

Signs of Meaning A Biosemiotic Approach



Jesper Hoffmeyer
University of Copenhagen, Biological Institute
<http://jhoffmeyer.dk>

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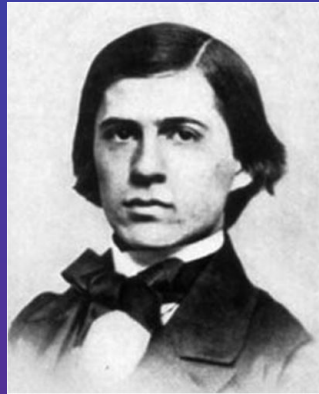
Plan

1. Semiotic realism
2. Biosemiotics
3. The “Self” as life history
4. Minding nature
5. Minding of the human body

1.

Semiotic realism

A Peircean view of semiotics



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Descartes' sensory mechanics

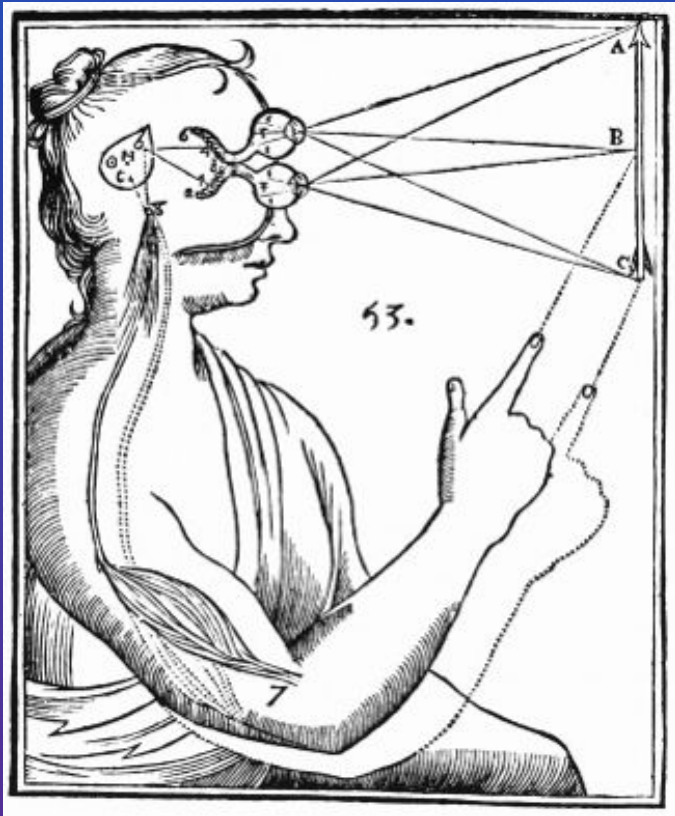


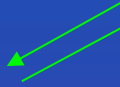
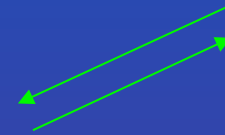
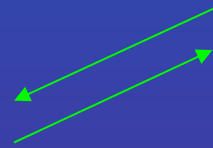
illustration fra René Descartes 1596-1650

The world reaches us through the mechanical actions of the sensory system

But how can sensory impressions become thoughts and ideas?

Sensory mechanics: The homunculus trap

How do we know what we are seeing?

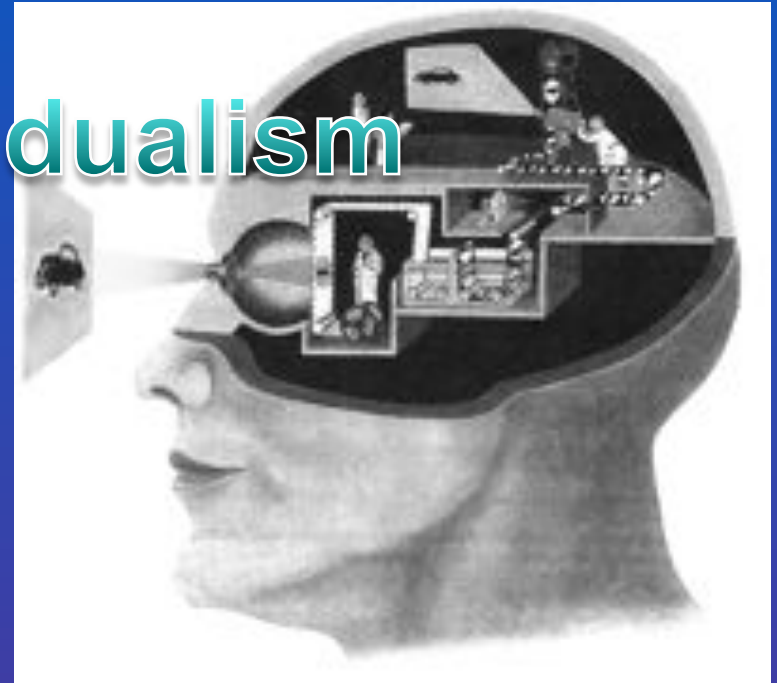
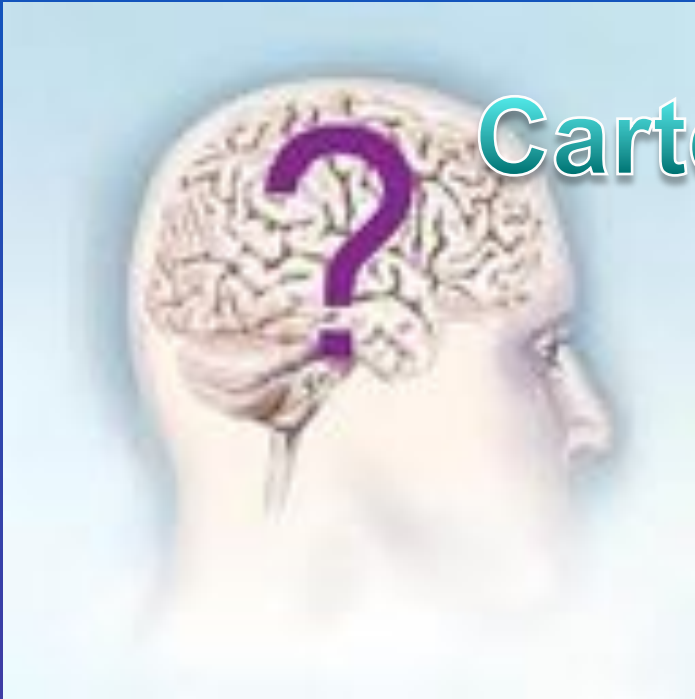


Does a homunculus inside our brain tell us?

