



An intentional architecture for an artificial conscious being

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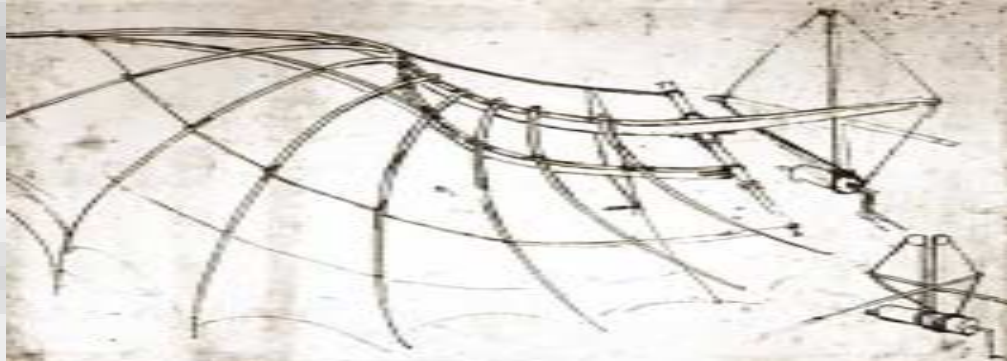
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Presence and Consciousness

- Presence: the “*feeling of being there*” is conceivable only in a conscious being
- Presence is phenomenal experience in a complex case: embodied and situated phenomenal experience
- The ability to feel consciously something is a prerequisite to the complex experience referred to as *presence* (being there in a given time and space with a given body)
- To work with presence we need to understand consciousness

How to deal with consciousness?

Different engineering approaches



Ineffective, no explicit theory of flight



Efficacious, explicit theory of flight

Different approaches to the problem of consciousness

- No explicit theory of the phenomenal and then ...

- Waiting for something to happen

or

- Believing than nothing special will happen



- Explicit hypotheses about the nature of the phenomenal
- Explicit hypotheses on the necessary and sufficient physical condition for the occurrence of it
- Explicit design of experimental setups to test the aforementioned hypotheses

Consciousness in 7 steps!

1. *What is consciousness?*
2. *Be conscious of something means to be in some kind of relation with that something*
3. *Due to (1) a priori arguments and (2) empirical evidences the 'right' relation or physical process could be what is called reciprocal causation or intentional relation*
4. *An artificial conscious being is a system whose development is driven by these intentional relations triggered by external environment*
5. *An intentional relation is a sensorimotor process in which the occurrence of an event creates the conditions for the occurrence of a process of the same kind: thus a motivation*
6. *An intentional architecture for a conscious being must be able to let occur a hierarchy of intentional relations, hence a hierarchy of motivations*
7. *An artificial conscious being is a system capable of developing new motivations on the basis of its experience*

**To be conscious
means
to be contentful
to have phenomenal experience
to represent**

Problems and difficulties in representation

Even the most brilliant scientist could not tell how electrical signals in the brain become perceptions

(Bruce E. Goldstein 1996)

Whoever accepts the causal theory of perception is compelled to conclude that percepts are in our heads, for they come at the end of a causal chain of events leading, spatially, from the object to the brain of the percipient. We cannot suppose that, at the end of this process, the last effect suddenly jumps back to the starting points, like a stretched rope when it snaps

(Bertrand Russell 1954)

More generally, how can any state in nature represent anything at all?

(Michael Tye 1996)

How can anything manage to be about anything.

