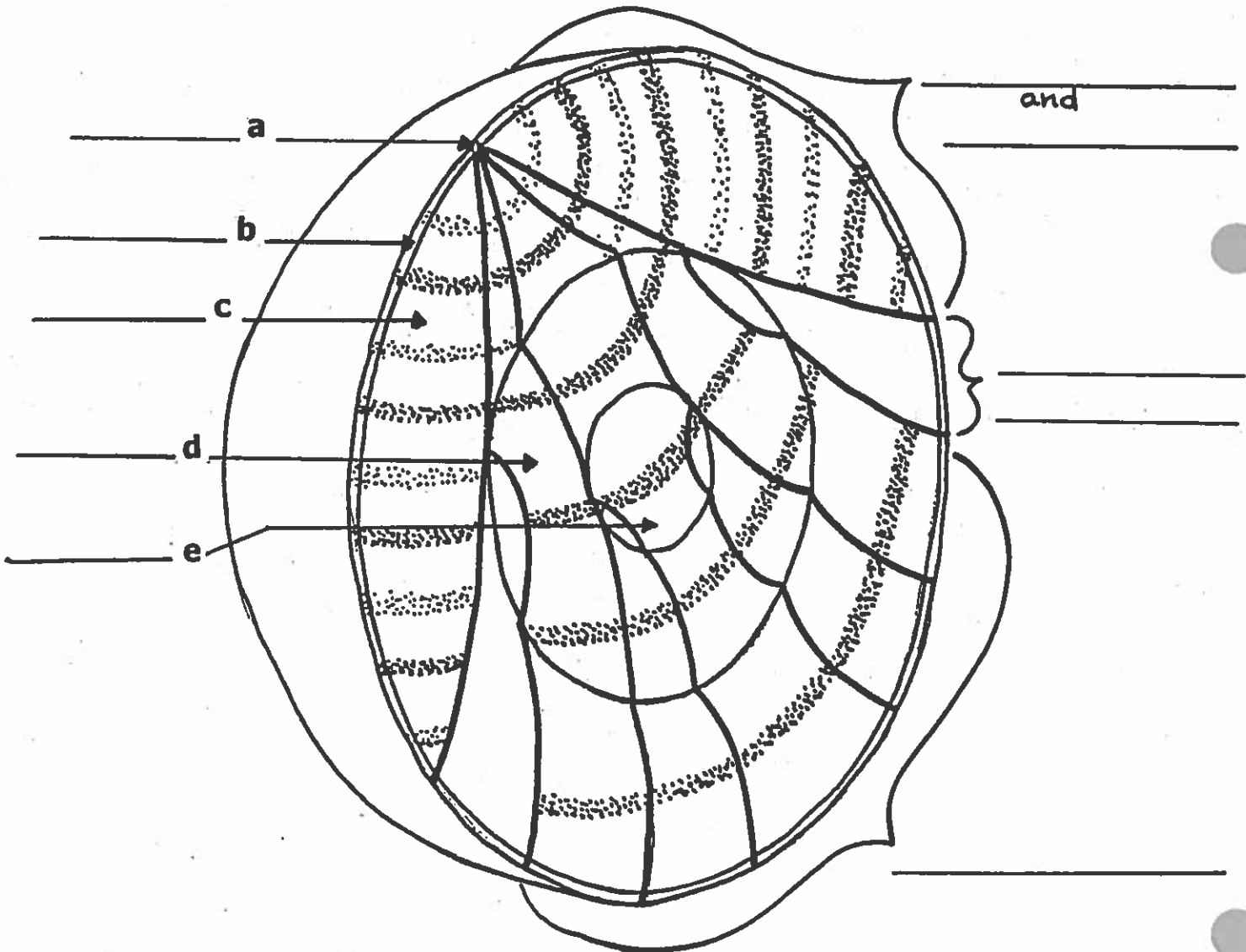


F. Earthquake Waves and Earth's Interior

1. Analysis of seismic waves (P and S waves) has led scientists to infer the interior structure of Earth.
2. a. P waves travel through _____ and _____.
- b. S waves can only travel through _____.
3. Earth's structure/interior is divided into the crust, mantle, outer core and inner core.
- 4.

