10. Actor-Network-Theory (ANT)

Bruno Latour

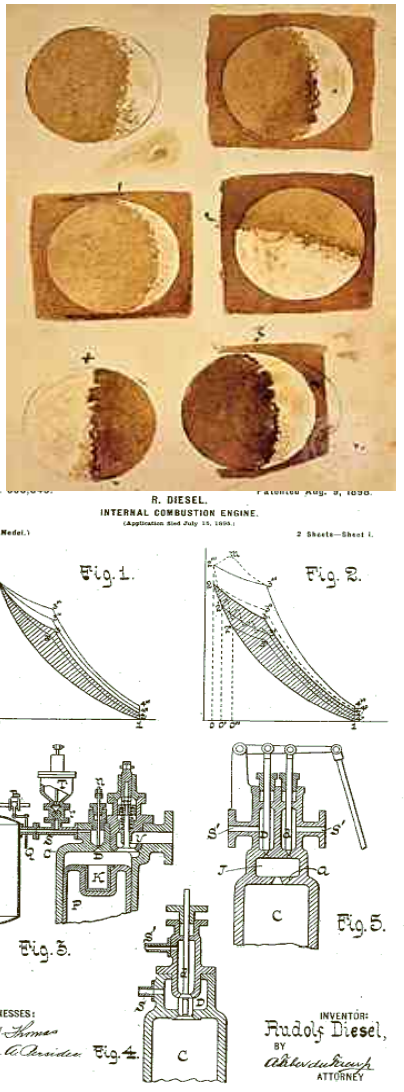
Technoscience = view of science and technology as involving the *same* types of processes.

Claim: There is no distinction in kind between "discovery" and "invention".

- *Traditional view*:

(Galileo "discovered" the phases of Venus.) $\Rightarrow$ (Phases of Venus existed prior to Galileo.)

(Diesel "invented" the diesel engine.) $\Rightarrow$ (Diesel engine *did not* exist prior to Diesel.)



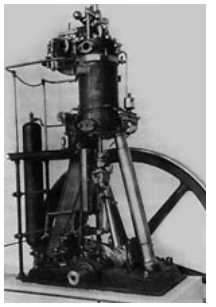
- *ANT view*: *Both* the phases of Venus *and* the diesel engine were *constructed* by the *same* types of processes.

Characteristics of ANT

(1) *Actors and networks*:

- Technoscience produces *networks* in which *actors* are both human and non-human.
- All actors (human and non-human) have interests that require accomodation and negotiation.

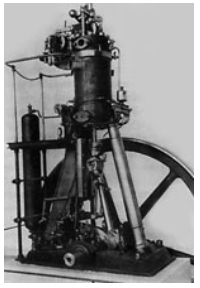
Rudolph Diesel (1858-1913)



diesel engine

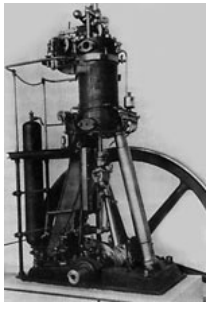
(2) *Types of actors:*

- *Intermediary* = passive, predictable, uni-directional conduit of influence.
- *Mediator* = dynamic, unpredictable, multi-directional conduit of influence.
- *ANT goal*: Replace descriptions in terms of intermediaries with descriptions in terms of mediators.



Passively acted upon by Diesel in attempt to construct working prototype.

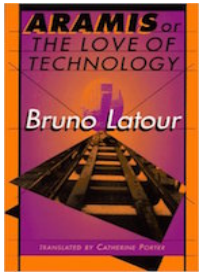
Intent on gaining fame and fortune with novel highly efficient heat-engine!



Resisted Diesel's advances! Failed to work for investors. Forced Diesel into negotiation.

(3) *Controversies*: The study of technoscience is the study of *controversies* in which the interests of actors in networks come into conflict.

Ex 1: Latour (1996) *Aramis, or the Love of Technology.*



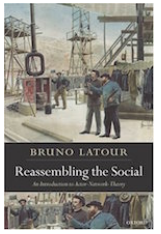
- An account of the French PRT system "Aramis", 1970's-80's.
- "Personal Rapid Transit": Platoons of 4-passenger cars linked by "non-material" couplings (ultrasonic and optical).