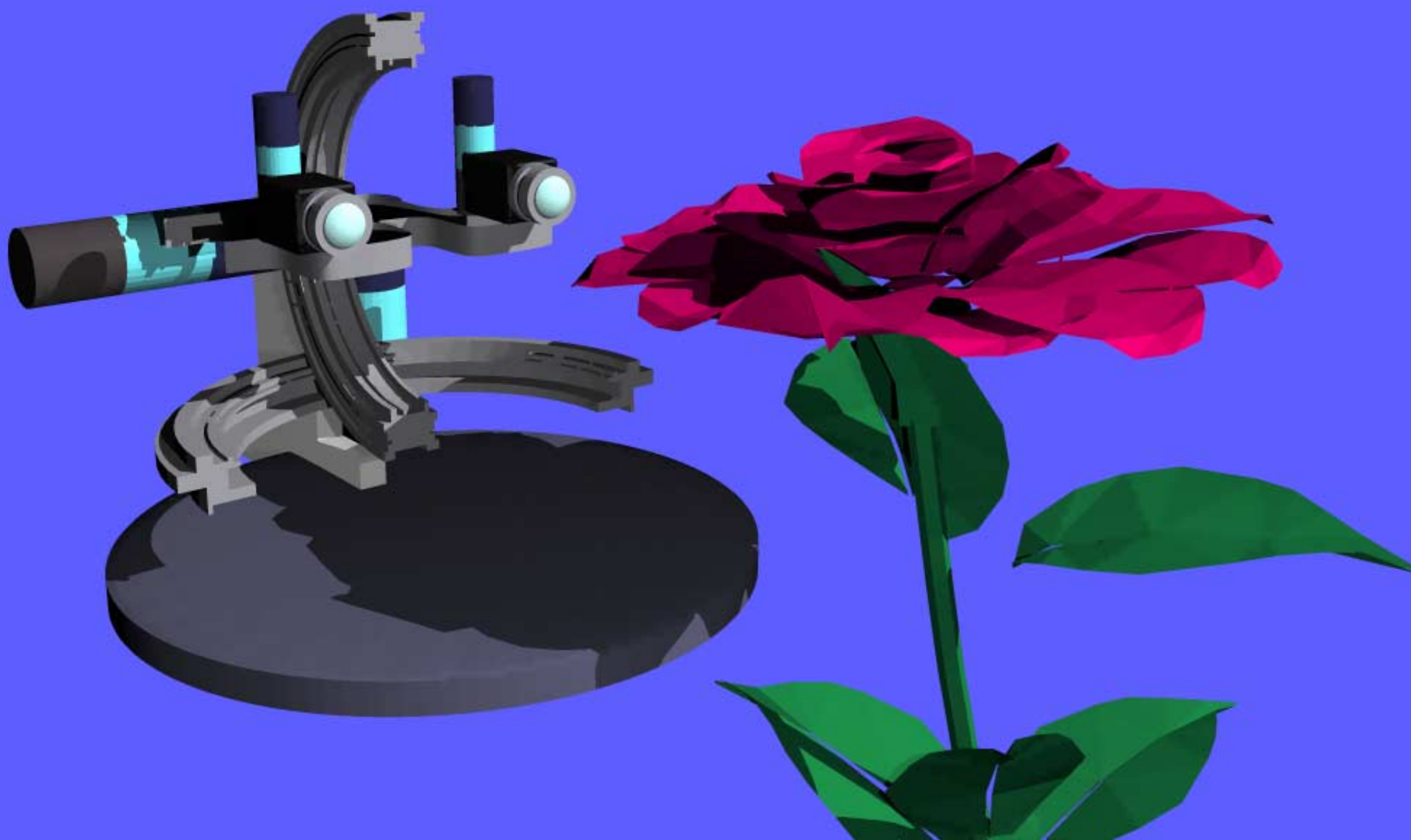
(Jerry Fodor 1987)

- **What is a representation?**

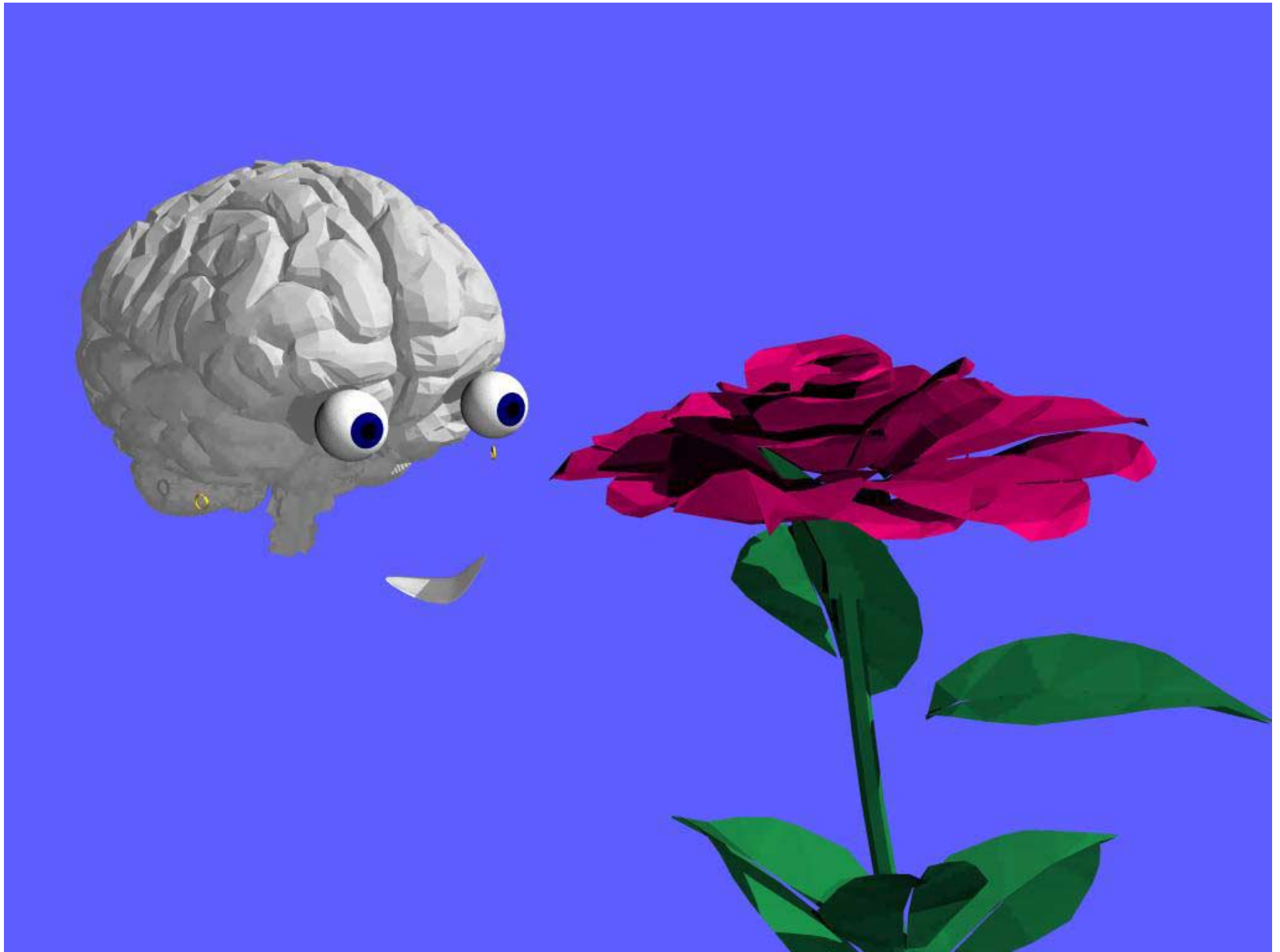
It is a re-presentation, that is a duplicate of reality

