

Science 201 – UNIT 1: INTRODUCTION, PLATE TECTONICS, MASS EXTINCTION

PLATE TECTONICS Outline – Lectures 2, 3, & 4

I. Introduction; Overview

II. Earlier Paradigms or Ways of Viewing the World

- A. Static Earth Theory
- B. Catastrophism
- C. Contracting Earth Theory
- D. Continental Drift

III. Plate Tectonics - The currently accepted paradigm

- A. Central Concepts
- B. Types of Plate Boundaries (Divergent, Transform, Convergent)
- C. Evidence for Plate Tectonics
- D. Consequences of Plate Tectonics (e.g., volcanoes, earthquakes, tsunamis)
- E. Conclusions

IDEAS TO CARRY AWAY FROM THIS UNIT:

1. Science is based on observations and evidence; scientific ideas must be tested.
2. Scientific progress involves the progressive building on the work of earlier scientists. Further, it is a synthetic process, pulling together information from many different fields.
3. Sometimes there are radical shifts in science called Paradigm Shifts or Scientific Revolutions where new ways of thinking cause major breakthroughs. Old theories in some cases have to be greatly modified or even discarded in order to make way for the new.
4. There are often cultural or social influences on the development or acceptance of scientific ideas.
5. We now have a very different way of looking at the planet on which we live. It is viewed as changing, dynamic and constantly evolving. How does this affect the way we view ourselves?

PLATE TECTONICS

LIST OF KEY WORDS (IN APPROXIMATE ORDER IN WHICH THEY ARE PRESENTED.)

Paradigm Shift
Geocentric
Anthropocentric
Static Earth Theory (=Unchanging Earth Theory)
Archbishop James Ussher
Heliocentric
Evidence
Observations
Catastrophism
James Hutton
Charles Lyell
Contracting Earth Theory (=Contraction Theory)
Uniformitarianism
Continental Drift
Alfred Wegener
Land Bridges
Matching Strata (=Matching Rock Layers)
Pangaea
Harold Jeffreys
Plate Tectonics
Tekton (from Greek=Builder)
Lithosphere (=crust and upper part of mantle)
Asthenosphere (=partially molten layer of mantle below the lithosphere)
Convection Currents
Divergent Boundaries or Margins (=Spreading Boundaries)
Mid-Ocean Ridges (=System of mountains over 30,000 miles long that snakes through the world's oceans.)
Rift (=Rift Valley)
Sea-Floor Spreading (=Ocean-Floor Spreading) (=Conveyor-belt view of the ocean floors.)
Harry Hess
Red Sea
Transform Boundaries (=Transform Faults, Transverse Boundaries, Shear Zones, or Fracture Zones)
San Andreas Fault
Convergent Boundaries (in many cases=Subduction Zones)
Trenches
Fit Evidence
Antarctica (Fossil Evidence)
Magnetic Evidence
Pole Reversals
Age of Ocean Floor
Ring of Fire
Tsunamis
Cocos Plate
Andes
Himalayas
Indian Plate
Nazca Plate
Nevado del Ruiz
Central American Volcanoes (Orizaba, Paricutin, Volcan Poas, Irazu)
Mount St. Helens