

## **Science and Values**

LFILO2602 – Philosophy of Science  
Session 8

What is the relationship between ethical value judgments and the practice of science?

- **The classic view:** There is **no role at all** for value judgments in science.
- **The new view:** The practice of science is profoundly influenced by ethical value judgments, and we need to seriously reflect on the ethical responsibilities of scientists!





First of all let me say that I have no hope of clearing my conscience. The things we are working on are so terrible that no amount of protesting or fiddling with politics will save our souls.

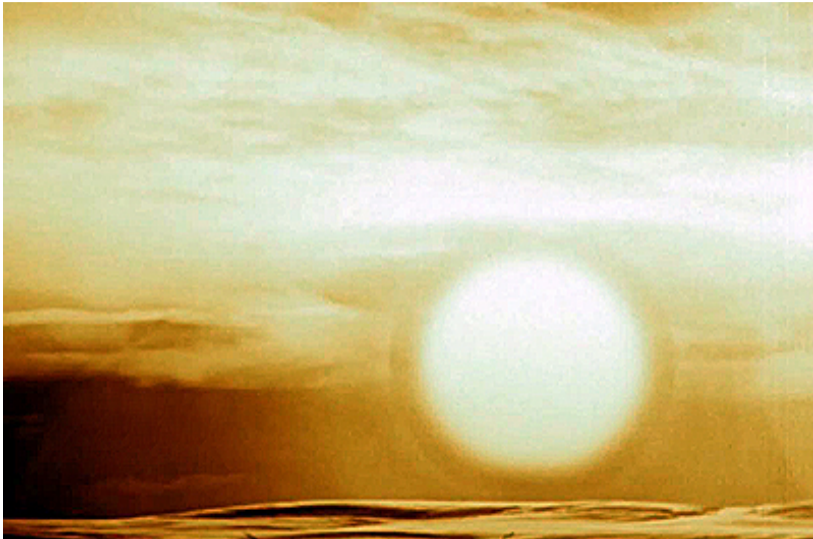


The accident that we worked out this dreadful thing should not give us the responsibility of having a voice in how it is to be used. This responsibility must in the end be shifted to the people as a whole and that can be done only by making the facts known.

(E. Teller to L. Szilard, July 2, 1945)



# Teller to Szilard



What is a value? Two criteria (from Kuhn):

- 1 Different people can disagree about the **importance** that we give to a value (i.e., in relationship with other values)
- 2 Different people can disagree about **how to value** something, even if they agree about the value (i.e., to what extent a thing expresses a value)



# A First Distinction

- judgments *external* to the practice of science — decisions about which scientific questions deserve an answer, which problems to solve, which things the government should finance, etc.
- judgments *internal* to the practice of science — decisions that one makes while actually doing science, or in the laboratory



# Epistemic and Non-Epistemic Values

There's a set of characteristics of theories that seem to act like "values," but don't seem to be "ethical:"

- accuracy
- consistency (either internal/logical, or external, between different theories)
- simplicity
- fertility

We don't accept these for social or cultural reasons (because we think they lead to a just society or a good life). We accept them because we think that theories that have them are **more likely to be true.**



# Epistemic and Non-Epistemic Values

- *epistemic values* — values that we adopt because theories that have them are more likely to be true
- *non-epistemic values* or *social values* — values that we adopt because the theories that have them will lead us to a better life or a better society





There are no internal, non-epistemic value judgments in science.

The debate:

	internal	external
epistemic	OK	OK
social	???	OK



When a scientific rule of acceptance is applied to a specified hypothesis on the basis of a given body of evidence, the possible 'outcomes' of the resulting decision may be divided into four major types: (1) the hypothesis is accepted (as presumably true) in accordance with the rule and is in fact true; (2) the hypothesis is rejected (as presumably false) in accordance with the rule and is in fact false; (3) the hypothesis is accepted in accordance with the rule, but is in fact false; (4) the hypothesis is rejected in accordance with the rule but is in fact true. The former two cases are what science aims to achieve; the possibility of the latter two represents the inductive risk that any acceptance rule must involve. (Hempel 1965, 92)

You're responsible for the analysis of two new herbicides for the ECHA (l'Agence européenne des produits chimiques). Herbicide A is a replacement for a product that already exists, which could be a little cheaper, but in general changes very little. Herbicide B is an entirely new product, which destroys a weed that threatens the food supply in a developing country.



All your analyses (like any other analysis) entail a risk of false negatives (to release a dangerous product by accident) and false positives (to forbid a safe product for no reason).

**Should you have different experimental standards for product A and product B?**



# Inductive Risk (Douglas)

- 1 *Of course* you should. If the consequences of removing a product from the market are only a bit of lost profits, you shouldn't be strict about false positives, and you should be *very* strict about false negatives. The opposite is true for the other herbicide. This is called **inductive risk** – the risk that an inductive judgment could be incorrect.



# Inductive Risk (Douglas)

- ② **These are moral judgments.** We think this is right because of how we *morally* evaluate the difference between lost profits and famines.
- ③ **These are internal value judgments.** Things like the standards for false positives and negatives, when to stop or continue a scientific experiment, etc. are paradigmatic internal questions.

The value-free ideal is therefore false. At the very least, here is one example of an internal, non-epistemic value judgment in science.



# The History of the Value-Free Ideal

- Why did this idea become so common? What's its history?
- What goals did it serve for the people who proposed it?
- Who benefited from the idea that science was completely without ethical or social values?