Reference Table
Page _____

Key	
P waves =	<input type="checkbox"/>
S waves =	<input type="checkbox"/>



G. Measuring an Earthquake

1. _____ - a scale used to express the strength or energy an earthquake releases by assigning a number from 1 to 10. (Each of the numerical steps represents a ten-fold increase in the amount of energy; for example, a reading of 3 indicates 10 times more energy than a reading of 2)

EARTHQUAKE OCCURANCES

RICHTER SCALE	NUMBER EXPECTED PER YEAR
1.0 to 3.9	> 100 000
4.0 to 4.9	6 200
5.0 to 5.9	800
6.0 to 6.9	120
7.0 to 7.9	20
8.0 to 8.9	<1

2. _____ - a scale used to show the damage caused by an earthquake by assigning a number from I to XII

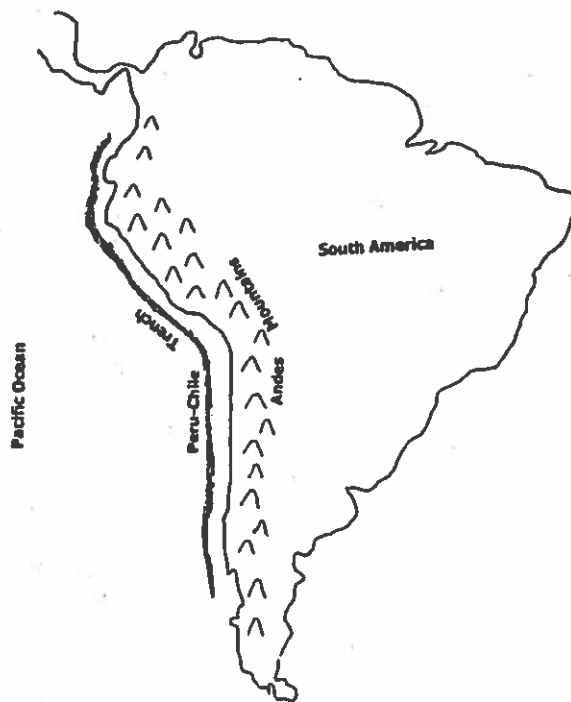
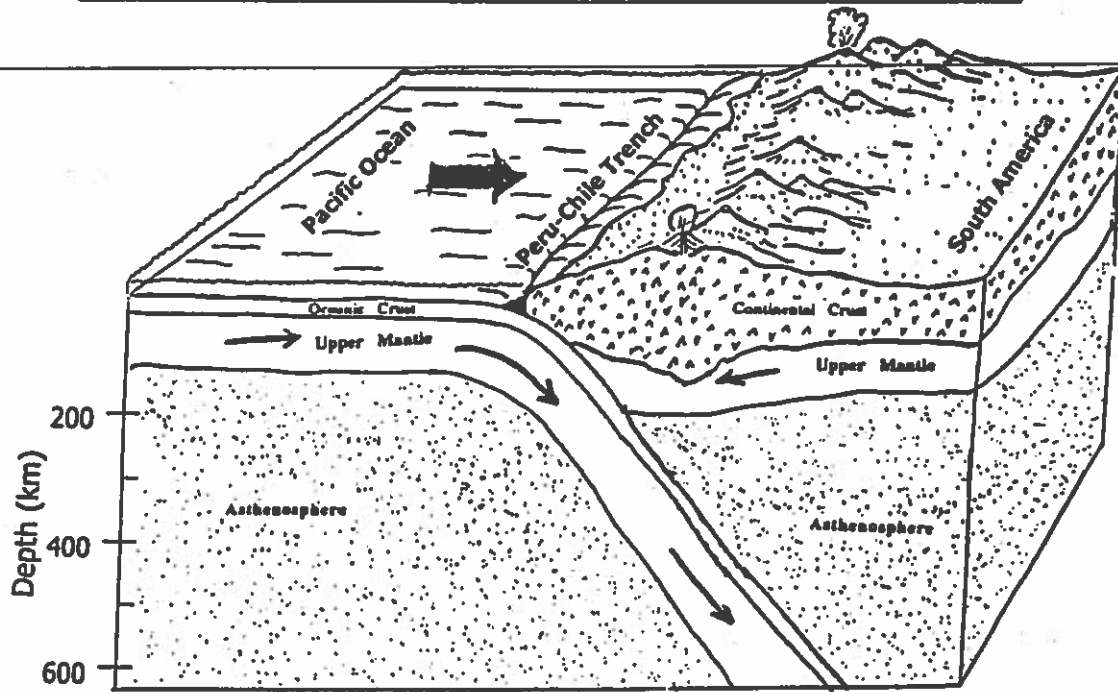
SOME STEPS IN THE MERCALLI SCALE OF EARTHQUAKE DAMAGE	
STEP	EXTENT OF DAMAGE
I	The earthquake is felt by only a few people near the epicenter.
III	The earthquake is felt in buildings, usually only upper floors.
V	Windows and fragile objects are broken.
VII	People run out of buildings, some masonry breaks.
IX	Cracks form in the ground, and all buildings are damaged.
XII	Objects are thrown into the air; all structures are destroyed.

