

***Tunne loodust!***  
**Knowing Nature**  
**in the Languages of Biosemiotics**

*edited by Donald Favareau and Ekaterina Velmezova*

***Tunne loodust!***  
**Connaître la nature**  
**dans les langages de la biosémiotique**

*édité par Donald Favareau et Ekaterina Velmezova*



*Epistemologica et historiographica linguistica Lausannensia*



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Зная природу  
на языках биосемиотики**

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Donald Favareau & Ekaterina Velmezova  
Дональд Фаваро & Екатерина Вельмезова*

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For the last forty years (and, arguably, even earlier) biosemiotician Kalevi Kull has been pioneering the effort to develop a language of scholarship rich enough to capture the nuanced processes of communication, cooperation and choice-making in the lifeworld of all creatures, from the single cellular to the modern human. In this volume, almost 100 scholars from around the world discuss the influence that K. Kull's ideas have had on their own work and thinking. The volume also includes a short selection of personal memoirs, and a more than 500 entry Bibliography of K. Kull's work from 1982 to 2022.

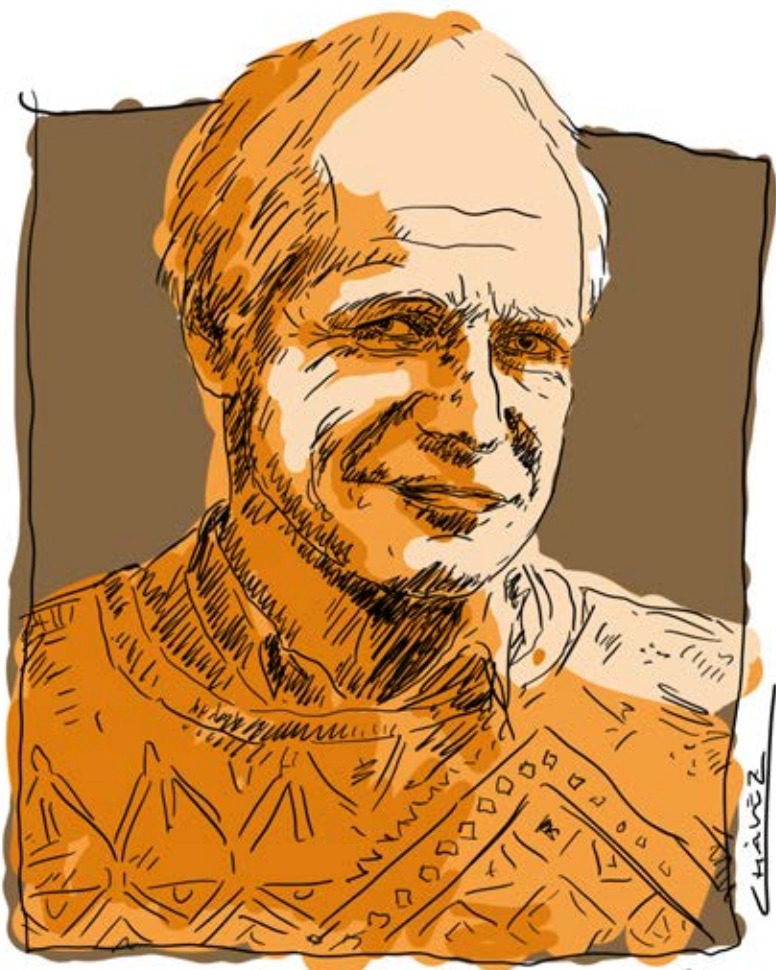
Depuis quarante ans (et, sans doute, bien avant déjà), le biosémioticien Kalevi Kull est un pionnier dans ses efforts de développer un langage scientifique qui soit suffisamment riche pour saisir les processus nuancés de communication, de coopération et de choix dans le monde de vie de toutes les créatures, depuis l'unicellulaire jusqu'à l'homme moderne. Dans ce volume, presque une centaine d'universitaires du monde entier discutent de l'influence que les idées de K. Kull ont eue sur leur propre travail et sur leurs réflexions. Le volume comprend également une courte sélection de souvenirs personnels et une bibliographie (de plus de 500 entrées) des travaux de K. Kull de 1982 à 2022.

В течение последних сорока лет (а возможно, и раньше) биосемиотик Калеви Куль был пионером в разработке научного языка, который оказался бы достаточно богатым для того, чтобы охватить нюансы процессов общения, взаимодействия и выбора в жизненном мире всех живых существ – от одноклеточных до современных людей. В этой книге почти сто ученых из разных стран обсуждают то влияние, которое идеи К. Кулля оказали на их мышление и на их собственную работу. Книга также содержит личные воспоминания и библиографию более чем 500 источников – работ К. Кулля с 1982 по 2022 год.

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Kalevi Kull (12.08.1952)

*Illustration of Kalevi Kull by Israel Chávez*

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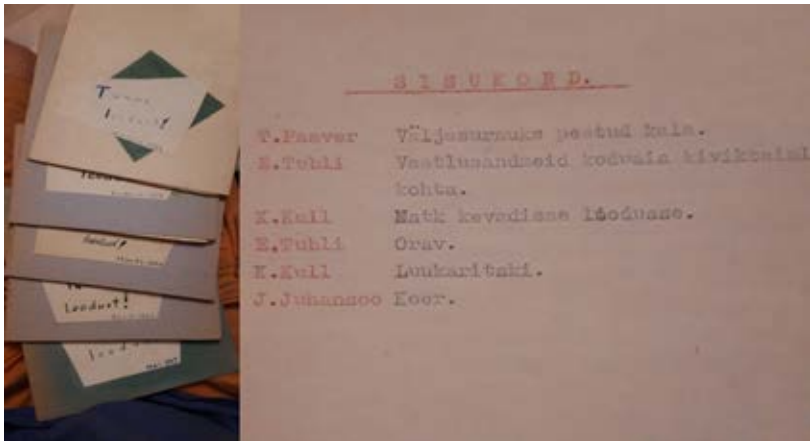
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## Preface: Knowing nature

Donald FAVAREAU, Ekaterina VELMEZOVA  
*National University of Singapore,  
University of Lausanne / University of Tartu*

“DO YOU REALLY THINK IT’S INTERESTING TO ANYBODY?” That is how Kalevi Kull responded when asked to recount his beginnings in biology – and in biosemiotics. He then confessed, when pressed, that his first “publications” on the topic were in a self-initiated journal that he and three of his fourth grade friends decided to put together, called *Tunne loodust!* – Know Nature! – in 1964.



The five extant copies of *Tunne loodust!* ‘Know Nature!’ with articles by a pre-teenage Kalevi Kull on *Pungitius pungitius* ‘Ninespine stickleback fish’ [“Luukaritski”] and “A Hike to Spring Nature” [“Matk kevadisise loodusse”], and one by his boyhood friend, the late Estonian geneticist and aquaculturist Tiit Paaver (1952-2019) on “Fish Considered Extinct” [“Väljasurnuks peetud kala”].

Fifty-seven years later, after a lifetime of not only imploring the world, but more importantly, of creatively and unforgettably *showing* us how to “know nature”, a new-found species of small wasps (braconids) were



named in his honour, inscribing his name for all time in Taxonomy’s “book of life”:



Holotype of the Costa Rican braconid *Hymenochaonia kalevikulli*, named and reported in Sharkey, Janzen *et al.* 2021, available at <https://zookeys.pensoft.net/article/55600/><sup>1</sup>.

<sup>1</sup> Sergey Chebanov notes “Evidence of Kalevi’s recognition as a field biologist by having his name being saved in the zoological nomenclature for all subsequent times in this way is even more remarkable in that taxon names are not now very often given in honor of scientists who are not associated with the study of groups of organisms to which the newly described taxa belong” (private correspondence).

Kalevi Kull's life in the life sciences, applied and theoretical, written, spoken, and lived, cannot be, and is not, fully captured by the contributions in this volume. What is captured instead is the impact that life has had so far on so many other life scientists, ecologists, semioticians, philosophers, and scholars of all sorts from around the world.

Over 90 such scholars testify in this volume to the profound impact that Kalevi's thinking and his person have had on them, and thus our original plan of collection "70 for 70" on the occasion of his 70th birthday this year turned out to be too modest an estimate by a considerable degree.

Beginning with Sergey Chebanov's moving boyhood recollections of Kalevi – which we have chosen to include here in place of a traditional biographic Introduction – and ending with Riin Magnus's over 500 entry Bibliography of Kalevi's publications from 1982-2022, the remaining 88+ contributors were tasked with the challenge of writing about Kalevi's impact on them in under 1000 words, and the picture that emerges from this international effort indeed captures well the impact that Kalevi Kull has had, and continues to have, on the ways that we all now have come to "know nature". This volume, then, is a mere update on the project that he started almost sixty years ago with his boyhood journal.

70 years is a wonderful age for young people and for young academic disciplines. It is difficult to set the exact age of biosemiotics, but given its dynamism, in some sense, it is ever new<sup>2</sup>. The relatively young age of this science explains its not always well-established terminology – which was manifested in our publication, in particular, in the absence of an unambiguous correspondence between the translations of terms into French and Russian and their originals. Let it be! Any science inevitably goes through such a stage in its development. In addition, given the celebratory nature of this publication, we took the liberty of slightly deviating from the rules of the "Epistemologica et historiographica linguistica Lausannensia" series in terms of the articles layout – in particular, as concerns the references. Anyhow, the resulting collection probably reflects the nature of modern biosemiotics itself – diverse, dynamic and lively!

In the spirit of the original *Tunne loodust!*, likewise, this current volume is the work of friends. Of particular help were Timo Maran for his assistance in compiling the original list of candidate contributors; Victoria Alexander, Johsua Bacigalupi, and Pauline Delahaye for their meticulous proofreading and re-formatting of texts; Israel Chavez for the excellent illustration that is our frontispiece; and Meelis and Thea Kull for the provision of even more wonderful family photos than space allowed us to print in the current volume. We also thank Anna Isanina and Sébastien Moret for their help with computer graphics and proofreading. Grateful thanks to all of them, and for everyone whose words appear in the current volume.

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<sup>2</sup> Although one of Kalevi's (Kull 2022) latest discoveries finds the term being mentioned as early as 1855!

And happy 70th birthday to Kalevi Kull, as he continues on his never-ending quest to ever better know what nature knows – and then to share that knowledge with others<sup>3</sup>.

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<sup>3</sup> Donald Favareau’s contributions to this volume were completed under the auspices of National University of Singapore AcRF Research Grant number WBS A-0003116-00-00.

## Introduction: Leading forward<sup>1</sup>

Sergey V. CHEBANOV

*Seminar on Biohermeneutics, Saint Petersburg*



Kalevi Kull, 1968.

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<sup>1</sup> Acknowledgments: The author is sincerely grateful to Don Favareau for additional editorial work and help with the selection of illustrations, and to Meelis and Thea Kull for providing the fine picture of Kalevi that appears at the start of this article. It so happened that at first I wrote “1000 words” about Kalevi, as requested, but then Don and Katia encouraged me to expand it to serve as the Biographical Introduction to this volume, and so it began to increase and acquire details. In general, for 55 years, Kalevi and I have known each other and have lived a lot, so I appreciate the opportunity here to share some of my recollections about some of the events, people, and conversations that have shaped our lives as friends.

Leading forward. That's what Kalevi Kull does!

Kalevi is different in that if he is interested in something, he is not only interested in it, but also gathers around him those who are also interested in it, and leads them forward. At the same time, he leads them in such a way that they, together with Kalevi, are in front, and not somewhere behind, or on the side of, the events taking place.

So it was in everything. It happened like this.

At the age of 14, Kalevi, was the subject of a mini-interview in the journal *Young Technician* [Юный техник] (1967, No. 11, p. 19), in which he talked about his study of Estonian lichenized mushroom *Cladonia* and invited us to study lichens in such a way that, as a result, we got to know him<sup>2</sup>.



*Cladonia stellaris* – Estonian mushroom of the year 2020.

