

Demarcation: Science and Nonscience

PHL 311
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Categorizing Science

- Descriptive
 - What scientists do
 - Body of knowledge
- Normative
 - How claims about the world should be shown to be true
 - Ultimate reference that should be used in discussions about the world

Norms and Debates

- Terms like 'unscientific' carry with them a normative force.
- It is as if a study called 'unscientific' should have been scientific and failed to live up to the rules of science. On the other hand, some studies may not be scientific at all and do not pretend to be scientific. Such studies may have other values. A study of the metaphors in *Moby Dick* may not claim to be scientific but may exhibit other values. It would be rhetorically misleading to call such a study unscientific.

Views

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| (1) Science offers explanations. | • (1*) Joe offers an explanation for hurricanes in terms of space invaders. |
| (2) Science is objective. | • (2*) Mathematics and logic are objective. |
| (3) Science is descriptive. | • (3*) News reports of the latest fashions are descriptive. |
| (4) Science makes predictions. | • (4*) My friends make predictions about football games. |
| (5) Science proceeds from observation. | • (5*) Cake making is based on observation. |

Traditional

- Many reasonable persons would claim that science is distinguished from non-science by its reliance on “the scientific method.” The scientific method involves observation, experiment, and, a certain kind of inference or reasoning often called inductive inference. Consider that it is a scientific law that water boils at 100 degrees Centigrade.

Traditional

- How is the law established? The standard answer according to the “scientific method” is that it is established by observation. Given a sufficient number of observations of boiling water and temperature readings, inductive inference shows that the law holds or is confirmed. The law is shown to hold by an inductive inference on the observations and it is shown to be scientific by being based on observation.

Which way?

- If this hypothesis is correct, then this should be observed.
- This is observed
- Therefore the hypothesis is correct
- If this hypothesis is correct, then this should be observed.
- This is not observed
- Therefore the hypothesis is false.

The Matrix - Thagard

- A demarcation criterion requires a matrix of three elements: [theory, historical context, community,].
- Under the first heading, "theory", fall familiar matters of structure, prediction, explanation and problem solving.
- Under the heading of historical context two factors are relevant to demarcation:
 - the record of a theory over time in explaining new facts and dealing with anomalies,
 - the availability of alternative theories.

The Matrix - Thagard

- Consider the *community* of advocates of the theory,
 - are the practitioners in agreement on the principles of the theory and on how to go about solving problems which the theory faces?
 - are they concerned about explaining anomalies and comparing the success of their theory to the record of other theories?
 - are the practitioners actively involved in attempts at confirming and disconfirming their theory?
