History of Geography

Lecture Outline

- Classical Period
- Age of Exploration
- Astrology
- Cartographic Accomplishments
- Mechanical Philosophy
- Active Role of Geography
- Regionalism
- Go-between (regionalism to systematic geography)
- Science of Space (Systematic Geography)
- Geography in the U.S.
- Applied Geography
- Theoretical Geography

Geographical Knowledge

- Paradigm – established concepts, research questions, and methods
- A paradigm will dictate course of research until it is no longer able to provide answers to new questions. At that time a new paradigm will emerge
- Two distinct geographical paradigms
  1. Regional (idiographic)
  2. Systematic (nomothetic)

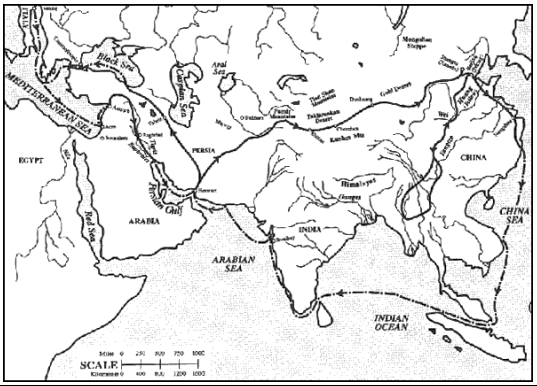
Beginning of Geography
Classical Period

- Eratosthenes – Greek, 3rd Century B.C.
  - Known as the father of Geography; first to use the word Geography (Geo/earth graphy /description)
  - Original computation of circumference of the world
- Strabo (64 B.C.-20 A.D.) – accumulated knowledge of the earth and wrote "Geography" (size, shape, and character of earth's surface)
- Ptolemy – Roman, 130 A.D.
  - Wrote "Guide to Geography"; 8 Volume work that dealt with projections and cartography (coordinate grid system)

Age of Exploration

- Voyages of Muslims, Scandinavians, Chinese, and medieval Christian adventures began to contribute to geographic lore
- Marco Polo – 1271 A.D., not a geographer, however knowledge of the Orient which he acquired was attributed to geographical exploration
  - Wrote " The Description of the World" became known as II Milione (million lies)
    - book was recognized as the most important account of the world outside Europe that was available at the time

Route of Marco Polo, Circa 1271-1297 CE



Age of Exploration
13th –17th Century



- Required technological and scientific skills (charting)
- Drew together cartography astronomy, and nautical instrumentation
- Major advances in Cartography –Magellan (1519), Columbus (1492), Da Gama , Coronado, Cartier,
- Dealt with overcoming 5 problems of the day
  1. Health
  2. Navigation
  3. Precise Measure of Longitude/Latitude
  4. Cartography and Projections
  5. Accumulation of Knowledge

Astrology
14th Century -

- Interest in the stars was stimulated by astrological concerns continued by Copernican theory - shift away from a geocentric (and anthropocentric) universe with the Earth at its center
- John Dee – the celestial and terrestrial worlds were held together in certain mathematical relationships in such a way that changes in one directly influence another
- Leonard Digges – weather forecasting required acquaintance with the significance of celestial changes in the moon, stars, and planets
- Jean Bodin – diversity of the worlds peoples and cultures was closely bound up with which sign of the zodiac governed the particular region they inhabited
- Demonstrates the role of apparently non-rational discourse in the evolution of the discipline

Cartographic Accomplishments
16th – 19th Century

- Whole new worlds had to be reduced to paper
- Gerard Mercator (1569) – solved some of the mathematical problems associated with transferring a sphere to a flat surface
- Dutch and Belgian cartographers splendidly mapped the progress of overseas discovery
- Closely associated with these accomplishments was the development of surveying skills and instruments
- Map making was as artistic as it was scientific – frequently maps were so elaborately decorated that they became *objets d' art* in their own right
- By 19th century geographers frequently involved themselves in thematic mapping of drift geology, soils, populations, disease, etc…

