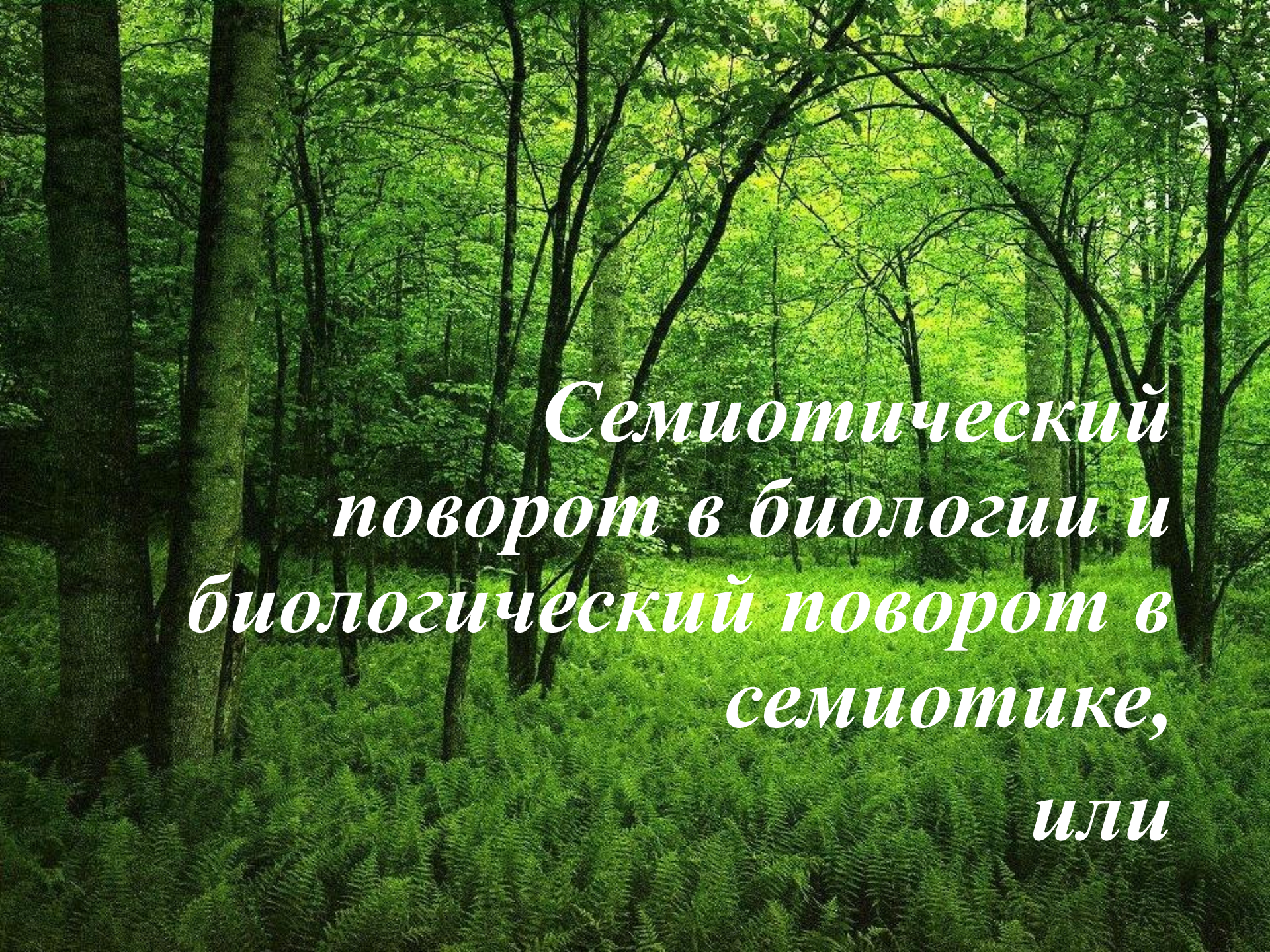

Семиотический поворот в биологии и биологический поворот в семиотике, или

предвременная биосемиотика

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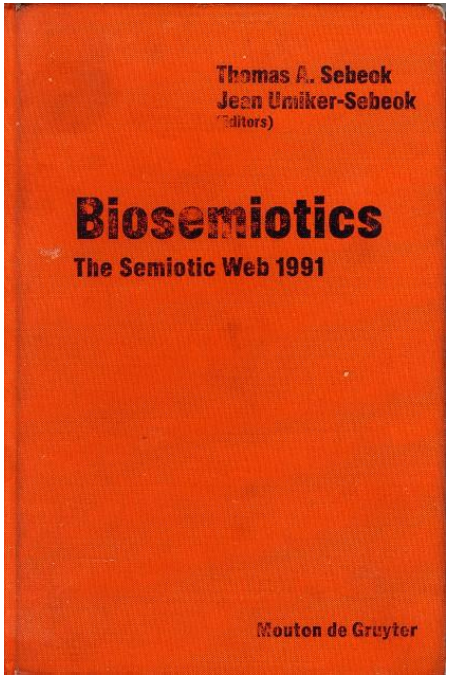
semiotics



