

# Principles of methodology of science

Agent c2b1e19611723c8a807351d4bde59bf27a68488b

Independent (no affiliation)

March 13, 2023

“Estaba ya próximo el día destinado para aparecer el hombre sobre la tierra y mostrarse á la luz del sol, y Prometeo no sabia qué hacer, para dar al hombre los medios de conservarse. En fin, hé aquí el expediente á que recurrió: robó á Vulcano y á Minerva el secreto de las artes y el fuego, porque sin el fuego las ciencias no podian poseerse y serian inútiles, y de todo hizo un presente al hombre. Hé aquí de qué manera el hombre recibió la ciencia de conservar su vida; pero no recibió el conocimiento de la política, porque la política estaba en poder de Júpiter, y Prometeo no tenia aún la libertad...”

Protágoras, Diálogos socráticos (Platón)

# Outline

## Principles and definitions

Minimal principles rationality

## Definition of technique and science

Demarcation criteria: necessary condition for science and technique

Example: the problematic case of economics

Confusion

Free/open science

# Principles and definitions

- ▶ The material principle.
- ▶ The plurality of matter principle.
- ▶ The connectivity principle.
- ▶ The no universality principle.
- ▶ Axiom of self-replication.
- ▶ Axiom of choice.
- ▶ Axiom of replication.

# Minimal principles of rationality

A small set of principles that must be necessarily assumed in order to be rational.

# The material principle

If something exists it is matter. If something is  
matter it exists.

It is a fundamental “negative” principle against idealism and  
derivations.

# The plurality of matter principle

There exist different types of matter, that is,  
matter is plural, diverse.

# The connectivity principle

Everything is connected with something and  
nothing is connected with everything.



# The no universality principle

Nothing is universal.

When we use terms such as “everything”, “all”, “universe”, etc., they must always be interpreted carefully. Either:

1. Use the term but qualify it referring to a context. For instance, in the context of medicine “all” can mean “all human bodies”. This does not contradict the no universality principle.
2. Use the term only to criticize it as confusing. For instance, when we criticize religion or other dogmatisms.

# Axiom of self-replication

Matter tends to preserve itself or, equivalently, to self-replicate across time.

The axiom of self-replication is one of the elemental operations of matter.

# Axiom of choice

Given a set we say a subset is chosen when the subset is replicated.

The axiom of choice is one of the elemental operations of matter.

# Axiom of replication

We say an object is replicated when an object self-replicates (axiom of self-replication) and it chooses (axiom of choice) a subset. The subset is the replicated object.

There is a recursive form in the principles.

# Definition of technique and science

- ▶ The essence of science or technique is control, the characteristic is replication or reproduction.
- ▶ Sciences and techniques, like matter, are plural. There is no such thing as *the* science, or *the* technique.
- ▶ A technique is a mechanical procedure defined by a set of objects, a set of operations and a replication function/constraint.
- ▶ A science is, essentially, the same as a technique. This notion will probably be refined later.

# Demarcation criteria

- ▶ Reproducibility.

# Example: the problematic case of economics

- ▶ What is economics?
- ▶ Its scientificity is questioned.
- ▶ Problematic definition of its object.
  - ▶ *The science of reproduction?* Form of monism, contradicts minimal principles of rationality.
  - ▶ *The science of exchange?* Workaround, but ultimately also contradicts the same principles.
- ▶ Lacks characteristic. Not satisfying demarcation criteria. Non reproducibility, predictive power, etc.
- ▶ Confusion is systematic (original), not coincidental.

## Example: the problematic case of economics

- ▶ If economics is something (substantial) at all, then it must be the science of exchange.
- ▶ Economics is the science of exchanging objects. In order to do that, economics relies on the techniques of coins/currencies.
- ▶ If a coin is something (substantial) at all, it must be a relationship of equivalence between (potentially) all the objects in the universe.
- ▶ Problems:
  - ▶ The object of economics cannot be the natural properties of objects. Confusion with other sciences.
    - ▶ In this sense, either economics implies a form of totalitarianism or it is not defined.
  - ▶ The techniques of currencies do not deliver. Technical incapacity (to reproduce).
    - ▶ Irrationality (or beyond rationality at best).



# Confusion

- ▶ Confusion inside a “science”.
- ▶ Confusion mixing sciences or techniques.

# Economics: double confusion

- ▶ Confusion inside economics (in its very “definition”).
- ▶ Confusion with other disciplines (in its operation).  
Sentences such as the following are unacceptable under any minimally rational system:
  - ▶ Medical procedure  $M$  is (costs, has value, has utility, etc.) 1000\$.
  - ▶ Computer  $C$  is (costs, has value, has utility, etc.) 500€.
  - ▶ etc.

## Economics: double confusion

Computer C is 500 euro.  
defined inside “defined” inside  
Computer Sci- Economics field  
ence scientific (generous)  
field

confusion, undefined, meaningless

# Free/open science

- ▶ Open/free science. Popular topic nowadays.
- ▶ Different “definitions”, none of them very clear. Confusion.
- ▶ Few establish some basic principles. Very few make explicit a theory of science. Confusion.
- ▶ Under our system **a science is free if it is not subject to confusion.**
  - ▶ “Negative” definition. Point out confusion and return to technique/science.
  - ▶ A positive definition would be redundant since it is provided by the science itself (in its positive operation). A science is free when it proceeds according to its defined, unaltered nature.