Mechanical Philosophy
17th Century

- Numerous efforts to retain the integrity of religious discourse in the face of apparently naturalistic implications of a mechanistic world picture
- Newton and Boyle argued that the world was like a grand clock and that by investigating the world machine scientists were interrogating the very mind of the great designer
- Regarded the world as teleologically designed and providentially controlled and interpreted the world environment as a functioning revelation of divine purpose
- The world's geography was seen as pointing beyond itself to nature's God
- Delivered a vision of nature as a holistic system that emphasized the interrelationships and interdependencies among organisms and environment

Exploration Continues
18th Century

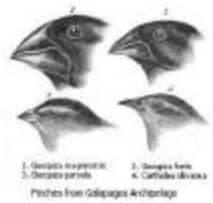


- Drake (1540-1596) – circumnavigated the world
- Hudson (1565-1611) – attempted to find northeast passage to Asia – instead found Hudson Bay
- Cook (1728-1779) – first European contact with Australia and New Zealand
- Lewis and Clark (1804-1806) – North America
- Charles Darwin (1831) – circumnavigated the world, developed theory of evolution
- Thomas Huxley – surveyor and biologist

Charles Darwin

- **Voyage of the Beagle (1831-1836)**
- **Published The Origin of Species**
- **Natural selection** is the biological theory that explains why living creatures seem to match their environmental niches so well – the process by which individual organisms with favorable traits are more likely to survive and reproduce than those with unfavorable traits. Insofar as there is genetic variability for the trait under selection, the genotypes associated with the favored traits will increase in frequency in the next generation. Given enough time, this passive process results in adaptations and speciation

Darwin's Finches



- Birds are all about the same size (10–20 cm)
- Most important differences between species are in the size and shape of their beaks
- The beaks are highly adapted to different food sources
- Birds were isolated on different islands
- Idea that somehow in this geographical isolation these different species could have been formed from a small number of common ancestors so that each was modified to suit "different ends".

Immanuel Kant
18th Century

- Assigned to Geography the task of studying all of the associations that are associated with space
- Study of space meant the study of places and the interactions of everything of significance within that space
- Credited as the father of Modern Geography because he emphasized the study of interaction of phenomena, but remained committed to the study of place
- *Nomothetic* is based on what Kant described as a tendency to generalize, and is expressed in the natural sciences. It describes the effort to derive laws that explain objective phenomena.
- *Idiographic* is based on what Kant described as a tendency to specify, and is expressed in the humanities. It describes the effort to understand the meaning of contingent, accidental, and often subjective phenomena.
- Usually, nomothetic approaches are quantitative, and idiographic approaches are qualitative

Active Role of Geography
19th Century

- Geography was frequently cast as the *aide de camp* to militarism, imperialism, racism, and a cast of the "isms"
- Institutional geography first flourished in military schools
- British expansion overseas aroused a renewed interest in geography for its functional purposes
- Considerable debate in geography on the subject of acclimatization because of the question of white adaptation to the topical and subtropical worlds – geographers worked closely with medical experts to delineate the significance of climatic factors

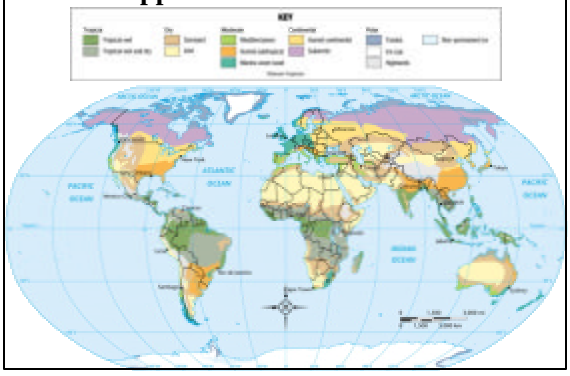
Active Role of Geography cont.
20th Century

- Environmental Determinism – (1910-1920) one of geography's first social theories
  - This theory noted the concentration of wealth and power in the midlatitudes; The theory stated that tropical heat and humidity inhibited cultural progress
  - It went on to state that mid-latitude climates stimulate achievement
  - Progress, according to Ellsworth Huntington, is based on climate, heredity and culture
  - These ideas were attacked as being ill-founded and racist; despite its failings, the idea of environmental determinism leads to a very important question. How does environment affect a culture and its development?