But if so:

Who tells the homunculus what to see?

Cartesian dualism



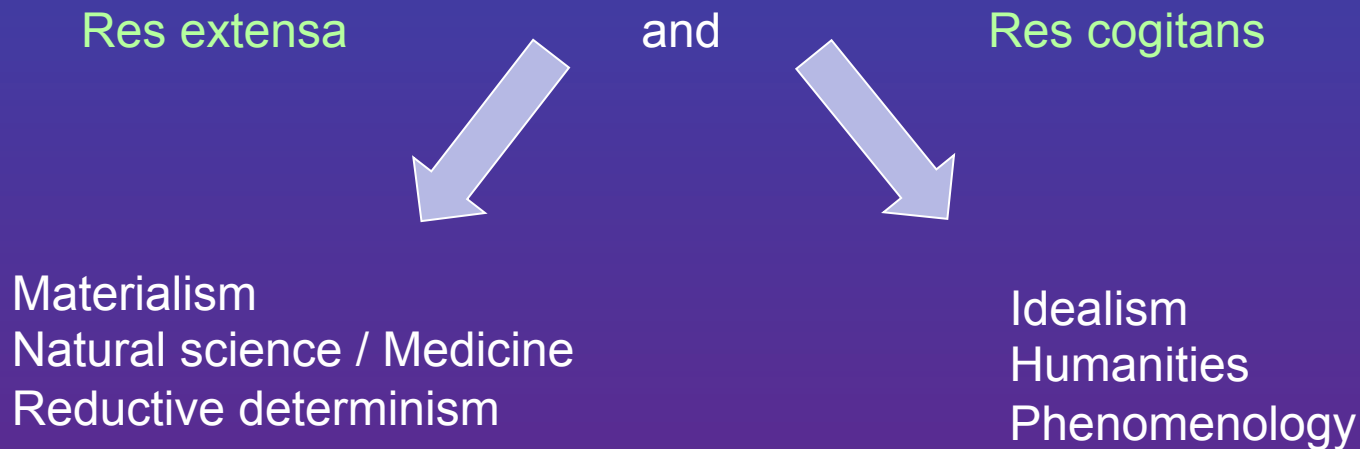
Descartes saw that the phenomenon of human thinking implies that in addition to sensible things, *Res Extensa* there must also exist 'stuff' without extension, for human thoughts have no physical extension.

Thus another principle would be present in humans, a principle which he calls *Res Cogitans* (thought substance).

Extensa and Cogitans

How those two entirely different “principles”, “properties”, or “substances” should possibly cooperate to produce a human life remained enigmatic however.

In reality dualism was soon split into the two halves (monisms) it had united



A consequence of the Cartesian philosophy (and the sensory mechanics on which it is based) was that human cognition had to be produced by the tools of Res Cogitans: **Ideas and concepts**.

But how can we be sure that our ideas and concepts reflect an external reality if they are produced entirely inside ourselves?

Immanuel Kant, as we all know, replied that we cannot, We can never come to know Das-Ding-an-Sich, but always only Das-Ding-für-Mich.

Das Ding an Sich



Immanuel Kant
1724-1804



Patient care

It is in hospitals, the problems of the soulless human picture emerges most acute.

The nurses must bring that element of common brotherliness into the health care, that medical science has no theoretical concept for.

It is out of this unsustainable situation that a new science takes shape, trying to make the rejected life-sphere visible: psychology.

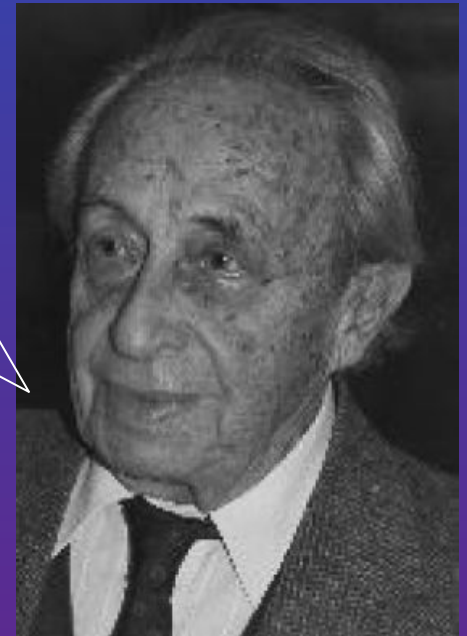
But does the psyche really exist ?

Hans Jonas on dualism:



The body as such is the grave of the soul, and
bodily death is the latter's resurrection

Life dwells like a stranger in the flesh which by
its own nature--the nature of the corporeal--is
nothing but corpse, seemingly alive by favor of
the soul's passing presence in it.



Sensory semiotics

The only way to transcend this dilemma is by replacing the sensory mechanics with sensory semiotics

This was what **Charles Sanders Peirce** saw more than 100 years ago



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Charles Sanders Peirce



1839-1914

A third position:

mind is real,
irreducibly intentional,
and explicable
naturalistically



Charles S. Peirce

1839-1914

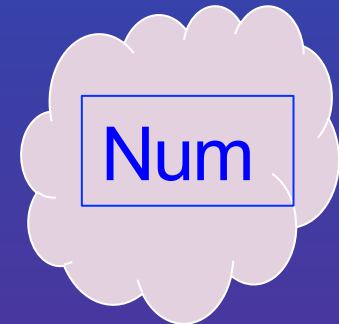
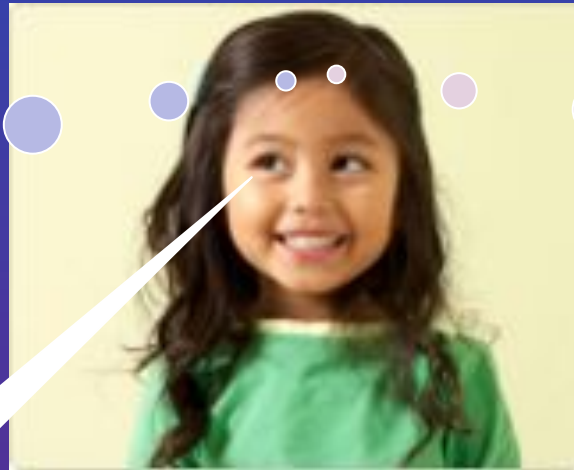
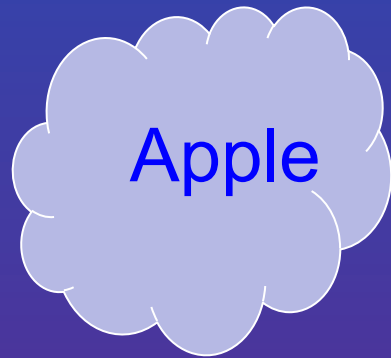
ESREA - Odense 2012

Sensory semiotics

The difference between concepts and signs is radical

Concepts refer

Signs signify



Semiotic realism

We can know about the world because it inevitably assumes **signification**.

