Topics in History and Philosophy of Science: Philosophy of the Historical Sciences
Philosophy 5810-001
Spring 2023
R 3:30-6:29p
36MK112

Description	This seminar will explore the epistemology of the historical sciences—paleontology, archeology, cosmology, paleoclimatology, etc. Of the many tasks undertaken in science, one is striking both in its scope and the epistemic difficulties it faces: the reconstruction of the deep past. Our epistemic access to past events is limited, often severely so. Despite the problem of access, some claims about prehistory enjoy strong epistemic support. In this seminar, we will analyze the problem of epistemic access for historical reconstruction. We will focus on paleoclimatology as a running example. The reconstruction of climates of the distant past is one of the principal sources of evidence for climate change before the advent of meteorological instruments. As a result, paleoclimatology has come to play a key role in developing models of future climate change. In this seminar, we will explore general epistemological questions like, can we observe the past? What can historical scientists do to overcome the impossibility of performing experiments on the past? To what extent can they overcome the destruction of traces of past events over time? The answers philosophers have proposed to such questions will be compared with the history of efforts to gain epistemic access to past climates. Doing so will enrich our understanding of how science works in general, as well as of one of the crucial sciences of our time.
Instructor:	Dr George Borg e-mail: gborg@upenn.edu phone : 215-898-7535
Instructor Office Hours:	Claudia Cohen Hall 426 Tu 11-12, F 11-12 and by appointment
Course website:	canvas.upenn.edu

Required Texts

All required readings will be available on Canvas **(C).**

Your Part	• *Term paper*
	  ○ 6,000-7,000 words, including references and notes.
	  ○ To be submitted on the day of the final (TBD) in hard copy or electronically by noon (433 Cohen for hard copy).
	  ○ I will only issue an incomplete under extraordinary circumstances. Get it done!
	  ○ The paper should be an original research paper on any subject of relevance to the seminar.
	  ○ To assist you in beginning work, please submit a paper proposal by the seminar meeting on April 4. It should be sent in email ahead of the class meeting or presented in paper in the meeting. The proposal need only be brief. It should contain a short

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<tr><td colspan="2"></td><td>paragraph describing the topic to be investigated and give a brief indication of the sources you intend to use.
o I encourage you to talk to me about possible topics. Earlier rather than later.

• Take your turn presenting material
o The seminar will be structured around presentations by seminar members, including me. They are based on weekly readings.
o Sign-up will occur in class on Jan 25
o We have 2 philosophy readings each week, so there will usually be 2 presenters. Each should expect about one hour of the seminar to be spent on the reading. For a small group such as we will have in the seminar, a highly structured “talk, then question time” isn’t optimal. A better model is for the presenter to develop the ideas of the paper in interactive discussion with the seminar members.
o In presenting a reading, you should presume that the seminar has read it. You should spend a short amount of time reviewing the principal claims and arguments of the reading. This is not intended to replace the seminar’s reading of the text, but merely to provide a basis of common agreement on its content and upon which subsequent discussion is based. Your principal burden is to provide a critical analysis, a response to the reading and to encourage analytic discussion. This analysis can take many directions.
▪ Is the project of the paper clear?
▪ Are the theses clear?
▪ Are the arguments cogent?
▪ How does the reading relate to other readings and issues in the seminar?
▪ Are there plausible counter-theses?
▪ What arguments support them?
o You are encouraged to stand at the front of the room, make strong eye contact with the seminar and deliver the material, writing as needed on the blackboard or gesturing at the screen (if you choose to do a digital presentation). This promotes a more engaging presentation than when you sit at the table with your head buried in your notes talking to the notes.

• Attendance and participation
o I look forward to seeing and hearing you each week in the seminar.</td></tr>
<tr><td colspan="2">Grading Policy</td><td>Overall course grade will be based on an evaluation of overall seminar participation, presentations, and research paper.</td></tr>
<tr><td>Date</td><td>Topic</td><td>Reading Due</td></tr>
<tr><td>1. Jan 18</td><td>Introduction</td><td></td></tr>
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2. Jan 25	1. Asymmetries of knowledge and overdetermination 2. Climate change – Fourier and greenhouse effect	• Turner, *Making Prehistory* ch. 1 "Asymmetries" • Cleland, "Methodological and epistemic differences between historical science and experimental sciences" • Fleming, *Historical Perspectives on Climate Change*, Intro and ch. 5
3. Feb 1	1. Can we observe the past? 2. Climate change – early research on CO_2 and climate	• Turner, *Making Prehistory* ch. 3 "Manipulation matters" • Kosso, "Observation of the past" • Fleming, *Climate Change*, Ch. 6
4. Feb 8	1. Information loss 2. Climate change – 19th c. theories of glaciation	• Tucker, "Historical Science, Over- and under-determined" • Sober & Steel, "Time and Knowability in Evolutionary Processes" • Fleming, *Climate Change*, Ch. 7
5. Feb 15	1. Laws and regularities in the historical sciences 2. Global warming – early 20th century	• Jeffares, "Testing times: regularities in the historical sciences" • Kravitz, "The thermodynamics time arrow and the logical function of the uniformity principle in geohistorical explanation" • Fleming, *Climate Change*, Ch. 9
6. Feb 22	1. Prediction and explanation in historical science 2. Case study in paleoecology	• Cleland, "Prediction and explanation in historical natural science" • Page, "The role of historical science in methodological actualism" • Charenko, "Reconstructing Climate: Paleoecology and the limits of prediction during the 1930s Dust Bowl"
7. Feb 29	1. What is a 'trace'? 2. The complexity of climate change—1950s-1960s	• Currie, *Rock, bone, and ruin* Ch. 3 "Traces" • Wallach, "Time will tell: against antirealism about the past" • Weart, *Discovery*, ch. 3 "A Delicate System"
Mar 7	**SPRING BREAK – NO CLASS**	
8. Mar 14	1. Measurement in the historical sciences 2. The growth of paleoclimate studies and climate models—1960s-1970s	• Wilson & Boudinot, "Proxy measurement in paleoclimatology" • Bokulich, "Calibration, coherence and consilience in radiometric measures of geologic time" • Weart, *Discovery*, ch. 4 "A Visible Threat"
9. Mar 21	1. What are 'data'? 2. The development of models and ice-core studies—1970s-1980s	• Wylie, "Radiocarbon dating in archaeology" • Latour, *Pandora's Hope* ch. 2 "Circulating Reference" • Weart, *Discovery*, ch. 6 "The Erratic Beast"
10. Mar 28	1. Evidential reasoning about the past	• Turner, *Making Prehistory*, ch. 8 "Snowball Earth in the balance"

