

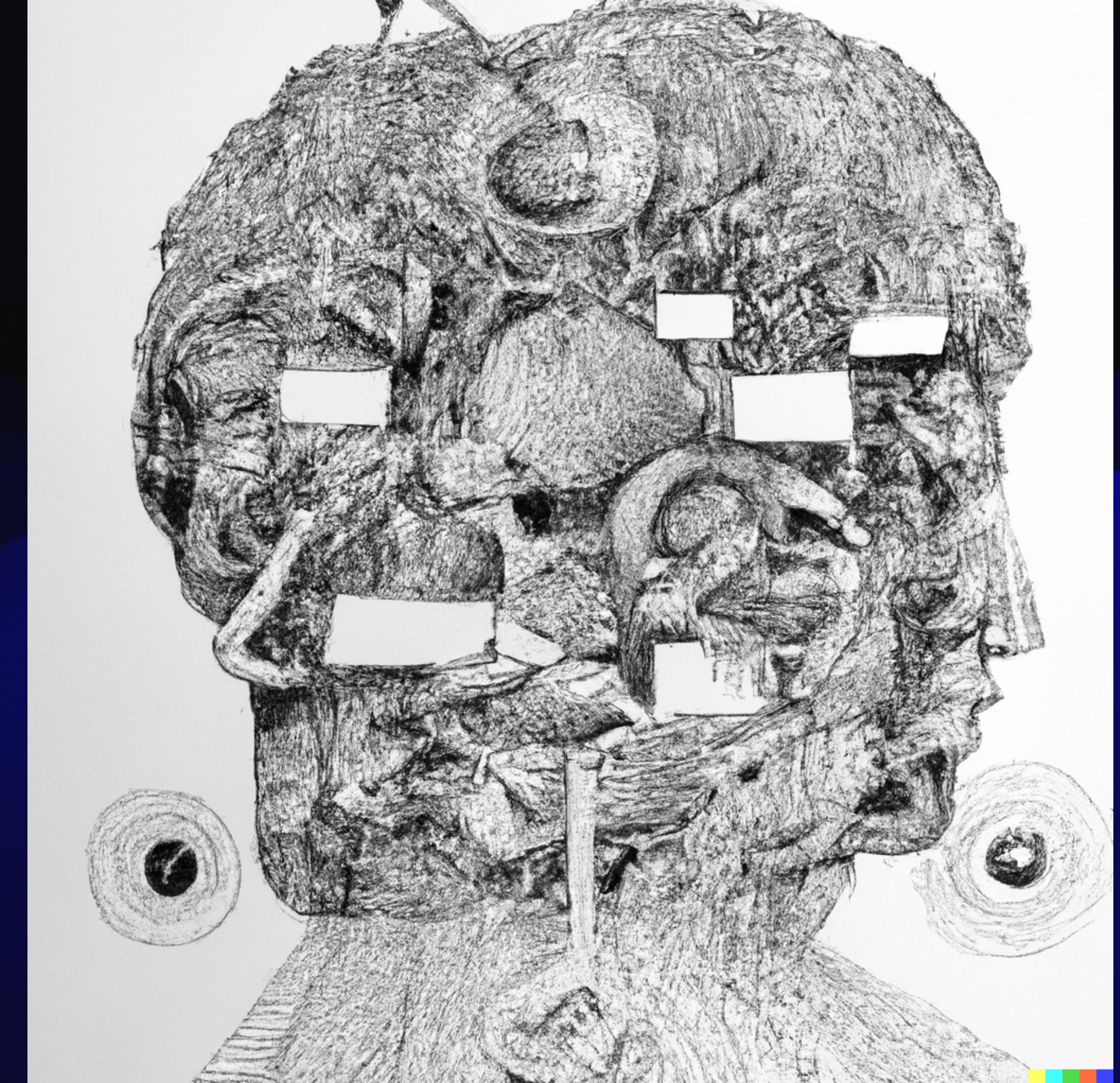
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Historical Foundations: Theory of Mind and Computers



Warm up.