Our sense apparatus does not mysteriously produce internal conceptual models or **representations** of the world

Instead we are embedded in the world as meaningful.

Only through our analytical skills can we scientifically learn to **designify** it

2.

Biosemiotics

A theory of life's creative agency

Biosemiotics

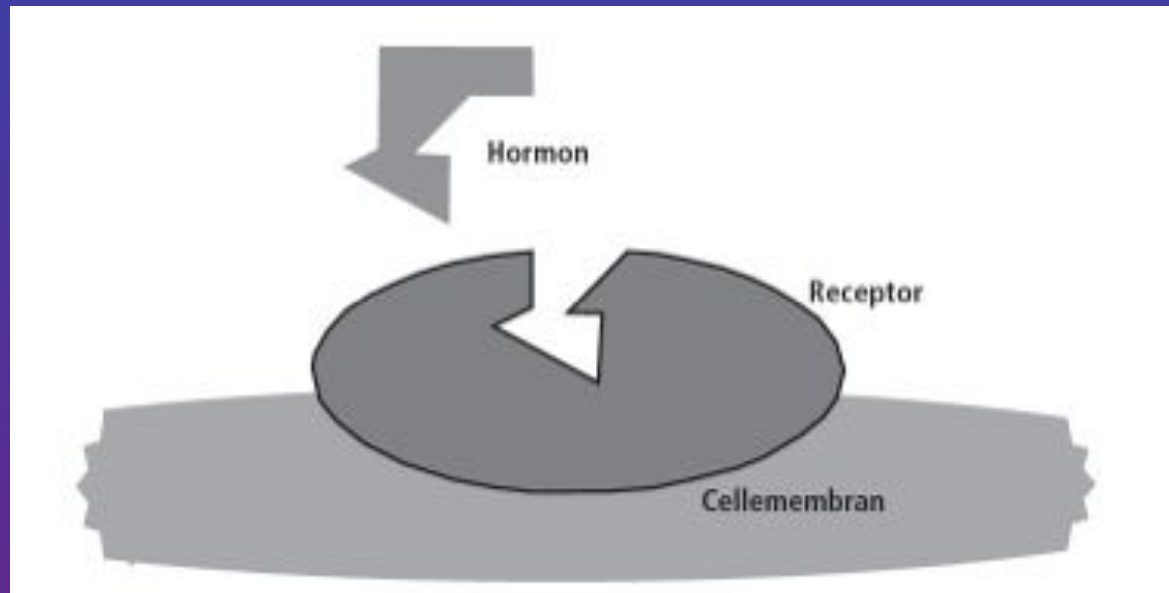


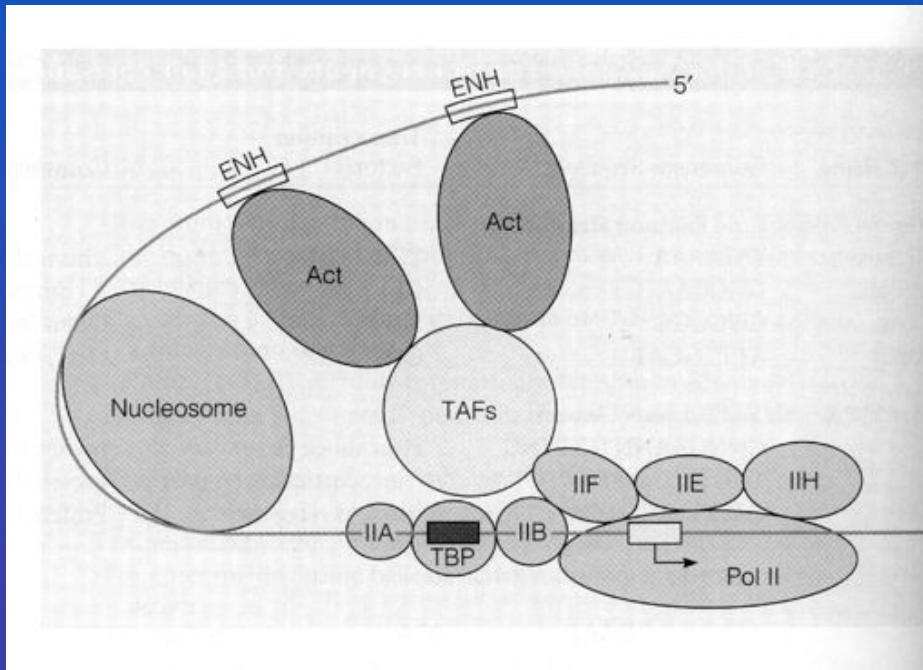
The study of living systems from a semiotic or sign theoretic perspective.

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Biosemiotics claims

- That life processes are organized in obedience to a semiotic dynamics
- Molecular structures are not just molecules: they are also signs

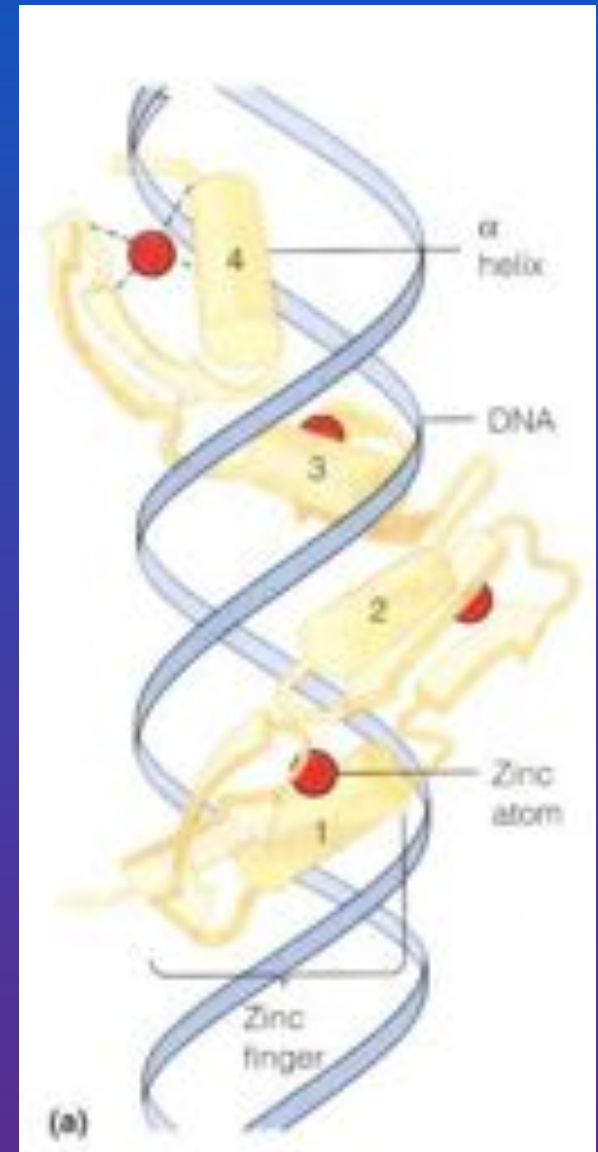




The DNA-string has to be fixed in the correct loop, which is effectuated by the help of a number of proteins (transcription factors) - grey spaces.