1992 – 2008

physics

Semiosis

= sign process (C. S. Peirce)

= interpretation = translation

= life process (biosemiotic program)

Sebeok's Thesis

life and semiosis are coextensive

Sebeok's Thesis

- "All, and only, living entities incorporate a species-specific model (umwelt) of their universe; signify; and communicate by […] signs" (Sebeok 1996: 102).
- "Because there can be no semiosis without interpretability – surely life's cardinal propensity – semiosis presupposes the axiomatic identity of the semiosphere with the biosphere" (Sebeok 2001: 68).

Minimum systems in which meaning arises

Complementary models of semiosis

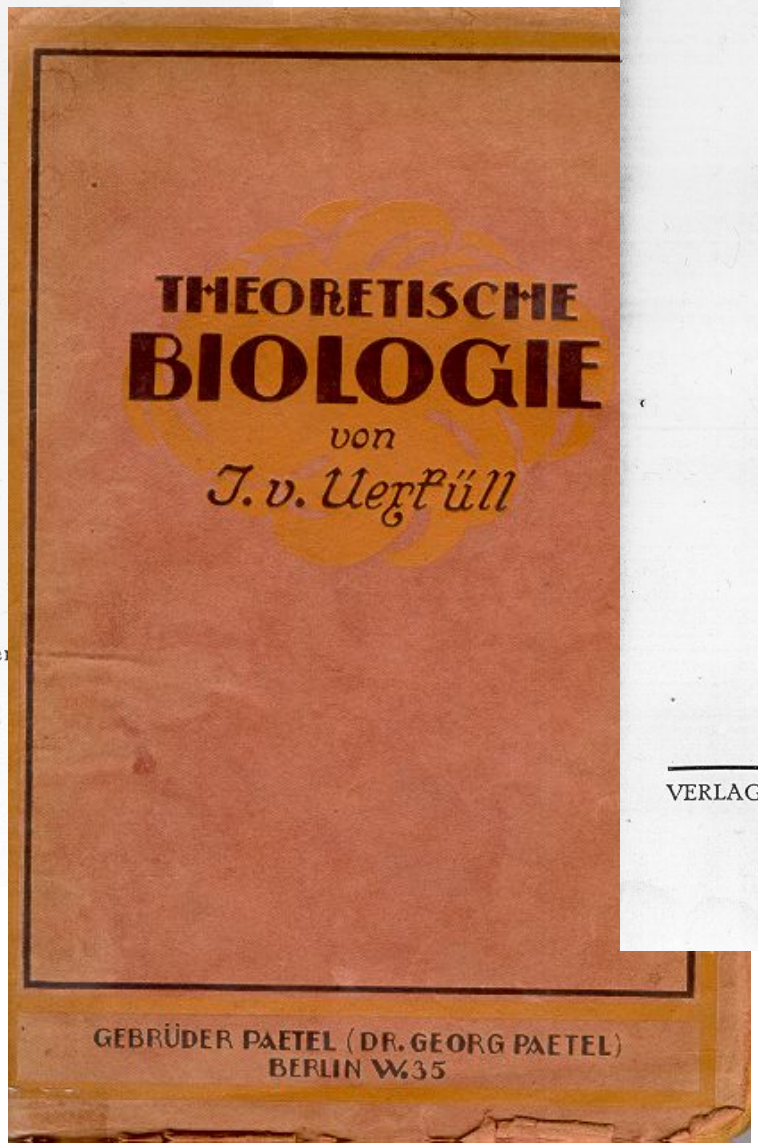
- Jakob v. Uexküll
- Juri Lotman

Umwelt und Innenwelt der Tiere.

Von

J. von Uexküll,
Dr. med. hon. c.

Berlin.
Verlag von Julius Springer
1909.



