HPSC0014 Philosophy of Science 2

Course Syllabus

2023-24 session | Chiara Ambrosio | c.ambrosio@ucl.ac.uk

Course Information

This course is a continuation of HPSC0004 Philosophy of Science, intended for students that have completed that course or studied a similar introduction to epistemology or philosophy of science elsewhere. The course explores some central debates in general philosophy of science, including: realism and antirealism about scientific theories, scientific explanation, values in science, and scientific pluralism. It also addresses some areas that are beyond analytical philosophy of science, such as Pragmatism and the broader relationship between philosophy and history of science, as well as the history *of* philosophy of science. The module is framed around the idea that philosophy is a fundamentally *conversational* activity: it consists of an ongoing dialogue, between many participants, that can take many different forms. As a student on the course, you will be part of that ongoing dialogue. While the idea of conversation seems intuitive and straightforward for a philosophy module, we will use it to challenge and question 'the canon' in philosophy of science, and think about the field in new and liberating ways. After this course you should possess a fairly well-rounded view of the field. You should also have gained a set of critical skills (listening and evaluating someone else's perspective, arguing honestly with different points of view, questioning established assumptions) that will allow you to decide where *you* would like to take the conversation(s) about science next.

Basic course information

Course website:	Not available
Moodle Web site:	Search HPSC0014
Assessment:	One video dialogue (7 minutes, worth 20% of the final mark); and an essay (2500 words for level 5 students, 3000 words for level 6 students, worth 80% of the final mark)
Timetable:	
Prerequisites:	HPSC0004 or HPSC0009 desirable, but the module has no prerequisites.
Required texts:	See the reading list
Course tutor(s):	Prof. Chiara Ambrosio
Contact:	c.ambrosio@ucl.ac.uk
Web:	https://www.ucl.ac.uk/sts/people/dr-chiara-ambrosio
Office location:	22 Gordon Square, Room 1.2.
Office hour:	Wednesdays 10.00-12.00, in person or on Zoom (whichever you prefer!). Please email me to book an appointment.

How the module works:

This course takes place in person on campus, and attendance is mandatory. There will be no recording of the lectures and seminar discussions. We will meet every week in term 1 (except in reading week) for two hours, which will comprise a lecture and a discussion of the topics we cover each week.

You should complete the readings for this course before the lectures. You should budget approximately 3-4 hours per week of reading for this module (some weeks will be lighter, some weeks will require more time, especially as you approach assessment deadlines). Make sure you take notes while you read, and also annotate any questions on what is unclear in the readings. You should also budget some time for *thinking* about what you have read – go for a walk and take a notebook with you after you complete the readings and note down further reflections and questions on each week's topic.

Each week, I will give a lecture on the readings and topic covered, which will clarify the course contents further. In the second part of the class we will discuss the readings collectively in greater depth, and I will also answer questions on concepts and passages that have remained unclear. You are welcome to ask any questions during the lecture, and you are also expected to contribute to the discussion in the second hour of our classes.

Each week has a simple task (see weekly schedule below) associated with the readings. Please refer to those tasks and complete them prior to the lecture: they are designed to help you think about each weekly topic and we will also use them to guide the discussion in class. Take your time to think about the tasks, but please engage with them and make some notes: the better prepared you are for each class, the greater the quality of our conversation!

A note on the framework we use in the module:

As you might have noticed, I structured the whole module around the idea that philosophy is essentially *conversational*. This seems simple and straightforward, but if you dig a bit deeper you will see that different kinds of conversations, and different conversational tones, fulfil different purposes (and have different effects on the participants!). Some conversations are openly confrontational (we don't like those very much, but if you come across one of those in the readings ask yourself: what is at stake there?). Some are exploratory: a dialogue between people who are trying to figure out the nature of a problem and possible solutions. Some involve present, living actors, while others are conversations with the past. Some conversations aim at changing the course of a field, others are aimed at probing new aspects of an old debate. Some conversations oppress, other conversations liberate. And so on.

As you navigate the readings, you are naturally in conversation with the philosophers you are studying. You are also in conversation with me as your tutor, and of course you are in conversation with each other. Listen to the philosophers in the syllabus, and listen to each other (and listen to me too, every now and then?), but also feel free to ask questions when issues remain unclear. Let's use the conversation model to find the answers *together*, as a class.

