The challenge from sociology of science

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Robert K Merton (1910-2003)

The Sociology of Science (1973)

Mertonian Norms of science ("cudos"):

1. communalism: common ownership of scientific ideas and results
2. universalism: personal attributes and social background irrelevant to value of person's ideas
3. disinterestedness: scientists act for the greater benefit of the scientific enterprise, not for their personal gain
4. organized skepticism: challenge and test ideas instead of taking them on trust or authority

Reward system in science

- basic currency for scientific reward is recognition
- evidence for this is found in fervor with which priority disputes are fought

$\Rightarrow$ basic community standard operating

- collateral damage: deviant behaviour (fraud, plagiarism, libel, slander)

The Matthew effect in science

"For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath." (Jesus's parable of the talents according to Matthew XXV:29, KJV).

- ambition and risk-taking will be rewarded, failure to do so will be punished
- Merton: eminent scientists often get more credit than lesser known scientists (whether they co-author a paper, or simultaneously discover something)
- prizes almost always go to senior scientist involved, although work may be done by graduate student
- example: isolation of antibiotic streptomycin (remedy against tuberculosis) by Albert Schatz in 1943, and the attribution of all credit (incl Nobel Prize 1952) to his advisor Selman Waksman

Merton Thesis: explaining the Scientific Revolution

- Max Weber: link bw Protestant ethic and capitalist economy
- Merton Thesis: link bw rise of Protestant pietism in England and Germany and early experimental science
  1. changes in the nature of science are due to an accumulation of observations and better experimental technique
  2. English Puritanism and German Pietism as causally significant in the development of the scientific revolution of the 17th and 18th centuries
- Objections:
  1. insufficient consideration of mathematics and mechanical philosophy in Scientific Revolution
  2. What counts as right type of Protestantism? Why are there important Catholic scientists in Sci Revolution such as Copernicus, Galileo, Huygens?
- Thesis suggests why England (and Germany) was driving motor of Sci Revolution

Strong program in sociology of scientific knowledge

- before: description of social structure of science as whole
- strong program: explain particular scientific belief in sociological terms

$\Rightarrow$ sociology has ambition to replace phil of science

- Symmetry Principle: all forms of beliefs and behaviour must be given the same kind of explanations
- all communities (not just scientific ones) have socially established local norms for regulating beliefs

$\Rightarrow$ we shouldn't give the Real World a special role in explanation of scientific beliefs that we wouldn't also give to explanation of any other forms of beliefs that pass their local community norms

- but: if you really think that the belief that arsenic is toxic merely passes a local community norm but has no objective meaning, then you shouldn't mind taking a mouthful...

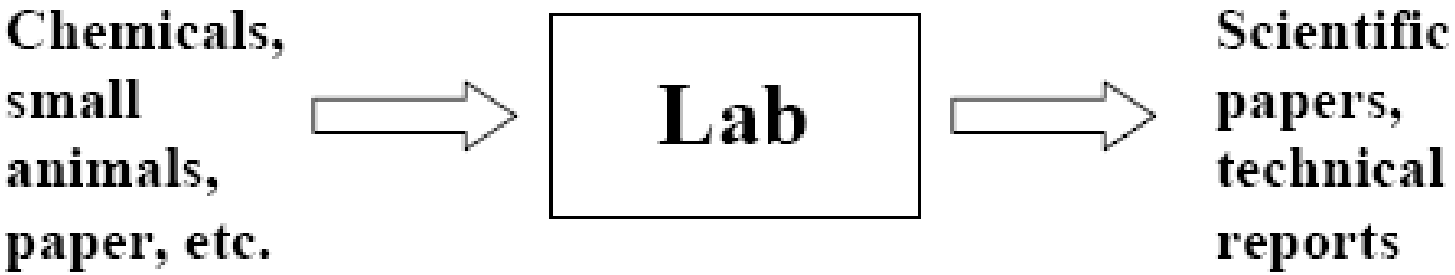
Shapin and Schaffer: *Leviathan and the Air Pump* (1985)

- in C17, Robert Boyle proposed new way of bringing experience to bear on theoretical investigation
- argued for distinction bw public investigation of experimental "matters of fact" from all other kinds of beliefs
- reconstructed questions about vacuum to bring them into contact with his experiments
- S&S argue that Boyle's treatment of terms like "vacuum" established new "language game", i.e. pattern of linguistic habits that contribute to a "form of life"

$\Rightarrow$ Boyle and friends engage in the manufacture of facts, i.e. ideas are made rather than found

- "It is ourselves and not reality that is responsible for what we know." (p. 344)

Latour and Woolgar: *Laboratory Life* (1979)



- objects of scientific study are constructed within lab and thus cannot be attributed with an independent existence
- scientific activity as system of beliefs, oral traditions and local practices, i.e. not as procedure, method, or principles but as a culture
- actor-network thy: agency of nonhuman actors but of material-semiotic networks, i.e. relations bw material objects and bw concepts
- both S&S and Latour close to social constructivism