Molecular structures are signs

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The DNA helix interacts iconically with specific proteins

Semeion = Sign (in greek)

Semiosis = Sign process

Semiotics = Science of sign processes

A sign

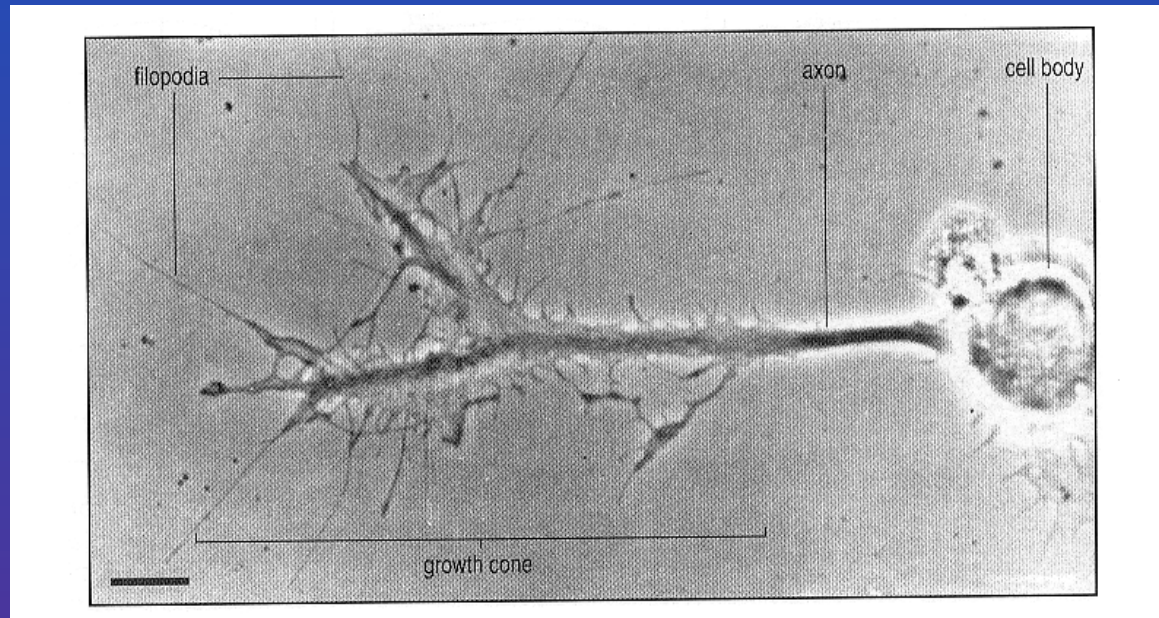
is something that refers to something else





Signs
show us something

Growth cone of embryonic nerve cell



Filopodia feel their way forward along cell surfaces, contracting or expanding dependent on circumstances