Schedule

Dates	Topic
Thurs 5 October	**Lecture 1 – Setting the stage: Philosophers in Conversation** Readings: Hutton; the module syllabus
	Task for this week (to be completed prior to the lecture): After having completed the readings, and ahead of the lecture, think about the following questions: What are the main features of Hutton's conversation model of the history of philosophy? How do you think her model applies to the structure of this module? Use the syllabus to answer this question. Does the conversation model fit with your existing views of what philosophy of science is, or should be about? If so, how? If not, why? Make notes, and we will discuss your answers in class.
Thursday 12 October	**Lecture 2 – Eavesdropping on the Vienna Circle: The Case of Rose Rand** Readings: Rentetzi; Rand
	Tasks for this week (to be completed before the lecture): 1. Post a question on Assessment 1 in the Weekly Seminar Activity 1 Forum. Read your peers' questions, choose a question you think you can answer, and post your answer. Note: you don't need a definite answer – It will be enough to say 'I interpret the instructions for the assessment as asking us to do X'. I will answer any unanswered questions in class. 2. Preparation for class discussion: think of an aspect of the readings you found either *surprising*, or *frustrating*, and be prepared to present and discuss it in class.
Thursday 19 October	**Lecture 3 – Conversations about Truth: Realism and Anti-Realism** Readings: Wylie; van Fraassen
	Tasks for this week – preparation for seminar discussion: Note: this week's tasks help you build toward the assessments. It is *really crucial* to complete them, as they will help you build confidence toward evaluating philosophers' arguments. 1. Identify the *argument* and distinguish it from the *literature review* in Wylie's paper. Make notes! 2. Note down three bullet points on what you think are the most important features of Van Fraassen's constructive empiricism. 3. Imagine you were Alison Wylie. Use one point from her article to evaluate one aspect of van Fraassen's anti-realist stance. Again, make notes!

	We will discuss your notes in class – make sure you bring them along.
Thurs 26 October	**Lecture 4 - Eavesdropping on experiment: Ian Hacking's experimental Realism** Readings: Hacking
	Your task for this week (to be completed before the lecture): 1. Hacking uses a lot of humour and witty expressions in his writing. And yet we all know that humour and wit are socially and culturally codified: some jokes are just not funny (or they are even inappropriate!) when translated into a different culture. Do you think Hacking's style makes concepts clearer, or did you find it requires a specific cultural/social background to be understood? Think about whether Hacking's writing style helped *or* hindered your understanding of entity realism, and make some notes. We will discuss them in class. 2. **Find a conversation partner! (stage 1)** Choose the philosopher you will want to be for your Assessment 1 and post an announcement on their behalf in this week's Forum. For example: "I am Rose Rand, I would like to converse with a member of the Vienna Circle and/or with a contemporary woman philosopher".
Thurs 2 November	**Lecture 5 – Conversations with the Phlogistonists: Realism and Pluralism** Readings: Chang
	Your tasks for this week (to be completed by Wednesday): 1. Note down *something surprising* you have discovered through Chang's writings. In class, we will discuss what surprised each of you from the readings. I bet you will all bring very different perspectives to the conversation! 2. Watch the interview with Hasok Chang (on moodle) filmed especially for this module! 3. **Find a conversation partner!** (stage 2). Look through the announcements from your peers in last week's forum. Think about the philosopher you would like to be, and respond to the announcement of the philosopher you would like to converse with in your video dialogue. In principle, ALL the philosophers we studied up to now have been in conversation with each other (either as contemporaries or as building on each other's work). So think broadly, and beyond the obvious combinations of philosophers that have *actually* talked to or about each other. If you struggle finding a partner, please email me and I will be able to help.
	Reading Week (6-10 November)
	Assessment 1 (Video Dialogue) due on Wednesday 15 November 5pm

Thursday 16 November	**Lecture 6 – Let's have a Serious Conversation: Scientific Explanation** Readings: Hempel, Woody
	Your task for this week (to be completed prior to the lecture): 1. What do you consider to be the main features of Woody's functional account of explanation (select one or two features). How do you think her account improves upon previous accounts? Note down your answers to these questions, and we will discuss them in class.
Thurs 23 November	**Lecture 7 – New Conversations about Explanation: Narratives in the Natural and Social Sciences** Readings: Morgan and Wise; Morgan
	Your task for this week (to be completed before the lecture): 1. On the basis of the lecture and the readings, try to think about a debate in philosophy of science (explanation, representation, reasoning…) which would particularly benefit from a shift to a narrative-based account. Make notes, and we will discuss your thoughts in class. 2. If you are doing a science degree, think about a particular aspect of your own practice that involves the use of narratives. Make notes and please share them with us in class! 3. Watch the interview with Mary Morgan (on moodle) filmed especially for this class!
Thurs 30 November	**Lecture 8 – A trip to America: Conversations with the Pragmatists** Readings: Du Bois or Addams
	Your task for this week (to be completed before the lecture): Depending on the readings you have chosen, think about the following questions: a) How does Du Bois describe "the problem" of African Americans? Does his writing resonate with contemporary issues at all? If so, how? b) Pick an example of wicked problem and sketch out which aspect/aspects of Jane Addam's work can help us tackle it. Make notes on your answers, and we will discuss them in class. Both questions however could be turned into possible essay questions…think about it for your Assessment 2, and I will be happy to discuss further! **Have you started thinking about your essay? If not, this is the right time to finalise your essay question. Remember that you can book an appointment in my office hours to discuss your topic, argument, and planned essay structure.**