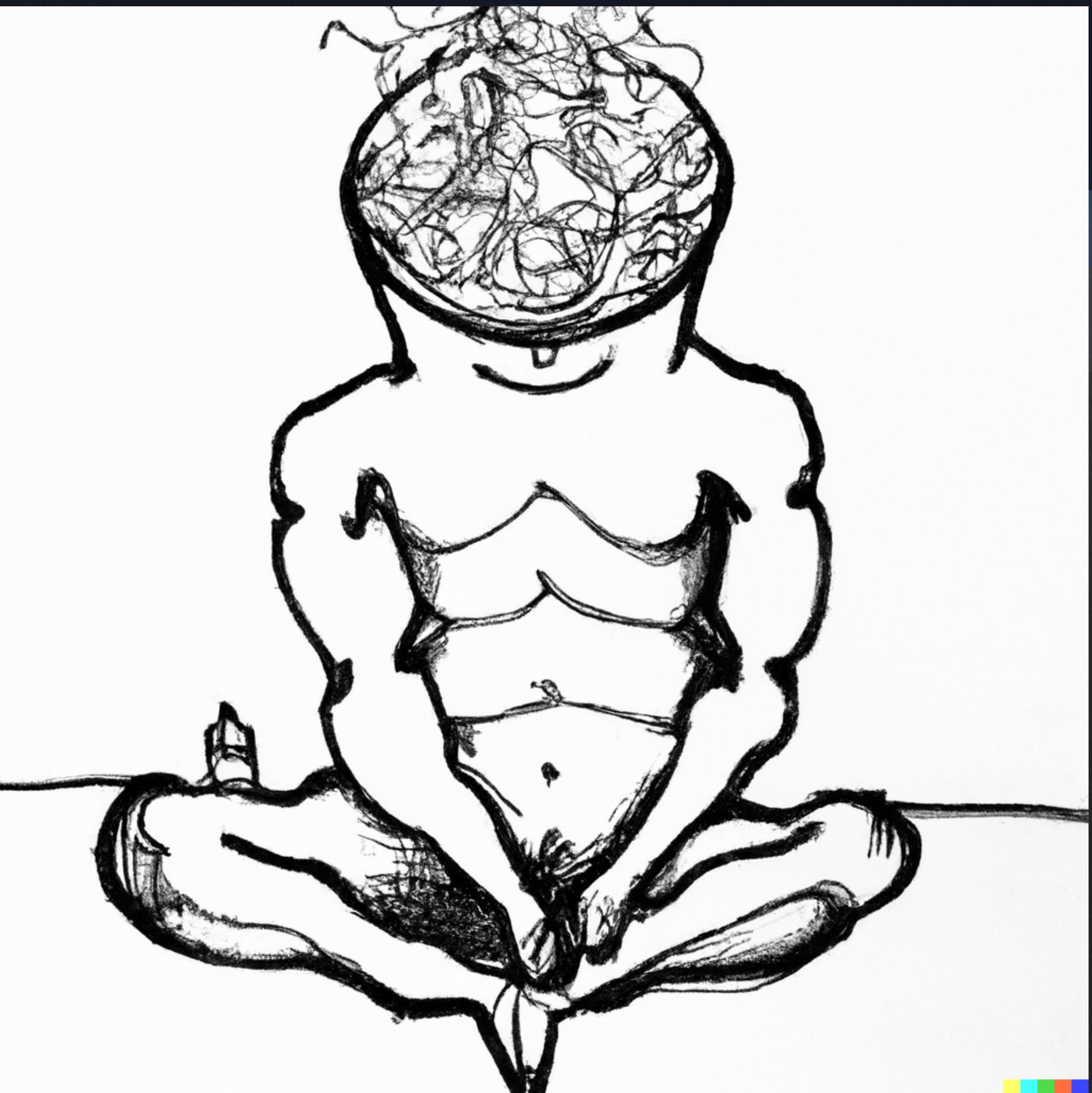
What features of entities with minds distinguish them from entities that lack minds?



The Mind-Body Problem

Historical Foundations

- What is the relationship between the mind and the body?
- Otherwise put, what is the relationship between mental properties (e.g., having the belief that there is beer in the fridge) and physical properties (e.g., having a certain bodily configuration)?



Computational theory of mind (CTM)