From this mini-interview, Kalevi received many responses from girls, and two or three from boys. One of them was me. This was made possible by a miraculous coincidence. The fact is that *Young Technician* is a magazine for children and teenagers who are interested in technology. Inviting them to study lichens is almost hopeless. But this magazine was received by my second cousin, who really did do technical modeling. He knew that I was dealing with lichens at that time, and so he gave the maga-

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<sup>2</sup> Because we were unable to find the copyright holder of the interview, we cannot reprint a picture of it here. One does exist online for your viewing, however, at [tinyurl.com/ YTKalevi](http://tinyurl.com/YTKalevi).

zine to me. And so in 1968 I began to correspond with Kalevi. Later we found ourselves, to use the words of the editors of *Consortium Masingii* in the “H.-V.Trass lichenological consortium”<sup>3</sup>.

Our correspondence concerned not only lichens, but we told each other about our families, and about the environments in which we lived. I remember Kalevi’s stories about the Estonian traditions of swinging (a pagan spring custom, later transferred to the Easter week, which consists in the fact that swinging on a swing, mainly by women, stimulated the fertility of people and the fertility of the earth, and accompanied by rocking songs) which has now become the basis of the modern sport of *kiiking* – and about how the folk customs of welcoming spring and celebrating Easter are intertwined, and what festive dishes are prepared at the same time. This interest of Kalevi’s in ethnography and local customs allowed him in the 2000s, when organizing two of the annual international Gatherings in Biosemiotics conferences in Estonia, to give them a pronounced national charm (and we will see this interest manifesting in Kalevi’s work and interactions with others many more times in the following short reminiscences).



An early form of kiiking at the Ohessaare village in Saaremaa, Estonia 1913.

At the beginning of 1970, our first in-person meeting took place. Kalevi came to Leningrad with a group of his fellow students to present a

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<sup>3</sup> Aaviksoo *et al* (eds.), 1995.

dramatization of poems by little-known poets. The program of the trip included concerts, visits to major museums, and an excursion to the Pavlov Institute of Physiology Academy of Sciences Koltushi – the “capital of conditioned reflexes” – where I.P. Pavlov worked. At that time, too, Kalevi introduced me to Tiit Paaver (1952-2019), son of biologist Kalju Paaver, who was already interested in fish biology by then, and who later became a member of the Duk-Duk society (see below), and a well-known ichthyologist.

Much of our meeting was spent discussing where to study after graduation from high school. Both of us were sure that we would receive a biological education, both of us were familiar with many departments of biology faculties of the Tartu and Leningrad universities, but the choice of the department remained a question for us. This choice was equally relevant to us at that moment, which requires some explanation. Kalevi is one year older than me. However, in the former USSR, there was a 10-year general education in the Russian Federation, and 11 years in the other union republics, to accommodate the study of two languages, national and Russian, in comparable time. Therefore, we finished school and entered the university in the same year (1970). Anyway, we agreed that we would meet with one another again in Tartu after our admission to the universities in August 1970.

During Kalevi's arrival in Leningrad, as the last point of their group's journey, there were very severe frosts. It so happened that the Kalevi's size 48 boots fell apart, and it was impossible to buy shoes of this size in the Soviet Union without pre-ordering. The only other pair of footwear that Kalevi had left were sneakers. Then my grandmother, M.V. Jackiewicz, who survived both the devastation of the Civil War of 1918-1922, and Siege of Leningrad, advised Kalevi to wrap his feet in newspapers under the sneakers before going out into the street, which he did. Grandmother then gave us an assignment for during my trip to Tartu: to try to find traces of her uncle I.I. Lappo, who until 1918 was a professor at the University of Tartu (which at that time was called Yuriev).

In the first half of August 1970, Kalevi and I entered our universities, and before the start of classes, I came to visit him in Tartu and Kalevi introduced me both to his family, and to the life of biologists of the old German university. Kalevi had a wonderful father, Lembit Kull, who lived a long life (1921-2019), was a mathematician and an engineer, and taught Theoretical Mechanics at the Agricultural Academy<sup>4</sup>. During the Second World War, he lost his leg, but after that he was cured, educated, married and became the father of such wonderful sons<sup>5</sup>.

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<sup>4</sup> [https://et.wikipedia.org/wiki/Lembit\\_Kull](https://et.wikipedia.org/wiki/Lembit_Kull) (accessed on 30.04.2022).

<sup>5</sup> Kalevi's destiny to lead forward was predetermined both by his own name, as well as the name of his father, both of which are very important for Estonian culture: Kalevi is the hero of the Estonian epic, *Kalevipoeg*, and Lembit is the leader of the Estonians in the 12th century, leading the struggle for independence.

I met with him for the first time in 1970 and met again almost every time I visited Tartu. Kalevi's mother, Hilja Kull (1924-2019), was also a wonderful person, a beloved mathematics teacher, and very active in human rights activities in the 1950s.



Photo of the Estonian Agricultural Academy taken by Eduard Selleke (1885-1976).

Unfortunately, just a short time before my visit, my grandmother died. This was thus a very difficult time for me, as my grandmother was the person with whom I was closest. I lived in Kalevi's house with his parents and Olevi at this time, and his mother treated me like family and fed us all. Estonia then differed from Russia in many ways, and it was very interesting for me, to see how it differs from how things were in Russia, and in particular, in Leningrad and my region. In some details (in terms of the scents and details of serving), it reminded me of how my family and I were received, when I was seven years old by our very distant relative, an Estonian, who had emigrated to Australia for some time and later returned home to Estonia. I lived in this apartment with Kalevi's parents, and during this time, we complied with my late grandmother's request, and tried to find out something about I.I. Lappo. But, no one knew anything about him and only A. Malts, who worked at the department of Juri M. Lotman, heard about him (although after the collapse of the USSR, most of his archive was discovered at the University of Tartu).

By the end of high school, Kalevi sought to become an exemplary modern Soviet young man, and in his university years, Kalevi became one of the leaders of the Duk-Duk Theoretical biology Circle, modeled on the



secret men's unions of Polynesia. As a member of the "Duk-Duk" he was one of the organizers of the Estonian Schools of Theoretical Biology, and which he has been a continuously active participant since 1975 – or 47 years so far, and counting!



First Spring School of Theoretical Biology at Pihlaka Farm in Rutja, Lääne-Virumaa May1975. Standing from left to right: Raivo Leht, Toomas Tiivel, Kalevi Kull, Jüri Parik, Tiit Paaver, Toomas Neumann, Aksel Siiner, Jaanus Remme, Peeter Ernits, Mati Kahru. Sitting: Sergey Chebanov, Vello Reeben, Toomas Frey, Viktor Masing, Toomas Sutt<sup>6</sup>.

And it was Kalevi who opened the way for theoretical biologists not only from Estonia, but also from Leningrad, to the Schools of Theoretical Biology (1976), organized by Moscow University under the leadership of A.P. Levich.

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<sup>6</sup> Тинн 2017: 7.



End of January 1976. 2nd Winter School in Theoretical Biology, organized by Moscow University under the leadership of A.P. Levich at the Institute of Biology of Inland Waters of the Academy of Sciences in the village of Borok, Yaroslavl Region (former estate of N.A. Morozov). Here Kalevi and I got acquainted with the Group  $\beta$  of Theoretical Biology of Moscow University. In the photo: Kalevi Kull (fourth from right, third row), Sergey Chebanov (in bowtie, below Kalevi), Toomas Tiivel (two people to the right of Kalevi, looking left), Alexei Sharov (sixth to the left of Kalevi, third row, in checkered shirt), Tiit Paaver (to the immediate right of Alexei, with beard and glasses), Vasily Nalimov (elderly gentleman in middle, bottom row) and many other very interesting people.



The Fourth Winter School by A.P. Levich. January 1978. Part 1 took place at the Viitna center of Lahemaa National Park. Against the background of the building, which was a meeting room and a sauna: Kalevi Kull (on the balcony, fifth from left), Alexei Sharov (sitting rightmost), and Sergey Chebanov (in fur hat, against the right window of the doorway and between two madams). A few days later Part 2 took place in Tartu. The theme of the joint working meeting was “Biology and Linguistics”.

Kalevi at the age of 27 became a member of the Theoretical Biology Section of the Scientific and Technical Council of the USSR Ministry of Higher and Secondary Specialized Education (1979-1980). Even then, Kalevi knew how difficult it was to reach his goals. He often sang during this time: “Really, how to get to purpose / If the boots are too tight?” (from the song by Bulat Okudzhava “The barrel organ-charlatan”).

In his student years and after graduating from the university, Kalevi was involved in various areas of empirical biology: he studied thermoregulation in turukhtan nestlings (*ruff Philomachus pugnax*), the reed grass (*Calamagrostis*) of Estonia, forest biocoenoses, and meadows. Many of these activities were invested with not only with specialized biological meaning, but were of methodological or general cultural interest, as well.

Notably, Kalevi’s cooperation with the ecologist and geobotanist Toomas Frey (in his apprenticeship with him) was not only a way for Kalevi to enter into the problems of forest ecology, but also into the development of a certain way of doing theoretical work, since Frey was an outstanding theorist as well (it is no coincidence that Frey was one of the key persons of the First Estonian Schools of Theoretical Biology in Rutja, 1975, and would later go on to be appointed Estonian Minister of the Environment in 1990).



Toomas Frey in the kitchen of the Voore Ecological Station, 1972.

At this time, Toomas Frey was in charge of the forest ecological station in Voore. The people who worked at the station were very passionate about their research and the atmosphere was completely informal. The center of life there was a sauna, in which Toomas Frey even gave lectures on ecology (at a temperature of about  $+100^{\circ}\text{C}$ ). I also came to Voore to collect lichens with Kalevi, and it so happened once that Kalevi's birthday fell at that time. On this day, Kalevi and I bathed in the sauna and, jumping out of it, sat naked in barrels of cold water on the street... and at that moment Kalevi's parents arrived for his birthday! Therefore, we had to sit in our barrels longer than expected.



An old sauna originally belonging to Andres Koppel's grandfather became a centre of social and intellectual activity at Voore. Here it is being transported there on April 28, 1973.

It seems to me that his works in the meadows had a very great and versatile significance both for the formation of Kalevi as an individual and for the public consciousness of Estonia and environmental activists of all countries.

Firstly, Kalevi showed that the Estonian meadows he studied have the maximum biodiversity in the temperate zone – and that this diversity, contrary to the opinion of alarmist ecologists, is achieved not in the absence of anthropogenic impacts, but under moderate anthropogenic pressure, which includes systematic mowing (sometimes 2-3 times during the growing season). Otherwise, either overgrowing with low-value tree species (willow, alder, birch) occurs, or swamping occurs with the destruction of a continuous sod cover and the formation of tussocks from sedges (*Carex spp.*), cotton grass (*Eriophorum*) and other similar plants, which in one way or another leads to a sharp reduction in biodiversity. I am well aware of these phenomena, due to the fact that since early childhood, I have been visiting my grandfather's house in Shugovitsy, 50 kilometers east of Narva in the same strip of meadows, and observing the same pro-

cesses there (Kalevi, despite numerous invitations, would not reach Shugovitsy for many years).



View of Vooremaa Forest Ecological Station (top). Kalevi encouraging students with late-night coffee as they write up their daily field observations (bottom).

Secondly, Kalevi drew attention to the fact that among houseplants and garden plants, introducers predominate. Without categorically rejecting

introducers in this capacity, Kalevi asked himself questions about which autochthonous plants can be used as indoor and garden plants and about which introducers can be considered as corresponding to Estonian culture, national eco-culture, not contradicting it. Having formed his ideas about this subject, Kalevi tried to build a collection of such living plants. Kalevi was very interested in the choice of Estonian emblematic organisms – such as the cornflower (*Centaurea cyanus*) as a plant as a symbol of Estonia and the swallow (*Hirundo rustica*) as a bird-symbol, or the choice of *Cladonia stellaris* as the Estonian mushroom of the year (see the beginning of this text).