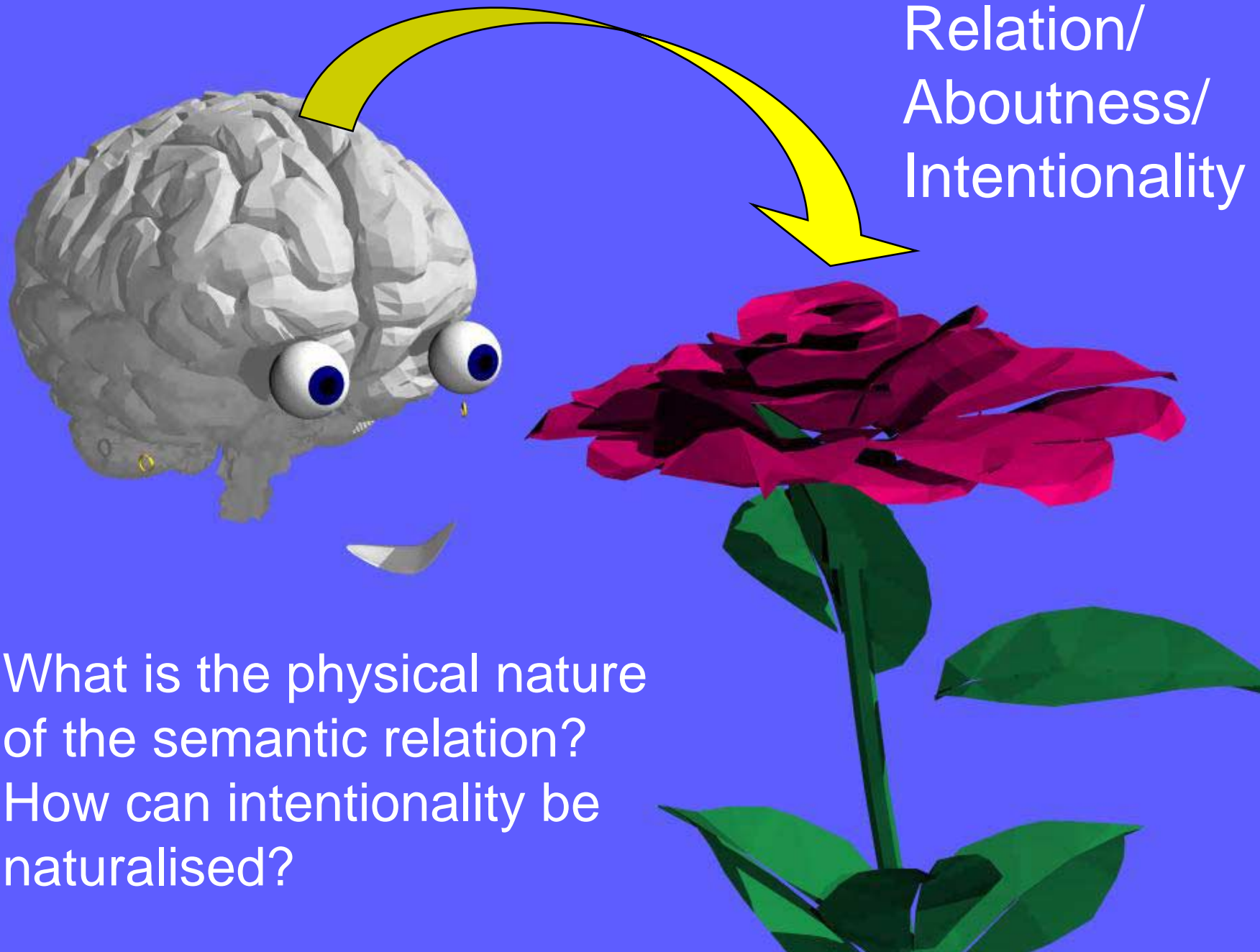
Thus representations entails dualism and, in turn, dualism entails representations

- **Do we really need dualism?**
- **Do we really need representations?**









Official standpoint: consciousness as a miracle!

