

SCIENCE AS CULTURAL PRACTICE

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Introduction:

The problem of science today — the need for a new philosophy of science

- Science is the key phenomenon in the contemporary world.
- *Science itself is a problem* — not only the solution to all problems.

Nietzsche, An Attempt at Self-Criticism, 1886: “And even scientific enquiry itself, our science—indeed, what does all scientific enquiry in general mean considered as a symptom of life? What is the point of all that science and, even more serious, where did it come from?... *for the problem of scientific research cannot be understood on the basis of scientific enquiry...*” (italics EV)

- *How do we understand science?*

The concept of science:

What is science?

- **Traditional conceptions – the notion of science is the extension from epistemology:**
 - *knowledge* – the best and the highest human knowledge possible (objective, neutral, critical, verified, etc.)
 - knowledge:
 - *representation* of reality (“mirror of nature”),
 - *propositional* knowledge (“true justified belief”)
- **Includes activities:**
 - inquiry;
 - searching for truth and/or certainty;
 - detecting and collecting data;
 - constructing theories;
 - explaining and interpreting facts and relations;
 - discovering and understanding new phenomena;
 - solving problems;
 - justifying and proving claims;
 - articulating scientific laws, etc.

Science is a practice

- **What kind of practice?**
 - very special (specialized):
 - epistemic,
 - cognitive,
 - empirical,
 - intellectual,
 - creative,
 - knowledge production
- **What is practice?**
 - Practical activity – **Everything humans really do** (perform)
 - Human thought and knowledge can be reconceptualized in terms of human practices
 - **Science is what humans do – what they practice (inquire, research)**
 - **To understand science = to understand scientific practice(s)**
 - What do scientists do? Why they do it? How they do it? When and where they do it? What are the results (products) of it?

Scientific practice



- Hasok Chang, Cambridge, UK
- SPSP (Society for the Philosophy of Science in Practice)
 - *Inventing Temperature: Measurement and Scientific Progress* (2004)
 - *Is Water H₂O?: Evidence, Realism and Pluralism* (2012)
- **“The Philosophical Grammar of Scientific Practice” (2011)**
- “The Chemical Revolution Revisited: Theory-Choice, Incommensurability and Pluralism” (2012)
- “Pragmatic Realism” (2016)
- “Who Cares about the History of Science?” (2016)
- “Putting Science Back in History of Science” (2016)
- **“How to Build Real Entities: a New Pragmatist Foundation for Scientific Realism” (2018)**
- Percy Bridgman, John Dewey, Nancy Cartwright, Paul Feyerabend, Marjorie Grene, Ian Hacking, Thomas Kuhn, Michael Polanyi, Richard Rorty, Joseph Rouse...

Scientific practice



- **Hasok Chang:**

- **“The Philosophical Grammar of Scientific Practice” (2011):**

“... all scientific work, including pure theorizing, consists of actions, of the physical, mental, and ‘paper-and-pencil’ varieties. When we set out to see what it is that one actually does in scientific work, the following set of questions naturally emerge: who is doing what, why, and how? More specifically, we must arrive at some coherent philosophical accounts of the following elements of scientific practice:

- the agent—free, embodied, and constantly in second-person interactions with other agents;
- the purposes and proximate aims of the agent;
- types of activities that the agent engages in;
- ontological principles necessarily presumed for the performance of particular activities;
- instruments and other resources that the agent pulls together for the performance of each activity.”

Scientific practice

- The best human epistemic practice possible
- The fundamental human scientific purpose (goal, aim, intention, need, interest):
 - to understand the world (as it is – “objectively”)
- How is this possible – if at all?
- Generally: To organize scientific practices according to “the measures (parameters, logics) of the objects”, not according to “the measures of the subjects”!
However: the objects do not speak, do not measure themselves, do not care about our understanding...
- We humans do it all, we humans care... this is our human practice serving our purposes...

Science as social practice

- **Scientific practice is social:**
 - each and every human practice is immanently (inherently) social
 - not performed by isolated practitioners (agents)
 - performed in communities and through communication
 - socially instituted and organized
 - social environment – provides regulation, support or barriers to scientific practices?
- **Ludwik Fleck, Michael Polanyi, Robert Merton, Thomas Kuhn**
- **Science studies**, Social studies of science, Science and technology studies (cca 1975)
- **Strong programme** in the sociology of scientific knowledge (David Bloor et al.)
- **Andrew Pickering:** *Science as Practice and Culture* (1992), *The mangle of practice: time, agency, and science* (1995)
- **Joseph Rouse:** *Knowledge and Power: Towards a Political Philosophy of Science* (1987), *Engaging Science: How to Understand its Practices Philosophically* (1996), *How Scientific Practices Matter: Reclaiming Philosophical Naturalism* (2002), *Articulating the World: Conceptual Understanding and the Scientific Image* (2015)
- Pragmatist, hermeneutic, feminist philosophies of science...

Science as cultural (socio-cultural) practice

- Scientific practice is cultural (socio-cultural):
- each and every human social practice is immanently (inherently) cultural
- culture is a way of doing things – of practicing science
- “internal” scientific culture – norms, values, institutions: “**culture in science**”
- “external” culture – norms, values, institutions in society: “**science in culture**”
- science-as-cultural practice features: **1. value-ladenness, 2. normativeness, 3. historicity.**
- Bruno Latour and Steve Woolgar: *Laboratory Life*, 1979...
- Helga Nowotny et al.: *The new production of knowledge: the dynamics of science and research in contemporary societies*, 1994...
- Karin Knorr Cetina: *Epistemic Cultures*, 1999...
- Classical pragmatism and neopragmatist philosophies of science...

Science as cultural (socio-cultural) practice

- Transcending traditional (false) dichotomies:
 - scientific/epistemic vs. social/cultural
 - content vs. context of science
 - ideas vs. relations of science
 - internal vs. external features of science
- Integration of: history, social theory and philosophy of science
- Complex holistic understanding of science
- **Science is human practice performed (and used as a tool) for the sake of our understanding reality.**

2 forms of practices based on 2 types of transactions

- Socio-cultural practices have two basic (ontological) forms:
 1. Practices, in which humans are in **causal transactions with nature** – transactions between humans and nature (primarily material, **nonlinguistic**),
 2. Practices, in which humans are in mutual **meaningful transactions between themselves** – transactions between humans and humans (primarily non-material, **linguistic**).
- Scientific practices also have two basic (ontological) forms:
 1. Scientific practices that inquire into **causal transactions within natural reality** (**natural and technical sciences**),
 2. Scientific practices that inquire into **meaningful transactions within socio-cultural reality** (**social and human sciences**).

Conclusion:

Science as cultural value

- What is **science good for**?
- How science “with a human face” is possible?
- The **goals of science** are the goals it takes on from and **within the culture** (or cultures) and its (their) **values – including “pure” epistemic goals**.
- A Rousseauian question: “Has the progress of the sciences and arts – that is of the culture – contributed to the moral progress of humanity?”
- **Without understanding science as cultural practice**, there is no way for us to fulfill the meaning of science.