Fruittfly songs

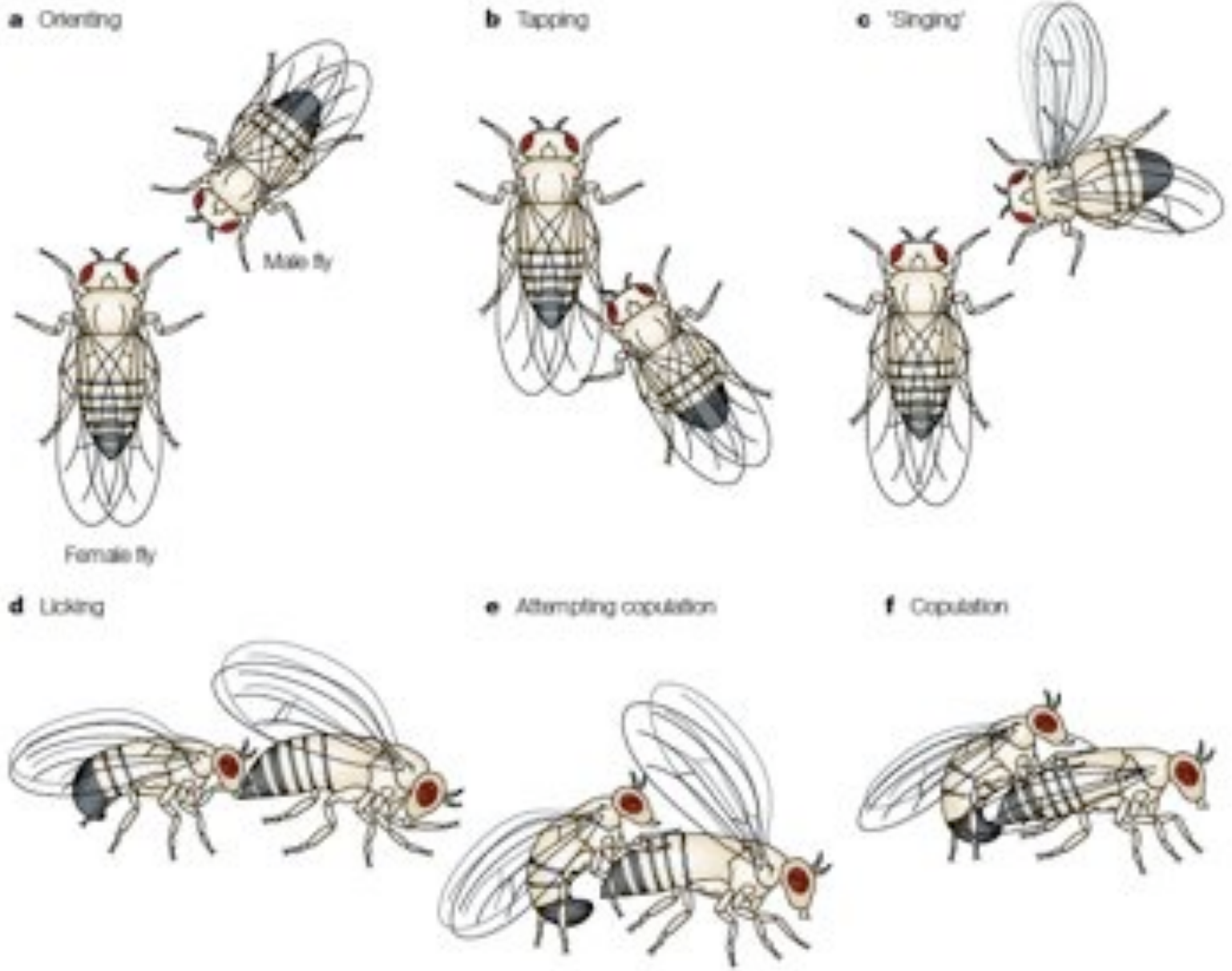
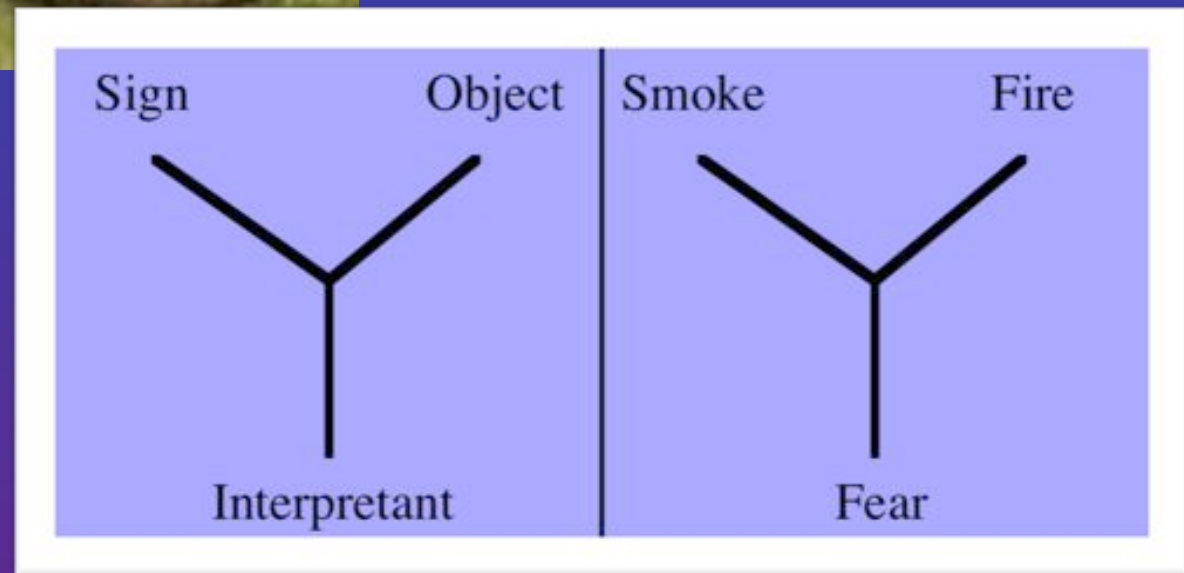
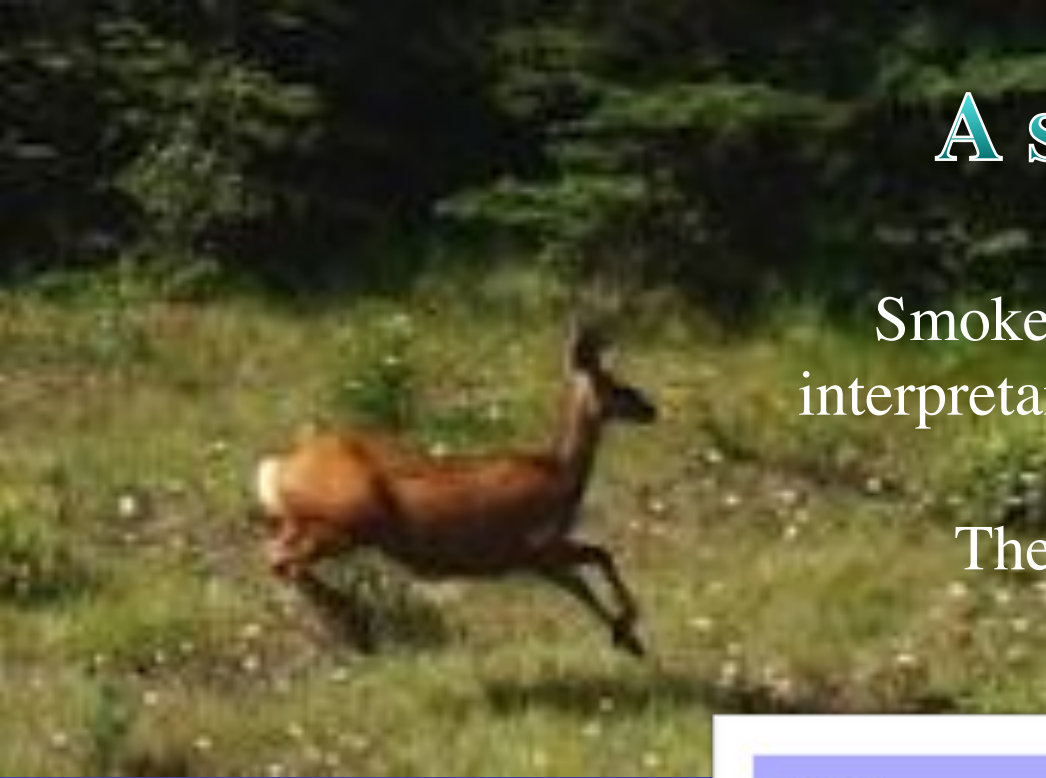


Figure 1 | Sequence of courtship behaviours shown by *Drosophila melanogaster* males towards females. a | The male fruitfly orientates towards the female, then follows her, b | taps her, and c | sings a species-specific courtship song by vibrating one wing. d | Finally, he licks the gut area of the female, and e | curves his abdomen in an attempt to copulate with her.

A sign is an action

Smoke provokes the formation of an interpretant in the animal causing it to flee.

The animal is **seized by alarm**



Semiosphere

The totality of messages and cues (potential or actual) in the world. The semiosphere penetrates the biosphere and consists in sign processes: sounds, odours, movements, colors, electric fields, waves of any kind, chemical signals, touch etc.