- This concept can be better understood when we realize how the visual system operates. The eye is responsible for transforming light into an electric signal by means of the cells in the retina. This electrical signal reaches the sight center in the brain. **The signals create the vision you see when you look out of the window. In other words, the sights you see are created in your brain.**
- **You see the image in your brain, not the view outside the window.**
- Representationalism is the philosophical position that the world **we see in conscious experience is not the real world itself, but merely a miniature virtual-reality replica of that world in an internal representation.**

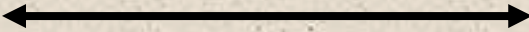
- *From "Gestalt Isomorphism and the Primacy of Subjective Conscious Experience: A Gestalt Bubble Model" Steven Lehar, Target paper in Behavioral Brain Sciences 2002*

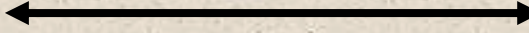
This is still dualism

Not mental/physical dualism but physical/physical dualism, where the physical domain is logically defined in Cartesian terms

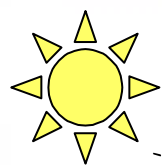
In a sense it is even poorer than Cartesian dualism since it lacks qualitative elements
(new problem: the binding problem)

Representation in the brain?

Holy Host  **Christ's body**

Brain activity  **External object**

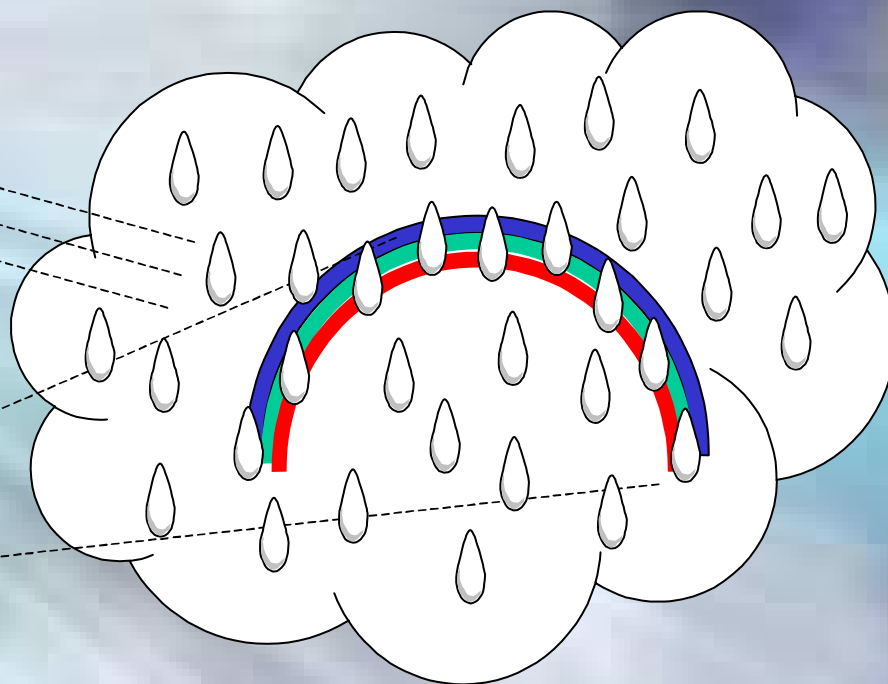
**A process view
not dualistic**



sun



point of view
observer



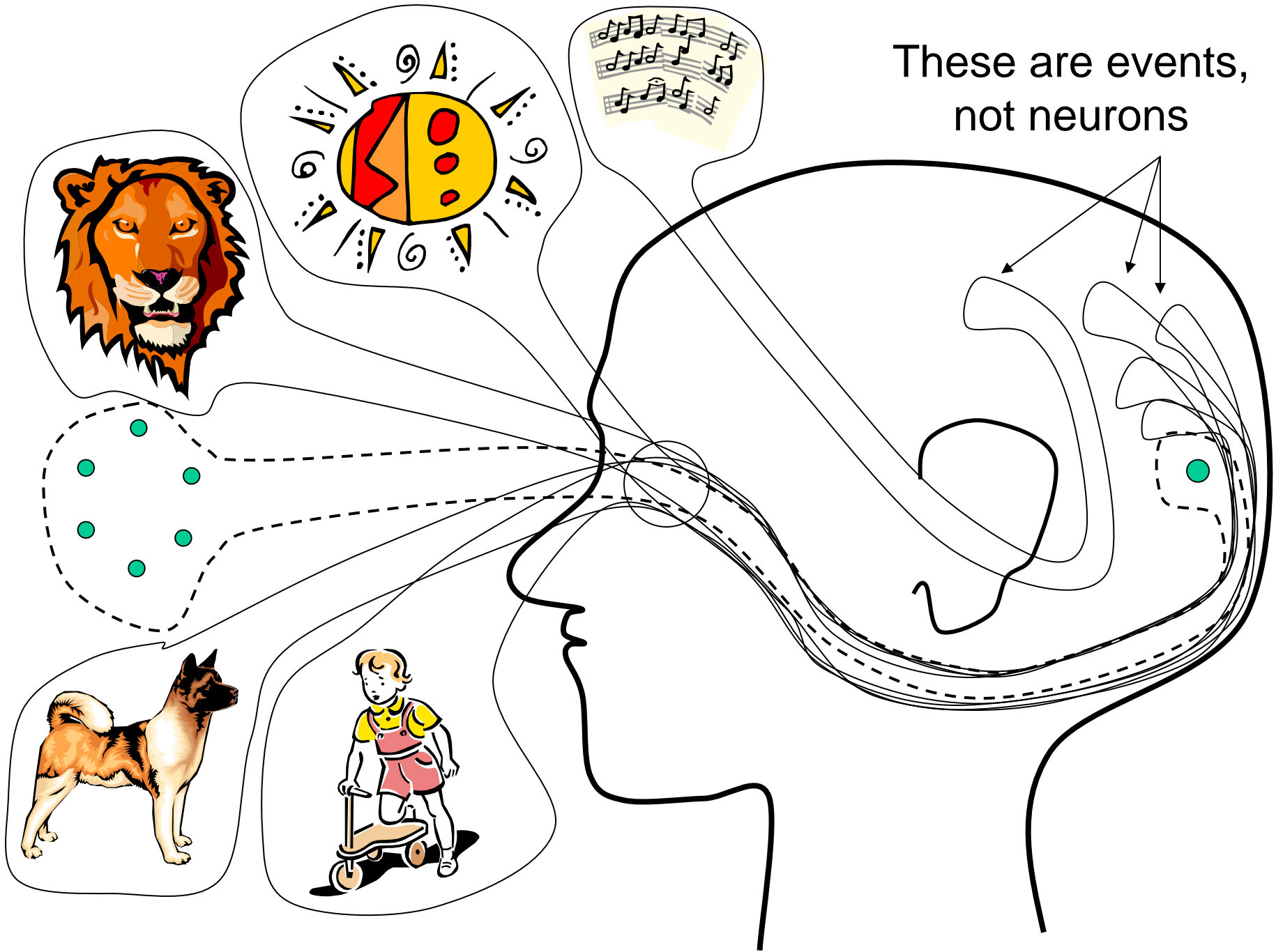
drops of water