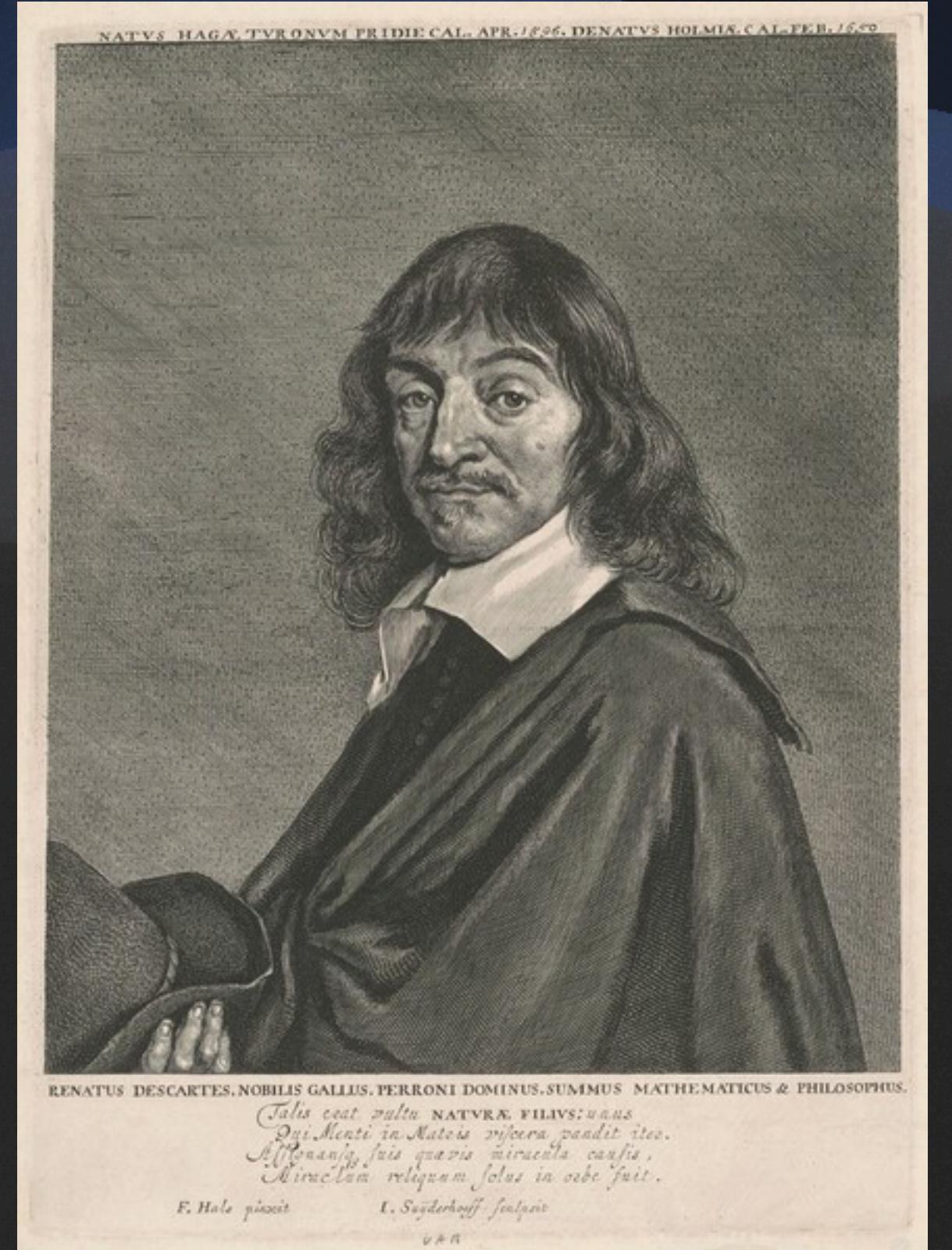
Historical Foundations

- Our central target in this course is the computational theory of mind; this may be understood as a specific answer to the mind-body problem.
- **Computational theory of mind (CTM)** – the mind *is* a computational system implemented by the body.
 - Analogy: the mind is to the brain as computer software is to computer hardware.
- But how did we arrive at this view?

Theory of Mind - A brief overview

Substance Dualism

- René Descartes (1596 - 1650)
- **Substance (Cartesian) Dualism** – Mind and body are distinct entities that causally interact with one another.
- Argument for Substance Dualism
 1. It's possible my mind exists without my body.
 2. If it is possible that my mind exists without my body, then my mind and my body are distinct entities.
 3. Therefore, my mind and my body are distinct entities.



Theory of Mind - A brief overview

Materialism or Physicalism

- **Materialism / Physicalism** – There is only material substance; minds are, in some sense, material.
- Varieties of materialism:
 - **Reductive Materialism**: mental properties are reducible to physical properties.
 - **Non-reductive Materialism**: mental properties are not reducible to physical properties.
 - **Eliminativist Materialism**: there are no mental properties; only physical properties exist.

Theory of Mind - A brief overview

Behaviorism

- Behaviorism, some varieties
 - **Psychological behaviorism** — the only data we should appeal to in the investigation of the mind is observable behaviors.
 - **Logical behaviorism** — sentences using mentalistic expressions (e.g., ‘belief’, ‘desire’, etc.) are translatable into sentences that are about observable behavior which do not include mentalistic expressions.
 - E.g.,

If Jordan believes there is beer in the fridge, then Jordan will say ‘Yes’ when asked ‘is there beer in the fridge?’.