Precursors to the contemporary value-free ideal, including Max Weber, did not articulate the full-fledged value-free ideal, suggesting instead that values served to help focus scientists on what was significant and that science could not proceed without values (Douglas 2011). That values shape what scientists chose to explore was, and remains, an uncontroversial way in which values influence science. That scientists' interests and concerns help direct scientists' attention in some directions and not others seemed unproblematic and was never contested by philosophers of science. (Douglas 2016, pp. 609–10)



# The VFI and the Logical Positivists

A few articles in the 1940s and 50s put forward the idea that ethical values might have a role in science, and then the positivists solidify their opposition...

[Judgments of value lack] all logical relevance to the proposed hypothesis since they can contribute neither to its support nor to its disconfirmation. (Hempel 1965, p. 91)



# Why Were We Confused?

Why did we think for so long that there weren't any internal social value judgments in science?

- ❶ The idea that the philosophy of science is nothing more than the logical analysis of scientific reasoning
- ❷ Connections between Marxism and the ethical dimensions of science (especially important in the mid-20th century in the USA)
- ❸ The idea that scientific reasoning is only about evaluating the probabilities of hypotheses



# Philosophy of Science as Logical Analysis

Recall the position of the positivists: if philosophy of science *just is* the analysis of the arguments for the justification of scientific knowledge, then there's no surprise that we don't see the entanglements between science and society, and we only explore internal questions.



# Philosophy of Science as Leftist Politics

We must remember that the 1950s, a period of red-baiting and McCarthyism, would not have been hospitable to public celebrations of a leftist political agenda for the philosophy of science. This was a time when people like Robert Cohen were being fired from teaching jobs for political reasons (Cohen was fired from his job at Wesleyan). Gerald Holton recalls [Philipp] Frank's being the recipient of a worrisome visit by FBI agents. (Howard 2003, p. 71)



# Philosophy of Science as Leftist Politics

Leaders in the nascent field of the philosophy of science, anxious to secure public and private funding for new departments, programs, and institutes, could not be faulted for being cautious about the political reputation of the philosophy of science in an era when an official at the Rockefeller Foundation wondered about “a faint tinge of pink” in a proposal that Charles Morris developed for an “Institute for the Study of Man” (see Reisch 1995, chap. 6, 6). (Howard 2003, pp. 71–72)



[O]ur conclusion is that if the scientist is to maximize good he should refrain from accepting or rejecting hypotheses, since he cannot possibly do so in such a way as to optimize every decision which may be made on the basis of those hypotheses. [...] The conflict can be resolved if the scientist either contents himself with providing them both with a single probability for the hypothesis (whereupon each makes his own decision based on the utilities peculiar to his problem), or if the scientist takes on the job of making a separate decision as to the acceptability of the hypothesis in each case. (Jeffrey 1956, p. 245)



# Epistemic and Non-Epistemic Values

Is there **really** a clear difference between epistemic and non-epistemic values? Maybe not...

At the very least, it looks like sometimes we value epistemic things for non-epistemic reasons: feminist scientists, say, value novel scientific theories *because* the old theories were sexist.



# The “Pandora’s Box” Problem

The prohibition on any role for ethical values *did* serve to prevent the introduction of bias, and to support one very particular kind of objectivity. Science isn’t just discovering the things that we want to discover!



# What Do We Do Now?

If there really are social values in science, but we don't want "the wrong values," how do we let in "the right values?"



Douglas: a new ideal to replace the VFI.

The alternative ideal depends on a distinction between two kinds of roles for values in science: a direct role and an indirect role. In the direct role, the values serve as reasons in themselves for the choices being made and directly assess those choices. [...] In the indirect role, the values help determine whether the evidence or reasons one has for one's choice are sufficient (sufficiently strong or well supported) but do not contribute to the evidence or reasons themselves. (Douglas 2016, 618)



# What Do We Do Now?

In short, the alternative to the value-free ideal is that (nonepis-temic) values should be constrained to the indirect role when scientists are characterizing phenomena and assessing hypotheses with respect to available evidence. If values were allowed to play a direct role, the values would be reasons to accept a hypothesis or to characterize phenomena, and this would shift science away from empiricism. (Douglas 2016, pp. 618–19)



# What Do We Do Now?

Perhaps we have to argue directly for **the right values** in science:

- Janet Kourany: Science should simultaneously meet epistemic and social standards; “sound social values as well as sound epistemic values must control every aspect of the research process” (Kourany 2013).
- Matthew J. Brown: We should reject the idea that evidence should always be given priority over value judgments; at times, for perfectly good pragmatic reasons, we might hold onto our values more tightly than onto the evidence.
- Daniel Hicks: We should evaluate whether the ordering of values expressed in science actually accords with the ultimate aims of the science at issue (e.g., profit vs. health).

# What Do We Do Now?

Perhaps we have to rethink the relationship between science and society:

- Philip Kitcher: Democratic societies should foster a dialogue about the goals of science, so that citizens understand how and why science advances their goals and scientists understand the role that they are supposed to play within a democratic society.



# Other Sites of Value Judgment

- How we choose which research projects to pursue and which questions are important
- How we choose which methods to use (e.g., restrictions on human or animal experimentation)
- How our language reflects value judgments (e.g., describing animal behavior as “rape”)
- How we communicate science to the general public

