PHIL 245

Contemporary Empiricism

Winter 2023

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Seminars: Thursday 12-2.50pm, RAWC 0472.

Office Hours: Monday 11-12, RAWC 0499.

Figure 1: Bas van Fraassen (1941–) and P. Kyle Stanford (1970–)

1 Course overview.

This course will cover some major themes in empiricism as it is currently conceptualized. (In this context, an 'empiricist' may be taken as broadly synonymous with a 'scientific anti-realist', although what that itself means is a debated issue that we will discuss throughout the course.) In the debates surrounding the nature of and motivation for empiricism in the contemporary era, no-one has cast so long a shadow as Bas van Fraassen, whose classic 1980 work *The Scientific Image* shook up the broadly realist consensus that then existed among philosophers. But since that time van Fraassen's view has developed into a much broader metaphilosophical position based on the notion of *stance*

voluntarism, the evaluation of which, in Part I of the course, will take us far from philosophy of science *per se*. We will reground ourselves in science more specifically in Part II by looking at how empiricism can be rooted in facts about theory change in science – a strategy which van Fraassen said he was 'proud' to never have deployed.[1] In particular, we will evaluate the arguments P. Kyle Stanford offers for his historically-motivated anti-realist position and determine how it differs from that of van Fraassen. We will then assess his claim that the realism debate is of genuine *political* importance insofar as the attitude one takes to his historical argument has implications for how the billions of dollars, both public and private, allocated in the US to funding science ought to be distributed. By way of closing, in Part III we will look at how different philosophers have reconstructed and assessed the argument for the existence of atoms by Jean Perrin in 1905 – an argument which persuaded almost overnight an initially agnostic scientific community – and assess the criticisms that both van Fraassen and Stanford have made of these reconstructions. The course as a whole will allow you to link up the philosophy of science with broader themes from across the landscape of contemporary philosophy; with key moments in the history of science; and with current debates over the place science ought to occupy within the public sphere.

1.1 PART I: van Fraassen and the 'empirical stance'.

In the first part of the course, we will (Week 2) get to grips with the basic notion of van Fraassen's *constructive empiricism* and some of the ways in which he justifies his rejection of scientific realism on the basis of a critique of inference to the best explanation. We will then take a first brief look at his grounds for endorsing a broadly permissive conception of rationality. (Note that the work on this issue is rather scattered through van Fraassen's writings and some excerpts here will be taken rather out of context: we will later read survey pieces that draw it together in helpful ways.) From there, we will (Week 3) aquaint ourselves with his notion of empiricism as a 'stance' and his reasons for holding that empiricism must be conceived of in this way. We will consider claims to the effect that this renders the debate over realism a permanent 'stalemate' and whether (Week 4) it succeeds, as van Fraassen claims it does, in avoiding a 'debilitating relativism'.[2]

[1] 'I am quite proud never to have relied on the so-called Pessimistic Induction either, any more than on this Argument from Underdetermination – though the former has also at times, quite wrong, been associated with The Scientific Image. Neither would be at all in harmony with the views I went on later to defend in epistemology, but whose beginnings are, as Van Dyck documents, traceable from The Scientific Image onwards.' ('From a View of Science to a New Empiricism', in Monton, B (Ed.). *Images of Empiricism: Essays on Science and Stances*, with a reply from Bas C. van Fraassen, p. 347.)

[2] 'There is a growing consensus that van Fraassen has argued to a stalemate against the scientific realists. Scientific realists cannot conclusively show that belief in the literal truth of scientific theories is epistemically warranted, but constructive empiricists cannot conclusively show that the aim of science is limited in the way they describe' (Monton 2007, p.3).

1.2 PART II: Empiricism and theory-change.

In the second part of the course we will consider the arguments for anti-realism rooted in scientific theory change. After aquainting ourselves (Week 5) with the classic rendering of the historical argument against realism – Larry Laudan's *Confutation of Convergent Realism* – and Tim Lyon's reconstrual of it, we will consider (Week 6) how, if at all, Kyle Stanford's reinterpretation of the historical evidence makes for a more compelling anti-realist argument than has been offered by either. We will then consider (Week 7) Stanford's argument that the debate over realism is not simply a philosophical debate but one with real-world implications insofar as it has implications for how science should be funded, and we will consider how this claim connects to van Fraassen's notion of empiricism as a form of stance voluntarism.

1.3 PART III: Arguments for atomism.

As detailed in the reading by Psillos, the scientific community was largely agnostic about the reality of atoms until the work of Perrin in 1905. This is despite the many successes that e.g. Daltonian chemistry and statistical mechanics had already enjoyed. What was it, then, that caused the scientific community to – almost without exception – embrace the reality of a world of unobservable particles almost overnight? This is not simply a question of historical importance, since it is arguably the reorientation of the scientific community towards realism that gave rise to the widespead philosophical presumption of realism until the seminal work of van Fraassen. In (Week 8) we will consider Salmon's influential 'common cause' argument of 1984 for why Perrin's argument succeeds, and consider how (if at all) this argument improves upon the (by now) familiar 'no-miracles argument'; we will then consider a recent publication arguing that Salmon completely misidentifies how Perrin is in fact reasoning. We will close the course in (Week 9) by considering the specific objections that van Fraassen and Stanford have made to the idea that Perrin's work makes a substantial form of scientific realism compulsory.