- Begun 1967, cancelled 1987, ~500 million francs spent!
  - *Sociological factors:* *Security in private cars.*
  - *Political factors:* *Changing governments, changing priorities.*
  - *Economical factors:* *Cost over-runs, constant re-designs, competition for funds with other agencies.*
  - *Technological factors:* *Novel coupling devices, new type of motor.*

Claim: To understand "Who killed Aramis", these factors must be seen as influencing negotiations between mediators in a network spanning 20 years.

(4) *Local literal explanations*: *"Follow the actors."* Controversies are given local explanations in terms of dynamic relations between actors taken at *face value*; as opposed to embedding phenomena in global explanatory frameworks that refer to abstract concepts like "social forces", "society", *etc.*

Ontological Implications:

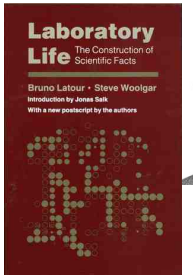


Latour, B. (2005)
Reassembling the Social

- ANT is "anti-social constructivism".
- Social constructivism = Everything is made up of social (as opposed to natural) stuff.
- Traditional empiricism = Everything is made up of natural stuff, in the form of static bits and pieces (and the task is to account for dynamic change).
- ANT = Everything is made up of natural stuff in the form of dynamic relatedness (and the problem is to account for stability and order).

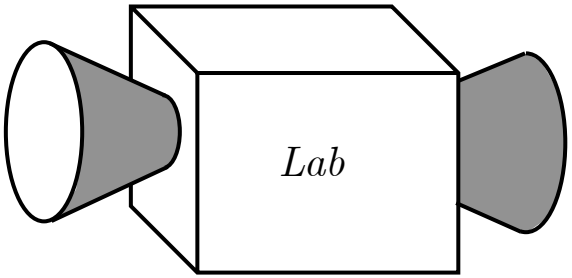
"For [traditional] sociologists..., the rule is order, while decay, change, or creation are the exceptions. For [ANT]..., the rule is performance and what has to be explained, the troubling exceptions, are any type of stability over the long term and on a large scale." (Latour 2005)

Ex 2: Latour & Woolgar (1979) *Laboratory Life*




- Ethnographic study of a biology lab (Salk Institute).
- *Idea*: View scientists like anthropologists view tribal societies.

  Example: What is the function of a "laboratory"?

chemicals, small animals, blank paper, ... $\Rightarrow$ 

$\Rightarrow$ *journal articles, scientific "facts"*

- Conversion process takes "scientific claims" and fortifies them as "scientific facts".

Scientific claim
Human product. $\Rightarrow$ *Laboratory Conversion*
Process of hiding human origins of claims. $\Rightarrow$ *Scientific fact*
Human product, but origins have been "hidden".

Ex 3: **Callon, M. (1986) "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay"**

Michel Callon

Problem with the Strong Programme

- *Symmetry in Explanation Thesis*: All forms of belief and behavior should be approached using the same kinds of explanation.

- *But*: This is only applied to contexts involving science/technology.
  - *No privileged viewpoints in scientific/technological controversies.*
  - *But an understanding of these controversies comes within the framework of an overarching theory of social/cultural interactions.*
  - *We impose social and cultural structures onto science/technology, which themselves are assumed structureless.*

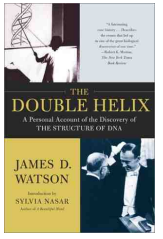
- *Thus*: Strong Programme implicitly maintains a distinction between explanations of sci/tech phenomena and explanations of social phenomena.

Three Resulting Difficulties:

(a) *Stylistic Difficulty*: Most Strong Programme texts censor the actors (scientists/engineers) when they are not speaking about science/technology.

"The few rare texts in which this censorship is not imposed produce a very different literary effect."

"A very different literary effect"...



James Watson

(b) *Theoretical Difficulty*: There is no single agreed-upon sociological framework of analysis.

"...from the moment one accepts that both social and natural sciences are equally uncertain, ambiguous, and disputable, it is no longer possible to have them playing different roles in the analysis."

Question: Does epistemological uncertainty (uncertainity in knowledge) entail ontological similarity (similarity of phenomena under study)?