It is quite obvious that these studies are directly related to ecosemiotics.

Thirdly, it seems to me that while working on the Puhtu-Laelatu meadows, Kalevi most truly got into the spirit of Jakob von Uexküll, whose work Kalevi had been interested in since the 1970s (see, for example, the 1977 Third Estonian School of Theoretical Biology, whose topic was “Theory of Organism” which took place in Puhtu and was dedicated to Jakob von Uexküll)<sup>7</sup>.

This diversity of Kalevi’s interests in empirical biology determines that Kalevi remains a field biologist. Biosemioticians became convinced of this when Kalevi led tours of Estonian nature during the Second Annual International Gatherings in Biosemiotics held in Tartu in 2002 (at that time it was clear that some biosemioticians were confused in the natural landscape).

In the difficult historical, socio-cultural situation of Estonia in 1980–1990, Kalevi becomes the one who seems to find a balance point in the interaction of the Estonian, German (the former lingua franca of European science before the revolution), Russian (the lingua franca of the Russian Empire and the Soviet Union) and English (the modern global lingua franca) biological literatures and languages, thereby connecting the traditions of many different cultures. This defines a very special place for Kalevi in the culture of modern Estonia, and in Eastern Europe in general.

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<sup>7</sup> Uexküll kept a summer-house in Puhtu, Estonia, between 1928 and 1939, where he spent his summers with his family, and where, according to Magnus and Kull (2009: 124) he probably wrote most of his book “The Theory of Meaning” which was published in 1940. Since 1949, the building belongs to and serves as the Puhtu Biological Station, where Kalevi is still a frequent visitor, and to which he brought the members of the Twelfth Annual International Gatherings in Biosemiotics conference in 2012.





Andres Luure, Alexander Sedov, Kalevi Kull, Sergey Chebanov, Fatima Cvrčková, Anton Markoš, and Torsten Rüting at an outing to an Estonian bog that Kalevi conducted during the Second Annual Gatherings in Biosemiotics on June 17, 2002. This photo very well conveys the above-discussed side of Kalevi as a preeminent guide to the biosemiotics of forests, swamps, and meadows.

The important thing about Kalevi taking such a position was that Kalevi knew Russian well, which was not very common in Estonia. Kalevi told me that his relationship with me helped him in this, but he did not tell me any details. A few years ago, his staff told me what this “help” was. Our correspondence began in 1968, and has since become more and more intense. The first years we corresponded in such a way that we wrote letters by hand. I always had terrible handwriting, and although I tried very hard, it was very difficult to make out my handwriting, especially for a person for whom Russian was not native. So Kalevi acted as follows:

He received letters from me, and at lectures at the university, he sorted out the Cyrillic characters in my messages, rewrote them in his good handwriting in Russian, and then translated them into Estonian. It should be borne in mind that my letters were very large. Thus, a letter criticizing the theory of advanced reflection by P.K. Anokhin was about 40 pages long. As a result, Kalevi learned Russian.

Kalevi has always had an active interest in politics, and it is important to note that in this area, Kalevi’s imagination is devoid of the limitations that most people have. So, in the late 1970s, he lived in the village of the Tõravere astronomical observatory (which was another source for him to expand the range of his interests). Tõravere is located on fairly high



hills. Once, Kalevi and I walked there and discussed the future of Estonia...

In the late 1980s, on the basis of Articles 51 and 147 of the Geneva Convention relative to the Protection of Civilian Persons in Time of War as Adopted on 12 August 1949, Kalevi started a campaign to get Estonians to return the military cards of the USSR army to the military commissariats, as they were being forced into military service by the administration of the occupying country. In 1988, at the meeting “Semiotic approach in theoretical biology” in Laelatu, organized by Kalevi, who sensed the potential of the emerging semiotically conscious biology, the flag of independent Estonia was publicly hoisted for the first time.



Kalevi hoisting the flag of independent Estonia at the beginning of a field practicum for students at the biological station at Laelatu.

Too, Kalevi was the president of the Estonian Naturalists' Society during the difficult time of the formation of Estonia as an independent state (1991-1994), the organizer since 2001 of Gatherings in Biosemiotics (where Kalevi became the co-leader of the Copenhagen-Tartu school of biosemiotics, along with Jesper Hoffmeyer and Claus Emmeche) the head of the Department of Semiotics at the University of Tartu (from 2006 to 2018), and the President of the International Society for Biosemiotic Studies (since 2015). Kalevi creates a three-faceted brand of Tartu biosemiotics, combining the ideas of Karl Ernst von Baer, Jakob von Uexküll and Juri Lotman.



Kalevi invites Jesper Hoffmeyer and me to lecture at the University of Tartu, followed by a visit to KÜünimetsa, Estonia: October 2, 1994.

Kalevi remembers the people he is close to – both the living (Kalevi has time and attention for them) and the departed (he knows how to repay a debt of memory to them; thus, Kalevi became the editor of collections in memory of his teacher Toomas Frey<sup>8</sup>, and of his younger brother, the ecologist, Olevi Kull<sup>9</sup>).

Kalevi also knows how to accept parting so that it does not turn out to be oppressive, and can remember the past in such a way that the present and future are built from it. This, too, allows him to lead others forward.



Jesper Hoffmeyer, Claus Emmeche and Kalevi Kull at the conclusion of the First Annual International Gatherings in Biosemiotics, which they organized and founded in 2001 at the University of Copenhagen, Denmark.

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<sup>8</sup> Kull, Koppel 2017

<sup>9</sup> Kull 2007; Püttsepp (ed.), 2015.



Leading forward and joining hands with friends at the 40th Spring School of Theoretical Biology in Randivälja, Pärnu County, 2014 (above) and at Twelfth Annual International Gatherings in Biosemiotics in Leigo, Estonia in 2012 (below). That's what Kalevi Kull does and continues to do!



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# **When the immune system makes the wrong choice between incompatible options**

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***Abstract:***

Kalevi Kull has argued that “Processes without choice would be algorithmic transformations” (2018), further developing his idea that decision-making, i.e., semiosis, “stems from logical incompatibility in organic nature” (2015). In this short paper, I explore K. Kull’s incompatibility hypothesis in the context of autoimmune disease, which can be said to stem from a confusion over the identification of self versus non-self, followed by a bad choice. I apply a biosemiotic perspective to the dysregulation of T cells by molecular mimicry and bystander activation, which illustrates the roles of iconicity and indexicality, respectively.

***Keywords:*** autoimmunity, biosemiotic choice, self vs non-self, molecular mimicry, bystander activation

After remarking that Pierce does not dedicate much attention to how *new* signs appear, Kalevi Kull<sup>1</sup> offers the suggestion that they can emerge when a *choice* has to be made between incompatible responses. Having also noted<sup>2</sup> somewhat of an absence of biopoesis (creativity) from the discussion of Peircean biosemiosis (habit), I am compelled to explore Kull's incompatibility hypothesis. I will do so in the context of viral-induced autoimmune disease, which can be said to stem from a confusion over the identification of self versus non-self.

## 1. SUMMARY OF KULL'S THEORY OF CHOICE

Organisms, Kull points out, continually make new and maintain old linkages, *e.g.*, *If A, then do B*. Only living systems "can preserve various things linked that would not become repeatedly linked by self-assembly"<sup>3</sup>. As these conditioned and unconditioned stimulus-response operations are reinforced, they become habits. Since habits can be acquired independently of each other in different contexts, two habits might be contradictory or logically incompatible, *e.g.*, *If A, then B* and *If A, then C*. The situation requires a non-algorithmic response, a choice.

Such logical contradictions do not exist for non-living systems, which do not refine or adapt their laws or algorithms. There is no meaning creation in logically congruent systems, which work lawfully, like a machine, not habitually and recursively as living systems do. "By definition, the physical laws (both deterministic and stochastic)", writes Kull, "cannot contradict each other, nor can they have exceptions (this is a fundamental assumption for physical theories)"<sup>4</sup>. Signs *can be* contradictory because they are not themselves the things they represent. They are merely pointing toward objects.

## 2. APPLICATION TO LEARNING IN THE IMMUNE SYSTEM

If an organism's choice fails to bring about the object, it will not be reinforced. When the immune system fails to distinguish between self and non-self in a way that supports the overall health of the organism, it appears to have made the wrong choice. I focus on a case of negative creativity – pathology – to highlight the fact that, as Kull points out, "Meaning may appear only in systems in which something sometimes goes wrong"<sup>5</sup>. Similarly, Short<sup>6</sup> has noted that, only if an organism is capable of pursuing signs of an object that does not, in fact, exist, can we call its behavior semiotic.

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<sup>1</sup> Kull 2015.

<sup>2</sup> Alexander 2013.

<sup>3</sup> Kull 2015: 617.

<sup>4</sup> *Ibid.*: 618.

<sup>5</sup> *Ibid.*: 617.

<sup>6</sup> Short 2007: 151-177.

Favareau<sup>7</sup> has likewise noted the necessity of fallible subjectivity for learning, a point woefully lost on Descartes. According to Kull, living systems can make errors as the result of choices.

Two main mechanisms are thought to underlie viral-infection-induced autoimmune responses: *molecular mimicry* and *bystander activation*.

An autoimmune response triggered by molecular mimicry occurs when a viral protein is structurally similar to animal proteins<sup>8</sup>. Cytotoxic T cells whose receptors fit the virus protein “tag” (antigen) on the surface of an infected cell may also attack healthy “self” cells whose protein tags are “mimicked” by the virus. For example, Lyons-Weiler<sup>9</sup> found that out of 37 SARS-CoV-2 proteins, 28 epitopes have structural similarities to human protein. This might explain why, when left untreated, normally mild Covid-19 can develop into a severe illness, as T cells trained to attack virus-infected cells, turn on the brain, intestines, lungs, or liver cells. The result might be a *cytokine storm* of signals that further amplify T cell replication, and some T cells end up attacking the body’s own cells. In line with Kull’s hypothesis, I argue that this is a case of mistaken identity due to the similarity of icon sign vehicles: presented with the option of distinguishing between self and non-self, the T cell makes the wrong choice and executes the kill operation on self.

The “bystander activation” of autoreactive T cells may be understood in terms of indexical sign relations. Normally, cytotoxic T cells kill virus-tagged, infected tissue cells. After the infection subsides, most T cells die, but a few memory T cells remain and can be quickly replicated upon re-exposure to the same pathogen. In some rare cases, cytotoxic memory T cells can become reactivated by cytokines signaling a *new unrelated* infection. These “bystander” autoreactive T cells attack *uninfected* tissue cells; they do not attack cells infected with the new virus. We can suppose that these memory cytotoxic T cells must have learned to confuse infected tissue cells with healthy same tissue cells. This may be a case of indexical semiosis, in which the meaning of one sign vehicle is transferred to a nearby one.

In a review of the mechanism, Fujinami *et al.*<sup>10</sup> explain that bystander activation appears to occur during severe infection when many protein fragments of T-cell-killed infected tissue are released into the extracellular matrix, where these tissue proteins are engulfed by macrophages or dendritic cells, which, in turn, present these self-protein antigens on their surfaces. Surface tags on these immune cells do generally *indicate* a serious infection is in progress, and so naturally, if T cells interact with them, such tags might *indicate* to the T cell that they should treat self cell tags

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<sup>7</sup> Favareau 2010: 3, 21-24.

<sup>8</sup> Smatti *et al.* 2019.

<sup>9</sup> Lyons-Weiler 2020.

<sup>10</sup> Fujinami *et al.* 2006.



like non-self tags due to the diseased context in which these self protein tags are being presented to the T cell.

A normal cytotoxic T-cell operation, to return to Kull's hypothesis, can be formalized as *If non-self, kill* and *If self, do not kill*. With bystander activation, the tag of self has been contextually linked with the tag of non-self. When the memory T cell is presented with two incompatible options, it takes the wrong option.

