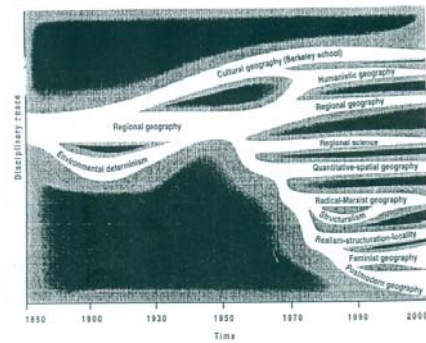


**“War is God’s way of
teaching Americans geography.”**

-- Ambrose Bierce

From Richard Peet,
Modern Geographical Thought (1998)



Causes of “The Quantitative Revolution”

- Technical expertise and spatial perspectives gained during World War II.
- Advances in computational technology.
- The rise in positivism and spatial analysis in the social sciences.
- Discontent of geographers, especially younger members of the discipline, concerning the nature (and “The Nature . . .”) of geography.
- The demise of geography at Harvard.
- The resistance of “The Old Guard” to change.

Philosophies of Geography Positivism

(a.k.a. Logical Positivism, Modernism, Scientism . . .)

Philosophy: The goal of geography should be to generate laws that explain and predict events and patterns in the real world. True understanding of the world is gained through verifiable experience in the form of data that are collected, analyzed, and reported in an objective manner (that is, free of investigator bias).

Epistemology: The scientific method. That is, a method of research in which a problem is identified, stated in the form of a hypothesis, relevant data are gathered and analyzed in an unbiased way, leading to acceptance or rejection of the hypothesis.

Paradigm: A scientific experiment.

Augean:

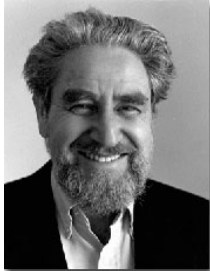
resembling the Augean stables in filth or degradation; difficult and unpleasant.

Augean stables:

In Greek mythology, the stables in which King Augeas kept 3,000 oxen, and which had not been cleaned for 30 years. Hercules diverted a river through them and cleaned them in a day.

**How does an academic discipline progress
(as by adopting new concepts,
methodologies and techniques) if its
“gatekeepers” – i.e., those who control
publication, promotion and tenure -- are
opposed to new ways of doing things?**

Zvi Grilches (1930-1999)



- Holocaust survivor who became a leading international expert on the economic impact of the spatial diffusion of technological innovation.
- Emigrated to the U.S. after World War II and studied sociology.
- His doctoral dissertation (U. of Chicago, 1957) on the diffusion of hybrid corn in the U.S. is considered a classic in many fields, including cultural geography.
- Numerous publications, principally in Rural Sociology and other journals in the field of sociology.

The Corn Belt



- A region in the Midwest where corn has been the dominant crop since the 1850s, replacing tall natural prairie grasses
- Since 1950, almost entirely hybrid corn.
- Most ends up as feed for livestock, especially hogs and chickens.
- Growing use for ethanol
- U.S. produces about 40% of world corn crop.
- Increasingly complemented by soy beans.

Hybrid Corn (center) vs. Earlier Varieties

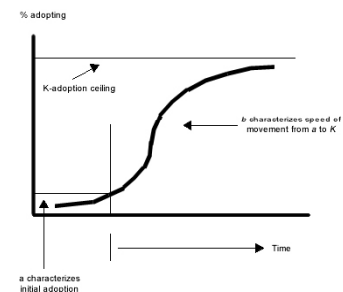


Inspecting ears of hybrid seed corn, Reinbeck, Iowa, Sept. 1939. Photo by Arthur Rothstein for the FSA.

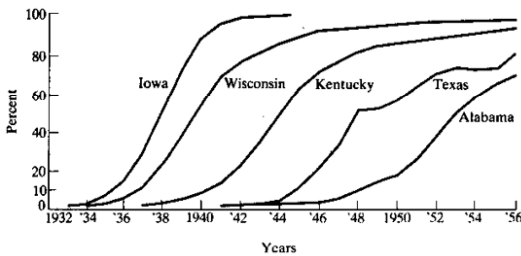
Corn Harvesting in the Midwest



The S-shaped adoption curve



Diffusion of hybrid corn in several states



Hybrid corn field



Thomas S. Kuhn (1922-1996)

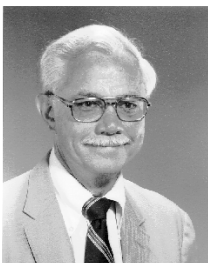


- American historian/philosopher of science.
- Wrote the highly influential and controversial book *The Structure of Scientific Revolutions* (1962).
- Argued against the “normal science” viewpoint that disciplinary progress is a slow, incremental accumulation of knowledge.
- Argued instead that “normal science” leads to a “crisis phase” when the existing paradigm (mode of explanation) proves unsatisfactory.
- The result is a period of upheaval followed by a “paradigm shift” that involves adoption of a more satisfactory mode of explanation.

Sequence of events in a scientific revolution, according to Kuhn

- **Preparadigm period:** Various schools of thought, often associated with noteworthy individuals, vie for disciplinary dominance.
- **Professionalization:** Responding to a need to define what a discipline is all about, one paradigm comes to the fore. (Happened in geography when a university degree became necessary to become a high school geography teacher.)
- A period of **normal science** ensues.
- A **crisis phase** develops when the existing paradigm proves increasingly unable to solve problems or operate satisfactorily.
- A **revolutionary phase**, characterized by a **paradigm shift** occurs when new exemplars prove superior to old ones. The new way of doing things often captures the allegiance of young practitioners. The revised science may adopt the new paradigm or exist as a contested discipline.

William L. Garrison (1924 -)



- Pivotal figure in “the quantitative revolution” that transformed American geography after 1950.
- Trained in advanced statistics during WWII. Focused on transportation and logistics.
- Received Ph.D. in Geography from Northwestern in 1950.
- One of the first geographers to use computers, applying advanced quantitative analysis to transportation issues.
- Taught (at U. of Washington) the first geography graduate seminar in quantitative methods.
- Enrollees became a “Who’s Who in American Geography.”