Thurs 7 December	**Lecture 9 – Let's have an open conversation: Values Matter!** Readings: Bright
	Your task for this week (to be completed before the lecture): 1. Pick an issue or problem in science which you think can be resolved or ameliorated by paying specific attention to values. Think about a) why values matter in resolving the issue; b) what perspective are you adopting on values in your specific example (use this week and last week's readings to justify your perspective). Make notes, and bring them to class.
Thurs 14 December	**Epilogue: Where will you take the conversation?** No readings this week. Catch your breath, or catch-up with any outstanding readings, and prepare yourself for one final conversation on the whole module!
	Your tasks: 1. Go back to Hutton's *conversation* model, and think about the ways in which that framework has opened new ways of thinking about philosophy of science in this course. Then pick your favourite topic, and note some thoughts on why you found it especially appealing. Be specific: in what ways has a certain reading made you see an aspect of science you had not thought about? What did you think before, and how has that reading changed your mind, or given new depth and sophistication to your previous convictions? We will discuss your thoughts and ideas in class.
	Assessment 2 (Essay) due on Monday 18 December 5pm

Assessments

Summary

	Description	Deadline	Word limit
Coursework	Video	**15 November 2023 5 pm**	N/A (7 mins video)
Coursework	Essay	**18 December 2023 5pm**	2,500 words (level 5) 3000 words (level 6)

Assignments

Assessment is by a video dialogue (contributing 20% of the final mark, 7 minutes), and one essay (2,500 words for level 5 students and 3000 words for level 6 students, contributing 80% of the final mark).

You must submit all the coursework in order to complete this module.

Please see separate documents on Moodle with detailed instructions for each assessment.

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Aims & objectives

By the end of this module, you should have a rounded and balanced overview of the field of philosophy of science. You will have also gained the ability to *listen* to different perspectives on particular problems and engage with them in a honest and non-confrontational manner. You will be able to surprise your friends at the pub with extraordinary stories about phlogiston, as well as with philosophical concepts nobody seems to care about very much, but you will also be able to explain *why* they matter for science, as well as in real life. You will have the advocacy skills to fight the good fights, for yourself and as an ally of those whose voices still remain unheard. This module will not give you the miraculous ability to snap your fingers and get a job (no module does!), but it will equip you with the critical skills to assess and present arguments, engage with different points of view, empathise and listen, have rewarding conversations (including in job interviews!), and make the world a better place as a result.

Reading list

Lecture 1 – Setting the Stage: Philosophers in Conversation

In this lecture we explore the methodological framework that we will use throughout the module: Sarah Hutton's *conversation model of the history of philosophy*. While Hutton's work focuses on the historiography of Early Modern philosophy, the implications of the conversation model she proposes are broad and far reaching. As 'eavesdroppers' on the conversations amongst philosophers of science past and present, we will set out to place key debates in philosophy of science within their contexts, examine a few neglected figures in the field, and investigate the genealogies of ideas that philosophers of science often take for granted.

Essential Readings

Sarah Hutton (2014) "Intellectual History and the History of Philosophy", *History of European Ideas*, 40:7, 925-937

Please also read the course syllabus closely. Pay special attention to the descriptions under each lecture title, which give you a sense of the overall narrative I have adopted for the module. Read also the description of the assessments, and note down any questions you have on them. There will be a dedicated forum on assessments where we will discuss them, and we will also discuss assessment in class. Having a clear overview of how a module operates and what is expected from you will make everything easier and smoother throughout this term!

Lecture 2 – Eavesdropping on the Vienna Circle: the Case of Rose Rand

The Vienna Circle has a foundational role in the history of philosophy of science. A whole new philosophical literature has highlighted how the core commitments of this movement came wrapped in democratic ideals and values, which were ever more pressing given the historical context in which the members of the Vienna Circle operated. And yet, despite its fundamentally democratic ideals, the movement is remembered as essentially led by male philosophers. In this lecture we explore the figure of Rose Rand, a woman philosopher and member of the Vienna Circle, whose contributions to the movement – and to logic more broadly – are only recently being rediscovered. We will use Rand to test one of the key aims of Hutton's conversation model of the history of philosophy: rediscovering the role of women in philosophy and framing the philosophical conversation from their perspective.

Essential Readings

Maria Rentetzi (2010), "I Want to Look Like a Lady, Not Like a Factory Worker' Rose Rand, a Woman Philosopher of the Vienna Circle", in Miklós Rédei, Mauricio Suárez, Mauro Dorato (eds*.) EPSA Epistemology and Methodology of Science*, launch of the European Philosophy of Science Association, Dordrecht: Springer Netherlands, pp.233-244

Rose Rand (1962), "The Logic of Demand-Sentences", Synthese Vol. 14 (4), pp. 237-254.

A note on this paper: I wanted to give you a flavor of Rand's work through one of her original papers, but many of them are in German! I managed to locate one of her publications in English, so you can experience her writing style and hear her voice as an author. This is a technical – and yet very clearly presented – logical paper. In many ways it is a traditional paper, in the sense that it fits very neatly within the tradition of logical analysis which is at the core of the Vienna Circle's approach to philosophy. Pay attention to Rand's characterisation of a 'sentence which makes sense': it both expands on and problematises the verificationist programme of Vienna Circle philosophers. Note that the article ends with a proposal for constructing 'deductive systems of norms' in ethics and law. What may be the benefits of that suggestion, and what do you think this proposal aims to achieve?

