

GEOG 701: Assignments for October 5

Ahmed, Sadiyah: Carl Ritter

Betancourt Mazur, Livia: Carl Ritter

Brown, Christina: Arnold Guyot

ArnolChim, Ivy: Matthew Maury

Cytryn, Margaret: Charles Darwin

Devlin, Jennifer: Robert FitzRoy

Douglas, Robert: Alfred Russell Wallace (Line)

Friedman, Erin: Stoddart article

Hymes, Marla: Stoddart article

James, Yolanda: Jean-Baptiste Lamarck

Jenkins, Kevin: Herbert Spencer

Laroussi, Joanna: Halford MacKinder

Mead, Victoria: Friedrich Ratzel

Murray, Wallace: William Morris Davis

Olesh, David: Royal Geographical Society

Sultana, Nighar: American Geog. Society

Visovsky, Stephen: National Geog. Society

Assignment for October 5th

Compare and contrast the Darwinian and Lamarckian theories of evolution. What were the implications of their differences for the field of geography?

A Primer on the Philosophy of Geography

- The philosophy (from the Greek, "love of wisdom") of an academic discipline involves the ways in which work is conducted in that field.
- A central element of an academic philosophy is its epistemology, or theory of knowledge. Thus, philosophies of geography address the nature, limits and validity of geographic knowledge.
- A philosophy and its epistemology may be exemplified by a paradigm, which is a model, or exemplar of standard practice, or archetype.


Five of the principal philosophies of geography in rough chronological order

- Empiricism
- Positivism (a.k.a., scientism, modernism . . .)
- Humanism
- Structuralism
- Postmodernism

Empiricism
(Gr. Empeirokos, experienced)
Derived from experience


- **Philosophy:** The things we experience are the things that exist.
- **Epistemology:** Geographic knowledge consists of knowing phenomena that can be directly observed or experienced (as opposed to values, theory, interpretations, or proof derived from scientific method).
- **Paradigm:** Exploration (travel; observe; take notes; publish them.)

Caspar Peucer (1525-1602)




- German mathematician and astronomer.
- Saw geography as the science concerned with the visible dimensions of divine Creation
- God had revealed Himself in Nature as well as in Scripture.
- Therefore, careful description and analysis of the natural world could reveal God's plan.

Jean Bodin
1529/30 - 1596




- French lawyer, historian, economist, natural philosopher . . .
- Linked history and contemporary life to environmental conditions.
- Linked culture to the signs of the zodiac, thereby suggesting that some cultures were industrious, lazy, bellicose, liberty-minded, independent-minded, etc. because of their local environmental circumstances.
- Suggested that religion, culture and morality were subject to environmental control.
- Anticipates later *environmental determinism*.

Archbishop James Ussher (1581-1656)



- Irish clergyman and scholar famous for placing the date of Creation as the period of darkness preceding Sunday, October 23, 4,004 B.C.
- Relevance to geography is that the nature and distribution of all earthly phenomena must be explained within that time frame.
- Believed in *catastrophism* and the notion that the biblical flood was the most important causal event in earth history.
- Gave rise to "Young Earth Creationism."

Robert Boyle
(1627-1691)



- Irish-born English chemist and naturalist philosopher who espoused a teleological view of the world.
- Viewed the interconnectedness of the natural world as something akin to a complex mechanism designed by God, who also provided the sustaining source of energy.
- Argued that plants and animals gave evidence of being specifically designed for the natural environments in which they were found.
- Believed that Adam and Eve were white, and that all races were derived from them.

Teleology: The argument to design

- The world was created by God and was designed by Him to operate according to His will.
- The study of geography provides evidence of His existence, design and will.
- Begins with the premise of God's existence and moves to evidence and nature of His handiwork.

Teleology: The argument *from* design


- Geography provides evidence of design in nature (versus, say, random chance).
- Evidence of design suggests the handiwork of a Designer and, therefore, the existence of God.