BEDEUTUNGS LEHRE

von

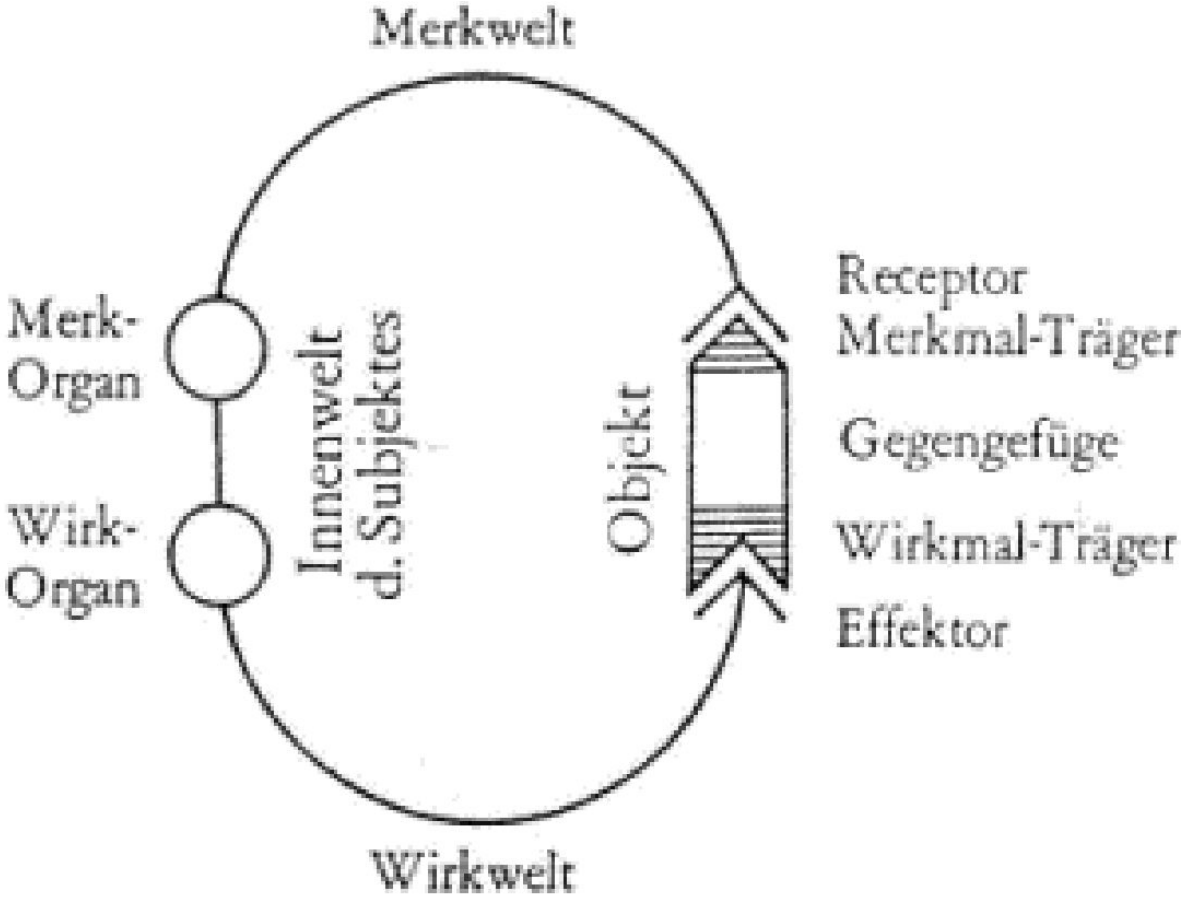
J. VON UEXKÜLL
Hamburg

Mit 1 Abbildung im Text

1 9 4 0

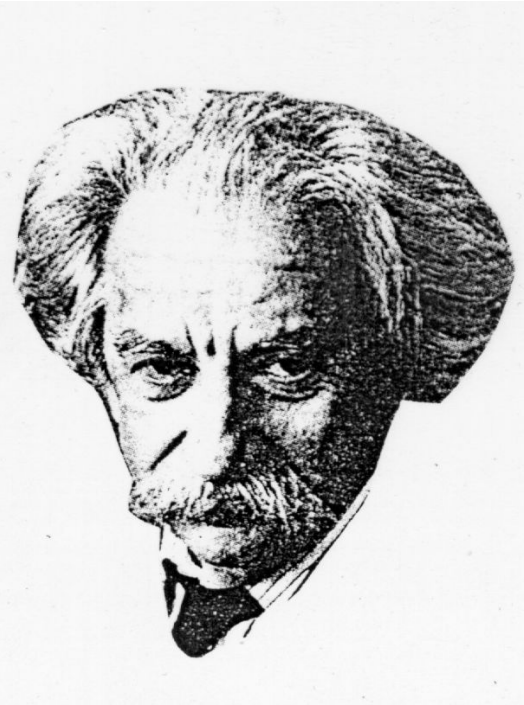
VERLAG VON JOHANN AMBROSIUS BARTH / LEIPZIG

