

Science studies

a)



What is science studies?

- Simple answer: studies science
- How does science work? – does this amount to asking what science *is*?
- Studies research in practice: interviews, participant observation
- Often focuses on diversity, rather than unity.

“Standard theories of science”

- Science as essentially different from other activities – epistemologically privileged - demarcation
- The *purity* of science, no influence from “external factors” (context of discovery)
- Science as politically neutral, above politics. Descriptive, not normative.



KUHN

- Paradigm belongs to **groups**, not individuals
- Paradigms not directly caused by nature
- Studies the history of science, rather than the products of science



Kuhn as basis

- knowledge is a *social* phenomenon, not the property of individuals
- science is being used *uncritically*
- scientific theories are upheld partly by *social control*
- Accepting a paradigm is not basically a *rational* choice
- Science is driven by (collective) psychology and values and ideology
- Opens the door for the social sciences



Political background

- Increasing concern over the uses of science (weapon's research, etc)
- Increasing concern over unintended consequences of science (DDT, thalomid)
- Concern over sciences' political influence (nuclear power)
- Hence, started from a *critical* perspective.

Standard theories revisited

- Science as essentially different from other activities – epistemologically privileged
- The *purity* of science, no influence from “external factors”
- Science as politically neutral, above politics. Descriptive, not normative.
- All of these traits serve to give science a special form of *authority*. Which matter for politics.



SCIENCE STUDIES

- **New-ish discipline**
- **“Family” of more or less related theories and methodologies**
- **Empirical study of scientific practice**
- **Philosophy, sociology, anthropology**
- **Science as a *product***



Bloor (1974) Science and Social Imagery

- Impartial with respect to truth or falsity, success or failure, rationality and irrationality.
- Symmetrical. The same kinds of reasons should be used to explain both kinds of beliefs (postulate of equivalence)



Late 70's: Laboratory studies

- Social scientists studying scientists as culture/tribe, and publishes reports from meetings with the tribes (How do they talk?, how do they dress?, what do they value?)



Laboraty studies

- Harry Collins
- Karin Knorr-Cetina
- Bruno Latour & Steve Woolgar
- Michael Lynch
- Andrew Pickering
- Sharon Traweek



Bruno Latour

- Originally trained as a philosopher
- 1977, w/Steve Woolgar: *Laboratory Life. The (social) construction of a scientific fact.*
- Ethnographic study of life inside Salk laboratories
- Latour's theories are influenced by a French structuralist tradition



A laboratory setting with a rack of test tubes containing blue liquid. A pipette is dispensing a drop of yellow liquid into the rightmost test tube. The background is blurred, showing laboratory equipment.

Laboratory life

- Naïve observer
- Witnessing the discovery of the hormone TRH –
- 500 tons of pig's brain => 1 mikrogram TRH
- Is now synthetically produced, and can be bought

Laboratory Life

- "inscription devices"
- "translation"
- Black boxes
- The «specialness» of science consists in its material practices





Central concepts

- All elements are actors/actants
- Actors belong to networks, and their meaning is produced by their relations – co-production



A more radical symmetry

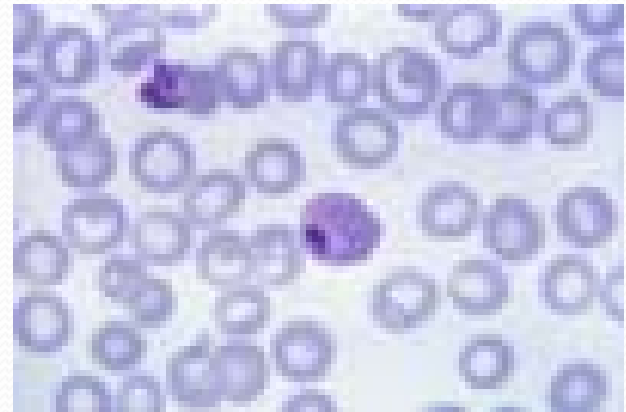
- The researchers should be symmetrical about what actors are natural, and what actors are social.
- Anything can be an actor – as long as it plays a role in the story



Existence precedes essence

- The characteristics or qualities of actors' are constantly developing
- The characteristics are the outcome of «trials»
- Existance = resistance

What does this mean?



Give me a laboratory!

Against critics

- What is the point of doing laboratory studies?
- Only looks at «**micro** level» - can't say anything about the role of science in society?
- Only looks at what happens **inside** the laboratory, should look at political forces, context.