Regionalism
19th Century

- Geographers pursued a form of spatial discriminant analysis, or "areal differentiation," to identify regions from the messy spread of human activity across the globe
- Geographers were pressed to differentiate their field from cognate areas like anthropology, political science, and history
- Geographers studied everything in its locational and spatial configuration and used maps as our signature tool of analysis
- Karl Ritter (1779-1859) – Co-founder of Modern School of Geography in Germany; wrote "Erdkunde" (1852), dealt with regional studies, ushered in the age of specialization
- 1874 - First Chair of Geography was established at the University of Berlin
  - Focus of Geography Department was on Chorology (Regional Studies); Methodological study
  - Geography was one of the first disciplines to specialize

Köppen Climate Classification



Go-between from Regionalism to Systematic Paradigms (19th-20th Century)

- A second sector of conceptual space (regionalism was the first) in the academic scheme of things stressed the functional role of geography: the integrating discipline that kept the study of nature and culture under one disciplinary umbrella
- It was appealed to to justify geography as a coherent and independent academic discipline
- Thought to be the only foundation on which geography as a causal science could be built
- Von Humboldt (1769-1859) – Co-founder of Modern Geography; systematic studies; wrote "Kosmos" (1845), a multi-volume book that tried to unify all of the sciences
- Geography's bridging role between nature and humanity frequently took the form of a strenuous engagement with questions to resources
  - Historical reassessment of man's role in changing the earth
  - Engagement of environmental systems analysis
  - Current environmental crisis

Science of Space (Systematic Geography)
20th Century

- Some Geographers found the emphasis on the particularity of places lacking in methodological rigor, bridging sciences and humanities seemed little more than academic political rhetoric
- Fred Schaefer published *Exceptionalism in Geography* in the Annals of the Association of American Geographers in 1953 designed to transform geography into a true science by urging that it become a law-seeking explanatory discipline concerned with universal laws not regional specifics
- Thus, the idea of geography as a science of spatial distribution was born that dealt with locational analysis and various theorems seeking to explain the location of economic behavior
- Geography, as defined as a spatial science, began to practice the scientific method and develop its own statistical techniques

Geography in the US

- Geography emerged in the US approximately 10 years after emergence in Germany (1880s-1890's)
- In 1987 William Morris Davis set early example of geographical study in the US Department of Geology at Harvard University. His major contribution was the Davisian system of landscape analysis, which involved recognizing the long-term, cyclical nature of erosion in landforms and landscape analysis
- First Geography Department established at University of Chicago in 1903
- 1920's – 1950's Geography focused on areal differentiation, major paradigm was regional descriptive idiographic in nature
- Major Work (1930) Hartshorne's "The Nature of Geography" - area-studies tradition (otherwise known as the chorographic tradition)

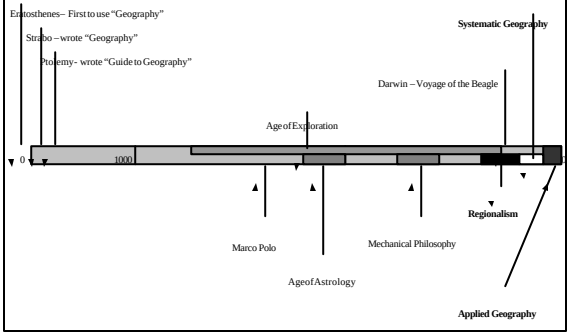
Geography in the US 1950 - Present

- During WWII questions arising could not be answered by regional approach
- New paradigm emerged – nomothetic (systematic), tried to establish a more scientific hypothesis testing approach
- New paradigm characterized by increased awareness of and emphasis on the methodological approaches in geographic models, systems, and the quantitative revolution