Further Readings
The Rose Rand papers are available online, through the University of Pittsburgh Digital Archives: https://digital.library.pitt.edu/collection/rose-rand-papers (warning: many of them are in German! Some of her later papers and notes are in English, but it takes a bit of time and patience to locate them).

New scholarship on women in Logical Empiricism is emerging slowly. See for example:

Frederique Janssen-Lauret. 2022. "Women in Logical Empiricism." In Routledge Handbook of Logical Empiricism, ed. C. Limbeck-Lilienau and T. Uebel, 127–35. New York: Routledge (chapter 13).

On Rose Rand (and substantively expanding on the material in Rentetzi's paper) see:

Katarina Mihaljević 2023. "Breaking into British Academic Life in Second World War Britain: The Story of Rose Rand", HOPOS (print version forthcoming; online first version available at: https://www-journals-uchicago-edu.libproxy.ucl.ac.uk/doi/full/10.1086/726075#fn3)

On the broader historiography of the Vienna Circle's political and social commitments see also:

John O'Neill, 2003. "Unified science as political philosophy: positivism, pluralism and liberalism." *Studies in History and Philosophy of Science Part A*, vol. 34 (3):575-596.

Donata Romizi, 2012. The Vienna Circle's "Scientific World-Conception": Philosophy of Science in the Political Arena," HOPOS, vol. 2(2): 205-242.

Thomas Uebel, 1996. "Anti-Foundationalism and the Vienna Circle's Revolution in Philosophy", The British Journal for the Philosophy of Science , Sep., 1996, Vol. 47 (3), pp. 415-440.

Thomas Uebel, 2008. "Writing a Revolution: On the Production and Early Reception of the Vienna Circle's Manifesto". *Perspectives on Science.* **16**(1): 70-102.

Thomas Uebel, 2020 "Vienna Circle", *The Stanford Encyclopedia of Philosophy,* Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/sum2020/entries/vienna-circle

Peter Galison,1990. "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism", *Critical Inquiry* vol. 16 (4), pp. 709-752.

> Note: this is a long and quite advanced article. It is one of my favourite papers ever, and it is worthwhile reading if you are interested in the relationship between science and art, which Galison addresses through the relationship between the members of the Vienna Circle and the Bauhaus movement in design and architecture. If you don't get to read this paper this year, don't worry: it is also on the syllabus of my third year module "Science, Art and Philosophy", so you will have another opportunity!

Lecture 3 – Conversations about Truth: Realism and Antirealism

This week we explore a longstanding debate in philosophy of science. Should we believe that the entities postulated by science exist, and that our theories about them are true or approximately true? Should we make a more modest commitment and argue instead that they are at best 'empirically adequate'? As you will see this is an issue that has kept philosophers of science busy for a long time, and makes an ideal example of the conversation model of the history of philosophy of science. It is also a topic that has set 'the canon' in philosophy of science, but we will try to question that canon through the work of Alison Wylie. Wylie's reasons for defending a moderate version of realism are eminently pragmatic, and they anticipate the 'turn to practice' that we will explore in greater depth in the coming weeks.

Essential Readings
Alison Wylie. 1986. "Arguments for Scientific Realism: The Ascending Spiral", *American Philosophical Quarterly* , Vol. 23, No. 3, pp. 287-297.

van Fraassen B. 1980. *The Scientific Image*, Oxford: Clarendon Press, Chapter 2 "Arguments concerning scientific realism", sections § 1-5 and 6-7.

Note: this week you have a substantive amount of readings to cover. If you have taken the first year module in philosophy of science (HPSC0004), you might want to revisit your notes as some of these topics were covered last year. If you have not taken the first year module, you might want to read Van Fraassen's chapter before reading the paper by Alison Wylie, as Wylie is responding to arguments that he lays out in *The Scientific Image*.

Further Readings

Anjan Chakravartty 2017. "Scientific Realism", *The Stanford Encyclopedia of Philosophy* (Summer 2017 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/sum2017/entries/scientific-realism/

Larry Laudan, 1981. "A Confutation of Convergent Realism." *Philosophy of Science* vol. 48 (1), pp. 19-49.

Philip Kitcher, 1993. "The advancement of science" Philip Kitcher. New York ; Oxford: New York ; Oxford : Oxford University Press (see especially chapter 5, "Realism and Scientific Progress").

Stathis Psillos, S. 1996. "Scientific realism and the pessimistic induction" Philosophy of Science vol. 63 (3): pp. 306-314.

Hilary Putnam, H. 1975. "What Is Realism?" *Proceedings of the Aristotelian Society* vol. 76, pp.177-194 (read only up to p. 184).

Lecture 4 – Eavesdropping on Experiment: Ian Hacking's Experimental Realism

Last week, Wylie taught us that we should look for pragmatic reasons to be scientific realists. This week, we look at an extension of her argument, which takes us straight at the core of what is now known as 'the turn to practice' in philosophy of science: Ian Hacking's experimental realism. Have you ever heard the expression 'if you don't like where the conversation is going, just change it'? This is exactly what Hacking tries to do with the realism/anti-realism debate. Up to you to decide if he is successful!

