The Demarcation Problem: What distinguishes science from non-science?

1. What **conditions** must any proposed criteria fulfill?

* Assessment of proposed criteria should not purely be a priori. Proposed criteria must acknowledge current **exemplars** of science. Thus, physics and chemistry should count as science.
* Proposed criteria should explain why science is **epistemically superior** to non-science.

1. What **kind** of criterion are we looking for?

* We need a criterion that consists of **individually necessary** and **jointly sufficient** conditions.
* Necessary conditions tell us whether something is non-science, but it does not tell us whether something is science.
* Sufficient conditions tell us whether something is science, but it does not tell us whether something is non-science.
* Thus, if our goal is to identify both science and non-science, we need both (individually) necessary and (jointly) sufficient conditions.

1. What is the **significance** of the criterion?

* Other than epistemic significance (or *because* of it), the criterion has **social** and **political** significance. It tells us what to believe in, and consequently what actions to take.

**Old Demarcation Tradition**

Aristotle’s two criteria:

|  |  |
| --- | --- |
| **Science** | **Mere Opinions** |
| Certain | Fallible |

|  |  |
| --- | --- |
| **Scientific Knowledge** | **Craft Knowledge** |
| Know-why | Know-how |

* Aristotle’s second criterion was rejected in the 17th century. Astronomers like Galileo, Huygens, and Newton maintained ignorance about causal knowledge, but maintained that their work counted as science due to its infallibility.
* By the mid-19th century, Aristotle’s first criterion was also rejected. Science was acknowledged to be fallible.
* With both of Aristotle’s criteria rejected, this marked a shift to the **methodology** of science.

**New Demarcation Tradition**

Logical Positivists’ Verifiability criterion:

* Although verifiability was proposed to distinguish between meaningful from nonsensical statements, the Logical Positivists also thought that it can be used to distinguish science from non-science.
* Laudan argued that much of science will excluded by verifiability’s demand for **absolute verification**, because general scientific statements cannot be exhaustively verified. [But this argument is based on a misunderstanding: The Logical Positivists meant for verifiability to be partial (confirmation) rather than absolute (verification).]
* Laudan also argued that many exemplars of non-science will count as scientific under verifiability criterion. E.g., Astrology is verifiable, indeed has been falsified many times over.

Popper’s Falsifiability criterion:

* Laudan argued that falsifiability leaves open scientific status of singular existential statements. [I don’t understand this argument. Singular existential statements are falsifiable, hence they are scientific.]
* Laudan also argued that many exemplars of non-science will count as scientific under falsifiability criterion. E.g., Astrology is falsifiable, indeed has been falsified many times over.

**Laudan’s Pessimistic Argument**

P1) The Demarcation Problem assumes that science is epistemically superior to non-science.

P2) All proposed demarcation criteria have so far failed.

C) Either the right criterion has yet to be found, or the assumption of science’s epistemic superiority is false.

* Laudan opts to reject the assumption that science is epistemically superior to non-science.
* In doing so, the **demarcation** problem is replaced by the **knowledge** problem.
* Rather than asking what distinguishes science from non-science, we should ask what distinguishes reliable knowledge from unreliable knowledge.

Very clear writing. As a result, the paper was very easy to read.

Agree with the proposal to shift away from the Demarcation Problem. The replication crises in recent years present further evidence of what Laudan calls “epistemic heterogeneity” of science.

page1image955706976 Conflation of **non-science** with **pseudoscience**. Pseudoscience is a subset of non-science, but there seems to be something especially defective about *pretending* to be science as opposed to simply not being science.