Semioses create umwelten



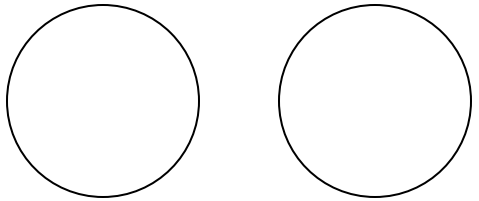
Jakob von Uexküll 1864–1944

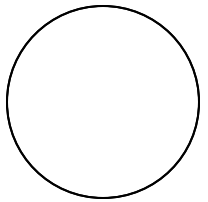
.. and semiosphere

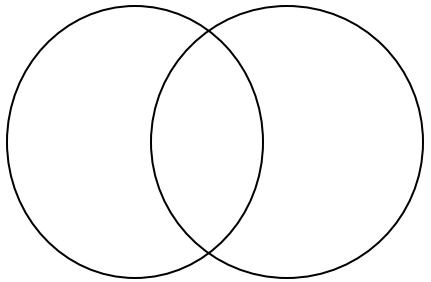


Juri Lotman 1922–1993

Meaningful
communication
assumes
non-translatability







- Semiotic threshold

Umberto Eco 1976

Lower semiotic threshold (border of life)

Indexical threshold (border of animal)

Symbolic threshold (border of culture & language)

Aristoteles – *De anima*
Thomas Aquinas, etc.

- *anima vegetativa*
- *anima sensitiva*
- *anima rationalis (intellectiva)*

semiosphere – sphere of life

- F. S. Rothschild 1962 - *biosemiotic*
- T. Sebeok 1963 - *zoosemiotic*
- M. Krampen 1981 - *phytosemiotic*

- Borders of human
- Borders of animal
- Borders of plant ...

Autocatalysis

$A + R \rightarrow B$

$B \rightarrow A + A$

Autocell

autocatalysis + self-assembly

autoreproductive systems – without semiosis

Semiosis requires codes

Semiosis is …

- conveyance of relations
- inheritance of needs

  (need is a recognition of absence)
- what *makes* a difference

  (Bateson's 'difference that makes a difference')
- responsible for qualitative diversity

- What are the principal types of sign systems in the realm of life?
- Which are the main types of umwelt?
- Who owns a space?
- Who owns a time?
- What are the mechanisms of stability in semiotic systems?

- Towards a theoretical biology 1968–1972

Towards complexity science

- Stuart Kauffman,
- Michael Arbib
- Rene Thom

Towards biosemiotics

- Brian Goodwin
- Howard Pattee
- Conrad Hal Waddington

- From stereochemistry to **code**
- Code as a part of of the mechanism of agency, and semiosis

- Cell as a system that has needs (semiosis — intentions)
- A need = recognition of absence

Simple social phenomena and categorization as a result of **iconic semiosis**

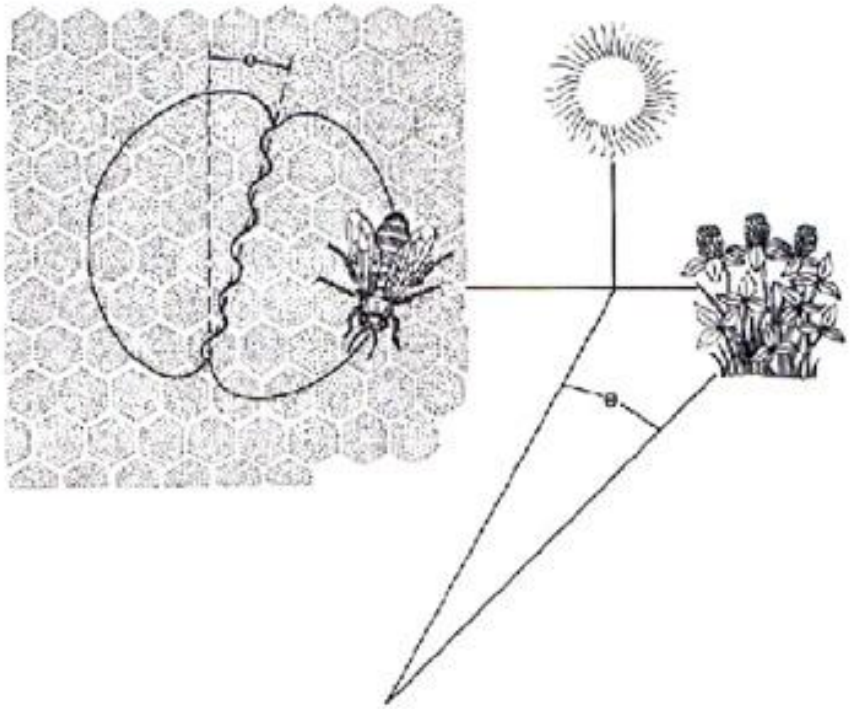
- Biological species
- Tissues
- Organic form
- Organism as a swarm