Essential Readings

Ian Hacking, I. "Experimentation and scientific realism", *Philosophical Topics* vol. Vol. 13, No. 1, pp. 71-87

Further Readings

Ian Hacking, 1983. *Representing and Intervening*. Cambridge: Cambridge University Press.

Note: this is a fun book to read and I recommend to go through it all at your own pace. But if you are short of time look especially at chapter 1 ("Scientific Realism"), which contains the famous motto: "If you can spray them they are real"; Chapters 9, 10 and 11 are particularly representative of why Hacking is considered a champion of the turn to practice in philosophy of science *and* of Integrated History and Philosophy of Science. The book has a useful annotated table of contents, which gives you a preview of the contents of each chapter.

Michela Massimi, 2004. "Non-defensible middle ground for experimental realism: why we are justified to believe in colored quarks", *Philosophy of Science* 71, pp. 36–60.

David Resnik, 1994. "Hacking's experimental realism", *Canadian Journal of Philosophy*, Vol. 24, No. 3, pp. 395- 411.

On the controversy about astronomical entities (if it annoyed you or perplexed you):

Ian Hacking, I. (1989) "Extragalatic reality: the case of gravitational lensing" *Philosophy of Science* vol.

56 pp. 555-81.

Dudley Shapere (1982), “The concept of observation in science and philosophy” *Philosophy of Science* vol. 49, pp. 485-525.

Lecture 5 – Conversations with the Phlogistonists: Realism and Pluralism

This week we listen to the past, and converse with an exciting chapter in the history of chemistry: phlogiston. We do so through Hasok Chang’s remarkable (and I promise you, unforgettable!) account of the so-called ‘Chemical Revolution’, and the potential loss of knowledge (and practices!) that came with its celebration. Chang’s account of phlogiston chemistry will give us the tools to place the turn to practice in dialogue with the history of science, and listen to actors that are not necessarily remembered as ‘the winning side’ in a scientific controversy.

Essential Readings

Hasok Chang, 2017. “Is Realism Compatible with Pluralism?” in Juha Saatsi (ed.) *The Routledge Companion to Scientific Realism,* London: Routledge, pp. 176-186.

Hasok Chang, 2012. *Is Water H2O? Evidence, Realism and Pluralism,* Dordrecht: Springer. Chapter 1, “Water and The Chemical Revolution”, pp. 1-70.

> Note: You don’t have to read the whole chapter (70 pages!), or at least you don’t have to read it in one go! Have a look at the introduction of the book (available through the ‘Download book PDF” option on the Springer site). It explains that each chapter is structured in three parts: section 1 of each chapter gives you ‘a surface approach’ to a problem, section 2 completes the picture and goes into greater depth, section 3 is there if you are obsessed about the details and really want to gain fine-grained, specialist knowledge of a topic. So in principle you can stop at the end of section 1.1 (p. 14, though I promise you will not regret reading at least until the end of section 1.2!)

Further Readings

Rachel Ankeny, Hasok Chang, Marcel Boumans, and Mieke Boon. 2011. "Introduction: philosophy of science in practice." *European Journal for Philosophy of Science* 1 (3):303-307.

Kusch, Martin. 2015. “Scientific Pluralism and the Chemical Revolution”, *Studies in History and Philosophy of Science* vol. 49, pp. 69-79.

Lena Soler, Sjoed D. Zwart, Michael Lynch, and Vincent Israel-Jost. 2014. *Science After the Practice Turn in the Philosophy, History, and Social Studies of Science*. New York and London: Routledge.

> Note: the introduction of this anthology is very helpful if you want to place the turn to practice in context and understand how it relates to STS more broadly. Each chapter tackles practice from a particular perspective, and with a focus on a particular branch of science or engineering.

Break – Reading week

We will take a break during reading week. Use this week to catch-up with the readings and finalise your Assessment 1.

Lecture 6 - Let’s Have a Serious Conversation: Scientific Explanation

Over the past few weeks, we have heard the realists claim, repeatedly, that realism is the best *explanation* for the success of science. But what does ‘explaining’ mean? What makes an explanation ‘scientific’? This week we place an early account of explanation (Hempel’s) in dialogue with a very recent one (Woody). A lot happened in between these two papers, and we will try to cover at least a bit of it in the lecture. The key transition to look out for here is again the move from theory to practice – and yet we will see that ‘practice’ has been itself

characterised in many different ways in the course of this particular philosophical debate.

Essential Readings

Hempel C. G. “Two basic types of scientific explanation” in Curd, Cover and Pincock, Philosophy of Science, The Central Issues, New York and London: Norton, pp. 657-666.

Note: This is the classic study of scientific explanation, which set the tone and the agenda for the debates that followed.

Woody, A. I. 2015. "Re-orienting discussions of scientific explanation: A functional perspective." *Studies in History and Philosophy of Science Part A* vol. 52, pp. 79-87.

Note: A brilliant paper, which shifts the emphasis from the relationship between *explanans* and *explanandum* to what the author calls ‘the functional approach’: what role do explanatory practices play in science? A fantastic example of how the turn to practice has contributed to shift an otherwise very abstract debate.

