

Two rights can make a wrong

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Scientists are once again worried about ideologically driven bad science. We explain that this problem results from the conjunction of two worthy values that make science susceptible to recurrence of such situations. The solution is to acknowledge the social, political, economic, and ideological frameworks in which science is embedded.

When Karl Popper proposed his famous demarcation criterion for distinguishing science from non-science, namely that science has to be falsifiable, the issue of what constitutes science and genuine knowledge was a key concern.¹ The preoccupation with this topic was already the legacy of the logical positivists of the Vienna Circle, who first proposed that an hypothesis has to be verifiable as a criterion for distinguishing sense from nonsense. However, as philosophers of science later articulated, both of these proposals are not up to the job.² They are either impossible to apply and adjudicate, or simply not the correct way for distinguishing science from non-science, if such a distinction can even be broached. Looking for a single demarcation criterion became a sign of naivety. For many years this situation remained as is. However, it has become increasingly urgent to re-engage with the issue of what distinguishes science from non-science, or more generally, information from misinformation. This is apparent in recent consternation about ideas echoing eugenic motifs, notably in the recent STAT News piece calling for retracting papers that make use of Richard Lynn's IQ work.³ Our main goal here is to note that the problem of distinguishing science from non-science, as found in Popper and his predecessors, approaches science as a body of knowledge rather than as a social system. Ironically, those studying science as a social system tended to be even more circumspect when it came to distinguishing science from non-science. This

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caution is found in various approaches to the sociology of knowledge. However, the fear of putting science on a pedestal is itself historically grounded, and hardly necessary.

In recent years, some philosophers of science have become increasingly interested in the role of values in science, harking back to earlier discussions of what has been termed “inductive risk”. These philosophers have argued that the value-free ideal of science is a mirage, and should be abandoned, and that values should be integrated more explicitly into scientific practice.⁴ More recently, there is a backlash to this wave, with other philosophers of science trying to rehabilitate the value-free ideal.⁵ However, if we go back to the question of distinguishing science from non-science, and indeed science from values, we find the entire scheme of this debate problematic. We propose a more socially grounded perspective on the problem of getting rid of bad science and of already falsified or debunked notions such as eugenics and related racist notions that resurface periodically. The challenge of eradicating these hypotheses is related to two legitimate and worthwhile assumptions that however in conjunction lead to problems. The first is the idea that every hypothesis should be open for scientific discussion, grounded in facts and rational arguments. The second is that there is no clear line beyond which an hypothesis cannot be ever revisited, or indeed there is no clear line when the weight of evidence makes an hypothesis no longer scientific. The first assumption harks back to the values from the Enlightenment. The second is related to the demarcation question: If you cannot demarcate between science and non-science, then you cannot even demarcate between good science and less good science. While each of these notions is laudable, their conjunction allows ideologically-led but scientifically debunked notions to be a never ending problem.

We suggest that the values of science, as well as understanding science as a social system operating within larger and more powerful social systems, can help address the challenge of ideologically driven bad science. In particular, when bad ideas are funded by and promoted to support ideological currents, they may resurface again and again, leading the relevant scientific community to play a game of whack-a-mole. In the case of issues like IQ and race, it is instructive to go back to the debates over sociobiology and the “science wars” in the 1970s and on.⁶ Sociobiology as a research program was ingrained in the theoretical discussions of evolutionary biology of the day (like those concerning adaptationism or the levels of selection); however, that research program

was also tied to political and ideological debates from the start (such as the heritability of IQ and its implications to allocation of educational resources). In particular, the 1994 book *The Bell Curve* by the experimental psychologist Richard Herrnstein and political thinker Charles Murray. The book was a culmination of a decades-old attempt to scientifically legitimize the view that people of African descent are intellectually inferior to people of European descent. Some notable figures in these efforts were Arthur Jensen, Jean-Philippe Rushton, William Shockley, Hans Eysenck, and Richard Lynn. It should also be noted that some of the main concepts in these arguments, heritability in particular, do not fit easily to either side of the scientific-ideological divide. While the controversies over sociobiology led to increasingly sophisticated arguments and analyses, evolutionary game theory being the most obvious, these did not permeate back to the feeding ideological views.

And therein lies the message. The social organization of science is such that when scientists just wait passively for value-laden hypotheses and proposals to come from outside they diminish their own ability to critically engage those proposals. The reason for this is that the interaction between science and the social systems around it (including ideological structures) is hardly symmetrical. The values of science – of open debate and keeping an open mind – embodied in the two assumptions we formulated at the beginning, make scientists an easy mark, while the ideologically driven views are harder to modify and are entrenched in large supporting social, ideological, and economic structures.

The sociobiology debate is instructive in that it shows that direct engagement between scientists, philosophers, historians, and sociologists of science, helps map these tensions, and evaluate which aspects of these tensions can be solved by using standard scientific practices, which require different approaches, and which cannot be solved without engaging with the ideological structures within which scientific activity is embedded. Realizing that scientific activity happens within a larger social structure that is far from neutral and is not open to rational debate is a first step. Distinguishing between ideas that are scientifically motivated and challenges that are ideologically driven is a harder but necessary second step.

¹ Popper, Karl R., *Conjectures and Refutations: The Growth of Scientific Knowledge* (Routledge, 1963).

² Laudan, Larry, *Progress and its Problems: Towards a Theory of Scientific Growth* (Univ. of California Press, 1977).

³ Dan Samorodnitsky, Kevin Bird, Jedidiah Carlson, James Lingford, Jon Phillips, Rebecca Sear, and Cathryn Townsend, *STAT* (June 20, 2024):

<https://www.statnews.com/2024/06/20/richard-lynn-racist-research-articles-journals-retractions/?ref=sequencermag.com>

⁴ Douglas, Heather E., *Science, Policy, and the Value-Free Ideal* (Univ. of Pittsburgh Press, 2009).

⁵ Hudson, Robert, *Perspectives on Science*, **24**, 167-191 (2016).

⁶ Ross, Andrew (Ed.), *Science Wars* (Duke Univ. Press, 1996).