	2. The development of models and the IPCC—1980s-1990s	• Forber & Griffith, "Historical reconstruction: gaining access to the deep past" • Weart, *Discovery*, ch. 8 "Speaking science to power"
11. Apr 4	1. Evidential reasoning about the past 2. Willi Dansgaard and the beginnings of glaciology	• Currie, *Rock, bone and ruin*, ch. 6 "The main business of historical science" •Vezér, "Variety-of-evidence reasoning about the distant past" •Dry, *Waters of the World,* ch. 7
Apr 4	**TERM PAPER PROPOSAL DUE**	
12. Apr 11	1. Analogical reasoning in climate science 2. Glaciology	• Wilson, "Paleoclimate analogues and the threshold problem" • Watkins, "Scaling procedures in climate science: using temporal scaling to identify a paleoclimate analogue" • Jouzel et al., *White Planet,* chs. 3 and 4
13. Apr 18	1.Technology in the historical sciences 2. Glaciology	• Tamborini, "Technoscientific approaches to deep time" • Borg, "Geochronology and the ontology of scientific methods" • Jouzel et al., *White Planet,* chs 7 and 8
14. Apr 25	1. Values in the historical sciences 2. Integrating paleoclimate records and climate models	• Perkins, "Culture's impact on the historical sciences" • Zhao, "Counterfactual History" • Sörlin & Isberg, "Synchronizing earthly timescales" • Flatø & Isberg, "Temporality and environmental history in the Anthropocene"
TBD	**FINAL PAPER DUE**	

I will use the following grading schema to calculate your grade:

Grades Scored Between			Will Equal	Grades Manually Entered as	Will Calculate as
97	% and 100	%	A+	A+	98.5 %
94	% and Less Than 97%		A	A	95 %
90	% and Less Than 94%		A-	A-	91.5 %
87	% and Less Than 90%		B+	B+	88.5 %
84	% and Less Than 87%		B	B	85 %
80	% and Less Than 84%		B-	B-	81.5 %
77	% and Less Than 80%		C+	C+	78.5 %
74	% and Less Than 77%		C	C	75 %
70	% and Less Than 74%		C-	C-	71.5 %
67	% and Less Than 70%		D+	D+	68.5 %
64	% and Less Than 67%		D	D	65 %
60	% and Less Than 64%		D-	D-	61.5 %
0	% and Less Than 60%		F	F	55 %

Student Support Services:

The Weingarten Center offers a variety of resources to support all Penn students in reaching their academic goals. All services are free and confidential. To contact the Weingarten Center, call 215-573-9235. The office is located in Stouffer Commons, 3702 Spruce Street, Suite 300.

Academic Support

Learning consultations and learning strategies workshops support students in developing more efficient and effective study skills and learning strategies. Learning specialists work with undergraduate, graduate, and professional students to address time and project management, academic reading and writing, note-taking, problem-solving, exam preparation, test-taking, self-regulation, and flexibility.

Undergraduates can also take advantage of free on-campus tutoring for many Penn courses in both drop-in and weekly contract formats. Tutoring may be individual or in small groups. Tutors will assist with applying course information, understanding key concepts, and developing course-specific strategies. Tutoring support is available throughout the term but is best accessed early in the semester.

Disability Services

The University of Pennsylvania is committed to the accessibility of its programs and services. Students with a disability or medical condition can request reasonable accommodations through the Weingarten Center website. Disability Services determines accommodations on an individualized basis through an interactive process, including a meeting with the student and a review of their disability documentation. Students who have approved accommodations are encouraged to notify their faculty members and share their accommodation letters at the start of each semester. Students can contact Disability Services by calling 215-573-9235.