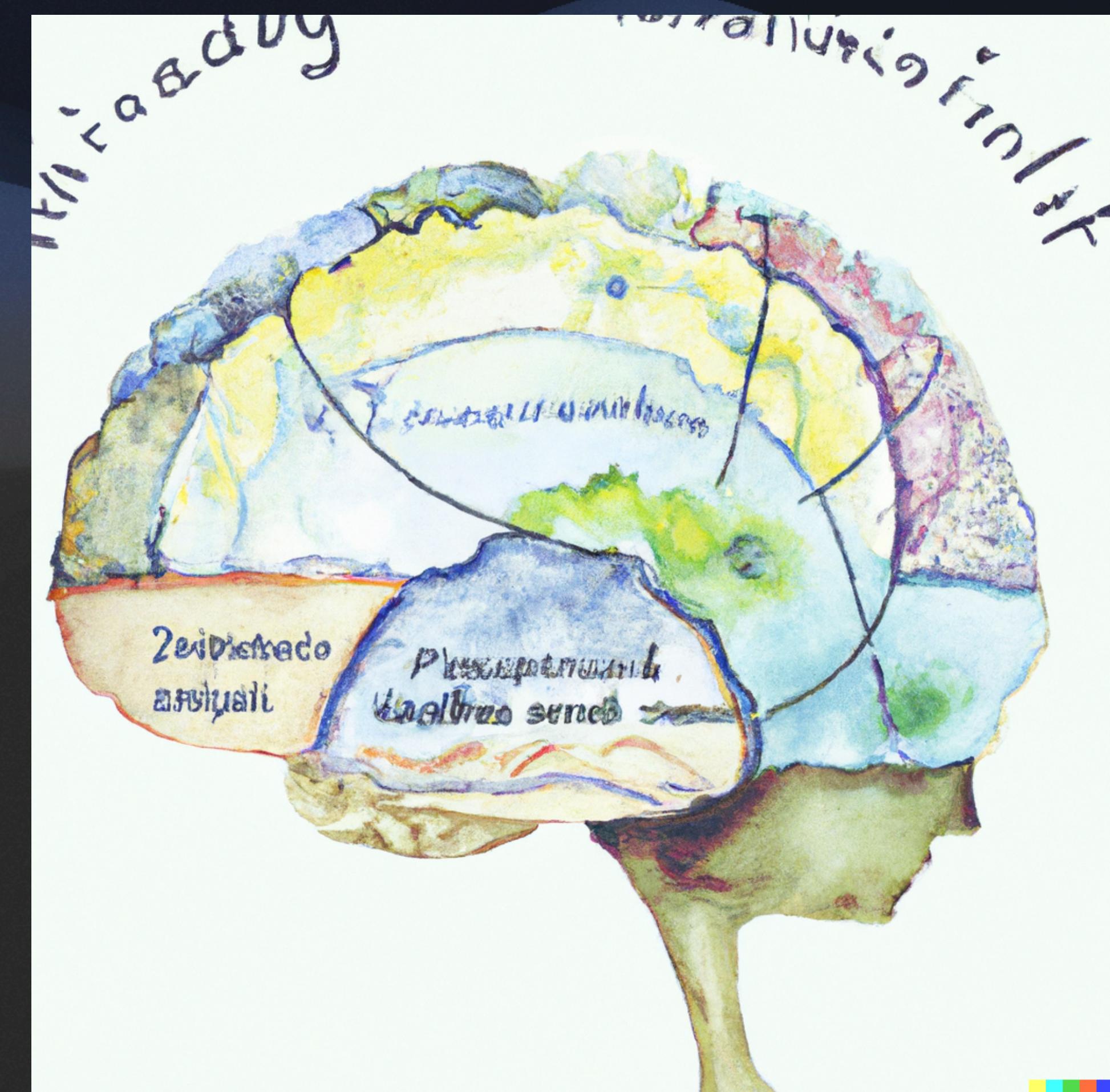
If Jordan believes there is beer in the fridge, then Jordan will get up and take a beer from the fridge if there is one.

...
- Dominant materialist position from the early 1900s - 1940s; championed by Gilbert Ryle (1900-1976)

Theory of Mind - A brief overview

Mind-Brain Identity

- **Mind-Brain (*type-type*) Identity theory** – a version of reductive materialism that claims the mind is identical to the brain; or otherwise put, mental properties are *type* identical to physical properties.
 - E.g., if I am in pain and someone else is in pain, then we share some physical property (presumably some neural configuration).
- Dominant position from the 1950s-1960s
- Championed by J.C.C Smart (1920-2012) and U.T. Place (1924-2000)