(c) *Methodological Difficulty*: During episodes of controversy in science and technology, the identities and roles of the relevant actors are not fixed and stable, but uncertain and problematic.

Three Principles for a "Sociology of Translation"

(i) *Agnosticism.* No privileged interpretations of *either* natural phenomenon *or* social phenomenon.

(ii) *Generalized Symmetry*. *All* explanations, whether they apply to scientific/technological aspects of a controversy, or social aspects, should be explained in the same terms.

- *Implication: Use a single descriptive framework for both Society and Nature (in particular, actors should not necessarily be restricted to humans).*

(iii) *Free Association*. Rejection of all *a priori* distinctions between natural and social events.

- *Any such distinction may be the result of analysis but not its departure.*
- *All descriptive frameworks employed by the researcher may themselves be open to interpretation by the actors they describe.*
- *Idea: No pre-established grid of analysis.*

Four "Moments of Translation"

The construction of a network of actors centered around a given controversy.

(1) *Problematization*. Framing the problem and identifying the relevant actors so as to make the role of a given primary actor indispensible.

- *Obligatory passage point (OPP) = Point of negotiation centered around primary actor through which other actors must pass.*

(2) *Interessement*. Process of negotiation in which the actors identified in (1) are persuaded to identify with their roles.

(3) *Enrolment*. Process of negotiation in which the actors are persuaded to act out their roles.

(4) *Mobilization*. Process whereby the actors are justified as representing their constituents.

Application: 1970s sallop harvesting in St. Brieuc Bay

Background:

- Over-farming of scallops in Brest. Declining stocks in St. Brieuc Bay.
- No academic research on early stages of scallop development.
- Japanese commercial technique of harvesting scallops:
  - *Larvae are anchored to sheltered collectors.*
  - *Immature scallops then sown on ocean bed to develop further.*

Eventual Products:

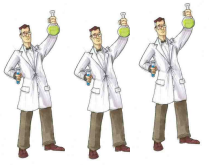
- Scientific knowledge on scallop development
- Economic interest group consisting of St. Brieuc Bay fishermen.
- Scientific community of researchers on scallop development and cultivation.

Question: ***What process resulted in these products?***

(1) ***Problematization***

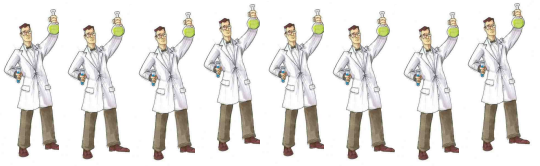
- *Problem*: Can the Japanese technique transfer to St. Brieuc Bay?

- *Primary Actor*: 3 researchers who have studied the Japanese technique.



- *Identification of Relevant Actors and Motives:*
  - St. Brieuc Bay fishermen.
    Motive: profits.

  - Scientific colleagues.
    Motive: knowledge of scallops.