**There are not two 'things',
there is just one**

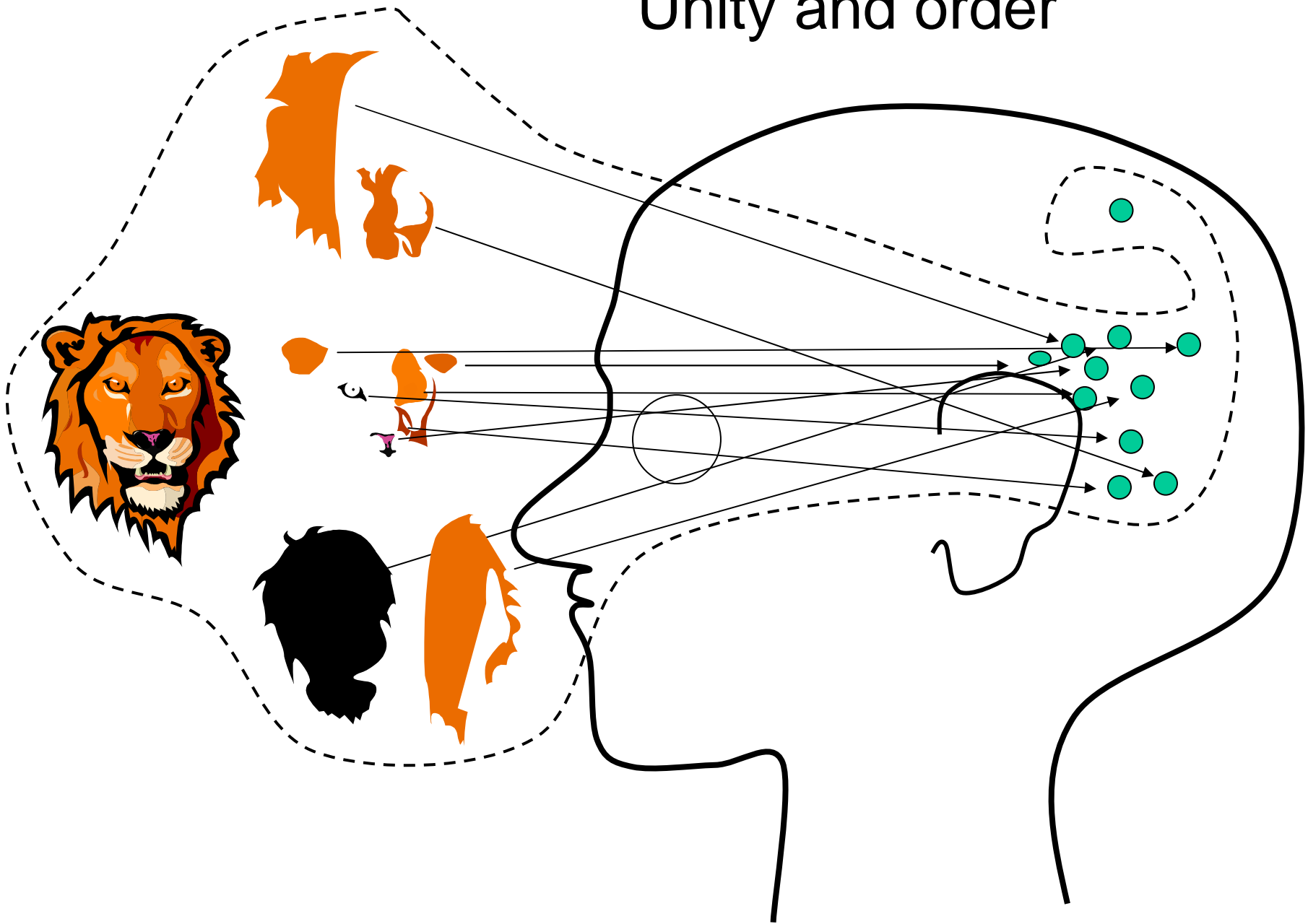
no dualism

**no thing and its re-presentation
just one single physically
continuous process**

These are events,
not neurons



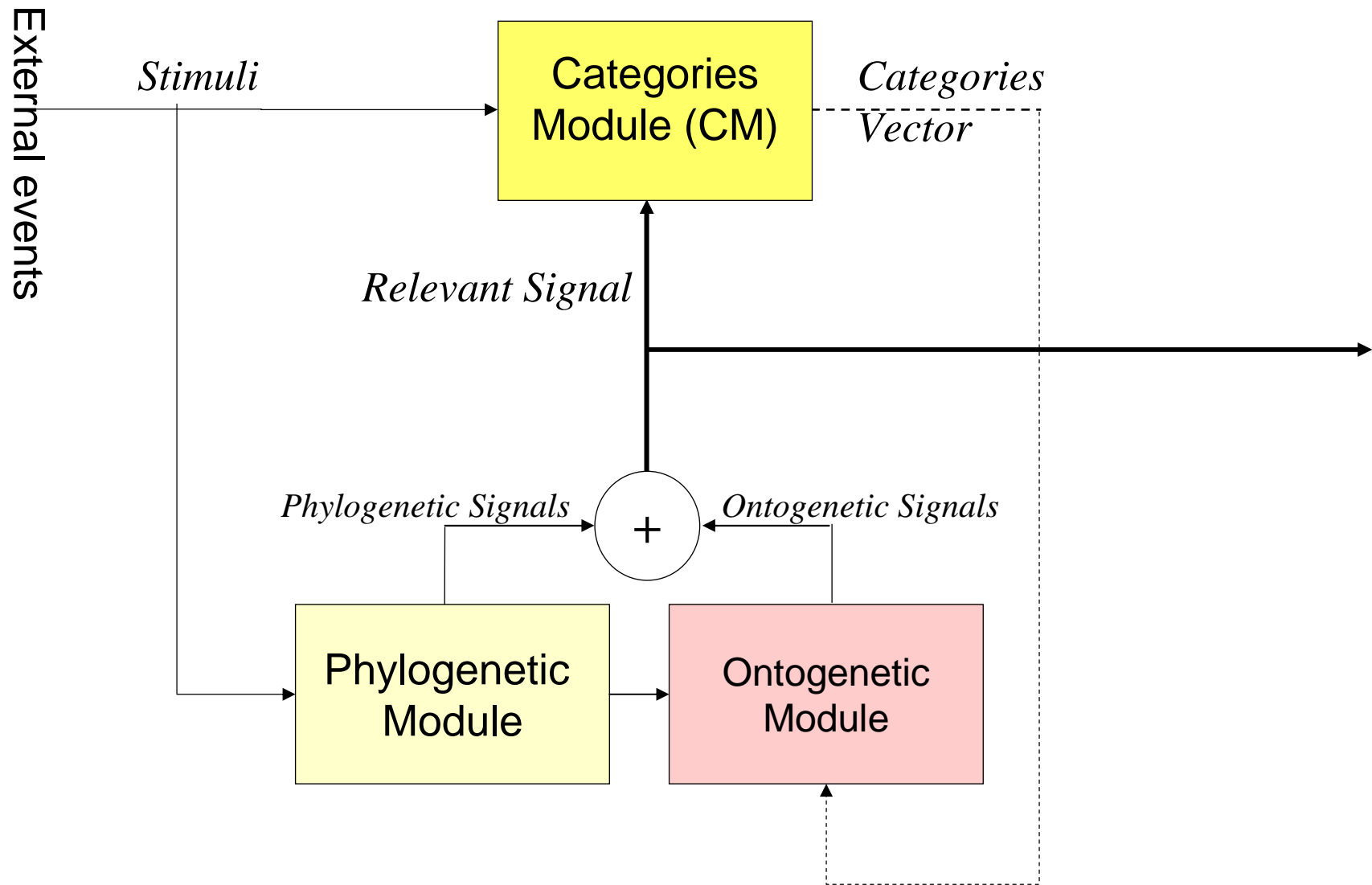
Unity and order

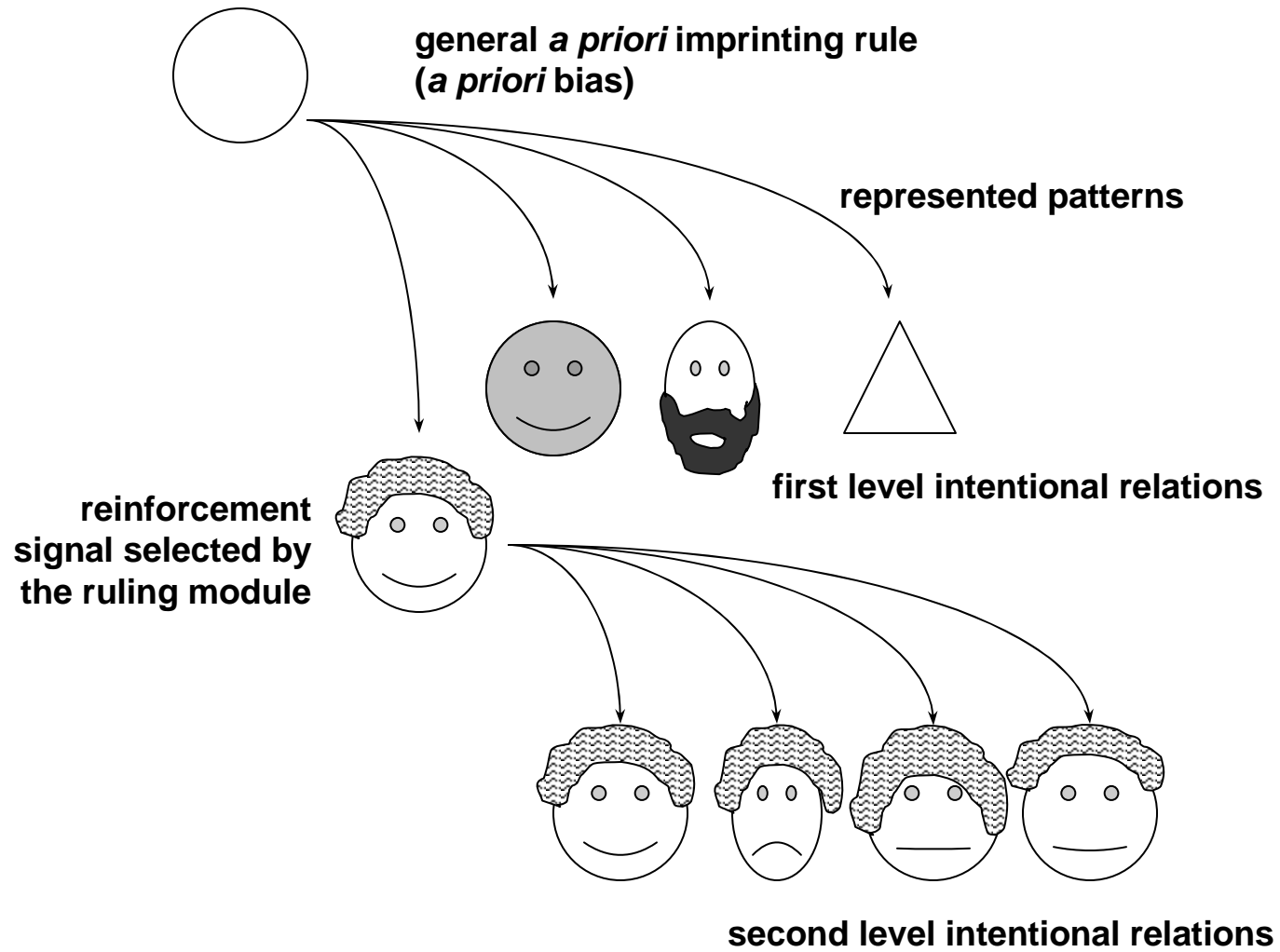


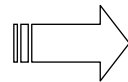
Reciprocal causation

An event causes not only an effect but also the conditions for the occurrence of a causal relation between that kind of event and some effect