Further Readings

Reutlinger, A. 2017. Explanation beyond causation? New directions in the philosophy of scientific explanation. *Philosophy Compass,* vol.12(2), n.p.

Bas Van Fraassen, 1980. *The Scientific Image*. Oxford: Oxford University Press. Read chapter 5: The Pragmatics of Explanation.

Woody, Andrea, 2014. Lena Soler, Sjoed D. Zwart, Michael Lynch, and Vincent Israel-Jost (eds.) *Science After the Practice Turn in the Philosophy, History, and Social Studies of Science*. New York and London: Routledge, pp. 123-150.

Note: in line with the functional approach presented in the essential reading, here Woody discusses the relationship between representing and explaining, with specific reference to the case of the periodic table.

James Woodward, 2019. "Scientific Explanation", *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/win2019/entries/scientific-explanation/

Note: this is an extensive entry, and it really touches upon all the recent debates in a clear and systematic way. It is a bit of a marathon to read it all – and I do not expect you to know all the accounts of explanation presented in it. But having an overview of the whole landscape of the study of explanation can be helpful and can clarify issues that have remained unclear from the lecture.

Lecture 7 - New Conversations About Explanation: Narratives in the Natural and Human Sciences

One of the many ways in which philosophers of science are now rethinking explanation is by attending to its narrative form. This cutting-edge area of philosophy of science has emerged in conversation with an unusual ally: the philosophy of history. In reacting to the positivist model of explanation, philosophers of history have argued for a long time now that historical explanation takes a narrative form – even though what exactly counts as ‘narrative’ is still debated. In open dialogue with these discussions, a group of philosophers of science led by the extraordinary Mary Morgan are currently investigating how natural and social scientists rely on narratives to understand the world. Here the ‘conversation model’ unfolds along several dimensions: across the philosophies of natural, historical and social sciences, across literary and philosophical theories of narratives, across the quest for generality and the need to pay attention to particular cases.

Essential Readings

Mary Morgan and M. Norton Wise, 2017. “Narrative science and narrative knowing. Introduction to special issue on narrative science”, *Studies in History and Philosophy of Science Part A*, vol. 62, pp. 1-5.

Mary Morgan, 2017. “Narrative Ordering and Explanation”, *Studies in History and*

Philosophy of Science Part A, vol. 62, pp. 86-97.

Further Readings

Morgan, M. Hayek, K. and Berry, D. (eds.) 2022. *Narrative Science: Reasoning, Representing and Knowing since 1800.* Cambridge: Cambridge University Press.

A brilliant collection which is the main output of the Narrative Science project. Alongside the 2017 special issue of the journal *Studies in History and Philosophy of Science* (see details below), this should be your main source on this week's topic.

The Narrative Science Website contains a lot of useful information about the various approaches to narrative currently developed by the Narrative Science Project:

https://www.narrative-science.org/

Check especially the "Resources" section – it contains a lot of useful material! Particularly useful is this anthology of primary sources:

Mat Paskins and Mary Morgan, 2020. *An Anthology of Narrative Science*. Available Open Access at: https://www.narrative-science.org/uploads/3/1/7/6/31762379/narrative_science_anthology_complete_final_draft_9_11_2019.pdf

Andrew Hopkins, Mary Morgan and Mat Paskins, 2023. *Narrative Science Anthology II.* Available Open Access at : https://www.narrative-science.org/uploads/3/1/7/6/31762379/anthology_ii_-_final_proof_high.pdf

Note how both anthologies contains primary sources that are examples of narrative science (broadly construed), as well as commentaries that place those narratives in context. Note also how some of the examples of narrative contained in Anthology II are directly linked to topics we cover this week and the next!

The entire special issue on Narrative Science (*Studies in History and Philosophy of Science Part A*, vol. 62) contains a variety of perspectives on narrative well worth looking at. Each article has an abstract that summarises the main argument, so you have a basis for selecting a couple as further readings. My personal favourite from that issue is:

Mary Terrall, "Narrative and natural history in the eighteenth century", *Studies in History and Philosophy of Science Part A*, vol. 62, pp. 51-64.

Additional general readings on Narrative:

Carl Hempel, 1942. "The Function of General Laws in History" *The Journal of Philosophy* Vol. 39 (2), pp. 35-48.

This is the famous paper by Hempel (along with the one we studied last week) that set the agenda for the debate about historical explanation. You will see it cited by a lot of philosophers working on narratives.

Clifford Geertz, 1976. "Deep Play: Notes on the Balinese Cockfight", *Daedalus* vol. 101, pp. 1-37.

This is the famous anthropological study that both Mary Morgan and Paul Roth (see reference below) mention in their articles.

Paul Roth, 1989. "How Narratives Explain", *Social Research,* vol. 56 (2), pp. 449-478.

Angela N. H. Creager, Elizabeth Lunbeck, M. Norton Wise, *Science Without Laws: Model Systems, Cases, Exemplary Narratives*. Durham, NC: Duke University Press.