**Charles-Louis de Secondat
Baron de Montesquieu
(1689-1755)**




- French social commentator and political thinker.
- Noteworthy to geography for the climatic determinism expressed in "The Spirit of the Laws" (1748).
Examples:
 - Climatic conditions governed the geography of culture traits.
 - Coldness and humidity produced drunkenness.
 - Warm climates produced hot-tempered people.
 - Slavery was a product of climates that produced laziness.
 - Temperate climates (as in France) produced advanced civilization.

**Varenus
(Bernhard Varen)
(1622-1650)**




- Articulated the dichotomy between General (systematic) Geography and Special (regional) Geography.
- Saw the former as dealing with data amenable to development of theory and law, and the latter with description.
- Viewed the two approaches as interdependent.
- In time, specialization in a systematic field and a regional field would become the model of a sound geographic education, but also contribute to geography becoming a male-dominated discipline.

Varenus Project letterhead, NCGIA




**Varenus:
NCGIA's Project
to Advance Geographic
Information Science**



**Varenus:
NCGIA's Project to Advance
Geographic Information Science**

**Georges-Louis Leclerc
Comte de Buffon
1707-1788**



- French mathematician, cosmologist and naturalist
- "The father of all thought in natural history in the second half of the 18th century."
- Appointed director of the Jardin du Roi.
- Major figure in the secularization of science.
- Challenged prevailing religious views on the age of the Earth and notions that human beings were special and separate from other animals.

Selected Viewpoints of Count Buffon

- Earth is the product of celestial collision, not divine creation.
- Geologic and geomorphologic phenomena have natural causes that do not include a biblical deluge.
- Rejected Linnaean classification that viewed life forms divided into categories that reflected a divine plan.
- Rejected post-Deluge dispersal as the key to understanding biogeography, believing instead in longer term ecological and climatic explanations.
- Saw humans as active agents of environmental change.
- Human modifications of the planet are linked to the history of civilizations.
- Humans were transforming the world for their purposes.

**Anton Friedrich
Busching
(1724-1793)**



- German theologian and geographer
- Author of the 11-volume *Neue Erdbeschreibung*, “the first geographical work of any scientific merit.”
- Viewed boundaries of all sorts as having been designed by an “all-wise Providence.”
- Saw evidence for design in trade, where “the superfluity of one country abundantly supplies the wants of another.”
- Believed environmental differences produced racial differences, but did not believe there was a geographic basis for intelligence.

**Immanuel Kant
(1724-1804)**



- German philosopher who also taught a course on physical geography (more than 40 times) at the University of Königsberg.
- Articulated the nature, uniqueness and necessity of geography among the various branches of knowledge.
- Though a devout proponent of teleology, he stressed the importance of reason in geographical enquiry.

**Immanuel Kant on the place of geography
within the realm of knowledge**

- The various fields of knowledge may be placed in one of two categories: Those distinguished by the peculiarity of the phenomena they study (“logical classification” – art, chemistry, sociology, mathematics . . .), and those distinguished by the perspective they use to study phenomena (“physical classification” – history and geography).
- History is a “chronological science” that examines the occurrence of phenomena over time.
- Geography is a “chorographic science” that examines the occurrence of phenomena over space.

**James Hutton
(1726-1797)**



- Scottish scientist sometimes called the Father of Modern Geology.
- Believed Earth to be much, much older than Ussher’s calculation, leading to the concepts of *geologic time*, or *deep time*.
- Espoused *uniformitarianism*.
- A proponent of *plutonism* as opposed to *neptunism*.
- Said nature showed no evidence of a specific beginning or ending.

Catastrophism vs. Uniformitarianism

Two opposing explanations of Earth History

- **Catastrophism:** Earth’s features were principally formed in the past by catastrophic events that were massive, sudden, and worldwide. By far, the most important of these events was the biblical flood.
- **Uniformitarianism:** Earth’s features tend to change slowly over time as a result of uplift, erosion and deposition. Notwithstanding the occasional flood, volcano or earthquake, these processes are uniform in the sense that they characterize past, present and future Earth history.