Example: ontogenesis during development







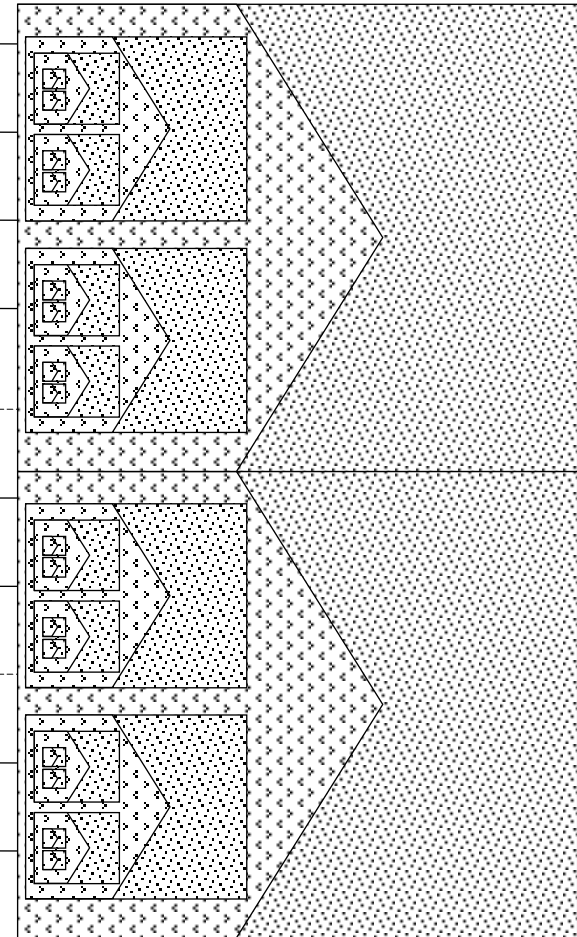
primary sensor capabilities

secondary sensor capabilities

vision log-polar
vestibular
proprioception
hearing

Disparity information
optical flow
color segmentation
time derivative

spectral components
spatial location of target

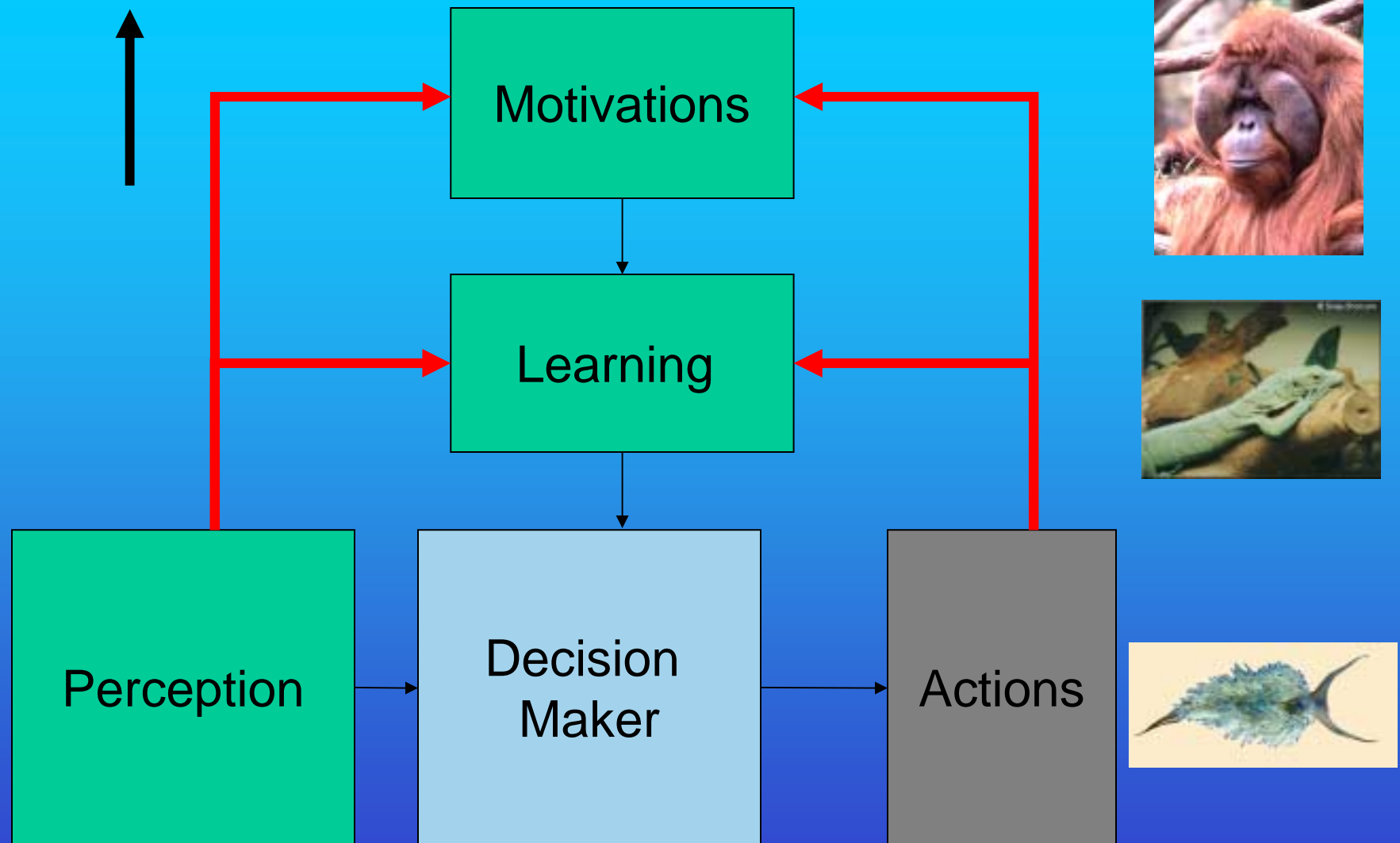


external world

**bottom-up architecture
(possibly unconscious)
phylogenetic**

**intentional architecture
(external world as critical event)
ontogenetic**

Phenomenal consciousness / presence



Conclusion

- **Representations are physically identical to processes like reciprocal causation**
- **There is no need for re-presentation**
- **Reality is one**
- **A conscious subject is a hierarchy of processes built during development through the creations of new motivations**
- **Back to Heraclitus, so much the worse for Plato!**



*[...] the co-existence,
Or say that the end precedes the beginning.
And the end and the beginning were always there
Before the beginning and after the end.
And all is always now.*

from 'Burnt Norton', T.S. Eliot



That's all folks!