H. Earthquakes tell us about Earth's surface movement

_____ = the depth at which an earthquake originates

KEY

- _____ = within 75 km of Earth's surface
- △ _____ = 75 to 300 km below Earth's surface
- _____ = 300 to 700 km below Earth's surface

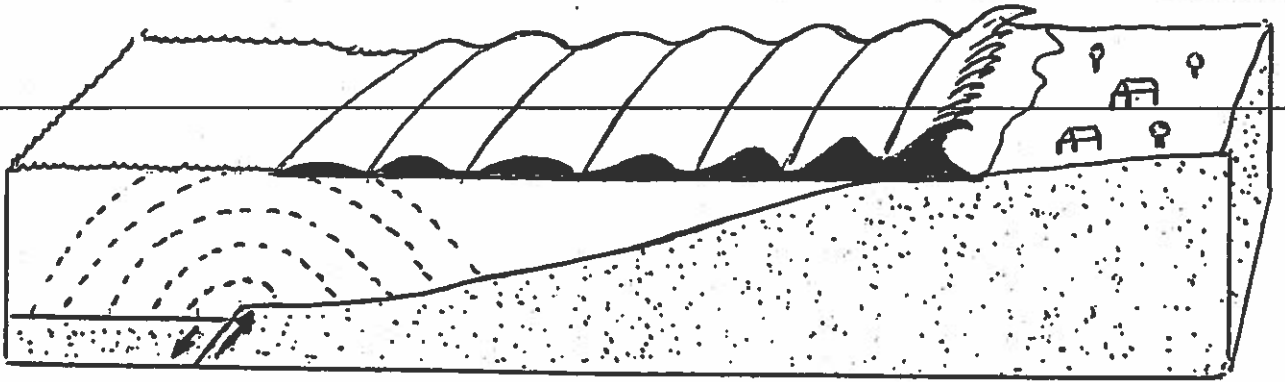


I. Earthquakes cause other disasters

_____ = gigantic sea waves.

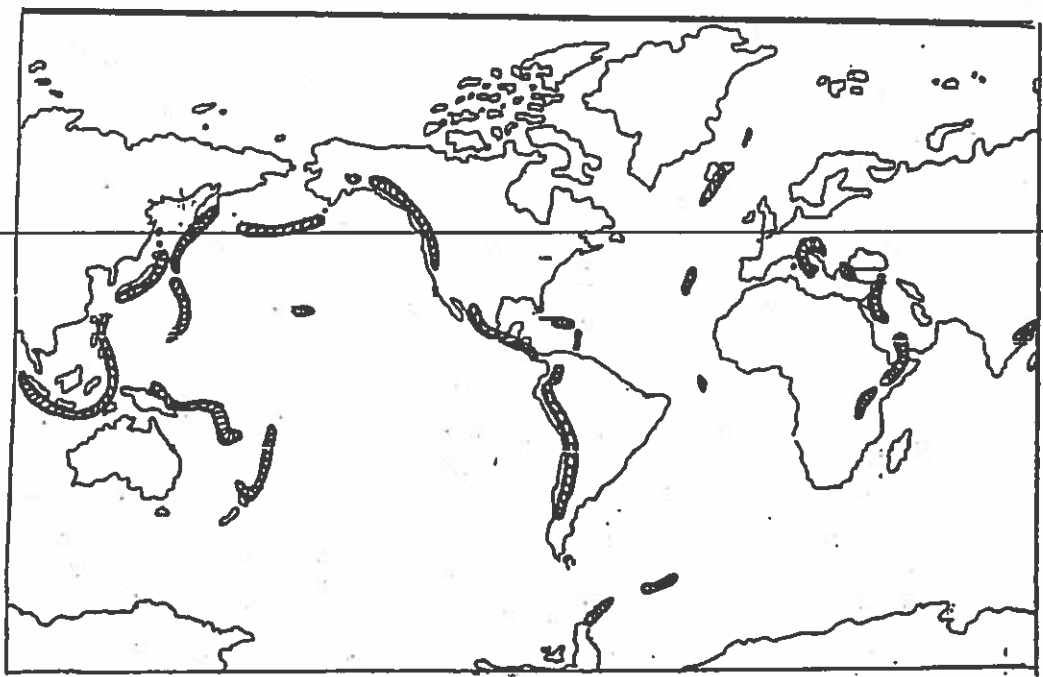