Recognition concept of species (H. Paterson)

Perceptual categorization

- Herds
- Flocks
- Families

Once communication is introduced, the discretization follows

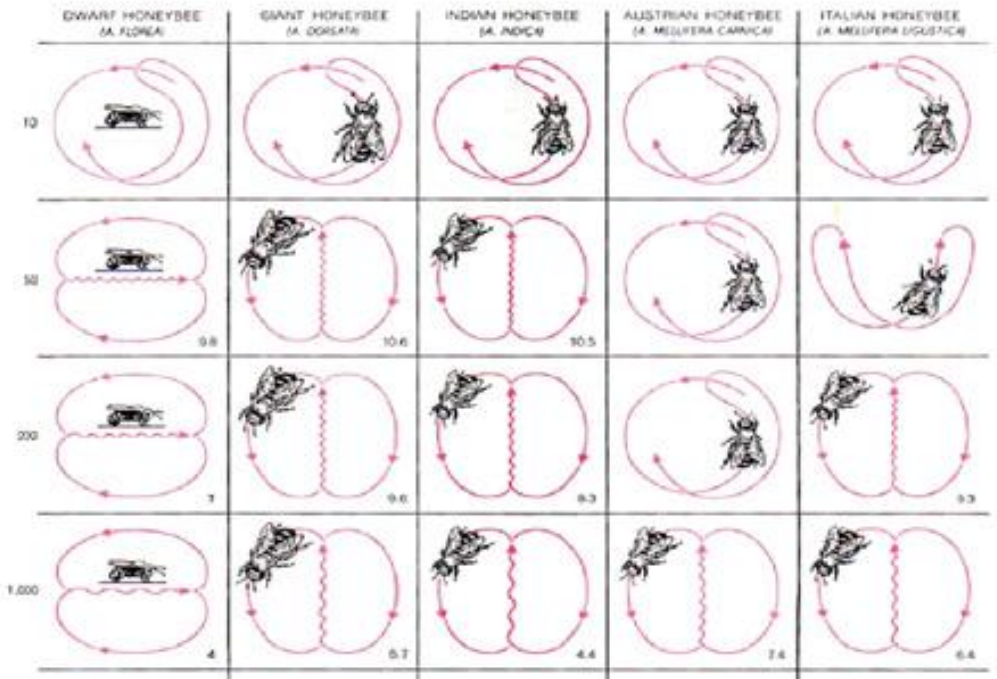


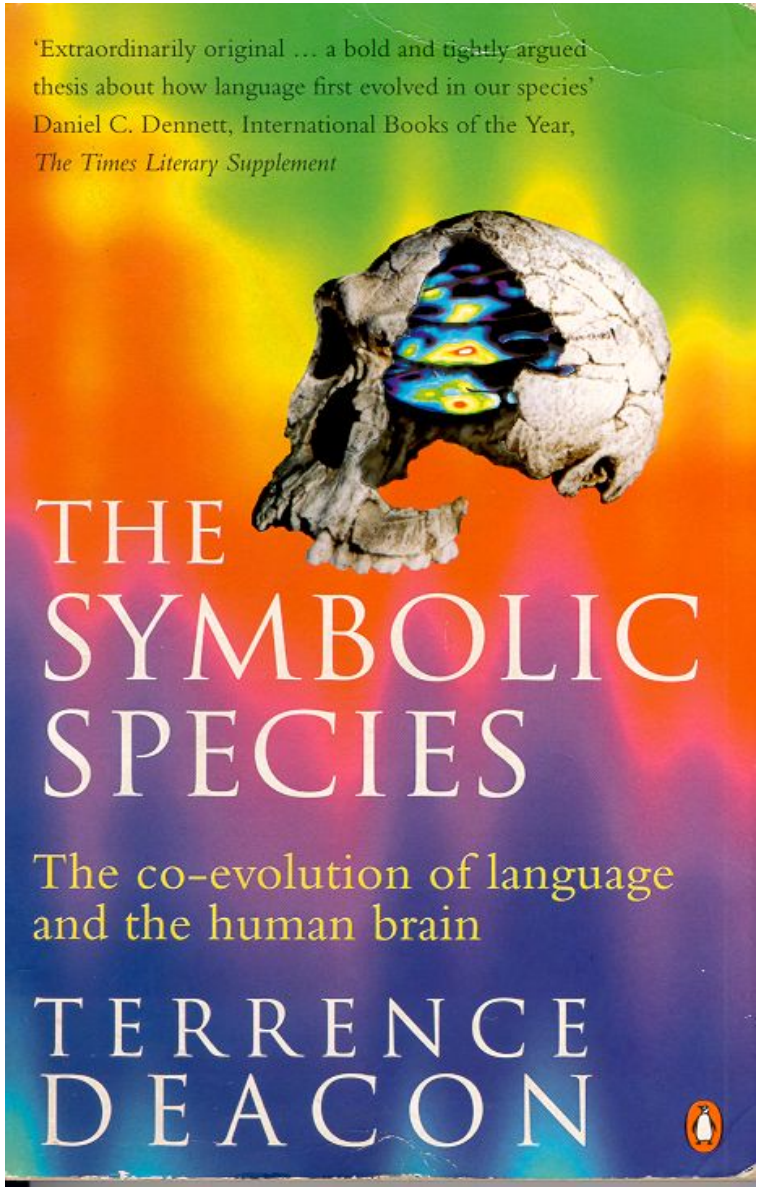
Indexical semiosis

associative learning

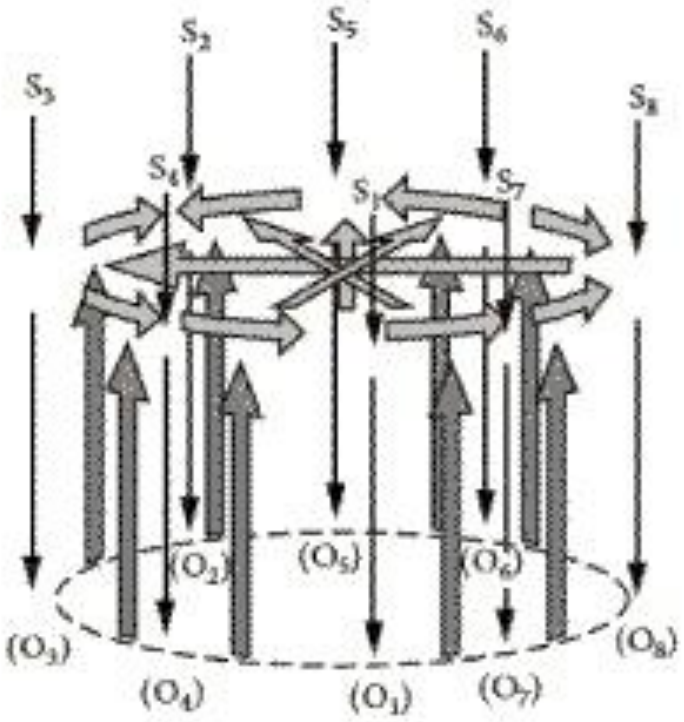
indexical relations

create spatial umwelten



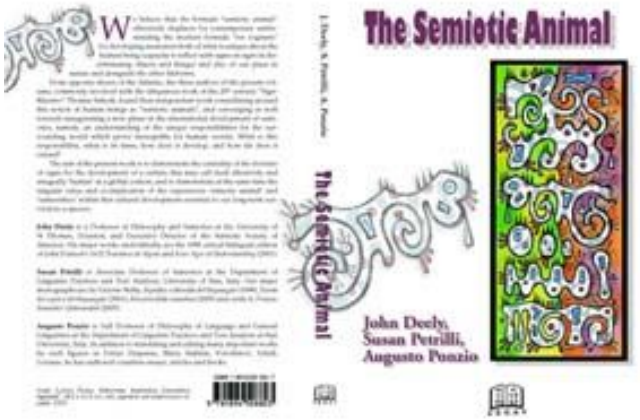


Symbolic threshold – **symbolic semiosis**



- 1997

- *animal symbolicum* – Ernst Cassirer
- *signifying animal* – Irmengard Rauch & Gerald Carr
- *semiotic animal* – John Deely & Susan Petrilli & Augusto Ponzio



- *Vegetatative semiosis* is based on the ability to recognize, or iconicity. [quality]
  - pure recognition, nonspatial umwelt
- *Animal semiosis* is based on the ability to associate signs, or indexicality. [action of opposition]
  - spatial umwelt, orientation
- *Propositional semiosis* is based on the ability to combine signs freely, or symbolicity. [synthetic thought]
  - temporal umwelt, language, narratives

- Biosemiotics is a study of (translation of)

  non-symbolic texts

  non-temporal umwelten

  non-propositional discourse

- First, by publishing and teaching as much as possible; and, equally important, by doing one's best to facilitate the success of one's colleagues in these respects. These are the only things I have ever wanted to do in my academic life.

