Agenda

Tacit knowledge and experimental reproduction

1. Administrative
2. Studying laboratories
3. Negotiation of scientific phenomena
4. Reading discussion

Studying laboratories

Scientific lab as ethnographic site

- In the 1970s and 1980s, STS scholars began conducting ethnographies in scientific labs.
- If scientific knowledge has a social component, scholars should focus on the ***process*** of knowledge creation.
  (Consider Bloor's *causal* tenet)
- Study the formulation of facts in a lab just as you would study any social process—field work, ethnography, conversation analysis, interviews, …

THEMES OF LABORATORY STUDIES

Tacit knowledge

- A big part of scientific knowledge cannot be written down, but is embodied in skills, 'tinkering' (Knorr Cetina), and tacit knowledge (Collins)
- "... experiments do not work; the numbers have to be cooked, the reaction doesn't react, the phage does not grow." (Hacking 1983, 229)

Negotiation

- Scientific observations, findings, and facts are not apparent, but must be *actively* constructed

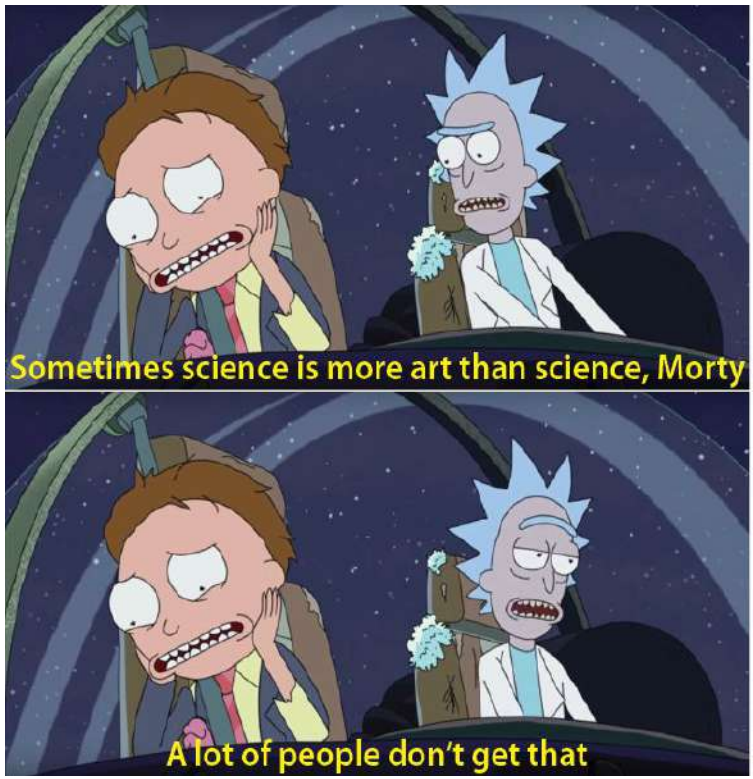
Translation

- Particular findings are susceptible to varied narratives
- Scientists must engage in *translation* of facts and data for different audiences (Latour, Callon)

Negotiation of scientific phenomena

Transferring knowledge (Collins 1975)

- Replication in science involves transmitting knowledge about a phenomenon of interest
- How should we understand this process?
  - **Algorithmical model**: "a finite series of unambiguous instructions which can be formulated [and] transferred" (206)
  - **Enculturational model**: Reproduction relies on shared assumptions, categories, skills, and baseline knowledge
- The only way to tell whether knowledge has been transferred is to see if the recipient's experiment '***works***'



Gravitational waves

In the 1970s, scientists had not yet settled on what a credible experiment to detect gravitational waves should look like. There was no agreement on what would qualify as "***working***"

Detecting gravitational waves was part of the ***normal science*** of confirming Einstein's general relativity.

In negotiating what constituted a "competent" ***experiment*** in gravitational waves, the scientists were actually negotiating the relevant ***characteristics*** of gravitational waves.

If gravitational waves were purely theoretical (in 1975), then ***to negotiate their characteristics was to negotiate gravitational waves themselves***

Joseph Weber ("O") working on a resonant-mass gravitational wave antenna, or "Weber bar" (c. 1965)

NEGOTIATING PHENOMENA

> It may not be long before the scientific community decides that the claims of the originator are completely spurious, or on the other hand, revolutionary. When that happens, and a new natural element in the scientific world has been constructed, the following section of my paper will look quaint. That is what is particularly interesting about writing it now before the solid existence of the facts clouds the look of contingency about their origins. (Collins 1975, 209)

- International network of large interferometers
- Agreement on "What counts as a 'working gravity wave detector'" (Collins 1975, 211)
- Agreement on relevant properties of gravitational waves

Representing reality

Amann and Cetina (1988)

The Fixation of (Visual) Evidence

Image credit

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Screen captures from Rick and Morty (2013)

Photo from University of Maryland libraries via Forbes

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