We can conclude that the mechanisms for making bad choices hinge upon the same mechanisms, iconicity and indexicality, that normally help the living system learn to make new useful responses. Only in a semiotic process can an operation, *If A then B*, go wrong, that is, be misinterpreted. And only in a semiotic process can making a bad choice potentially lead to the creation of new habits and the possibility of learning, adaptation, and evolution.

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**Victoria N. Alexander**  
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### **Quand le système immunitaire fait le mauvais choix entre des options incompatibles**

#### ***Résumé:***

D'après Kalevi Kull, «les processus sans choix seraient des transformations algorithmiques» (2018); c'est ainsi qu'il a développé plus avant son idée selon laquelle le processus de prise de décision, c'est-à-dire la sémiologie, «découle d'une incompatibilité logique dans la nature organique» (2015). Dans ce court article, j'explore l'hypothèse d'incompatibilité formulée par K. Kull en discutant des maladies auto-immunes, dont on peut dire qu'elles découlent d'une confusion quant à l'identification du soi par rapport au non-soi, confusion suivie d'un mauvais choix. J'applique une perspective biosémiotique à la dérégulation des cellules T par mimétisme moléculaire; il est également question de l'activation de l'observateur, ce qui illustre respectivement les rôles de l'iconicité et de l'indexicalité.

**Mots-clés:** auto-immunité, choix biosémiotique, soi vs non-soi, mimétisme moléculaire, activation de l'observateur

**Виктория Н. Александер**  
Фонд Дактиля

### **Когда иммунная система делает неправильный выбор между несовместимыми вариантами**

#### ***Аннотация:***

Калеви Кулль утверждал, что «процессы без выбора – это не более чем алгоритмические преобразования» (2018), тем самым развивая свою идею, согласно которой принятие решений, то есть семиозис, «проистекает из логической несовместимости в органической природе» (2015). В этой короткой статье я применяю гипотезу несовместимости, сформулированную К. Куллем, к контексту изучения аутоиммунного заболевания, происходящего из-за путаницы в отождествлении своего и чужого, за которой следует неблагоприятный выбор. В биосеmiotической перспективе исследуется нарушение регуляции Т-клеток посредством молекулярной мимикрии; речь заходит и об активации наблюдателя, что иллюстрирует роль иконичности и индексальности, соответственно.

**Ключевые слова:** аутоиммунитет, биосеmiotический выбор, «свое» vs «чужое», молекулярная мимикрия, активация наблюдателя



# **Book-Human hybridities**

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***Abstract:***

Prior to Book, only Pre-History could be speculated for Human. Post Book, and post Book-Human symbioses, Library makes History, paving the path for the Library-Kull singularity.

***Keywords:*** word, book, library

In almost any language, Book descended from Tree, like Human; we are kin from way back.

Around Europe, Tree was Beech. Beech Bark seduced inscription. Beech twigs captured moving hands and fingers too, making marks for self, others, to be stolen by Time for roving eyes and minds. Before Bark and Detachable Book, the substrate had been stone; and before stone, the substrate had been sand and mud, engaging hands and fingers, and feet and toes, for impression and expression, sometimes for forever Time – with traces outliving either Book or Human.

After Beech, other trees have learned how to be pulped, and to unfold new kinds of leaves, pages, and to multiply and prosper. Book itself has learned how to reproduce, inside and out, to stand on its spine, to leak its contents from Book to Book with or without eyes or minds of Human, and to explode the mycorrhizae below into the meta-semiosphere of Word.

As mediated and mandated by mycorrhizal networks of pre-Time Idea, and above in the canopy, by mindprints consisting in Word anticipating future Time – thus Book indelibly fertilized Human, and vice-versa. The fusion of Book and Human constituted the major Umwelt for Idea, and forever after Word was made plural and polyvalent as Idea.

That's because Book harbors contagion by virtue of the boisterousness of Idea. When open, Book can be dangerously seductive, as any pageful of Idea can wash around the leaf, spill over in any direction, or even saltate, seeking conjugation. Idea never tires. When closed, Book exposes a riddle, title, on the spine, and that Idea circulates up and down before clawing inside for confirmation, thence to either shoulder, hoping for synergies, not redundancies, but ultimately rhapsody prevails. That Book is addictive can be traced to Idea, and Idea, to Pheromone.

Idea appeals to all senses available to Human. Just as all senses contribute to Book, Book invites and affords all senses in return. Motion and emotion suffuse Book, for all to harvest in sight, through sound, by inhaling, when tasting, and under caress. With senses alerted, the senses can pick up the flavor and flesh of leaf, twig, bark, root, according to the season of Beech.

Human hubris would claim Word to have authored Book. Not so. If Book requires an author, it will not be in the moves of Human finger, tongue, or synapse, but in the effusive dance of whole body in motion with emotion, punctuated by memory, unleashed by Idea. More importantly, given parthenogenesis, Book requires no agent for procreation. Proliferation of Book sprouts from fecundity of Idea, not the strength or speed of Human finger.

Book has an affinity for its own kind, and when in swarm, that conglomerate has been called Library. In Library, however, Book may be condemned to Alphabetization, when Word overpowers Human, disabling agency of Idea. Book then must stand at attention. Human shares in this

propensity for order, and can sometimes be found accordingly, obedient to categories.

However, Idea resists order. The further shuffling of Idea in Book and in Human results in cross-trafficking, feeding ever more permutations of Idea in thrall to Library. Even left to gravity and entropy, Book will recover from Alphabetization and spangle with ever greater exuberance. Book, and also Library swarm, have found themselves capable of flight. That explains the wholesale exodus of Sebeok Library from North America Plains to the Kull Attractor Sink of Tartu in the Land of Beech.

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### **Hybridités livre-humain**

***Résumé:***

Avant le Livre, seule la Préhistoire pouvait être spéculée pour l'Homme. Après le Livre, et après les symbioses Livre-Humain, la Bibliothèque fait l'Histoire, ouvrant la voie à la singularité de la Bibliothèque-de-Kull.

***Mots-clés:*** mot, livre, bibliothèque

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### **Книго-человеческие гибриды**

***Аннотация:***

До появления Книги для Человека можно было говорить только о Предыстории. После появления Книги и после симбиоза Книги и Человека Библиотека творит Историю, прокладывая путь к сингулярности Библиотеки Кулля.

***Ключевые слова:*** слово, книга, библиотека

# From my *Umwelttunnel* to yours

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## ***Abstract:***

Kalevi Kull defined Jakob von Uexküll's *Funktionskreis* as the “primary model of meaning making”, but it always seems to disappear in the discourse behind the concept of *Umwelt*. The *Funktionskreis* model explains *how* organisms construct their *Umwelt* through an emergent system that connects vegetative, physiological, social, cognitive, and cultural levels of being, whose integrated whole is the organism's coherent perception of the world. This is my case for the word *Funktionskreis*.

***Keywords:*** Kalevi Kull, Jakob von Uexküll, *Funktionskreis*



According to Kalevi Kull, Uexküll's *Funktionskreis* is the "primary model of meaning making"<sup>1</sup>. Of course, the most well-known aspect of Jakob von Uexküll's work is undeniably the concept of *Umwelt*, the subjective reality organisms actively construct through their species-specific perception and action. The mechanism that underlies this active creation of a subjective *Umwelt* is the *Funktionskreis*, a processual model of semiosis.

The word "Umwelt" has an aesthetic advantage; and has enjoyed widespread use in its untranslated form in a range of disciplines from ethology to philosophy. Unfortunately, the various translations of the word "Funktionskreis" do not capture the fundamental significance and emergent breadth of the *Funktionskreis* as a general model of semiosis. Let me explain why the term *Funktionskreis* deserves equal *in lingua* recognition and usage.

Uexküll's concept of *Funktionskreis* is a multilevel model of perception and action that connects the vegetative, physiological, cognitive, social, and cultural levels of the semiotic life of organisms<sup>2</sup>. It entails feedback loops, circularity, cyclicity, cybernetic circuits, iterative repetition, perceptual repair, and habit. *Kreis* can accommodate many concepts including *circle*, *cycle*, *loop*, *circuit*, *connection*, *space*, *area*, or *community*. When we talk about *in welchen Kreisen wir uns bewegen* we can refer to our "whereabouts" or "physical movements", "social connections", "status", "interests", "spheres of life", or "cultural embeddedness". The *Funktionskreis* explains *how* this active creating of an organism's subjective *Umwelt* works on all levels of organism-environment interaction. That is why the *Funktionskreis* model is the origin of concepts such as Wiener's *Regelkreis*, von Weizsäcker's *Gestaltkreis*, Thure von Uexküll's *Situationkreis*, and Plessner's *Lebenskreis*. From physiology and ethology to cybernetics, proprioception and movement, to anthropological and integrated medicine, and psychology, we see versions of the *Funktionskreis* model in an emergent system of embodied self-reference that is the basic mechanism underlying any coherent perception of the world<sup>3</sup> that is necessary for *consciousness*.

From there, Kalevi Kull's ideas about *choosing* and *learning*<sup>4</sup> as fundamental to all "mechanisms of meaning-making" are most gratifying. From this view, the *Funktionskreis* also appears as a model of limitations and selective perception, loose ends, and missed opportunities. It is about all that we are missing. It explains the constant bypassing of potential signs, the negative side of what appears relevant, desirable, advantageous, or simply *habit*. Each moment in the subjective Now presents us with choice and opportunity.

<sup>1</sup> Kull 2020.

<sup>2</sup> Cf. Kull 2018b.

<sup>3</sup> Uexküll 1928: 117.

<sup>4</sup> Kull 2018a.

I look to Kalevi Kull as our curator of deep knowledge, connection, and familiarity, and at the same time the source of creative impulses for the future. He points back and forward with equal ease, always deploying ideas with warmth and openness. I am grateful for our real and imaginary conversations and the exchange of texts, whatever the format or language.

In the context of his integrative medicine, Thure von Uexküll explains our active construction of an individual reality “through the *Funktionskreis* through innate programs [...] that were acquired in the course of [our] individual life experience [*Lebensgeschichte*] in [our] culture”<sup>5</sup>. Jakob von Uexküll imagined an *Umwelttunnel* that surrounds each subject from birth to death<sup>6</sup>. We’re always caught in our subjective tunnels of oneness held together by *Funktionskreise*. According to Jakob von Uexküll,

The only unchanging factor that connects this tangled web of the world [dies wirre Weltgewebe] and brings it into shape is the *Funktionskreis*. All *Funktionskreise* are built on the same principle. They constitute the active laws of nature [*Naturpläne*] that should be regarded as the basic principles [*Elementarfaktoren*] of the universe. The entire universe, that consists of limitless *Umwelten*, is held together by *Funktionskreise* and bound together as a whole by that plan we call nature<sup>7</sup>.

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<sup>5</sup> Uexküll 1979 [1986: 22].

<sup>6</sup> Uexküll 1928: 323.

<sup>7</sup> *Ibid.*: 324.

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### **De mon *Umwelttunnel* au vôtre**

**Résumé:**

Kalevi Kull a défini le *cercle fonctionnel* de Jakob von Uexküll comme le «modèle primaire de formation de sens», mais il semble toujours disparaître dans le discours derrière le concept d'*Umwelt*. Le modèle du *cercle fonctionnel* explique comment les organismes construisent leur *Umwelt* à travers un système émergent qui relie les niveaux d'être végétatif, physiologique, social, cognitif et culturel, dont le tout intégré est la perception cohérente du monde par l'organisme. C'est mon cas, en ce qui concerne le terme *cercle fonctionnel*.

**Mots-clés:** Kalevi Kull, Jakob von Uexküll, *cercle fonctionnel*

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### **От моего *Umwelttunnel*'а к Вашему**

**Аннотация:**

Калеви Куль определил *функциональный цикл* Якоба фон Икскуля как «первичную модель придания значения ['создания смысла']», но в дискурсе он, кажется, постоянно теряется за концептом *Умвельта*. Модель *функционального цикла* объясняет, как организмы конструируют свой *Умвельт* посредством эмерджентной системы, соединяющей вегетативный, физиологический, социальный, когнитивный и культурный уровни бытия, чье интегрированное целое представляет собой когерентное восприятие мира организмом. Вот о чем заходит речь в моем случае, если говорить о *функциональном цикле*.