Neptunism vs. Plutonism

Two Enlightenment-era explanations of near-surface geology

- **Neptunism** (from the Greek god of the sea): Earth was originally covered by a liquid containing a high concentration of particulates. Over time, these precipitated to the bottom according to their weights, forming the different kinds of rocks and strata we now observe. Later, much of the sea evaporated, exposing the rock. (Volcanoes are the result of coal-burning.)
- **Plutonism** (from the Greek god of the underworld): Earth’s interior heat – recognized as a result of coal mining – was sufficient to cause ocean sediments to rise over time and form continents. While some land masses were being formed, others were eroding – suggesting an ongoing cycle of building, weathering, and regeneration.

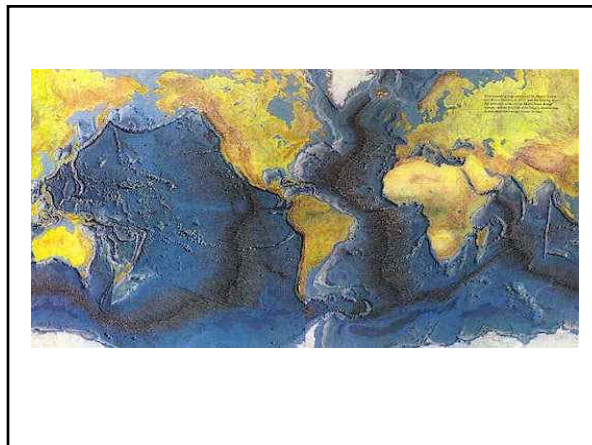
1691 map of the world by N. Sanson
(note the undiscovered southern continent)



Alfred Wegener
(1880-1930)



- German physical scientist interested in locations of continents over time.
- Wrote (1912) "*Die Verschiebung der Kontinente*", suggesting the continents had broken off from a single landmass and moved apart.
- *Verschiebung* = shift, displacement. Mistranslated as "drift". Hence, *continental drift*.
- His theory was greeted with skepticism because he could provide no verifiable explanation as to what would cause the break-up and movement of such large land masses.



Actual photos of magma vents on the Mid-Atlantic Ridge

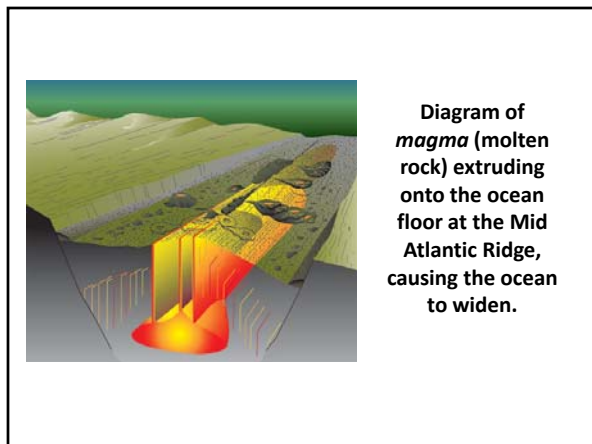
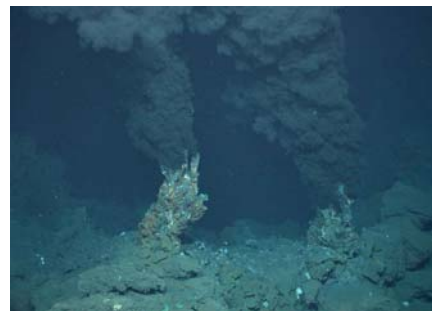
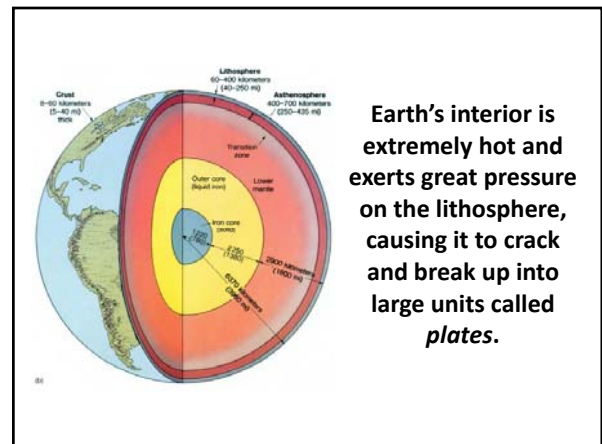


Diagram of magma (molten rock) extruding onto the ocean floor at the Mid Atlantic Ridge, causing the ocean to widen.