History of Applied Geography

- Geographic research used in problem solving – extends the experimental method to include evaluation and implementation
  - WWI – Geographers attached to governmental agencies, conducted commodity and mineral studies
  - 1920's to 1930's – Land Classification studies, TVA planning
  - WWII – logistics, transportation, intelligence
  - Contemporary applied geography employs geographic research methodologies and techniques toward solution of relevant problems
  - Major objective or current applied geography programs is to increase non-academic employment while at the same time educating the public as to what geographers do

Geographic Timeline



Geography (Physical/Human)

Geography

- Geography – provides a framework for describing and understanding the distribution of human and physical phenomena at the earth's surface.
- Geography focus is on identifying relationships between patterns and processes using a spatial perspective
- Geographers answer questions such as
  - Why are spatial distributions structured the way they are
  - Why things/people located where they are
  - Where should something be located
- Geographic perspective has great utility because virtually everything occurring at a landscape level has a local attribute based on where the event took place. Spatial location is by itself an integrating concept.

Geography Continued

- Branch of academic research and study primarily concerned with the acquisition of spatial knowledge within a scientific and highly structured framework
- It is concerned with the identification, analysis, and interpretation of spatial distributions of phenomena and their areal associations as they occur on the surface of the earth
- The goal of geographic science, as with all science, is to describe, analyze, and predict
- Geographic research is the application of the scientific method towards solving spatial questions

Physical vs. Human Geography

Human	Physical
• Economic	• Lithosphere
• Social	• Biosphere
• Political	• Hydrosphere
• Cultural	• Atmosphere

Geography (Applied/Theoretical)

Applied Geography

- Applied Geography – builds on spatial perspective and focuses on how geographic information and methodologies can be used in human and environmental problem-solving
- Applied Geography emphasizes analysis, evaluation, implementation, and recommendation
- Applied Geography has utility in a number of areas including government, public policy, business, national security, environmental management

Applied Geography Continued…

- Spatial geographic problems– all research starts with some type of problem statement establishing how the process will be conducted.
- Problem identification– world is full of problems, many with geographic dimensions.
- Geographers identify patterns on the landscape through observation and inquiry, and begin to ask questions related to the spatial concepts:
  - What differentiates one place form another?
  - Why is one region as part of the Metroplex different form some other?
  - Where is the best location to build a new school?
  - What would be the best route for a new highway?
  - Is there a geographical pattern as to where certain types of disease occur?

Applied Geography Continued…

- General problem – establishes the context of the problem locally, regionally, nationally, and/or globally. Provides an orientation as to why the problem will be studied and it's significance/importance
- Specific problems
  - Identify smaller questions, which must be answered in order to achieve larger research objective.
  - Specific research questions can be concept focused and/or directed at individual steps in research process. Specifically, this research will: 1) locate…2) inventory…3) analyze… and 4) recommend solutions to the general problem.
  - Spatial or geographic research problems can start with a map of dependent variable or the pattern we are attempting to understand.

Applied Geography Continued…

- Components of Applied Geographic Research
  - Process oriented focused on discovery
  - Systematic and logical
  - Scientific method
  - Empirical approach based on collection, analysis, interpretation, presentation, and application of data to problem - solving.
  - Builds on conceptual framework
  - Starts with problem identification and definition.

Theoretical Geography

- Primarily concerned with the search for knowledge and truth, regardless of any practical value
- Examples
  - Climatic conditions during the Pleistocene
  - Development of a mathematical model to explain the diffusion of an innovation
- Although the goal of theoretical geography is not practical significance, it may at one time or another have practical application
  - For example, the theoretical factors of why and when a person purchase a new innovation are of value to a marketer
- Applied research adds two stages: 1) evaluation of research findings for a specific strategy, and 2) implementation of change by controlling change
- Applied research is primarily concerned with providing answers to a present problem, but may use theoretical research to achieve goal