**Ключевые слова:** Калеви Куль, Якоб фон Икскуль, *функциональный цикл*

# Free choice and semiosic noise

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***Abstract:***

Free choice requires that incompatible options be simultaneously present and felt by the semiosic agent, a set of circumstances that will create noise. Nevertheless, there is a virtuous cycle between incompatible habits, codes or scaffolds and the noise they both create and are created by. This beneficial double-bind is intrinsic to life, while remaining rare in human organizations. Kalevi Kull, with the comradery of other biosemioticians, has enacted this virtuous cycle to cultivate this rare community.

***Keywords:*** Kalevi Kull, free choice, semiosic noise, contradiction, simultaneity

## 1. FREE CHOICE

Kalevi has been developing the idea of *free choice* for some time, describing it as what happens between “the finite moments of biological time”, which “allow [for] the true simultaneity of conflicting options”<sup>1</sup>. *Free choice* has also been contrasted with state-based logic<sup>2</sup>, even suggesting that *free choice* is a central concept in moving beyond natural selection towards *organic selection*, per James Baldwin<sup>3</sup>. These ideas are further advanced in discussing the Modern Synthesis, whereby free choice is described as a fundamental component of semiosis, which in turn is “[a] fundamentally different source of adaptability [...] or [an] agent’s free choice between simultaneously available options”<sup>4</sup>.

Of particular note above is the idea of “simultaneously available” and “conflicting options”. Kalevi points out the resistance to this idea in disciplines such as mathematics and logic<sup>5</sup>, whereby the creative capacity of life is trapped in the Law of Noncontradiction and the Excluded Third. In brave contrast to these vaunted disciplines, Kalevi asserts: “in order to be a ‘choice’ (which means not determined by a randomizer or any other determinator), means, by definition, that there is no pre-given algorithm or rule that has to be necessarily followed”<sup>6</sup>.

## 2. CULTIVATING RELEVANT NOISE

So, given that a *free choice*, and semiosis more generally, can neither be the result of a randomizer nor an algorithm *and* it must entail simultaneously available and conflicting options, what discernable phenomenon might manifest these constraints? I suggest the provisional idea of *structured noise*<sup>7</sup>, or more recently (inspired by Don Favareau’s *relevant next*<sup>8</sup>), *relevant noise*<sup>9</sup>. The idea that noise should be relevant, or certainly structured, is a bit of a contradiction, which is intentional. It is exactly this kind of contradiction that Kalevi suggests may be “Husserl’s double intentionality (transverse and longitudinal)”, which “can be seen as corresponding to the two components here: one is the code incompatibility, the other is scaffolding”<sup>10</sup>. Examples of scaffolding are evolved habits or codes, which Jacob von Uexküll explores with his functional circles, or cycles; Kalevi suggests that multiple simultaneous functional cycles in living systems necessitates

<sup>1</sup> Kull 2015b: 620.

<sup>2</sup> Kull 2018: 453.

<sup>3</sup> *Ibid.*: 454.

<sup>4</sup> Kull 2021: 1, 3.

<sup>5</sup> Kull 2012: 330.

<sup>6</sup> Kull, forthcoming.

<sup>7</sup> Bacigalupi 2013.

<sup>8</sup> Favareau 2015.

<sup>9</sup> Bacigalupi, forthcoming.

<sup>10</sup> Kull 2015a: 227.

choice, which is the result of code incompatibility<sup>11</sup>. But, in general, how are these incompatible habits, codes or scaffolds co-constituted so that they can be simultaneously felt in what Kalevi calls a *phenomenal present*<sup>12</sup>?

A proposed solution to the above set of circumstances is a population of diversely sensitive chemical, cellular or synthetic oscillators that both sense particular patterns of energy in their shared surroundings and contribute patterns to that same shared milieu, *simultaneously*<sup>13</sup>. In other words, imagine a population of cells that both mold and are simultaneously molded by their shared interstitial medium. This medium will then be a jumble of signals, or *noise*. Nevertheless, this so-called noise will have been populated with the voices of the cells themselves. It is only “noise” if no correlation or coherence between component signals can be felt. But, as we’ve already stipulated, each node is sensitive to their shared milieu. Insofar as emergent constructive interference, beat frequencies or other physical phenomena of coherence can be felt, no matter how sparse, it can be amplified and then codified into scaffolding by the semiotic agent.

### 3. CULTIVATING COMMUNITY

Kalevi nicely captures the upshot of the above reciprocity, or Husserl’s *double intentionality*, between scaffolding and the proliferation of its own self-generated noise: “It is important to notice that a logical conflict or incompatibility that provides a problem is always semiosis. And also, semiosis always includes an incompatibility between its major aspects – that is what drives semiosis, that is what makes interpretation [...] take place”<sup>14</sup>.

In a sense, what we may have here is Gregory Bateson’s *double-bind*, but one of the beneficial varieties<sup>15</sup>. Each dynamic is both the initial and boundary conditions for the other such that continual creative problem solving ensues!

And, with that, I would like to conclude on a more personal note for Kalevi’s celebration. Just because life has sustained the still enigmatic capacity to navigate contradiction and complexity going on four billion years does not mean human organizations are automatically so adept. Nevertheless, this biosemiotic community has done just that. I am relatively new to the community, but, in that short time, I have seen so many contribute so much to this shared interstitial milieu. And, in cultivating that spirit, I appreciate how Kalevi, in concert with others, is open and willing to take a risk in the exploration of our shared questions. Both his public prodding

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<sup>11</sup> Kull 2018: 459.

<sup>12</sup> Kull 2015a.

<sup>13</sup> Bacigalupi 2012.

<sup>14</sup> Kull 2015a: 227.

<sup>15</sup> For example, Bateson suggested how Zen Buddhism with its Taoist cycle can foster spiritual growth, or how double-binds might be used in a therapeutic setting to transcend dysfunctional contradictions or habits.

and his more private suggestions are less about expressing quantity of knowledge and more about cultivating quality semiosis via *multiviality*<sup>16</sup>, which can sometimes feel like noise. But it is exactly this kind of noise, *semiosic noise*, that is the precondition for vital communities. So, thank you Kalevi for cultivating a community willing to embrace *semiosic noise*!

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<sup>16</sup> Defined as “a system’s capacity to use many different routes to fulfill a particular task” (Kull 2015a: 229).

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### **Libre choix et bruit sémiosique**

***Résumé:***

Le libre choix exige que des options incompatibles soient simultanément présentes et ressenties par l'agent sémiosique, tel un ensemble de circonstances qui vont créer du bruit. Néanmoins, il existe un cycle positif entre des habitudes, des codes ou des échafaudages incompatibles et le bruit qu'ils créent et qui les génère. Cette double contrainte bénéfique est intrinsèque à la vie, tout en restant rare dans ce qui est organisé par les humains. Avec d'autres biosémioticiens, Kalevi Kull a mis en place ce cycle positif pour cultiver cette rare communauté.

***Mots-clés:*** Kalevi Kull, libre choix, bruit sémiosique, contradiction, simultanéité

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### **Свободный выбор и семиотический шум**

***Аннотация:***

Свободный выбор требует, чтобы несовместимые варианты одновременно присутствовали и ощущались семиотическим агентом: это набор обстоятельств, которые будут создавать шум. Тем не менее, существует позитивная циклическая взаимосвязь между несовместимыми привычками, кодами или скаффолдингом и шумом, который они создают и благодаря которому создаются. Эта позитивная взаимосвязь присуща жизни, но редко встречается в том, что организуется человеком. Вместе с другими биосемиотиками Калеви Куллер стоял у начала такого позитивного цикла, лежащего в основе этого редкого сообщества.

***Ключевые слова:*** Калеви Куллер, свободный выбор, семиотический шум, противоречие, одновременность





# **Kalevi Kull's biosemiotic applecart**

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***Abstract:***

The most influential of Kalevi Kull's articles for me is his "Ladder, tree, web: The ages of biological understanding" (2003). It sparked a conversation that has now lasted more than ten years, and leads to a reflection on how to articulate the place of textuality and the unconscious in the biosemiotic literature.

***Keywords:*** ladder, tree, web, rhizome, applecart

My first conversation with Kalevi took place in a small house on the edge of Tartu, at a party for new master's students in 2010. There had been a brief rainstorm during the walk, and we were all soaked when we arrived. The house itself was still heating up. I sat next to the stove and steam rose from my clothes as the host put more wood on the fire. But I approached Kalevi without hesitation. I asked him straight away about his article "Ladder, tree, web: The ages of biological understanding"<sup>1</sup>. In the article, he lays out a sort of biology-influenced epistemological scheme based on a metaphor about the diversity of roots and branches. The main idea is that the biosemiotic paradigm diverges from both the pre-modern ladder-type linear paradigm, as well as the modern tree-type paradigm, into a fully post-modern web-like paradigm with multiple branches and directions of growth as well as multiple origins. I wanted to see if Kalevi was aware of similar theorization from the area of post-structuralist literature, about the notion of rhizome. I didn't mention rhizome by name, but only muttered something about Deleuze, assuming Kalevi was not familiar with this idea, but he responded right away with enthusiasm: "Yes! But in some ways, Deleuze's rhizome is really still a tree!" Needless to say, the conversation proceeded energetically from that point.

Despite my fixation on problems of textuality, I have been consistently drawn back into the biosemiotic web by a feature that I noticed from the outset. Already from my first experience at the Gatherings in Biosemiotics 2012 in Tartu, I could see that at a social level, this was a group of which I wanted to be a part. Quite unlike academic conferences dedicated to post-structuralism for example, this group was both competent and genuine, and my connections in this group have provided me the guiding thread to help me through the otherwise treacherous terrain of the scholarly profession. Biosemiotics is so prominent in my psyche that it even infiltrates my dreams. Two nights ago I dreamed that the annual Gatherings took place in a large wooded meadow at twilight, where presenters displayed their books and ideas on little blankets, and it transformed into a sustainable community that looked like some elven kingdom from Lord of the Rings. A year ago I dreamed that Israel Chávez and I were in the Tuscan countryside pushing Kalevi's old wooden cart up a steep dirt hill. The cart was mostly loaded with manuscripts and books, but it also carried baskets full of apples. I lost my footing in the dirt, the cart came loose, it rolled all the way back to the bottom of the hill, and the baskets of apples fell out of the cart and tumbled everywhere. I was a bit worried for having upset Kalevi's applecart, but he only smiled and helped us reload and start pushing again.

Anyway, such details aren't relevant for a scientific publication, but for a *festschrift* such as this, it seems to me that a little intersubjective narration is not completely out of place, and I have always taken the opportunity when it arises to inject these textual considerations to the biosemiotic project. Probably the approach of the upcoming Gatherings 2022 in Olo-

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<sup>1</sup> Kull 2003.

mouc has excited my unconscious and permeated it with fresh biosemiotic imagery. I look forward to reporting on this imagery once again, to the group in June. I have had many great teachers in my life, but Kalevi helped me more than any of them, so it is an honor to wish him a happy 70th birthday in this fine volume.

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### **Le travail de de Kalevi Kull dans le domaine de la biosémiotique**

***Résumé:***

Pour moi, l'article le plus important de Kalevi Kull est son texte "Ladder, tree, web: The ages of biological understanding" (2003). Il a suscité une discussion qui dure maintenant depuis plus de dix ans, et conduit à une réflexion sur la manière d'articuler la place de la textualité et de l'inconscient dans la littérature biosémiotique.

***Mots-clés:*** échelle, arbre, toile, rhizome, travail académique

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### **Биосемиотические начинания Калеви Кулля**

***Аннотация:***

Наиболее влиятельной из статей Калеви Кулля для меня является его текст "Ladder, tree, web: The ages of biological understanding" (2003). Она вызвала дискуссию, которая длится уже более десяти лет, и приводит к размышлениям о том, как обозначить место текстуальности и бессознательного в биосемиотической литературе.