Earth's interior is extremely hot and exerts great pressure on the lithosphere, causing it to crack and break up into large units called plates.

Locations of the Earth's Plates and their directions of movement

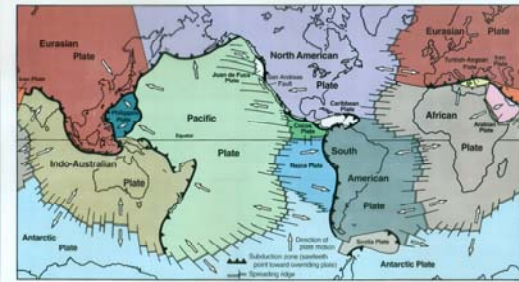


Plate tectonics is the theory that the Earth's outer hardened lithosphere is broken into very large units called *plates*, which move relative to each other, resulting in mountain building, earthquakes, and volcanoes.

["Tectonics" comes from the Greek word *tektonikos*, roughly meaning "of a builder."]

Mountains are built in three ways:

- Faulting
- Folding
- Volcanism

Johann Gottfried von Herder
(1744-1803)



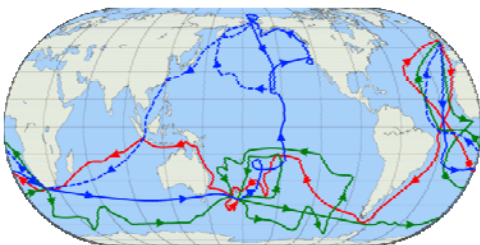
- German philosopher and theologian.
- Strong critic of climatic determinism.
- Said that although climate influences human behavior, climatic determinists were guilty of overgeneralization.
- Wrong to say that climate effects were uniform or universal.
- For his time, held a very empathetic view toward "native peoples."
- Praised travel writers who had the capacity to "place themselves into the customs and culture" of the people they studied.

Capt. James Cook
1728 - 1779




- British explorer, cartographer and navigator.
- Geographically noteworthy for his practice of including scientists, naturalists and artists on his voyages.
- Famous for recognition of fresh fruits as an antidote for scurvy.

Voyages of Captain James Cook
(1)red (2)green (3)blue



Cook's chart of Newfoundland, 1775






Alexander von Humboldt (1769-1859)

“The greatest scientific traveler who ever lived.”
-- Charles Darwin

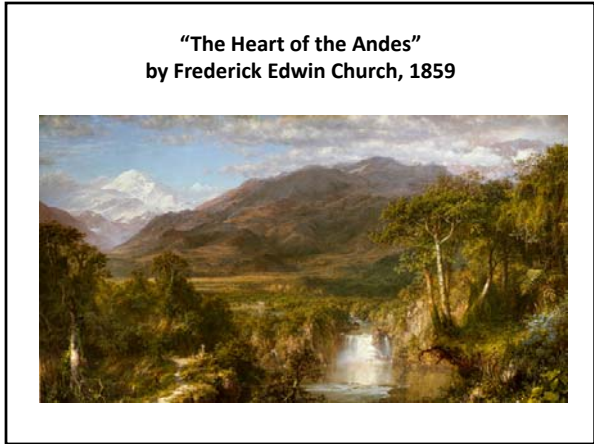
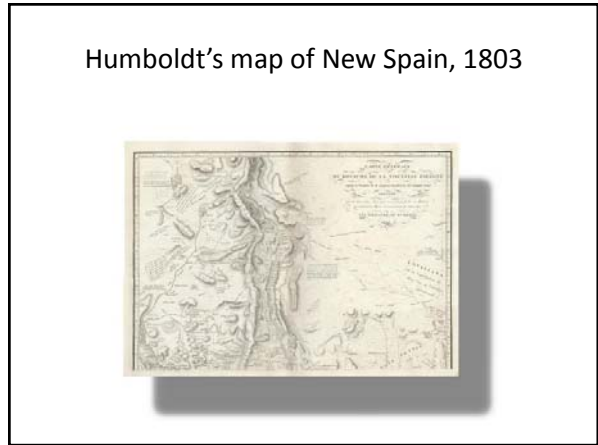
Portrait by F.G. Weitsch, 1806