- [1991]

:-)

:-)

Semiotics is:

- Study of signs and sign systems and sign processes or semioses
- Study of meaningful communication
- Study of qualitative diversity
- Knowing of knowing

semiotics

- Medical
- John Locke
- Husserl, Frege, Peirce
- Saussure

Problems

- Roland Posner (Presidental address in Semiotics Congress, 2000):
  Semiotics is the physics of the XXI century

- Robert Rosen (Life Itself, 1999: 105):
  Life poses the most serious kinds of challenges to physics itself.

- John Locke (An Essay Concerning Human Understanding, 1690):
  Science may be divided into three sorts.

John Locke

- **Chapter XXI**

Of the Division of the Sciences

- -1. Science may be divided into three sorts. All that can fall within the compass of human understanding, being either, First, the nature of things, as they are in themselves, their relations, and their manner of operation: or, Secondly, that which man himself ought to do, as a rational and voluntary agent, for the attainment of any end, especially happiness: or, Thirdly, the ways and means whereby the knowledge of both the one and the other of these is attained and communicated; I think science may be divided properly into these three sorts:--

- -2. Physica. First, The knowledge of things, as they are in their own proper beings, their constitution, properties, and operations; whereby I mean not only matter and body, but spirits also, which have their proper natures, constitutions, and operations, as well as bodies. This, in a little more enlarged sense of the word, I call *Phusike*, or natural philosophy. The end of this is bare speculative truth: and whatsoever can afford the mind of man any such, falls under this branch, whether it be God himself, angels, spirits, bodies; or any of their affections, as number, and figure, &c.
- -3. Practica. Secondly, *Praktike*, The skill of right applying our own powers and actions, for the attainment of things good and useful. The most considerable under this head is ethics, which is the seeking out those rules and measures of human actions, which lead to happiness, and the means to practise them. The end of this is not bare speculation and the knowledge of truth; but right, and a conduct suitable to it.

- -4. Semeiotike. Thirdly, the third branch may be called Semeiotike, or the doctrine of signs; the most usual whereof being words, it is aptly enough termed also Logike, logic: the business whereof is to consider the nature of signs, the mind makes use of for the understanding of things, or conveying its knowledge to others. For, since the things the mind contemplates are none of them, besides itself, present to the understanding, it is necessary that something else, as a sign or representation of the thing it considers, should be present to it: and these are ideas. And because the scene of ideas that makes one man's thoughts cannot be laid open to the immediate view of another, nor laid up anywhere but in the memory, a no very sure repository: therefore to communicate our thoughts to one another, as well as record them for our own use, signs of our ideas are also necessary: those which men have found most convenient, and therefore generally make use of, are articulate sounds. The consideration, then, of ideas and words as the great instruments of knowledge, makes no despicable part of their contemplation who would take a view of human knowledge in the whole extent of it. And perhaps if they were distinctly weighed, and duly considered, they would afford us another sort of logic and critic, than what we have been hitherto acquainted with.

- -5. This is the first and most general division of the objects of our understanding. This seems to me the first and most general, as well as natural division of the objects of our understanding. For a man can employ his thoughts about nothing, but either, the contemplation of things themselves, for the discovery of truth; or about the things in his own power, which are his own actions, for the attainment of his own ends; or the signs the mind makes use of both in the one and the other, and the right ordering of them, for its clearer information. All which three, viz, things, as they are in themselves knowable; actions as they depend on us, in order to happiness; and the right use of signs in order to knowledge, being *toto coelo* different, they seemed to me to be the three great provinces of the intellectual world, wholly separate and distinct one from another.

- **THE END**

Deely, John 2001. *Four Ages of Understanding*. Toronto: Toronto University Press.

- I *Greek* – semiotics and science not distinguished
- II *Latin* – semiotics without science
- III *Modern* – science without semiotics
- IV *Post-modern* – science with semiotics

The end of modernism

- John Deely (2001). *Four Ages of Understanding*. Toronto: University of Toronto Press.
- John Deely (2005). *Basics of Semiotics*. 4th ed. Tartu: Tartu University Press.

Greek – Latin – Modern – Postmodern

Modern: sociobiology, semiology, Saussure

Ultramodern: Derrida

Postmodern: semiotics, Peirce, Uexküll, ecophilosophy

The ending of modernism in physics

- Quantum physics – the role of observer
- N. Bohr's *complementarity* principle
- J. Horgan (1996). *The End of Science*.
- H. J. Pirner (2002). The semiotics of "postmodern" physics. In: M.Ferrari & I.-O.Stamatescu (eds.), *Symbol and Physical Knowledge*. Berlin: Springer, 211-229.
- Interdisciplinarity

The ending of modernism in biology

- Rosen, R.; Pattee, H. H.; Somorjai, R. L. 1979. A symposium in theoretical biology. In: Buckley, Paul; Peat, F. David (eds.), *A Question of Physics: Conversations in Physics and Biology*. Toronto: University of Toronto Press, 84–123.