Note: this is a very useful anthology, especially if your interest is how to relate the need for generalising to the close-up study of particular cases. Mary Morgan's chapter and her concluding remarks can be especially helpful.

Lecture 8 - A trip to America: Conversing with the Pragmatists

Who are these mysterious 'Pragmatists' everyone keeps referring to? Wylie and van Fraassen briefly mention Peirce; Chang refers to Peirce and Dewey as the founders of a sensible philosophy of scientific practice. This week we travel to late nineteenth-century America and converse with this remarkable philosophical tradition. Once again, we will do this by partially subverting the canon. Instead of reading the classical (white, male) pragmatist authors, we will look at two important figures in the history of Pragmatism who are being rediscovered only recently: William Edward Burghardt (W.E.B) Du Bois and Jane Addams. Both Addams and Du Bois have important lessons to teach us about where and how we should set our scientific priorities, and the relationship between science, activism and social work.

Essential Readings:

As this week's readings are a bit more unfamiliar in tone and style (and one of them is a bit long), you can choose to read either Du Bois or Addams (you are of course welcome to read both!). To make an informed decision on which reading to pick, scan quickly through their respective entries in the Stanford Encyclopaedia of Philosophy (in further readings below).

W.E.B. Du Bois, 1898. "The study of the Negro Problem", *Annals of the American Academy of Political and Social Science*, pp. 1-23, reprinted in *The Annals of the American Academy of Political and Social Science*, Vol. 568 (2000), "The Study of African American Problems: W. E. B. Du Bois's Agenda, Then and Now", pp. 13-27.

> Note: this paper uses a terminology that we now find painful and disturbing. The word "Negro" as it appears in the title was used in Du Bois' time, but is today recognized as a deeply racist term. Its use was inseparable from the cruelties of slavery and colonial oppression, and its elimination from the common vocabulary is part of the long struggle against racism and is itself a victory of the fight for human rights. You will not hear me using that word in the lecture, except when I am citing Du Bois' texts *directly*. Note that Du Bois was a key actor in the fight against racism, and he is appropriating the terminology of the establishment to *advance* the cause of the African American people in his sociological and philosophical work. So, citing him *directly* may justify the use of the term in an essay (with the acknowledgment that it comes with a problematic history); using it lightly in the middle of a sentence in an essay or in a seminar, however, is plain unacceptable.

Jane Addams 1964, *Democracy and Social Ethics*. Cambridge: Mass., Harvard University Press. Read chapter 5, "Industrial Amelioration", pp. 137-177.

Further Readings:

On/by Du Bois:

Some of Du Bois' writings are available via the UCL catalogue. I recommend:

W.E.B. Du Bois [1899] 2007. *The Philadelphia Negro*. Oxford: Oxford University Press.

> This is now recognized as a classic in social studies. It contains Du Bois' philosophy at work in his empirical research, with a distinctive pluralist methodology.

W.E.B. Du Bois [1920] 2007, *Darkwater*. Oxford: Oxford University Press. Available at Project Gutemberg, here: http://www.gutenberg.org/files/15210/15210-h/15210-h.htm

> A powerful and evocative collection of essays. It contains, among other things, the essay "The Souls of White Folks", a frank and open essay that inspired the field we now know as 'whiteness studies".

The whole special issue of *The Annals of the American Academy of Political and Social Science* (Vol. 568, 2000) contains a fantastic overview of the current relevance of Du Bois' work for the study of race from an anthropological, statistical, philosophical, political and sociological (and much more!) point of view. I recommend in particular:

Mary Frances Berry, 2000. "Du Bois as Social Activist: Why We Are Not Saved". *The Annals of the*

American Academy of Political and Social Science, Vol. 568, pp. 100-110.
Note: this paper contains a honest and candid evaluation of Du Bois' personality (including his flaws!), aspirations, and still very relevant philosophical and political agenda. It is a passionate, beautifully written essay, and a really great piece of scholarship. Read it through the end – I promise you, it is a transformative experience!

Tukufu Zuberi, 2000. Introduction: The Study of African American Problems. *The Annals of the American Academy of Political and Social Science*, Vol. 568, pp. 9-12.
This is the introduction to the special issue, It is very short, but it provides a clear and accessible introduction to the main points of Du Bois' paper. More on Du Bois' can be found in the Stanford Encyclopedia, full details below.

Shannon Sullivan (2019), "Dewey and Du Bois on Race and Colonialism", in Steven Fesmire (ed.), *The Oxford Handbook of Dewey*. Oxford: Oxford University Press (n.p.)
I heard Prof. Sullivan give this paper at a conference in 2019, and was completely captivated. She really puts Dewey in his place!

Robert Gooding-Williams, 2020. "W.E.B. Du Bois", *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/spr2020/entries/dubois/

On/by Jane Addams:

Jane Addams 1938. *Twenty Years at Hull House*. New York: Macmillan.
This is Jane Addams' autobiographical account of the founding of Hull House and the philosophy of social work behind it.

Jane Addams, 1964, *Democracy and Social Ethics*. Cambridge: Mass., Harvard University Press.
This is the book which contains your reading for this week. It does contain Addams' key ideas and philosophical contributions about social work and democracy, complete with examples.