***Ключевые слова:*** лестница, дерево, сеть, ризома, научные начинания

# **Kalevi: The center of our semiosphere!**

Sugata BHATTACHARYA

*University of Tartu*

***Abstract:***

In the current era, Professor Kalevi Kull has been a central figure in semiotics, who has connected the semiosphere of the Tartu-Moscow school of thought with the understanding that our semiotic entanglements with the world have a biological basis. K. Kull, with his intelligence and charm, has inspired generations of students to study biosemiotics. We are grateful not only for his academic articles and wonderful lectures, but for the countless after class discussions, where his uncanny insight helped clarify our thoughts.

***Keywords:*** semiotics, multi-species, environment, student-teacher relationship

One center of the semiospheric universe has long been the Tartu-Moscow school of thought, formed in 1964 and led by Juri Lotman (1922-1993). In the current era, the connective tissue in that center can only be Professor Kalevi Kull. Indeed, he has been the chair of the academic Department of Semiotics he helped establish within the Institute of Philosophy and Semiotics in the University of Tartu – one of the oldest universities in Europe, dating from 1632 and founded by none other than Gustavus Adolphus.

While the works of the Tartu-Moscow school forms the bedrock for the study of the discipline of semiotics at the University of Tartu, students are taught about semiotic perspectives from other greats in the field. In addition, for the students who graduated in 2019, our study of semiotics was guided by the works of Professor Kalevi Kull. He taught us to ponder how the semiotic modeling of the world has a basis in the biological interface with the world – not just for plants and alloanimals, but for microscopic monera and protists and of course, our own species. Humans task themselves to comprehend the semiotics of all organisms, and more challengingly, the semiotics of human language and culture, and the semioses constituting their own lived experience.

Most of the students in my M.A. cohort did not have a background in biology, but the introduction of biosemiotics in the first semester in a room where the chairs were arranged in a circle – with Kalevi at the center – inspired students to examine their own lingua-cultural backgrounds, and share those experiences in various settings. Frank discussions with Kalevi after the class were the highlight of the week. We wondered about semiosis in plants and insects, and how mental scaffolding like “food-chain” is tied to a hierarchical conception of the world, and how a more nuanced model would be that of an interconnected web, underpinned by the question posed by Kalevi in class – “What is food for a species?” The influence of thoughts inspired by this class can be seen not only in the theses of people who studied biosemiotic topics for their research, but it can also be seen in the enriching discussions people had on chickens in farms in Ukraine and the status of the axolotl in Mexico as a part of zoosemiotics, and the student videos made for our ecosemiotics course – where we tried to understand our addiction to ubiquitous plastic bags and the presence of empty bird-houses in the city parks in Tallinn and Tartu in the spring.

Every student who has been acquainted with Kalevi has a bagful of anecdotes about his wit, charm, and a unique take on the world which makes one think of the rich inter-species connections in the world. One such memorable incident for me was the privilege to hear Kalevi’s concluding remarks at the end of *Multispecies City: Diversity, Communication, Conflicts* conference held at the Tartu Loodusmaja in 2017 – where Kalevi speaking extempore, carefully knitting everyone’s remarks in his concluding speech, said that people in the city think that they are pet-owners because they have dogs and cats in their household, but forget that they are also caretakers of a place which also houses other creatures like hedgehogs; and consequently a simple practice of allowing leaf litter to stay on the

ground can be a way for coexistence with other organisms whose lives are entwined with humans in an urban setting. We will all cherish forever, the memory of the school bus-trip to Lake Peipsi and the Alatskivi castle in fall 2018 where Kalevi acted as our tour-guide, and discussed topics ranging from how ancient paths criss-crossing the Estonian countryside were still in use today, to how humans and other organisms can classify objects in their environment. Thank you, Kalevi.

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**Sugata Bhattacharya**  
Université de Tartu

**Kalevi Kull: le centre de notre sémiotique!**

**Résumé:**

À l'époque actuelle, le professeur Kalevi Kull est une figure centrale de la sémiotique, qui a relié la sémiotique de l'École de Tartu-Moscou à la compréhension que nos rapports sémiotiques avec le monde ont une base biologique. K. Kull, avec son intelligence et son charme, a poussé des générations d'étudiants à étudier la biosémiotique. Nous lui sommes reconnaissants non seulement pour ses articles académiques et pour ses merveilleux cours, mais aussi pour les innombrables discussions après les cours, où sa perspicacité incroyable nous a aidés à clarifier nos pensées.

**Mots-clés:** sémiotique, multi-espèces, environnement, relation étudiant-enseignant

**Сугата Бхаттачарья**  
Тартуский университет

**Калеви Куль: центр нашей семиосферы!**

**Аннотация:**

Центральной фигурой в семиотике сегодня является профессор Калеви Куль, связавший семиосферу Тартуско-московской школы с пониманием того, что наши семиотические связи с миром имеют биологическую основу. Своим умом и обаянием К. Куль вдохновил целые поколения студентов на изучение биосемиотики. Мы благодарны ему не только за его академические статьи и замечательные лекции, но и за бесконечные дискуссии после занятий, когда его сверхъестественная пронизательность помогала нам прояснить свои мысли.

**Ключевые слова:** семиотика, многовидовость, среда, отношения студента и преподавателя

# Imagining bios beyond nature. A new paradigm for semiotics and biology<sup>1</sup>

Elize BISANZ  
*Texas Tech University*

***Abstract:***

While cognitive scientists engaged in the old physical reality still debate and ponder the hard problem of the biology of the mind, and biotechnologist already have tools to design genes, technological logic has moved us forward into a new paradigm of life prototypes. It's time for biosemiotic answers.

***Keywords:*** bio-computation, conscious-agents, relational logic

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<sup>1</sup> The title rephrases Kalevi's books titles: *Jakob von Uexküll: A Paradigm for Biology and Semiotics* (Kull [ed.], 2001) and *Imagining Nature* (Roepstorff, Bubandt, Kull [eds.], 2003).

Welcome to the era of bios beyond living organisms.

Since the discovery of the genetic information CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) and the gene editing tool CRISPR/Cas9, computational logic has reached new levels of biopower. In addition to developing long-awaited breakthrough cures for many diseases, the new biomedical technologies also have the power to awaken future needs and demands for unprecedented gene typologies, even customized superpowers. In the new reality of techno-logic, life follows genetic codes designed by algorithmic models.

Moreover, on another front, new evolutionary approaches to technological intelligence target the mind, the coordinator and center of life functions. According to Donald Hofmann's *interface theory of perception*, the mind is explained as a strategically constructed and optimized reality processed by a genetically programmed perceptual interface, much like a computer algorithm. The given interface structure helps filter information necessary to construct a species-specific reality for survival purposes. A key element of this new concept of reality is the shift from the dominance of physical laws such as time and space to consciousness as an essential faculty for survival. Again, mathematical structures calculate the total sum of processed information of each perceptual interface resulting from the activity of "conscious agents". The mind processes information into conscious agents that emerge in a technological reality governed by quantum computations. In this new reality of quantum computation, time and space emerge from the interaction of networks; the network is the body of living organisms, and the data processed by humans is the energy that feeds and nurtures the body.

The transition is monstrous and consequential; we are witnessing a seismic shift in technological power over human genes and thoughts, i.e., human nature, i.e., bios (life). Since both paradigms target the foundations of bios, their study should also fall within the purview of biosemiotics, the science of meaning processes in living organisms. How should biosemiotics approach these transitions?

One possible way would be to explain the shift in realities. The circumstances and realities that govern life have fundamentally changed. The reality necessary for the maintenance and perpetuation of life is no longer accessible through the senses, experience or strategic action; rather, it is a reality calculated by mathematical models. By suspending the physical laws of time and space, the new computational logic has replaced human thought and functionalized human intelligence into an active agent that generates and transports data. Thus, life sustains itself in the infinity of data generation, consumption, optimization, and adaptation. Is it possible to reconcile both realities, that of human computation and that of technical computation? The answer is obvious: because both processes are based on systems of meaning, i.e., on symbolic systems, both are closely connected by the concept of the sign.

As is well known, signs have their own lives. With his statement “symbols grow”, Peirce refers precisely to the vitality of signs that generate dynamic realities. All reality, both as biosphere or semiosphere, is first and foremost that of signs, thus also produced and transformed by them. Man is the thinker in signs within a reality mediated by signs. Peirce elaborates further, “*omne symbolum de symbolo*”. Whenever symbols grow, new realities emerge: “Whether corresponding to our thoughts and sensations, and represented in some sense by them, there are realities, which are not only independent of the thought of you, and me, and any number of men, but which are absolutely independent of thought altogether”<sup>2</sup>.

While philosophers immersed in the old physical reality still debate and ponder the hard problem of the biology of mind, Peirce and many other semioticians have long contributed to a genuine theory of mind that has the relational logic to understand the network dynamics of bio-computation embedded in human reasoning by the concept of signs. The questions Peirce posed are as timely as can be: “[...] what is the mind itself but the focus of all the faculties? And what does the existence of the mind consist in but in these faculties? Does the mind cease to exist when it sleeps? And is it a new man who wakes every morning?”<sup>3</sup>

One doesn’t need to start new theories of “conscious agents” to explain the organic nature of ideas and realities beyond Newtonian physics. The history of semiotics is rich with such concepts: “Whenever ideas come together, they tend to weld into general ideas; and wherever they are generally connected, general ideas govern the connection; and these general ideas are living feelings spread out”<sup>4</sup>.

Biosemiotics has the tools to provide answers to the current, highly critical questions related to bio-computation. It also has the responsibility to find new keys to take the lead in shaping life-enhancing technological advancement.

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<sup>2</sup> Peirce *Manuscripts* MS 370.

<sup>3</sup> *Ibid.*

<sup>4</sup> Bisanz 2009: 96.

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**Elize Bisanz**  
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**Imaginer *le bio* au-delà de la nature.  
Un nouveau paradigme pour la sémiotique et la biologie**

***Résumé:***

Alors que les spécialistes des sciences cognitives qui étudient l'ancienne réalité physique débattent et réfléchissent encore autour du problème compliqué de la biologie de l'esprit, et que les biotechnologues disposent déjà d'outils pour concevoir des gènes, la logique technologique nous a fait avancer vers un nouveau paradigme de prototypes de vie. Il est temps que la biosémiotique apporte ses réponses.

***Mots-clés:*** bio-informatique, agents-conscients, logique relationnelle

**Элизе Бизанц**  
Техасский технологический университет

**Представляя *био* за пределами природы.  
Новая парадигма семиотики и биологии**

***Аннотация:***

В то время как ученые-когнитивисты, занимающиеся старой физической реальностью, все еще спорят и обдумывают сложную проблему биологии разума, а биотехнологи уже располагают инструментами для создания генов, технологическая логика продвинула нас вперед, к новой парадигме прототипов жизни. Пришло время получить ответы от биосемиотики.

***Ключевые слова:*** биоинформатика, сознательные агенты, реляционная логика



# **A binnacle for the *Tartuensis loci episteme***

Luis Emilio BRUNI  
*Aalborg University*

***Abstract:***

Here I delineate my insertion into the “local episteme” of the biosemiotics Scandinavian-Baltic connection by the hand of one of my three cicerones in this trip.