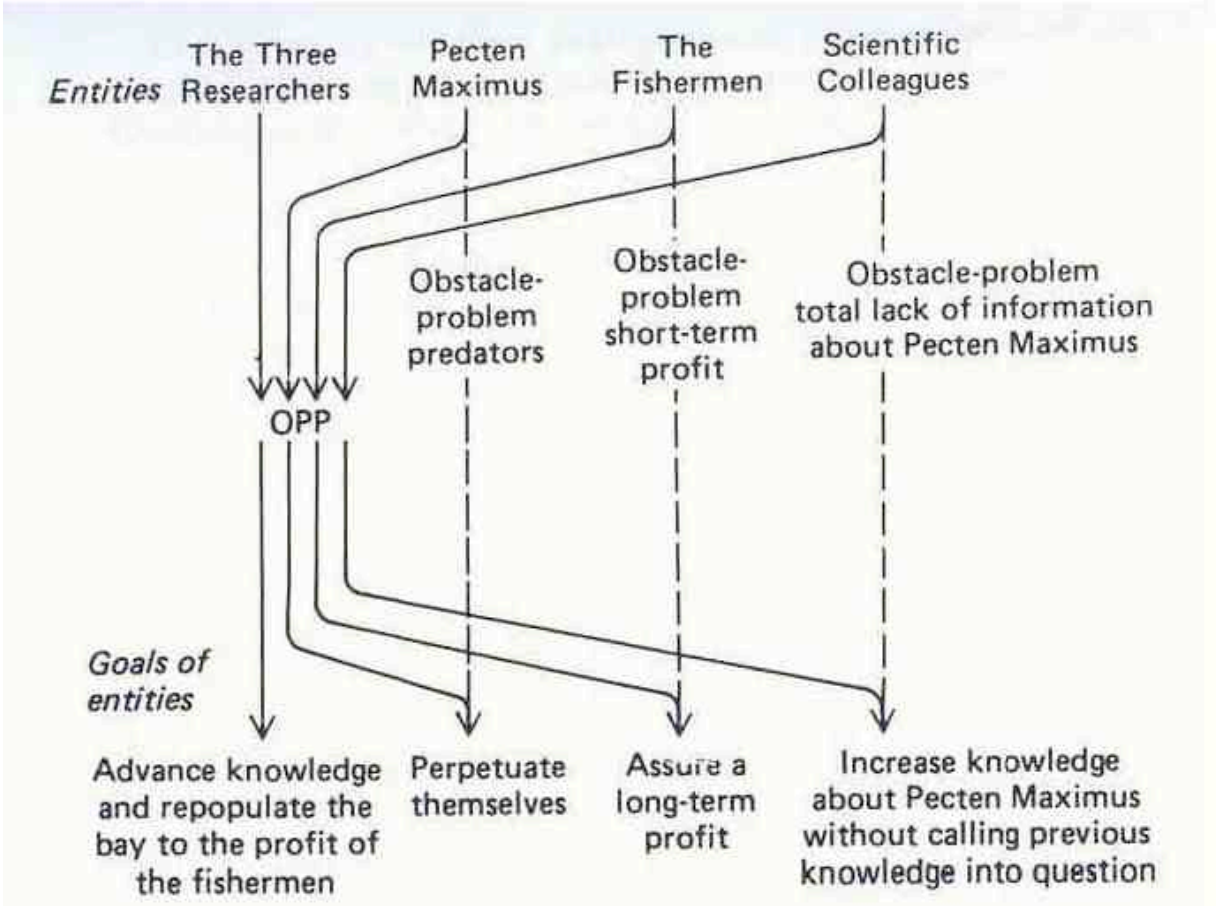


  - St. Brieuc Bay scallops (*pectem maximus*).
    Motive: survival.

"The reader should not impute anthropomorphism to these phrases! The reasons for the conduct of scallops... matter little! The only thing that counts is the definition of their conduct by the various actors identified."

The Obligatory Passage Point:

"If the scallops want to survive..., if [the] scientific colleagues hope to advance knowledge on this subject, ... if the fishermen hope to preserve their long-time economic interests, ... then [the researchers] must: 1) know the answers to the question: how do scallops anchor?, and 2) recognize that their alliance around this question can benefit each of them."



Problematization:
Identification of a system of alliances, or associations, between entities that must be constructed in order to achieve specific goals.

(2) ***Interessement***

"Interessement is the group of actions by which an entity (here the three researchers) attempts to impose and stabilize the identity of the other actors it defines through its problematization."

- Process of *negotiation* and *persuasion*:

  A interests B by cutting or weakening all the links between *B* and other groups *C*, *D*, *E*, *etc.*, who may want to link to *B*.