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The semiotic niche

The totality of signs or cues in the surroundings of an organism that it must be able to meaningfully interpret to ensure its survival and welfare. The semiotic niche includes all of the traditional ecological niche factors, but now the semiotic dimension of these factors is also strongly emphasized.

In order to occupy a semiotic niche, an organism or species has to master a set of signs of a visual, acoustic, olfactory, tactile, and chemical nature, by means of which it can control its survival in the semiosphere.

Semiotic emergence

By the term ‘semiotic emergence’ I mean

the establishment through evolutionary processes of higher-level organization based on situated semiotic exchange between subcomponents

The important point is, that the emergence of higher-level patterns is the result of semiotic – and not just physical – interactions between entities at the lower level.

Mechanism of semiotic emergence

1. Communicative patterns arising by chance in groups of animals or plants will tend to stabilize themselves simply because they work
2. New communicative patterns will tend to appear on the top of already established patterns
3. This may strengthen the scaffolding of the initial interactive pattern
4. If interactive patterns endure for many generations mutational events may take over the task of scaffolding
5. This makes the scaffolding more reliable but less flexible

3.

“Self” as a life-historical category

Illuminated body-swarms

*The body is not a mindless substrate
The psyche is not a bodiless spirit*

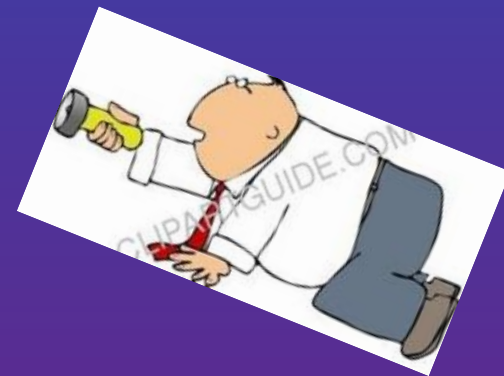
The psyche is not a mysterious appendage to neuronal processes in the brain, and the body is not a lifeless support for an illusory world of experiences.

The body is one huge self-organizing swarm of swarms of communicative processes, and our psychic preparedness is nothing other than the illuminated part of this swarming whole - the tip of the iceberg.

Agency

The metaphor of the illuminated body swarms presupposes an agency: Someone has to direct the light toward that which should be illuminated ...

Who is in charge of this?



Might consciousness be such an agency?

But consciousness is a passing companion. In the next moment it may well be somewhere else - at the beach for instance



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Agency and life-history

Of the countless tracks that work in parallel in our brain
only one becomes prominent in each moment

Which one, and why?

“When the unconscious
becomes conscious it happens
quite unconsciously”



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Storm P., Danish cartoonist

Responsibility



It is not consciousness that makes us responsible individuals: It is our "life-historical self"

Hour per hour through our life this 'self' evolves, and from time to time it undergoes deep structural redeployments.

Our personal life story has left millions - or rather billions - of indelible traces in our body and brain. Like **buoys in the sea** these traces guide the way we navigate through life, and these traces are what make us just whom we are. They reflect our life story and they act as a **semiotic scaffolding** of our personality.

Our **agency** is embedded in these scaffolding patterns.

Semiotic scaffolding

Kids do not just copy the movements of adults, they map them upon their own bodily feelings.



Step by step the child moves forward through a series of stages corresponding to the establishment of new semiotic scaffolding patterns.

As soon as some activity has become scaffolded consciousness is no longer needed for that activity and is directed instead towards new challenges, the establishment of new semiotic scaffolding patterns.

4. Minding of nature

The semiome

The **semiome** of an organism may be defined in analogy with the genome as

THE ENTIRETY OF ITS SEMIOTIC TOOL SET ***

The means by which the organism may extract significant content from its surroundings and engage in intra- or interspecific communicative behavior.

The semiome thus defines the scope of the organism's cognitive and communicative activity.

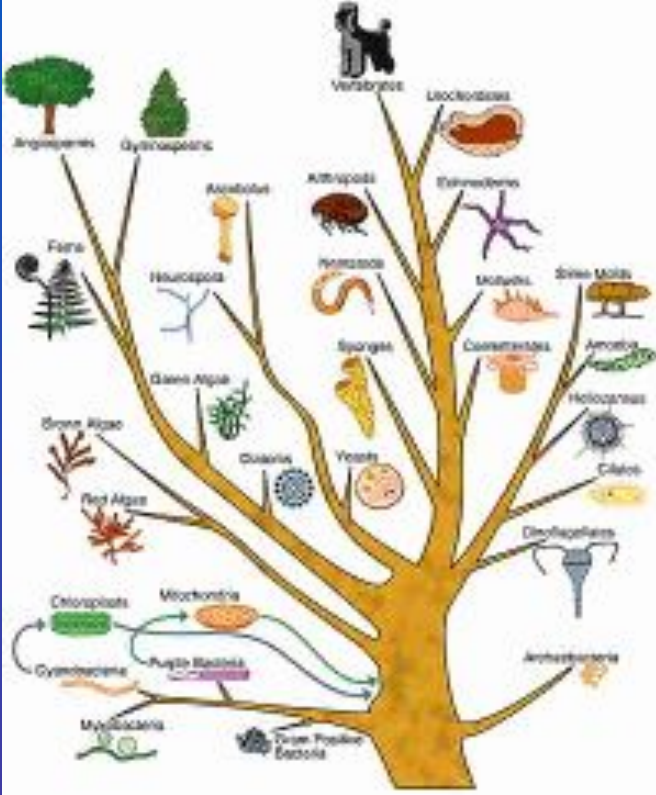
***the genome = the entirety of an organism's hereditary information



A moth semiothisid

Moths live in a totally mute world apart from one particular note, that being the note emitted at a frequency of 20.000 hertz by a bat taking soundings to locate its prey. This note enables the moth to determine how far off its enemy may be and in what direction.

If the bat is some distance away the moth will head directly away from the sound. If on the other hand the bat is close by, it will execute a number of abrupt and unpredictable movements.



Evolution of the semiome

To extend the scope of one's cognitive and communicative capacity is one way to avoid extinction.

For obvious reasons this strategy has been more profitable for animals than for plants and fungi.

Early in metazoan evolution we already find the first 'archaic brains' and we find considerable brain capacity both in arthropods and cephalopods - and of course in chordates.