"What is important in biology is not how we see the systems which are interacting, but how they see each other." (Rosen et al. 1979: 87)

where the partition between "system" and observer is drawn is entirely arbitrary. (Rosen 1999: 86)

- *Ecological web (of mind)*:
  our *self* would include our umwelt, our ecosystem.

Physical *versus* Semiotic
Φ-sciences *v.* Σ-sciences

- All qualitative is in its last end reducable to quantitative. Science means measuring. Physical space is commensurable.

Quantitative methods are supplementary, to find out the qualitative differences. Semiotic space (semiosphere) is incommensurable.

Φ-sciences *v.* Σ-sciences

Study fields	natural sciences	sciences of meaning & natural history
	study of quantities	study of qualitative diversity
Objects (models) of study	physical space	semiotic space, semiosphere
	non-textual or detextualised	textual or textualised
	things and interactions	signs and semioses [1]
	laws	codes, habits
	transformations	translations, interpretations
	quantities	qualitative diversity
	multiple objects	*unique* objects
	as if non-living	as if living

[1]

Φ-sciences *v.* Σ-sciences

Features of objects (models)	commensurability	incommensurability
	context-independence	context-dependence
	errorless nature	fallibilism
Methods of study	measurements	qualitative methods
	experimental	experiential
	from outside	from inside
	ceteris paribus	organicist
	by independent researcher	participatory study
	reductionism	holism
	statistical tests	comparisons
Truth, reality	*single*	*plural*

Mathematics & idealizations

- Louis H. Kauffman –
  The one and the many.

Cybernetics and Human Knowing 12: 159-167.

singletons

- A set with single element

- Element L
- Singleton set {L}

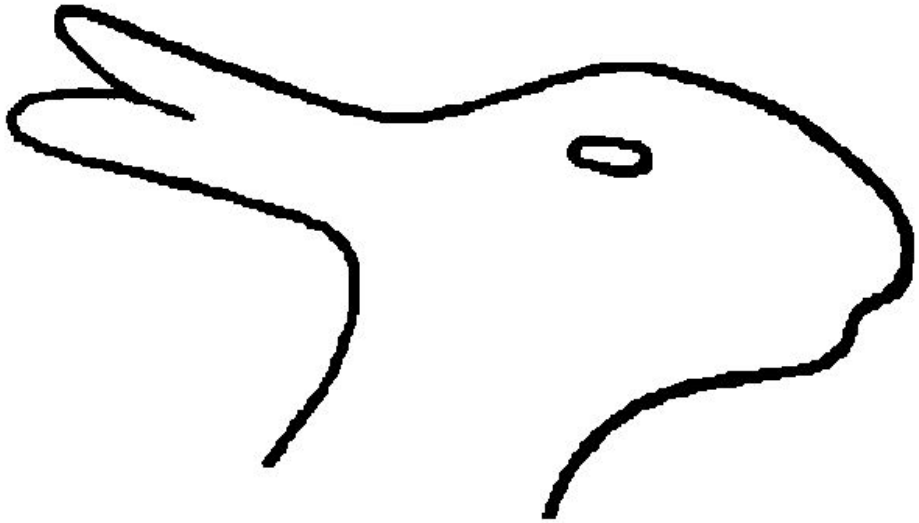
Principle of collection – any sets that already exist can be selected as members of a new set that is created from them

- L
- {L}
- {{L}}
- {{{L}}}
- ...
- {L, {L}}
- {L, {L}, {L, {L}}
- ...

- *Semiotic world* – singletons are distinct from their members
- *Physical world* – the difference between singleton and its element collapses

- Note. Mathematical world is semiotic – the world of relations and possibilities. This creates a permanent tension between *mathematical* description and *purely physical* world.

"objective reality"	Faultless world	Erroneous world
scientific transcendental ("hidden")	Physical reality **Φ-sciences** Universal laws of nature monism	Semiotic reality **Σ- sciences** Local codes pluralism
Social, rhetoric	Public reality	



	Physical approach (law-based)	Semiotic approach (code-based)
• Non-living realm (faultless)	One ⇓ One	One ⇓ Many
• Living realm (erroneous)	Many ⇓ One	Many ⇓ Many

Branches of semiotics

- Semiotics of culture
- Biosemiotics

The fourth Age:
Co-existence of science and semiotics

- ***The world is locally plural***