Characteristics: speed = _____

height = _____



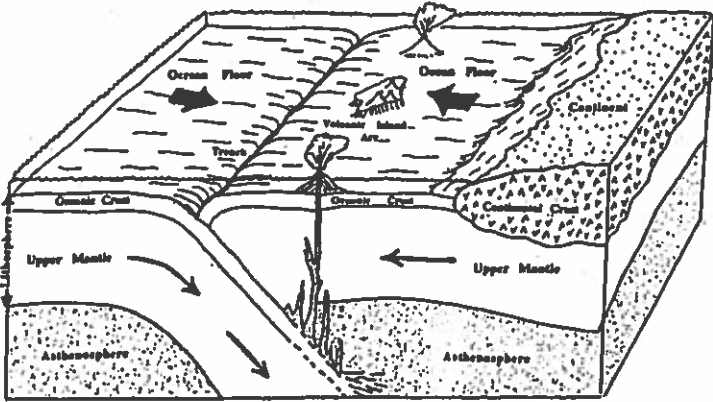
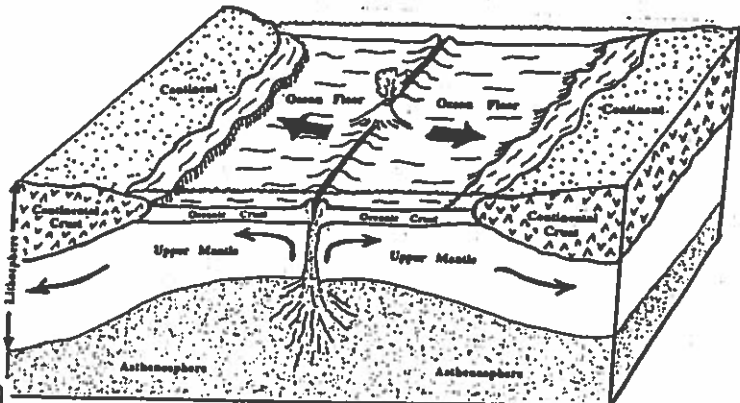
IV. VOLCANOES

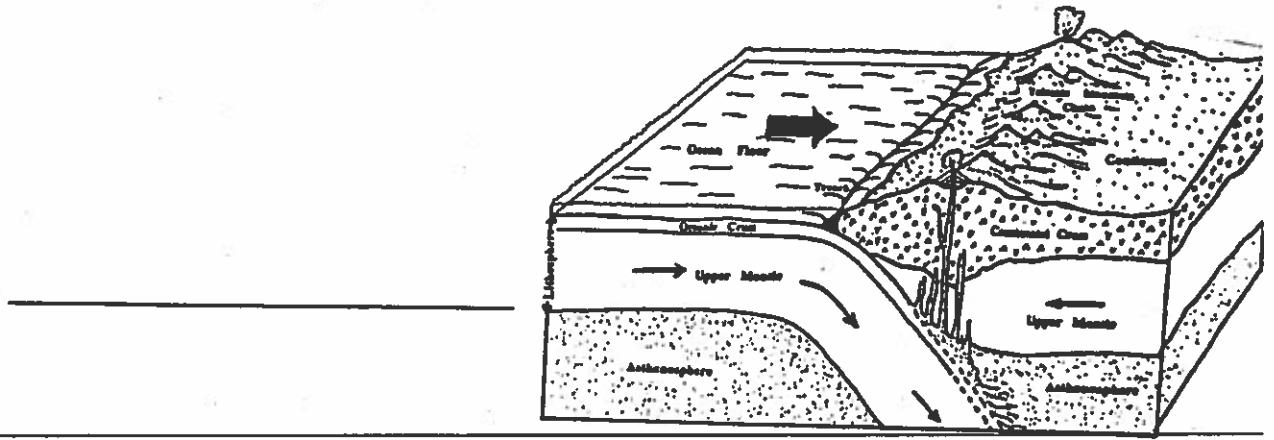
A. Volcanic Regions on Earth



_____ = region of volcanoes that encircle the Pacific Ocean.

C. Causes of Volcanic Activity 1. Plate Boundaries





2. Hot Spots
Hawaiian Islands