An evolutionary trend toward increased semiotic freedom

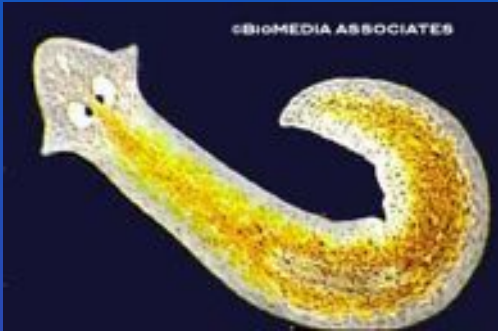
Molecular recognition.....	Bacteria
Irritability (e.g thigmotaxis).....	Many plants (e.g. Mimosa)
Phenotypic plasticity.....	e.g. Downey birch
Sense perception / habituation.....	Cnidaria (e.g. Jellyfish)
Behavioral choice.....	Flatworms
Individual learning	Fish
Sentience / object play.....	Turtles, other reptiles?
Consciousness.....	Mammals and birds
Linguistic intelligence.....	Humans



Aglantha digitale, a hydrozoan jellyfish living in the Arctic Ocean

Sense Perception

Most of the neurophysiological features of more 'advanced' metazoan nervous systems are actually present at the cnidarian grade, including multifunctional neurons, action potentials, synapses, and chemical neurotransmission.



Decerebrated flatworms

Decerebrated flatworms may still swim and crawl, but the movements are not integrated into the normal sequences;

Decerebrated animals also show no satiety and continue passing food items towards the mouth even once the gut is completely full.

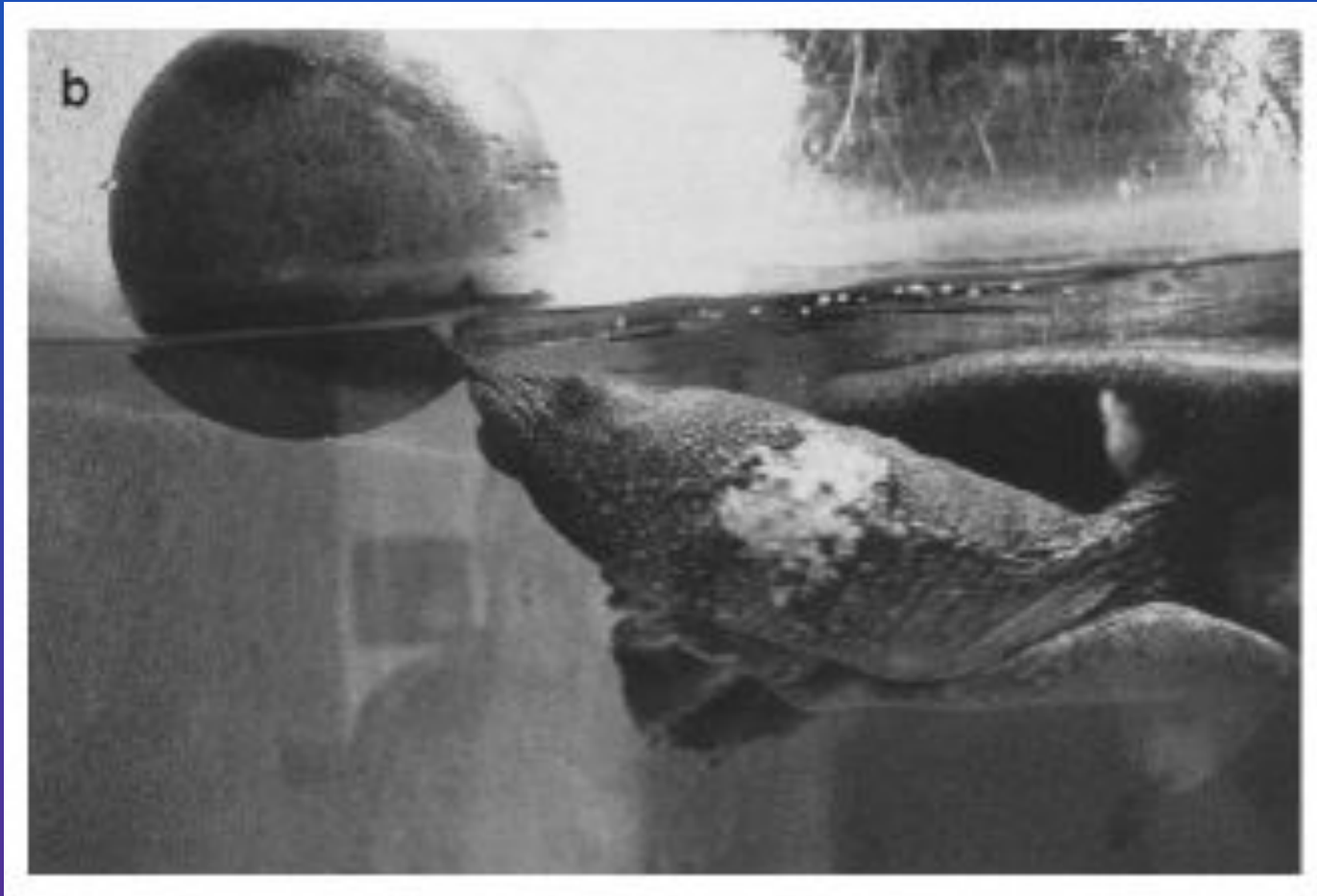
Without brain the worms apparently could no more make the saturated gut feeling become knowledge in the sense: I need not eat.

Social intelligence in cleaner fish



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Sentience in turtles



Captive turtle playing with a basketball

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Consciousness

Ravens are highly sophisticated when it comes to assessing their adversary's degree of knowledge.