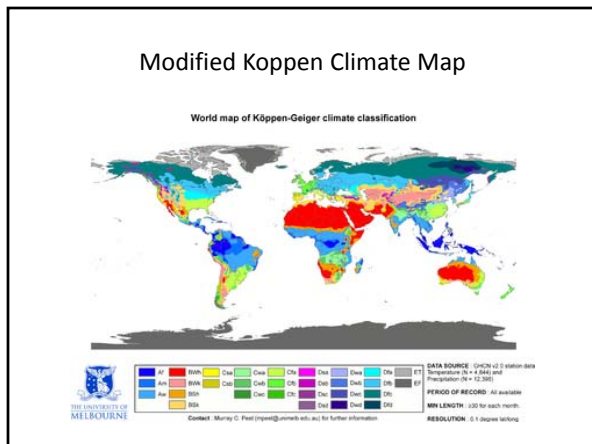
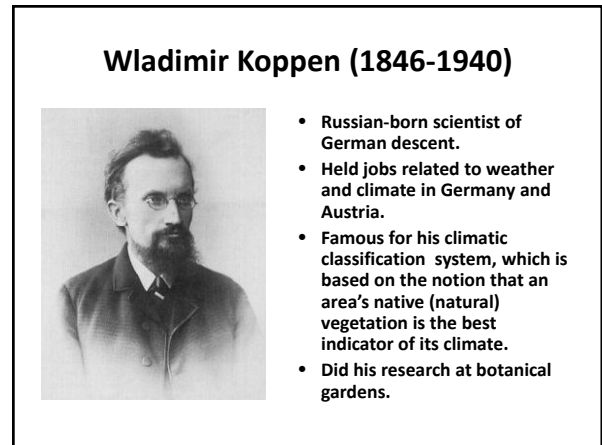
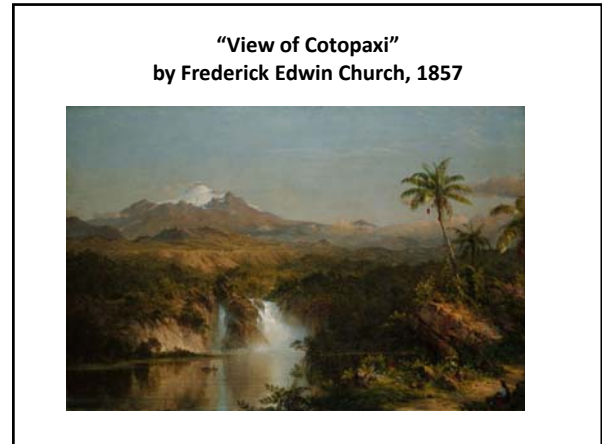


Alexander von Humboldt (1769-1859)



- Independently wealthy German naturalist and explorer
- Influenced by childhood collections, the Cook voyages, and early job as a mine inspector.
- After securing his inheritance, travelled extensively in the Americas.
- Noted for rigorous scientific note-taking and collections.
- Focused on the inter-relatedness of phenomena, especially of plants to their environmental setting.
- “Father of biogeography”
- Never suggests divine cause
- Accessible writer and lecturer
- *Kosmos*
- Possibly the world’s last “Renaissance man.”





Mary Somerville

- “The first woman scientist in English history.”
- Completely self-educated, thanks in part to an inheritance left by her first husband, and the encouragement of her second.
- Published *Physical Geography* at age 68. Appeared in seven editions, the last in 1877.
- Noted for lucid writing and emphasis on the interconnectedness of natural phenomena.
- Friend of von Humboldt and other noted scientists of her time.
- Denounced from the pulpit of York Cathedral for published comments that ran counter to Biblical accounts of earth history.