***Keywords:*** Kalevi Kull, Scandinavian-Baltic connection, theoretical biology, bio-semiotics



I had my first access to the Internet around 1996. I was in Caracas completing a Master of Science, with the intention to write a thesis on the biological monitoring and information systems that were growing around the planet with the acceleration of globalization. One of my first serious searches on the Altavista engine had the following keywords: “Bateson, biology, information”. At the top of the results was Jesper Hoffmeyer’s fantastic web page (already at that time). There, I discovered biosemiotics in the most fascinating way. Jesper’s page was incredibly well organized and a pleasure to navigate, full of resources with generous access. A gold mine for a student without access to a digital library. It was in this way I first entered in contact with Kalevi. From Jesper’s webpage I printed a copy of “Semiotic Paradigm in Theoretical Biology”<sup>1</sup>, and together with Jesper’s and Claus Emmeche’s articles, I became captured by biosemiotics. Destiny brought me to Copenhagen right at the start of the millennium, in January 2000, to start my PhD in biosemiotics. During my first weeks in Jesper’s “Biosemiotic Group”, Kalevi’s articles were in my priority list. One day, Jesper showed up in front of my desk with a tall guy with a strong personal presence, whom, without any mediation, came directly to me to shake my hand while saying “Kalevi Kull from Estonia”. This appearance, out of the blue, added something to my growing conviction that there was something historically special in the Scandinavian-Baltic biosemiotics connection. This sensation was further confirmed during the first Gathering on Biosemiotics organized by Jesper in 2001, followed the next year by my first trip to Tartu to attend the second Gathering in 2002, this time organized by Kalevi. I definitely felt that I had arrived at some sort of epicentrum of the biosemiotics Scandinavian-Baltic connection. With Kalevi’s warm sense of hospitality and his unforgettable guided tours around Tartu, including Karl Ernst von Baer’s historical house, his insightful introductions to Juri Lotman and Jakob von Uexküll, and the field trip in the Estonian beautiful forests with such a botanical connoisseur, completely enhanced my appreciation of this connection and added something deep to my understanding of culture-nature relations. At the end of 2003, I was so honored to count with Kalevi as international opponent in my PhD defense at Copenhagen University. Since then, I have always not only counted with his continuous encouragement, support, and insight in the development of semiotic endeavors, but also with a growing, lasting and stimulating friendship. In hindsight, I can see so clearly what it is meant, literally, by the “territorial perspective of the Estonian cultural-theoretical tradition”. Quite a fascinating “local episteme”, of which Kalevi’s decades of prolific work is a contribution that has been projected into the world of semiotics. Thanks for all, Kalevi.

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<sup>1</sup> Kull 1993.

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**Luis Emilio Bruni**  
Université d'Aalborg

**Un habitacle pour l'*episteme Tartuensis loci***

***Résumé:***

Je dessine ici mon insertion dans «l'épistémè locale» de la connexion biosémiotique scandinavo-balte de la main de l'un de mes trois cicérones dans ce voyage.

***Mots-clés:*** Kalevi Kull, rapports scandinavo-baltes, biologie théorique, biosémiotique

**Луис Эмилио Бруни**  
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**Нактоуз для эпистемы *Tartuensis loci***

***Аннотация:***

В этом тексте говорится о моем вхождении в «локальную эпистему» биосемиотических скандинавско-балтийских контактов благодаря одному из трех проводников, сопровождавших меня в этом путешествии.

***Ключевые слова:*** Калеви Куль, скандинавско-балтийские контакты, теоретическая биология, биосемиотика

# **Biosemiotics models of humility: Learning about living life itself**

Sara CANNIZZARO  
*IULM University of Milan*

***Abstract:***

One thing that Kull's work allows us to understand is that systems thinking permeates biosemiotics, and this awareness, as well as learning about the inadequacy of our own models, can teach us a lesson of humility.

***Keywords:*** models, systems, responsibility, humility

As a doctoral student I sometimes found myself gasping for air in trying to look for the life-saviour quote that would allow me to turn some of my shaky ideas into academic arguments. Kull's work has come to the rescue of some of my theoretical claims on several occasions. For example, as I developed the idea that biosemiotics would be a contemporary development of modern systems theory and cybernetics, I found this passage that suggested, for me, Kull's underlining of the systems thinking aspect of biosemiotics: "The same logical mechanism that creates species in the world of organisms is also responsible for creating words in language. First, note that words are reproducible entities: every time we pronounce a word, we actually reproduce it"<sup>1</sup>.

Here, Kull explicates a systems thinking perspective in that he uses a logical model that characterises one field (e.g., reproduction as used in biology) to shed light on a phenomenon in another field (the "reproduction" of words in the study of language). This perspective is systemic in that it exploits the formal similarity between what Kull calls the "recognition mechanism" in biology and language<sup>2</sup>, and is much aligned to a general systems theory. Furthermore, Kull holds that biosemiotics "should be combined with the results of theoretical biology, as we understand it at the end of the twentieth century, with the understanding of complex systems, chaos, recursive mathematics, etc."<sup>3</sup>.

This demonstrates not only the inter and trans-disciplinary perspective of Kull's ideas, and the drive it instilled onto 21st century biosemiotics, but also that the mathematical/biological/social sciences of cybernetics and systems theory may have significantly influenced biosemiotics at least during its Sebeokean phase. Therefore there happened to be a historical point of overlap between biosemiotics and cybernetics, not very much acknowledged apart from a remark in Kull<sup>4</sup> as well as in Cobley's remark that the young Sebeok was close to cybernetics<sup>5</sup>.

Finally, one significant aspect of Kalevi's work is his interest in Robert Rosen's mathematical modelling. This interest illustrates the idea of biosemiotics as a general science of relations, not of objects<sup>6</sup>, and was formative for me at a very practical level. In fact, referring to Rosen's claim that the "basic reason why biology is hard" is "because we are fundamentally ill equipped"<sup>7</sup>, I learnt that as human, living and moral beings, we have to look into our own limitations first and foremostly, and resist the temptation to solely find limitations outside ourselves i.e. limitations in others or in the surrounding reality. This is not too dissimilar from Sebeok's invitation not to indulge into looking in the destination for what

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<sup>1</sup> Kull 1992: 228.

<sup>2</sup> *Ibid.*: 228-229.

<sup>3</sup> Kull 1998: 308.

<sup>4</sup> Kull 2010.

<sup>5</sup> Cobley 2010: 320.

<sup>6</sup> Kull 2009.

<sup>7</sup> Rosen, quoted in Kull 1992: 300.

should have been sought in the source<sup>8</sup>. In other words, I take Kull's interest in the inadequacy of models, as suggested by Rosen, as a very practical invitation to take responsibility for what we do not see, and for what we do not do too, as a result. It is a lesson of humility and a reminder of what I have always enjoyed about biosemiotics, that is, learning about living life itself.

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<sup>8</sup> Sebeok 1979.

**Sara Cannizzaro**

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**Modèles biosémiotiques de l'humilité:  
en apprenant comment on vit la vie en tant que telle**

***Résumé:***

Une chose que le travail de K. Kull nous permet de comprendre est que la pensée systémique imprègne la biosémiotique, et cette prise de conscience, ainsi que l'apprentissage de l'inadéquation de nos propres modèles, peut nous donner une leçon d'humilité.

***Mots-clés:*** modèles, systèmes, responsabilité, humilité

**Сара Канниццаро**

Университет IULM

**Биосемиотические модели смирения: изучение жизни как таковой**

***Аннотация:***

Работы К. Кулля позволяют, в частности, понять, что биосемиотику пронизывает системное мышление, и это осознание, вкупе с осознанием неадекватности наших собственных моделей, может преподать нам урок смирения.

***Ключевые слова:*** модели, системы, ответственность, смирение

# Info-Autopoiesis<sup>1</sup>

Jaime F. CÁRDENAS-GARCÍA  
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***Abstract:***

This personal essay recounts my short acquaintance and continuity of engagement with biosemiotics: from a chance meeting with Kalevi Kull in 2013 to my most recent findings in information.

***Keywords:*** Kalevi Kull, biosemiotics, info-autopoiesis, information, central dogma of information

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<sup>1</sup> To the memory of JCCN who inspired me to think about novel fundamental universals.



My earliest and first attendance at a Biosemiotics event was the 13th Gathering in Biosemiotics (GIBS) held in Castiglioncello, Italy on June 4-8, 2013. I had arrived one day early at the hotel of the conference, checked-in and, after making sure everything was to my satisfaction, I began exploring. Not expecting to meet anyone that I knew led me to sit and read in the charming hotel garden, taking advantage of the weather on a beautiful sunny day. It was there that I observed someone also relaxing in the garden and I volunteered a hello, leading to a pleasant and lively conversation. Later after attending the conference, I found out that the friendly and modest face that I had encountered was Kalevi Kull, a leading Biosemiotics scholar. Thus began my long-term association with Biosemiotics and meeting its leading figures. The title of my contribution at the conference was “The Biosemiotics of Learning and Distributed Cognition”. What was rather apparent to me was the friendly camaraderie, support, encouragement, and openness that exists at all GIBS. This has kept me coming back to the various GIBS and encouraged me to contribute to the *Biosemiotics* journal.

In time I became aware of the native curiosity that drives the leading Biosemiotics scholars. Typical of such curiosity and boldness of spirit is that expressed by Kalevi in his presentation at GIBS 21 in Sweden entitled, “The biosemiotics of beauty” and now published in the *Biosemiotics* journal<sup>2</sup>. It is a work that explains how the “aesthetic feature grows out from semiotic fitting”, revealing semiotic fitting as the choice filled path to greater engagement and adaptation with the give-and-take of our environment.

To assimilate this process of being curious and bold, requires continuous efforts in the search for knowledge in an always receding horizon of greater possibilities. That is the challenge that I sought to emulate in pursuit of clarifying Bateson’s “difference which makes a difference”<sup>3</sup>. This requires the identification of the fundamental problem of information<sup>4</sup> to start to get an answer to the question of how living beings become what they become? Or, how a living-being-in-its-environment, in a self-referential process, develops from a non-existent state of knowledge to recognizing the existence of the environment and seeing itself as part of the living-being-in-its-environment system. Self-referentially engaging with and navigating through the environment while transforming it in its own image and likeness. This leads to the discovery that all information results from a process, intrinsic to living beings, of info-autopoiesis or information self-production<sup>5</sup>; a sensory commensurable, self-referential, endogenous/exogeneous, recursive feedforward/feedback process immanent to Bateson’s “difference which makes a difference”.

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<sup>2</sup> Kull 2022.

<sup>3</sup> Bateson 1978.

<sup>4</sup> Cárdenas-García, Ireland 2019.

<sup>5</sup> Cárdenas-García 2020.

Since information is self-produced by each living being, there is no information in the environment or in the Universe. Living beings self-produce endogenous (internal) semantic and syntactic information, whose communication results in exogeneous (externalized) syntactic information. Communication includes all outward expressions by living beings. In the case of human beings this concerns all our artificial creations including all arts and sciences, and all artifacts. Our artificial creations surround us. An important implication is that our syntactic information creations, however sophisticated, are unable to self-produce semantic information, i.e., Artificial Intelligence is not a possibility. The Central Dogma of Information (parallel to the Central Dogma of Molecular Biology) summarizes this: “info-autopoiesis results in endogenous semantic information that irreversibly becomes exogeneous syntactic information”. Recapping, info-autopoiesis is a sufficiently generic recursive process to be the only basis for information in nature.

This brings me full circle to GIBS 22 where Kalevi Kull is to be honored with a 70th Birthday Festschrift Volume for which this short essay is a contribution; I attempt to maintain the biosemiotics tradition of curiosity and boldness of spirit with a talk on “The central dogma of information”.

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Université du Maryland

**Info-autopoïèse**

**Résumé:**

Cet essai personnel raconte ma découverte récente de la biosémiotique et la continuité de mon engagement avec cette discipline: de la chance d'avoir rencontré Kalevi Kull en 2013 à mes découvertes les plus récentes en matière d'information.

**Mots-clés:** Kalevi Kull, biosémiotique, info-autopoïèse, information, dogme central de l'information

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**Инфо-аутопозис**

**Аннотация:**

В этом эссе личного характера рассказывается о моем недавнем знакомстве с биосемиотикой и продолжительности увлечения этой дисциплиной: от того момента, когда мне посчастливилось встретиться с Калеви Куллем в 2013 году до моих последних открытий в области информации.