Danielle Lake, 2014. "Jane Addams and Wicked Problems", *The Pluralist* vol. 9 (3), pp. 77-94.
This is a fantastic paper, and it really puts Jane Addams' philosophy in dialogue with STS, via the connection with the literature on "wicked problems".

Marilyn Fischer, 2014. "Addams on Cultural Pluralism, European Immigrants, and African Americans", *The Pluralist* vol. 9 (3), pp. 38-58.

Tom Burke, 2010. "Empiricism, Pragmatism and the Settlement Movement", *The Pluralist*, vol. 5(3) 75-90.

Maurice Hamington, 2019. "Jane Addams", *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/sum2019/entries/addams-jane/

On pragmatism in general:

Legg, Catherine and Hookway, Christopher, 2020. "Pragmatism", *The Stanford Encyclopedia of Philosophy* (Fall 2020 Edition), Edward N. Zalta (ed.) URL = https://plato.stanford.edu/archives/fall2020/entries/pragmatism/

If you think Pragmatism may be your kind of philosophy do get in touch. There is a lot more than what I managed to include in this session!

Lecture 9 - Let's Have an Open Conversation: Values Matter!

One of the key contributions of Pragmatism is that it is born as a philosophy that naturally considers science as embedded in a social and political context. Since its inception in the nineteenth century, pragmatist philosophy blurred the artificial distinction between 'facts' and 'values'. But stopping at 'values' in general is not enough: it seems that for a while philosophers of science have been far more open to including epistemic values (accuracy, simplicity, fruitfulness etc.) in their analysis of science than non-epistemic ones (the social and political commitments that underpin scientists' choices). Starting from a reassessment of

the "value-free ideal" advocated by Du Bois last week, this week we place epistemic and non-epistemic values in dialogue with each other, and look at the contributions that the participants in this debate continue to make to the entire field of philosophy of science, as well as to areas where philosophy can make a practical difference, such as science policy.

Essential Readings

Bright, L. K. 2018. "Du Bois' Democratic Defence of the Value-Free Ideal", Synthese vol. 195(5), pp.2227-2245.

If you have enjoyed thinking about Du Bois last week, you will enjoy this paper too. It places Du Bois at the centre of the philosophical debate about values, and contextualises his defence of the value-free ideal showing that it was motivated by a broader argument about a truly democratic science.

Further Readings

A general and very useful recap on the debate about values:

Douglas, H. 2015. "Values in Science." In *The Oxford Handbook of Philosophy of Science*, edited by Paul Humphreys. Oxford University Press.

For those of you who have studied values as part of Philosophy of Science 1, this is a useful refresher. For those of you who are studying values for the first time, this article will put you up to speed with the main debates. Follow the bibliography if you are interested in the topic! We will summarise the main debates on values in the lecture too, before moving to Bright's assessment of Du Bois.

Longino, H. E. 2004. "How values can be good for science." In *Science, values, and objectivity*, Peter Machamer and Gereon Wolters (eds.), Pittsburg: Pittsburgh University Press, pp. 127-142.

Douglas, H. 2000. "Inductive Risk and Values in Science." *Philosophy of Science* vol. 67 (4), pp. 559-579.

Brown, M. 2020. *Science and Moral Imagination*. Pittsburgh, The University of Pittsburgh Press.

Beautifully brings together values and Pragmatism – and it is very accessibly written. A great source if you want to write an essay on this topic.

Kuhn, T. S. 1977. "Objectivity, value judgment, and theory choice.", in *The Essential Tension,* Chicago: The University of Chicago Press, pp. 320-339.

Note: the UCL Library does not have an electronic subscription to books from the University of Chicago Press. If you have a copy of Curd and Cover (the first or the second edition), you will find it there, in chapter 2. You will also find several versions of the essay online - all it takes is a simple google search.

Harold Kincaid, Alison Wylie and John Dupré, 2007. *Value-Free Science? Ideals and Illusions*. Oxford: Oxford University Press.

Note: this is an excellent anthology. The chapters by Dupré, Wylie and Nelson and Douglas expand on some of the themes we have considered in the lecture. In the online version, each chapter has an abstract which can help you make an informed decision on what to choose as an additional reading.

Lecture 10 Epilogue: Where Will ***You*** Take the Conversation?

Well, we got to the end of the road. And what a journey it was! For this last session there are no required readings. Instead, I would like you to revisit the syllabus once more and think about which sessions in the overall module and related readings have made a difference in your way of thinking about science. Go back to Hutton's *conversation* model, and think about the ways in which that framework has opened new ways of thinking about philosophy of science in this course. Then pick your favourite topic, and note some thoughts on why you found it especially appealing. Be specific: in what ways has a certain reading made you see an aspect of science you had not thought about? What did you think before, and how has that reading changed your mind, or given new depth and sophistication to your previous convictions? We will discuss your ideas in the last class.

Important policy information

Details of college and departmental policies relating to modules and assessments can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook

All students taking modules in the STS department are expected to read these policies.