Syllabus.

1. **WEEK 1. Jan 12th. Welcome and Overview.**

   - 'The world of empiricism', BvF, in *Physics and our View of the World*, ed. Jan Hilgevoord.

2. **WEEK 2. Jan 19th. Themes from van Fraassen: the Aims of Science and Inference to the Best Explanation**

   - *The Scientific Image* (1980), BvF, Chapter 2.
   - *The Scientific Image* (1980), BvF, Chapter 4, sections 1, 2.4, 4.1, 4.3.
   - Optional: 'What is Constructive Empiricism?' (1994), Gideon Rosen.

3. **WEEK 3. Jan 26th. Empiricism as a Stance**

   - *The Empirical Stance*, Lecture 2.

4. **WEEK 4. Feb 2nd. Stances Evaluated**

   - 'Must Empiricism Be a Stance, and Could it be one? How to Be an Empiricist and a Philosopher at the Same Time', Anja Jauernig, 2007 (Chapter 8 of *Images of Empiricism*, ed. B. Monton).
   - 'Stance relativism: empiricism versus metaphysics', Anjan Chakravartty, *SHPSA* 2004.
   - Optional: *Laws and Symmetry* (1989) BvF, Chapter 7, sections 5 and 6.
   - Optional: 'The false hopes of traditional epistemology' (2000), BvF, Section III.

5. **WEEK 5 Feb 9th. Theory Change**

   - 'A Confutation of Convergent Realism', Larry Laudan (1981)
   - 'Scientific Realism and the Pessimistic Meta-Modus Tollens', Tim Lyons (2002).

6. **WEEK 6 Feb 16th. Kyle Stanford and the 'New Induction'.**

   - 'Refusing the devil's bargain: What kind of under-determination should we take seriously?', P. Kyle Stanford, 2001.
   - 'What's new about the new induction?', P.D. Magnus, *Philosophy of Science* 2006.

7. **WEEK 7. Feb 23rd. Unobservability or Under-determination?**

   - 'Realism, Instrumentalism, Particularism: A Middle Path Forward in the Scientific Realism Debate. P. Kyle Stanford, *Philosophy of Science*, 2021.

- 'Unconceived alternatives and conservatism in science: the impact of professionalization, peer-review, and Big Science', P. Kyle Stanford, *Synthese*, 2015.

8. **WEEK 8. March 2nd. Atomism I**

   - Handout on some historical background.
   - 'Theoretical Explanation', Chapter 8 of *Scientific Explanation and the Causal Structure of the World*, Wesley Salmon, 1983. (OK to focus just until p. 227.)
   - 'What was Perrin really doing in his in proof of the reality of atoms?', Robert Hudson, *HOPOS* 2021.

9. **WEEK 9 Mar 9th. Atomism II.**

   - 'The Perils of Perrin, in the Hands of Philosophers', BvF 2009.
   - 'Scientific Realism, the Atomic Theory, and the Catch-All Hypothesis', P. Kyle Stanford, *Philosophy of Science* 2009.

10. **WEEK 10. Mar 16th. Presentation of abstracts**

Procedure and Assessment.

• **Discussion board and class discussion (30% of grade).** Each week participants will post 2 questions/comments about that week's readings a couple of days before the seminar, and also reply to 2 of the questions/comments posted by other participants. Please read everyone's comments. These comments will be used to structure the in-class discussion, and you can expect to be asked to elaborate on what you write here in class. So please gear these questions and comments towards topics that would, if discussed, enrich our understanding of the texts at hand or help build constructively critical interpretations of them.

• **Presentations.** The final week will consist of 10-15 minute presentations of your paper abstracts.

• **Final Essay of approx. 3.5–5,000 words (70% of grade)**. Your final essay will be due by Wednesday of exams week, on a topic connected to the course. (I will propose some essay questions but you are welcome to develop your own.) Given the broad metaphilosophical nature of the concept of stances, you may wish to draw on resources outside of philosophy of science to make your argument. But you **must** display some engagement with and understanding of some of the texts and concepts explicitly covered in the course to do well.

Academic Integrity.

UCSD is committed to academic integrity. According to their *Policy on Integrity of Scholarship*[3],

[3] Go to https://students.ucsd.edu/academics/academic-integrity/policy.html

"Integrity of scholarship is essential for an academic community. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind.

If you are at all unsure of what acting with integrity demands of you in this context, I'll be happy to discuss it with you.