Claims that this is exactly the point:

- There is no «inside» or «outside» of science or laboratories
- There is no difference between «micro» and «macro» levels
- Science is there to dissolve such distinction

The story of Pasteur and the anthrax microbes

- Big disease – little scientist?
- Pasteur **translates** the interests of the farmers into his own
- Using a laboratory, he can make the disease little and controllable
- Then he changes the farms into small laboratories, and is able to control the big disease «out there»

The laboratory destabilizes relationships of power

- In the lab, Pasteur may make the Antrax small, and himself big
- He purifies the microorganism, and makes it visible
- He demonstrates his power over the disease by controlling its virulence in the lab
- Science produced new phenomena, and learns how to control them

A process of translation

Anthrax =

microbes



A process of translation

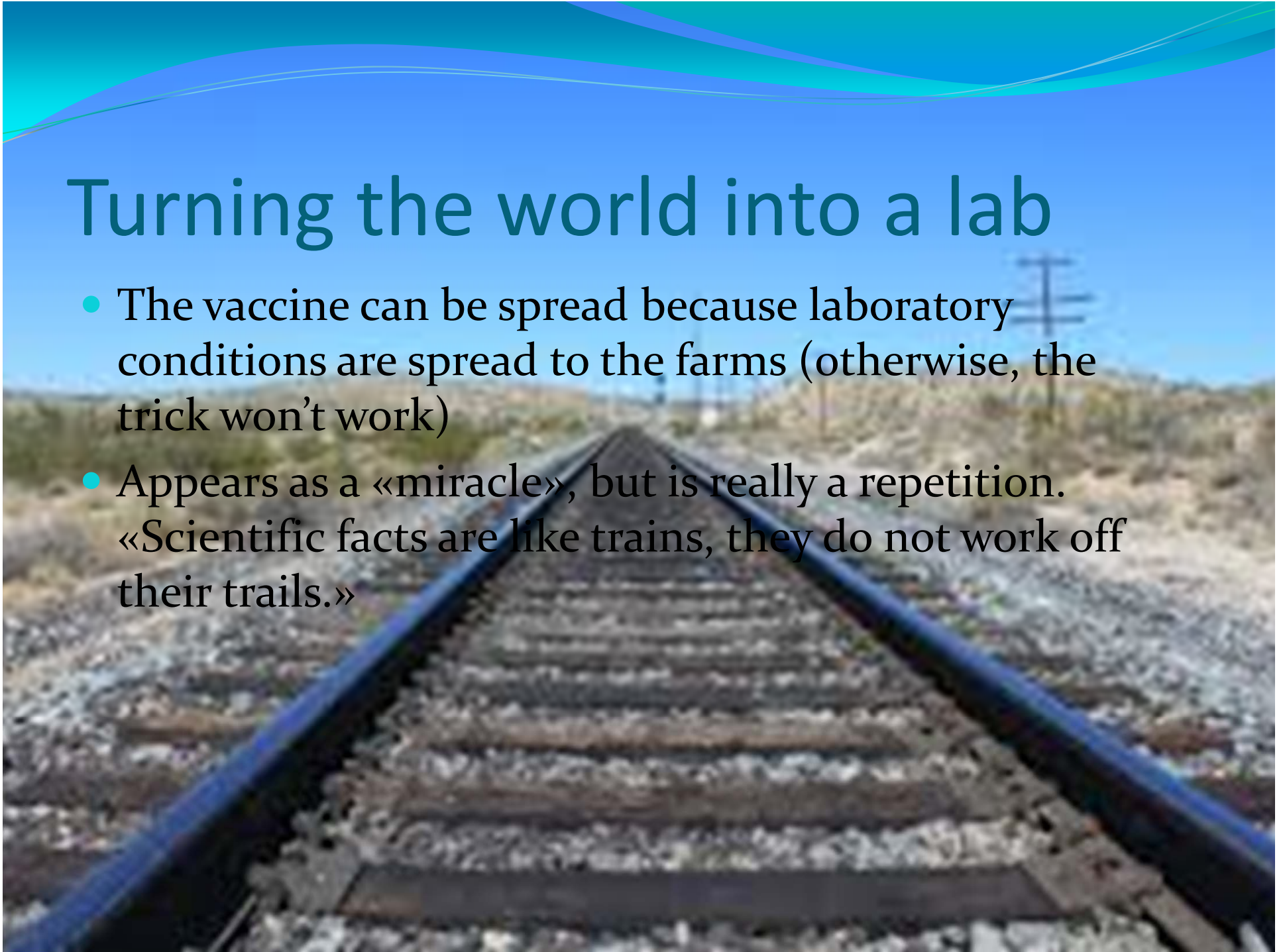
Salvation =

vaccine



Turning the world into a lab

- The vaccine can be spread because laboratory conditions are spread to the farms (otherwise, the trick won't work)
- Appears as a «miracle», but is really a repetition. «Scientific facts are like trains, they do not work off their trails.»





So what has happened?

- The distinction between the big and the small has disappeared
- There is no distinction between the inside and the outside of science
- There is translation, displacement, transference.
- The actors are different, and hold different powers, than they did before



Science is politics by other means

- Science changes society – and makes it more «scientific». Therefore no point in talking about science as a separate sphere of activities
- The laboratory is a «technological device to gains strength by multiplying mistakes» – and thus the scientists may perform «miracles»



What is science?

- The success of science was often explained by «special methods», «special minds», «special culture».
- Laboratory studies have shown that this is not the case
- Science has the technology to change scales – and thus make mistakes without consequences – rehearse before taking results elsewhere (unlike politicians).
- Because society is getting more scientific, science can now work in more places.





Social construction

Criteria (Hacking)

- 1) *Contingency* = science could have developed in other directions
- 2) Nominalism = do words represent things?
- 3) Stability = internal or external sources?



Group discussions

- Discuss whether there has been anything that could be described as a scientific revolution in your field
- Does the “Social Construction” undermine the rationality of science?