Theory of Mind - A brief overview

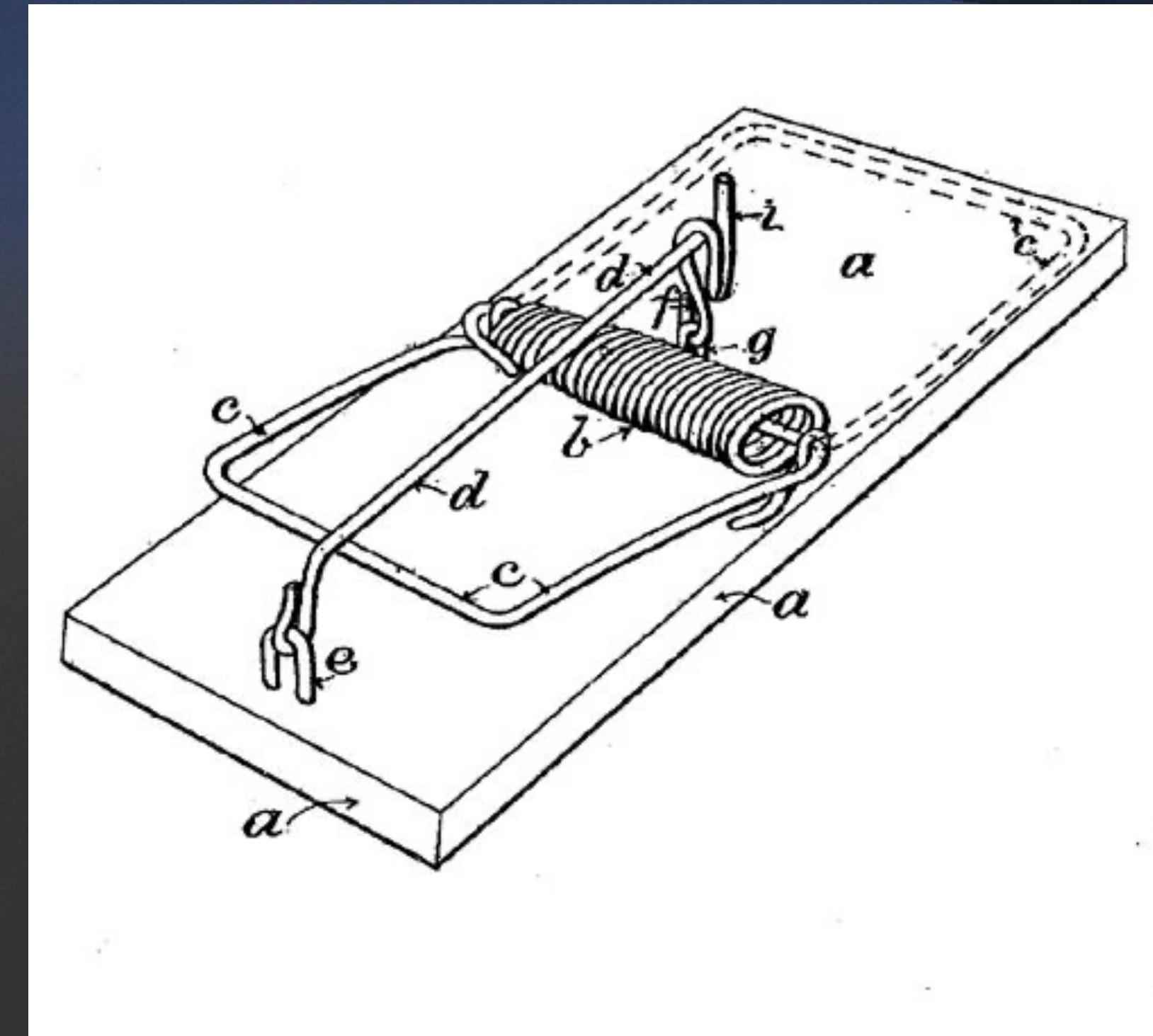
Functionalism

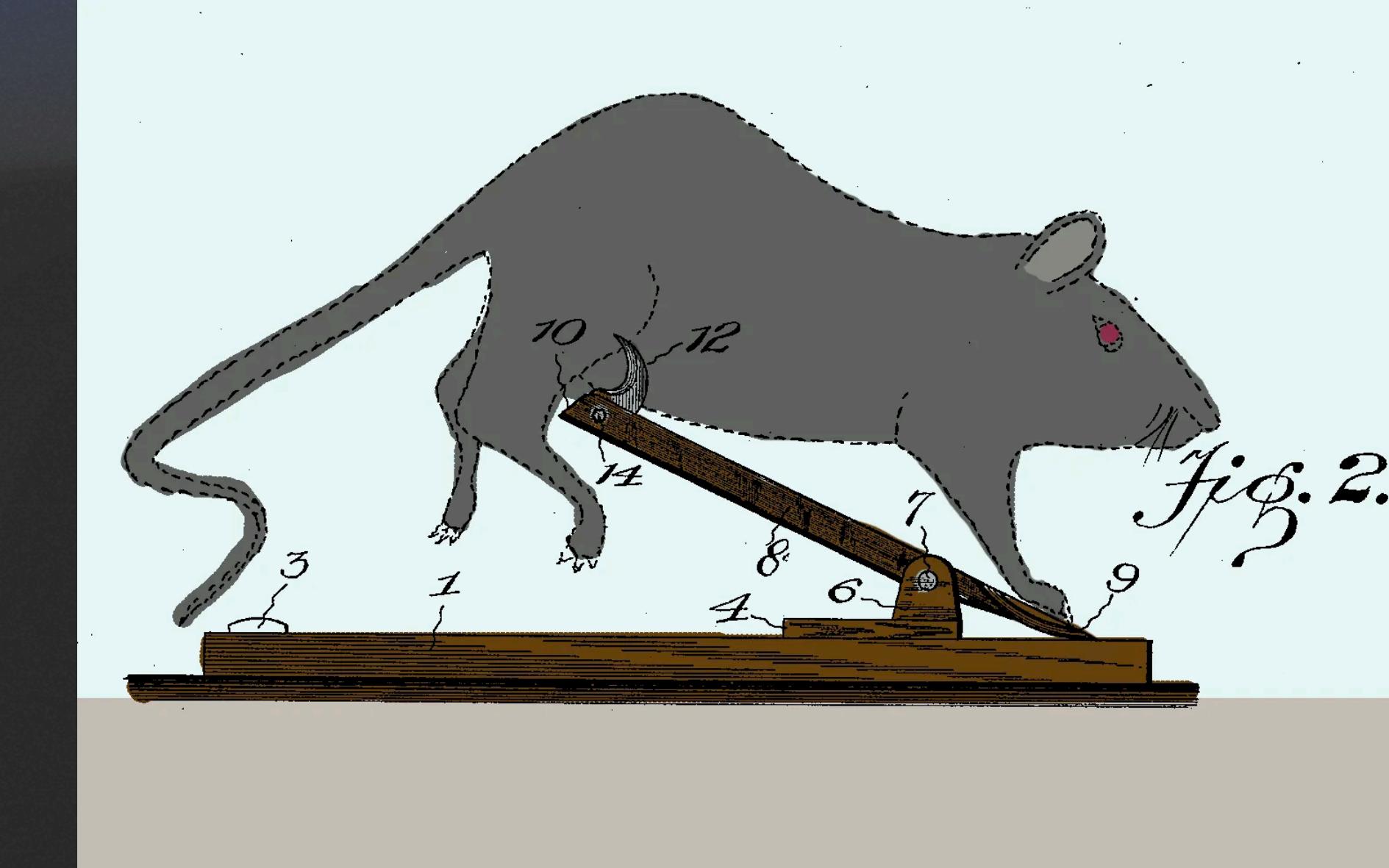
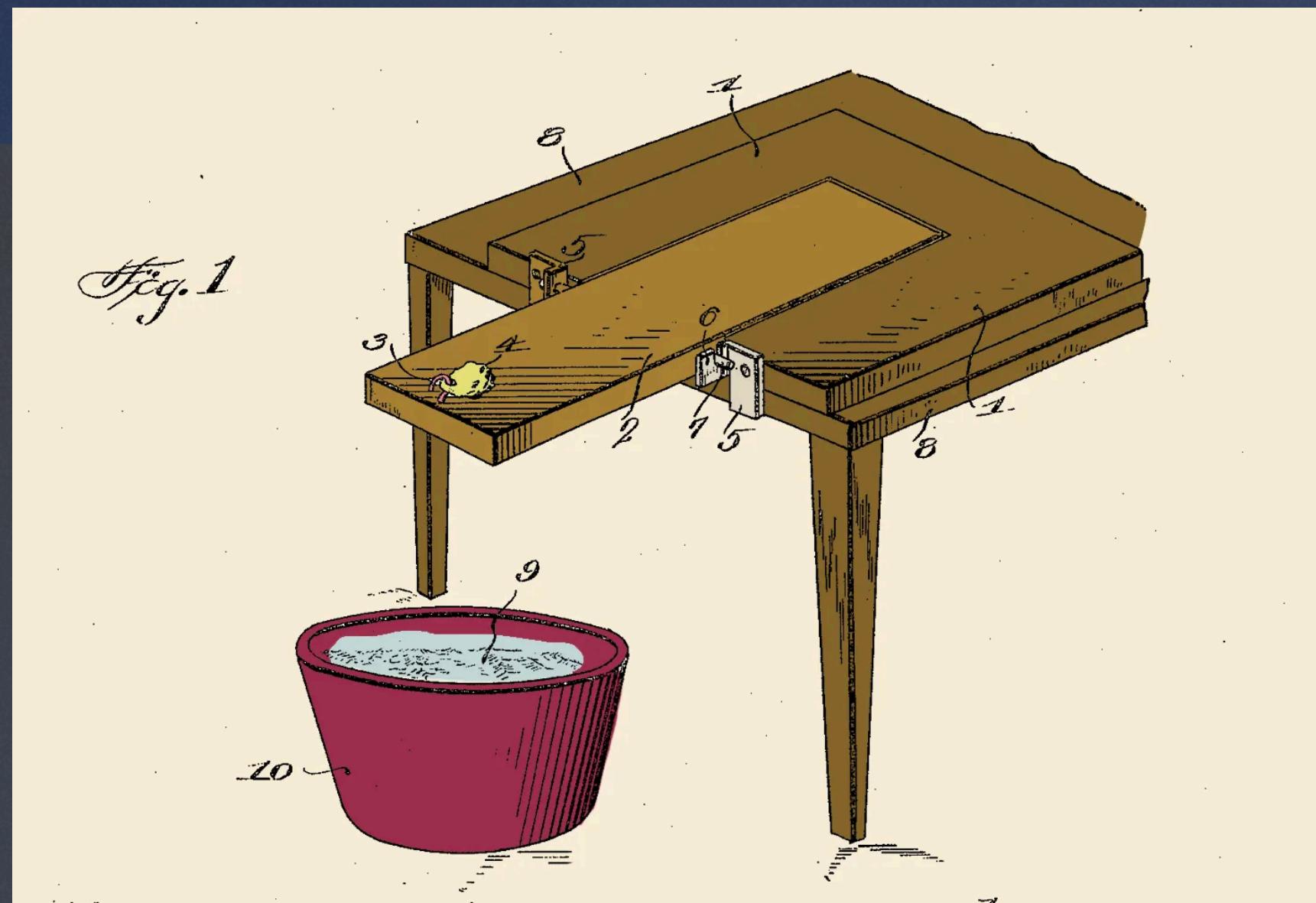
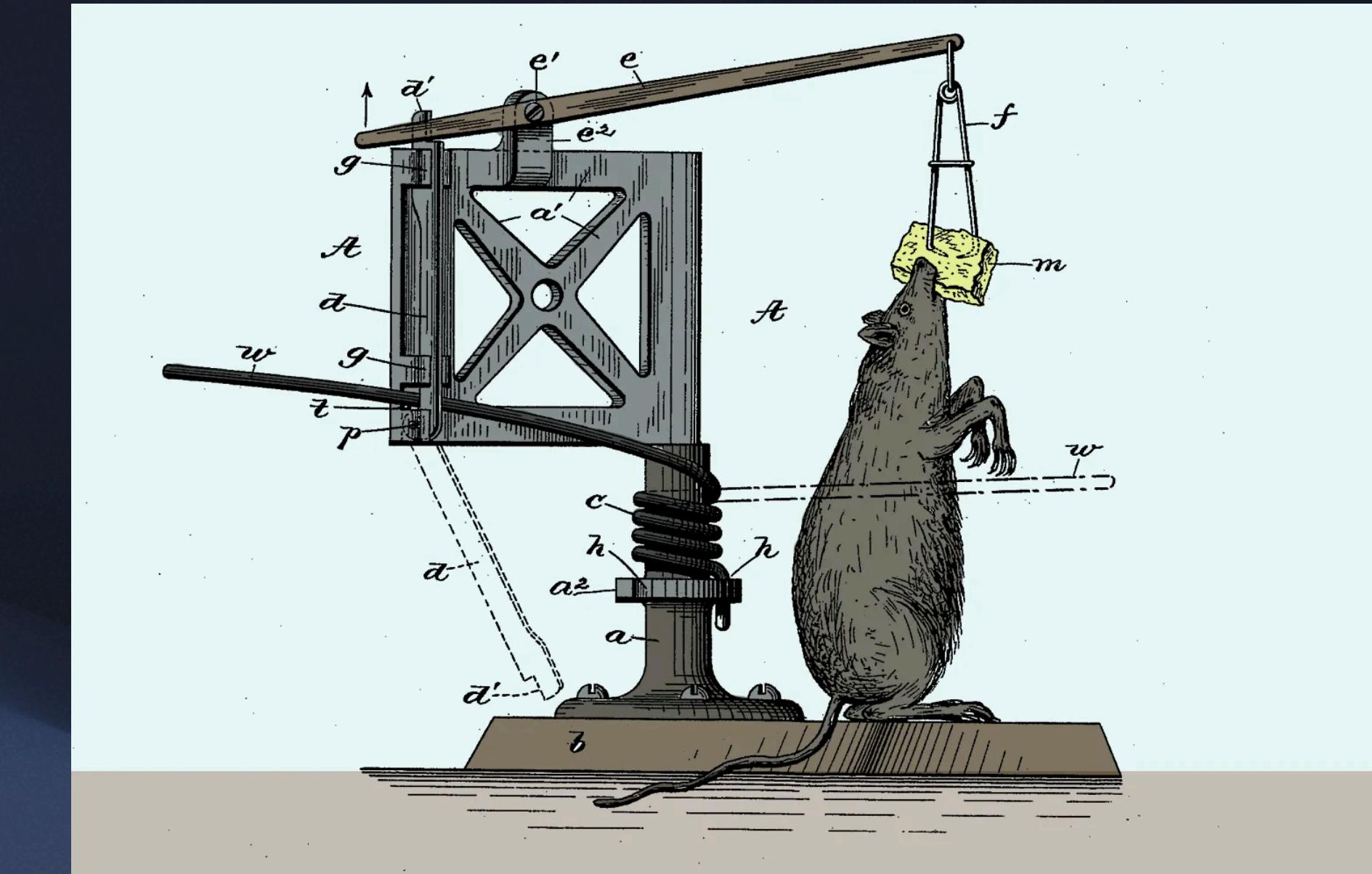
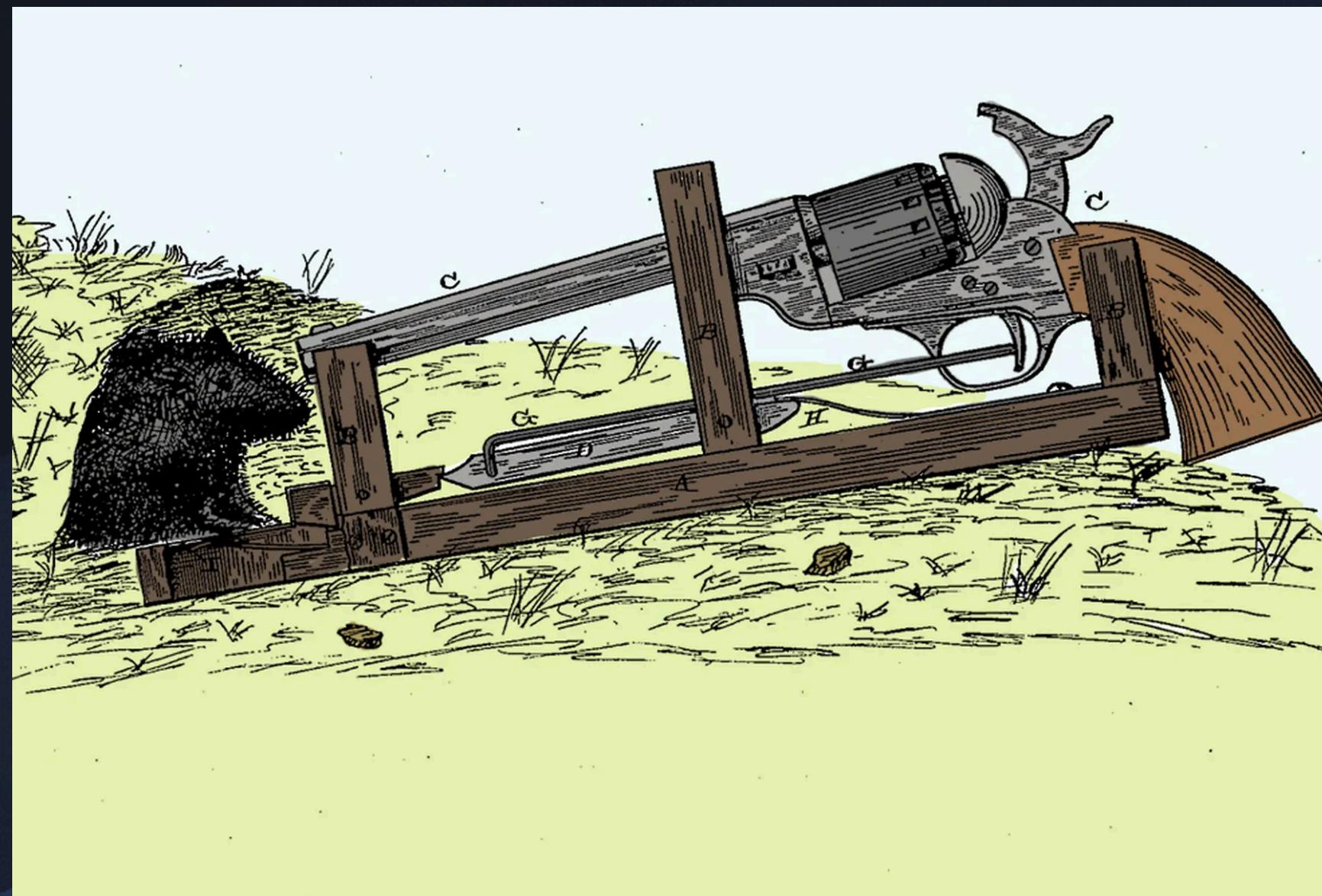
- Functionalism is often understood as a non-reductive materialist position. The computational theory of mind is a variety of functionalism.
- **Functionalism** – *any entity with the appropriate *functional* structure has a mind*; otherwise put, having a mind is determined by an entity's structure being so arranged that it shares the same *functions* as those structures that account for minds (e.g., the structure of a human brain at the relevant level of description).
- Different varieties of functionalism have been the dominant view in philosophy of mind from the 1970s until today; championed by Hilary Putnam (1926-2016), David Lewis (1941-2001), Jerry Fodor (1935-2017), and many others.

Theory of Mind - A brief overview

Functionalism

- Consider a mouse trap.





Theory of Mind - A brief overview

Functionalism

- In short, the functionalist is committed to the claim that minds ought to be ‘constructed’, in a certain sense, out of any materials that, when arranged appropriately, play the right sorts of roles.
 - In the same way that we can create a mouse trap out of many different materials as long as the device functions to capture mice.
- Regarding the **computational theory of mind (CTM)**, we can understand it as the functionalist view that *any* system with the appropriate *computational* structure will have a mind.
 - To be further explicated as we proceed.
 - This brings us to the development of computers and their place in the philosophy of mind.

Foundations of Computing

Historical Foundations

- Here is a brief documentary from Cambridge Educational that covers the history of computers from Babbage to (1791-1871) to the early 90s:
https://youtu.be/ApJSz_OrkiA
- Take note of how the materials used to construct computers have changed over time.