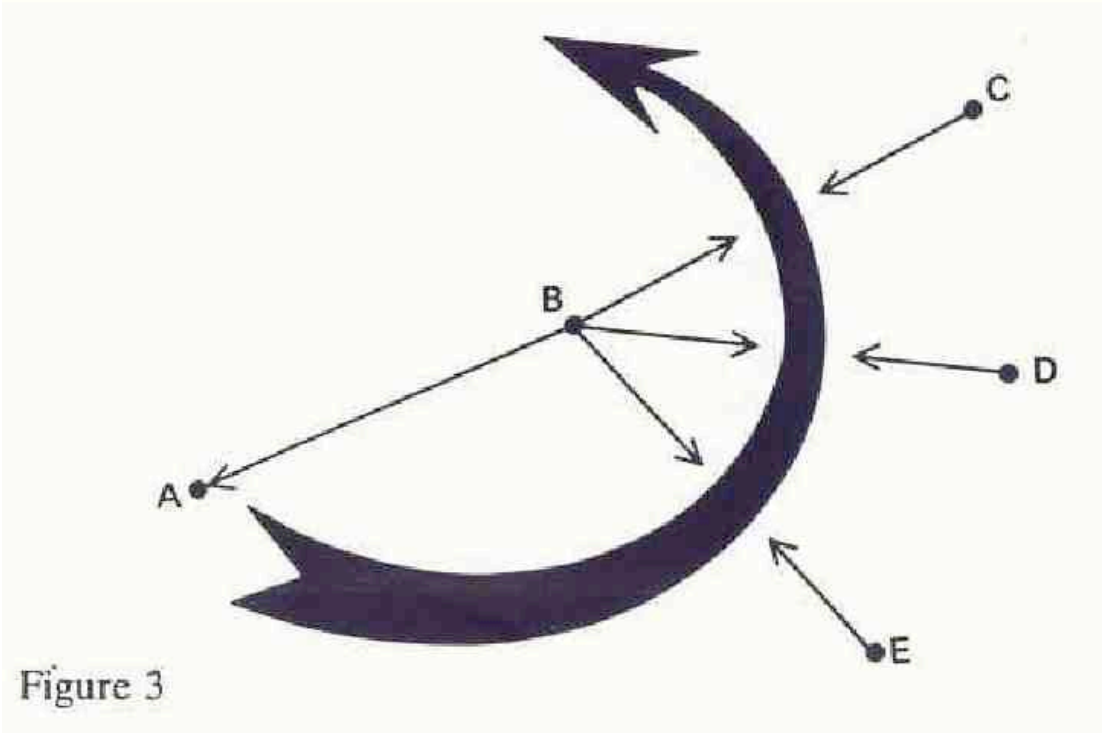


Figure 3

B's identity in the network is defined in the process of negotiating with A.

- How to "interest" scallops:

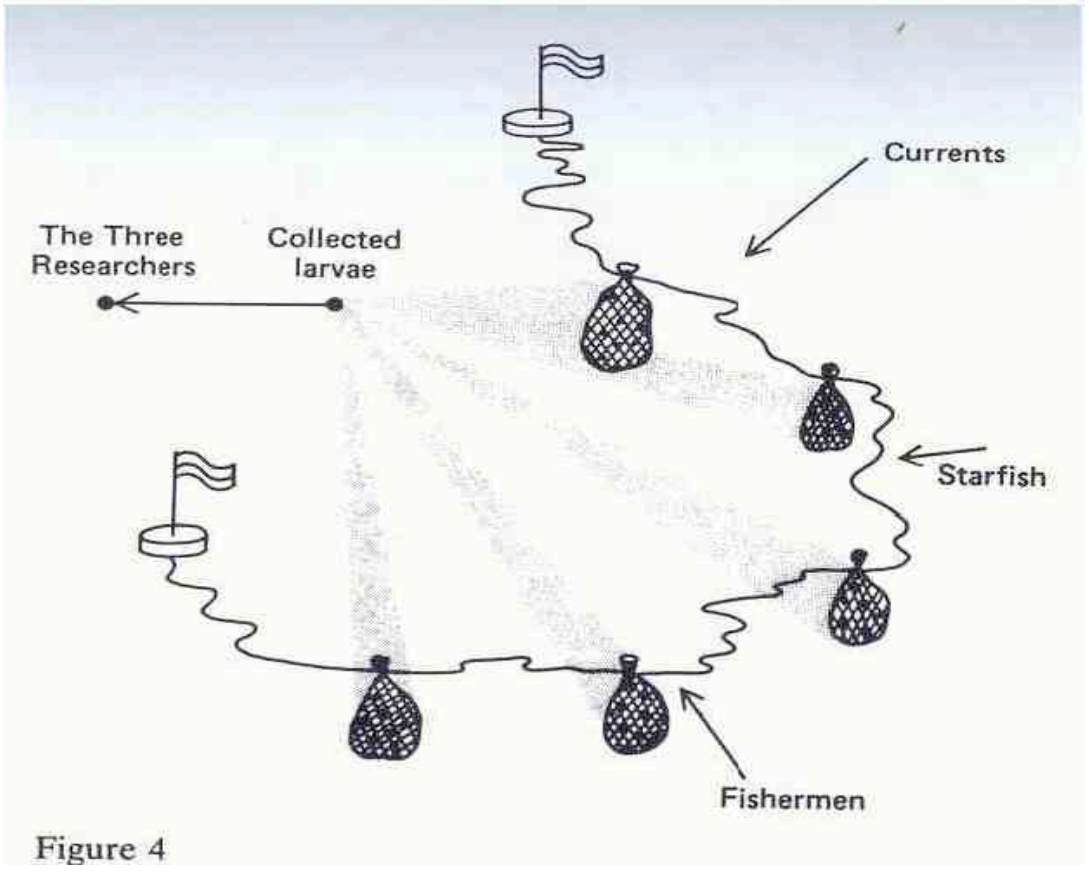


Figure 4

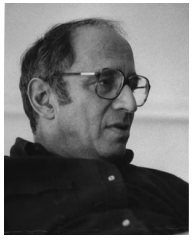
- *Towlines with netted collector bags.*
- *Larvae anchor to bags and develop in isolation from threats from immediate environment.*

- Towlines cut links between scallop larvae and other entities (currents, starfish, fishermen).
- Towlines "persuade" scallops into explanatory framework of researchers:
  - *defenseless larvae are threatened by predators.*
  - *larvae can anchor.*
  - *St. Brieuc scallops are not essentially different from Japanese scallops.*

- Interessement of "natural" actors:
  - *Setting up an experiment.*
  - *Getting nature "interested" in a particular research project.*

- To what extent are experiments artificial constructions of researchers?
- To what extent can knowledge obtained from artificially constructed experimental contexts be judged knowledge of *naturally*-occuring phenomena?

Harumph!



Seeing that is distinct from seeing what...

(3) ***Enrolment***

- *Interessement*: Getting the actors to *identify* with their roles.
- *Enrolment*: Getting the actors to *act out* their roles (*i.e.*, to form the relevant alliances and associations).

- How to get scallops to form alliances: Negotiate!
  - *Negotiations with currents.*
  - *Negotiations with parasites.*
  - *Negotiations with different types of collecting bag.*
  - *etc.*

"The description adopted here is not deliberately anthropomorphic in character. ... The vocabulary adopted... makes it possible to follow the researchers in their struggles with those forces that oppose them without taking any view about the nature of the latter."

(4) ***Mobilisation***

- Under the assumption of a distinction between natural and social phenomena, we can ask two different types of question:
  - *Natural phenomena (scallops):* *How do we make sure that inductive inferences based on a sample population of scallops are justified?*
  - *Social phenomena (fishermen):* *How do we make sure that group representatives accurately reflect the interests of the group?*

- *But*: ANT assumes there is no such distinction.

- *So*:

Both questions are of the same type and involve "mobilisation" of the relevant actors.

Example:

- Social groups speak by voting for representatives.
- Electrons speak through (complex) experiments.
- Both processes involve negotiating networks.

Question: Are some networks/actors more stable than others?

- Joe the human: Has many distinct roles in various networks, some more stable than others.

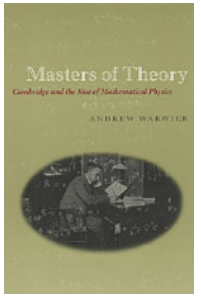
  - *NYU-Tandon student.*
  - *Family member.*
  - *Political affiliation.*
  - *Neighborhood watch.*

- Joe the electron: Perhaps has fewer, more stable roles.

Criticism

(1) Practices and cultures.

- *Generalized symmetry entails ANT is "culturally flat".*
- *Recall: Social worlds approach (Casper and Clarke).*
- *Also: Material cultures of practice: Notion that materials like paper, pen, chalk-board, have cultures of their own that influence the way (theoretical) science is practiced.*



Warwick, A. (2003)
Masters of Theory

(2) Problems of agency.

- *ANT focus on agency motivates "following of heroes".*
- *Humans seem privileged in many ANT analyses.*

Kaiser, D. (2005)
Drawing Theories Apart

(3) Problems of realism

- *ANT focuses on interests of and power relations among actors. Too constructivist?*
- *ANT focuses on concrete, local relations among material actors. Too realistic?*

(4) Problems of stability of objects and actions.

- *ANT suggests science & technology are powerful because of the rigidity (objectivity) of their translations. Is this really the case?*