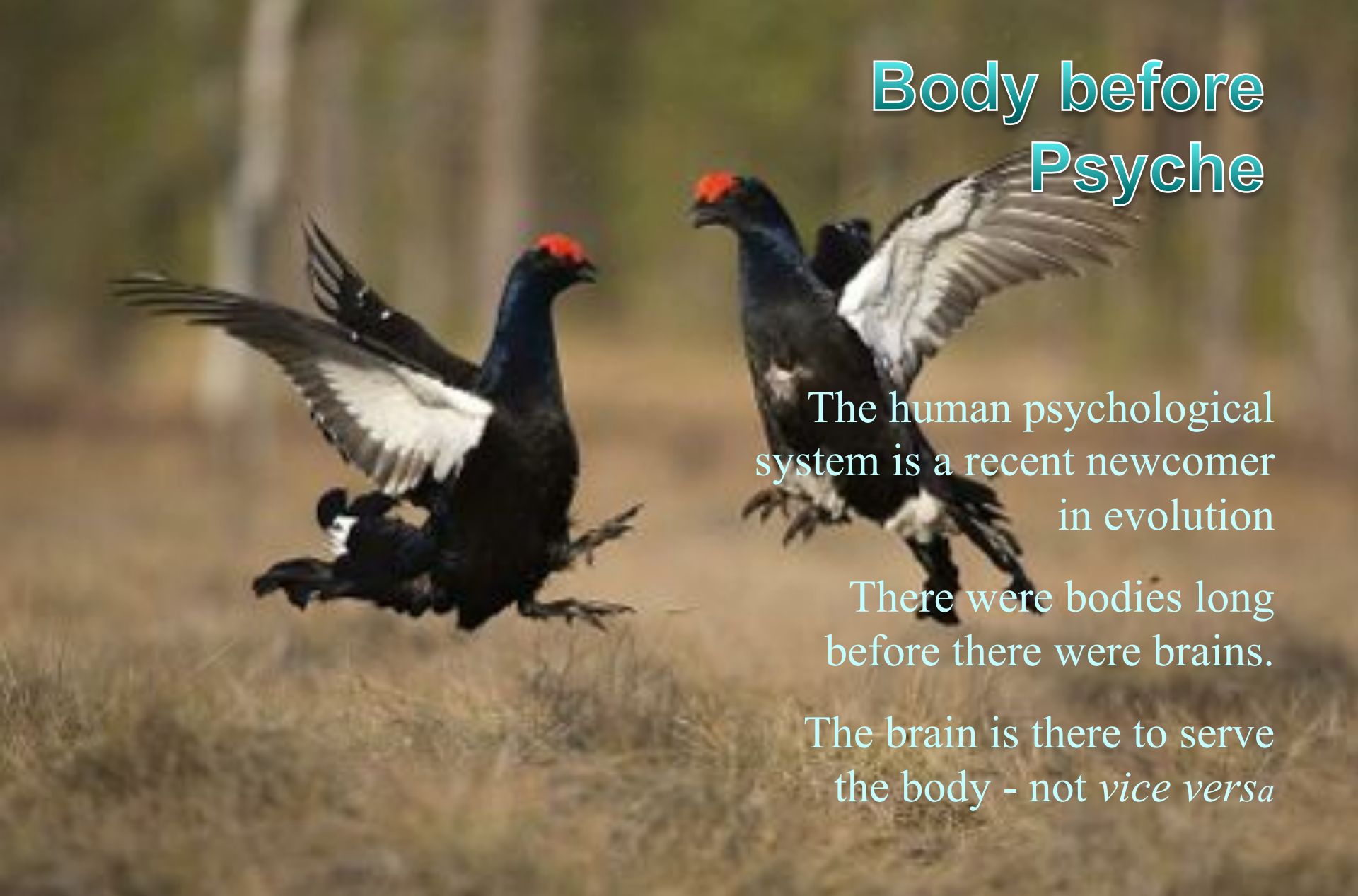
When ravens discover a wolf burying a piece of meat, they watch him openly. And when he leaves, they just dig it up.

But when it comes to their conspecifics, who are prepared for such tricks, they act demonstratively uninvolved, grooming their feathers and stiling about as if bored.

5. Minding the Human Body



Body before Psyche

The background image shows two black grouse (Lagopus lagopus scoticus) in a natural setting. They have dark, iridescent black plumage and a prominent, bright red comb on their heads. Their wings are partially spread, and they appear to be in motion, possibly running or displaying. The ground is covered in dry, yellowish-brown grass, and the background is a soft-focus natural landscape.

The human psychological system is a recent newcomer in evolution

There were bodies long before there were brains.

The brain is there to serve the body - not *vice versa*

Entering a No-Mans-Land

By replacing the traditional chemical approach to the understanding of body function with a sign-theoretic or semiotic approach, biosemiotics enters a no-man's-land between biological and social domains of human life.





Semiosis as a platform

Since semiosis (viz. the meaningful interpretation of cues, signals, events or states) is vital to communication at both levels (biological and social), the sign-process is an obvious choice as the basis for an integrated theory of human nature

Mind

Biosemiotics sees meaning and signification (**sema**) as inherent to the body proper (**soma**) and not as outsourced to non-descript locations in the brain or mind.

Whatever the mind is it is also body

body in a semiotic sense, a body that is inherently engaged in communicative processes that serve to coordinate the activities of cells, tissues and organs inside the body and to calibrate them with needs derived from the outer world, physical or social

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The mind is an interface

The mental system or mind may be seen as an interface through which an organism (human or animal) manages its coupling up onto the surrounding web of things, natural or social.

The mind, thus, is not a thing and has no more distinct location (in the brain?) than the electronically mediated processes whereby a changing pattern of pixels is at each moment shaped on the screen.

Interface

An interface generally refers to set of named operations whereby an entity presents itself to the outside.

Thanks to the interface-operations the methods of external communication are separated from the methods of internal operations.

The interface thus provides the means for communication between systems that depend on different sign systems.

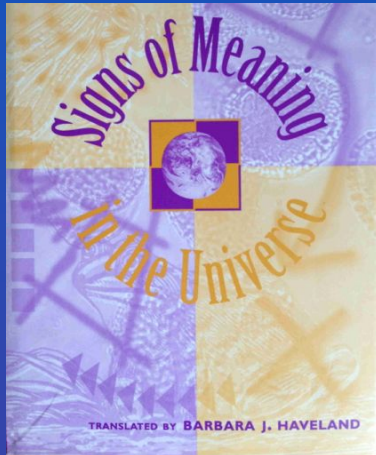


The mind-interface

makes the world comprehensible to the organism by triggering emotional-cognitive and/or motoric activity.

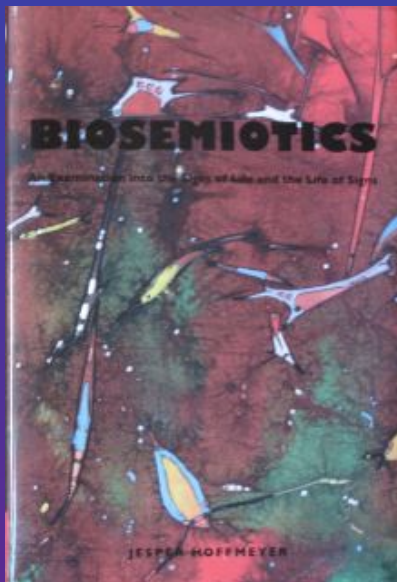
Muscular, endocrinological, immunological and neural (e.g. cerebral) memories are incessantly activated and brought to bear in interpreting the world as it is presented to the body through the mind's activity.

Our minded behavior is thus deeply ingrained in the socio-cultural settings of our lives



Signs of Meaning in the Universe

Indiana University Press
1996



Biosemiotics. An Examination into the Signs of Life and the Life of Signs,

University of Scranton Press,
2008

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