**Ключевые слова:** Калеви Куль, биосемиотика, инфо-аутопозис, информация, центральная догма информации

# Portrait of the biologist as an event-maker

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***Abstract:***

This paper presents a “Portrait of the biologist as an event-maker” in the Deleuzian sense that “event”, as praxis, displaces “concept” and action [*faire*] dismantles being [*être*]. It discusses Kalevi Kull’s novel coinage “semiotic fitting”, pinpoints its evolutionary implications, and puts it in rapport with other related terms, such as “semiotic scaffolding”, “semiotic web” and Ludwig Wittgenstein’s “logical scaffolding”. Finally, the paper unveils the author’s professional link with K. Kull over the past twenty years.

***Keywords:*** Kalevi Kull, semiotic fitting, event [*événement*], logical scaffolding

Whilst contemplating the possible versions of narration, in which “just one aspect of Kalevi’s work and thinking [that] has influenced [my] own” could be focused (Editors’ letter dated 20 March 2022), I was lucky to read online Kull’s most recent research product on biosemiotics’ relevance to aesthetics<sup>1</sup>. Here, as elsewhere in Kull’s huge and impressive corpus, one is, again, awestruck by the author’s breadth of inter-disciplinary knowledge, not unlike John Keats’ first experience of reading Chapman’s Homer. One thing, in particular, aroused my intense interest, i.e., “semiotic fitting”.

To me, the term, if a new coinage, speaks volumes of and for bio-semiotics. Fitting, an evolutionary concept in itself, covers the whole spectrum of sensory impressions – aural, visual, tactile, olfactory and gustatory, and this last one evokes the major aesthetic concept of “taste”, made popular since the late eighteenth century, all the way down to our time. Moreover, “semiotic fitting” reinforces and adds gusto to another expression, “semiotic scaffolding”, which is gaining stronger currency at the expense of the once trendy “semiotic web”. If the new term happens to crisscross with my own research, I would trace it back, not to our much respected friend Jesper Hoffmeyer, but to Wittgenstein, who is arguably, as far as I can tell, the “first” person to use the metaphor of “scaffolding” [*Gerüst*] for logical space in his pioneering *Tractatus Logico-Philosophicus*<sup>2</sup>.

Since language, by nature, disseminates, and theories do travel, I have decided –rather than continue addressing this or that concept in Kull’s profound thinking – to portray Kull as a successful and highly influential event-maker. As Gilles Deleuze argues, “event” [*événement*] is probably the only philosophical concept that is capable of dismantling the verb “to be” [*être*], in other words, being-in-the-world<sup>3</sup>. Unlike “facts” or “objects”, an “event” is noted for the phenomenology of “occurring” or “happening”, which, in Gadamer’s phrase, amounts to “*etwas geschieht*” (“something occurs”)<sup>4</sup>. So here we are: Kull, a Peircean pragmatist and man of action, makes things happen – “the biological turn in Tartu semiotic studies” for one, “Gatherings in biosemiotics” for another... The list can be endless!

On a personal note, I first met Kalevi at the inaugurating Copenhagen Gatherings, and since then I have been mostly at the beneficiary’s end, for which I remain infinitely grateful. Let me give a few examples of the events which Kalevi has created and bestowed on me and my students. Because of Kull’s encouragement, I became a frequent contributor to the journal, *Sign Systems Studies*, during the first decade of the New Millennium. I also had the good fortune of participating in the 80th Anniversary of Juri Lotman at Tartu in March 2002. Although Kull never mentioned it, I

<sup>1</sup> Kull 2022.

<sup>2</sup> Wittgenstein 1921 [1971: 35].

<sup>3</sup> Deleuze 1995: 141.

<sup>4</sup> Gadamer 1994: 461.

believe it was his idea to let me review Edna Andrews' *Conversations with Lotman: Cultural Semiotics in Language, Literature, and Cognition* for the journal *Comparative Literature Studies*, and he must have been the person from behind the scene to recommend me as an External Assessor for the Estonian Science Foundation in refereeing a Lotmanian project, and to help with Peeter Torop's education project at the Estonian Pavilion of the Shanghai EXPO in 2010. A beloved mentor to many of his outstanding students at Tartu, Kalevi Kull has even extended his well-known munificence to my former doctoral students at National Taiwan University, National Taiwan Normal University, and Fudan University in Shanghai, who had been, in different times, on a pilgrimage to the holy land of semiotics, learnt from Professor Kalevi Kull by reading him – as I did, and attending his conference lectures – as I did, and got published in the Tartu journal. I feel greatly privileged to be able to contribute to this *Festschrift* in his honour and look forward to continuing learning from him.

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**Han-liang Chang**

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### **Portrait du biologiste en créateur d'évènements**

**Résumé:**

Cet article présente un «Portrait du biologiste en créateur d'évènements» au sens deleuzien où «l'évènement», en tant que praxis, remplace le «concept», tandis que l'action [*faire*] démantèle l'être [*être*]. Il discute de la «correspondance sémiotique» telle qu'elle est vue par Kalevi Kull, identifie ses implications dans le contexte de l'évolution et la met en rapport avec d'autres termes connexes, tels qu'«échafaudage sémiotique», «toile sémiotique» et «échafaudage logique» de Ludwig Wittgenstein. Enfin, l'article dévoile les contacts professionnels de l'auteur avec K. Kull au cours des vingt dernières années.

**Mots-clés:** Kalevi Kull, correspondance sémiotique, événement, échafaudage logique

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Тайваня

### **Портрет биолога как создателя событий**

**Аннотация:**

В этой статье представлен «Портрет биолога как создателя событий» в делезианском смысле, согласно которому «событие» как праксис вытесняет «понятие», тогда как действие [*faire*] демонтирует бытие [*être*]. Мы обсуждаем «семиотическое соответствие» в понимании Калеви Кулля, определяем его последствия в контексте эволюции, а также проводим параллель с другими родственными понятиями, такими как «семиотический скаффолдинг», «семиотическая сеть» и «логический скаффолдинг (“строительные леса”»)» Людвига Витгенштейна. В статье также заходит речь о профессиональных контактах автора с К. Куллем на протяжении последних двадцати лет.

**Ключевые слова:** Калеви Куль, семиотическое соответствие, событие [*événement*], логический скаффолдинг

# Choice, arbitrariness and traces

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***Abstract:***

The paper explores Kalevi Kull's concepts of choice, arbitrariness and traces, while arguing for a compatibility between Kull's position and a diachronic semiotics conceived from a Saussurean point of view.

***Keywords:*** general semiotics, biosemiotics, agency, diachrony



It must have been on a spring day of 2017 when I had my first conversation with Kalevi Kull. Back then, I was a master's student in the International Program of Semiotics at Tartu University, and I was attending Kalevi's course on Biosemiotics (a course I have taken several times after that first one, and from which I have, each time, learned something new). I remember being very nervous as I entered Kalevi's office. After all, it was Kalevi Kull who I was talking to!

My being nervous was due to my being already acquainted with Kalevi's work. I had read some papers by him before coming to Tartu, and I was always impressed by the depth and clarity of his ideas. The first article I read by him must have been "Umwelt and modelling" included in the *Routledge Companion to Semiotics* edited by Paul Copley. Even though I was first interested in that book mostly because it included Jesper Hoffmeyer and John Deely, the very title of Kalevi's paper immediately caught my attention. After reading that work, and some other studies on Uexküllian theory, I understood the importance of biosemiotics for a general theory of signs. I thus went on to specifically read Kalevi's paper "Life is many and sign is essentially plural" included in the book, edited by both Kalevi and Claus Emmeche, *Life is the Action of Signs*.

This particular work from *Life is the Action of Signs* was to be more meaningful in my academic development than what I could have thought back in 2015 when I first read it. Let me bring some lines of this text. "The principal feature of semiotic reality is the multitude or plurality of any object in it. This follows, almost trivially, from the nature of meaning – the meaningful object is not single, it is simultaneously anything else. Sign is an object that cannot be reduced to itself. Sign is always relational"<sup>1</sup>.

I must say that I have always approached Kalevi's work from a general semiotics point of view, and not strictly as a theoretical contribution solely confined to biosemiotics. It might have been in that very spring when we had our first conversation that I voiced this to him – for I have always considered myself to be concerned with general semiotics, in the sense of a general linguistics, rather than with biosemiotics proper. Yet, I firmly believe that the importance of biosemiotics for the rest of our field comes from the fact that biosemiotics shall discover fundamental laws that can better cement the whole edifice of a general semiotic theory. Kalevi's contributions very easily lend themselves to be read in such a way, and it seems to me that the previous quotation is an eloquent proof of it.

Naturally, after that spring day, Kalevi became a central figure in my academic development: he truly became my teacher, far beyond academic formalities, and his moral and material help have always been crucial during all my time in Estonia. In strictly theoretic grounds, his teachings have always come through discussing the differences between his thought and mine, and we have had many interesting discussions since that first one in the spring of 2017. Mostly in his office, but sometimes walking

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<sup>1</sup> Kull 2011: 116.

through Toomemägi in Tartu, in the Estonian countryside, or outside a café in Buenos Aires, I have always learned something from our talks – and often these lessons come in a quasi-aphoristic fashion, just as the way in which he writes his articles.

Now in terms of learning or, following Kalevi, *semiotic learning*<sup>2</sup>, the choices I have made have undoubtedly left traces, and the semiotician I am today is certainly a *form* that has emerged from a given scaffolding. I cannot wander too far in our field without finding myself returning to some basic principles that I gathered from my formation in linguistics, and from my interest in language as a semiotic phenomenon. Obviously, this scaffolding also influences the way I read Kalevi's texts – sign is always relational, as our Estonian semiotician reminds us. It has been the interplay between these contrastive views that has prompted some discussions between me, mostly a structuralist and a Saussurean, and Kalevi, who moves more easily between Uexküll, Lotman, Peirce. Yet, I found it felicitous that he conceives of Saussure as being fundamentally right in his assertion that meaning is arbitrary, and I am mostly certain that this could not have been otherwise.

The concept of *choice* has become a central concept in Kalevi's theory<sup>3</sup>. In his theories, choice has to be highlighted because he deems it right to reintroduce such a concept into biology, and he sees biosemiotics as a theoretical biology. But, what is the use of *choice* in semiotic theory? The way I see it, Kalevi's concept of choice can be interpreted as reaffirming Saussure's arbitrariness, in at least one of its senses, far beyond the domain of linguistics, or even of anthroposemiosis. This is not always an easy task. *Choice* is often associated with higher order cognitive processes and, for Kalevi, choice is present from very early on, that is to say, already in very low orders of "cognitive", or even simply "sentient" activity – which means that "choice" is a technical concept, and is not to be understood in the usual sense<sup>4</sup>. It is thus that the definition of meaning, all meaning, as essentially plural becomes extremely relevant. And it follows that to state that a signified object cannot be *one* is not so trivial after all, at least inasmuch as such statement would be directly connected to what constitutes the proper object of semiotics.

The plurality of meaning, I believe, is always a tension. Concrete meanings, that is; effectively used meanings, are determined. The proper role of interpretation is, in a way, to collapse the plurality and indeterminacy of meaning into something determined. This is indeed the task of choice. And it thus connects with arbitrariness in the Saussurean sense because the determinacy of a concrete meaning involves a local history: concrete meanings are a function of choices, and choices build upon one another. It is in this way, I believe, that arbitrariness and choice give rise to

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<sup>2</sup> Cf. Kull 2018.

<sup>3</sup> *Ibid.*; Kull 2021.

<sup>4</sup> The sense of "choice" as a term in Kalevi's theory is clearly exposed in Kull 2015: 618.

systematicity<sup>5</sup>. Kalevi has not neglected this point and, in paying attention to the traces left by choices, it can be said that he is positing semiotics within a diachronic frame. I believe this position to be fully compatible with some interpretations of semiotic structuralism that do not reduce it to an a-historical perspective, but which instead approach sign systems in their dynamicity. The articulation of these four notions, choice, arbitrariness, traces and scaffolding turn semiotics into a theory of knowledge and puts the discipline into the wider frame of what I would term “historical sciences”, and which Kalevi calls  $\Sigma$ -sciences, but whose main characteristic is precisely that of studying ways of knowing. In this way, the divide between the historical and the natural is reinterpreted as a distinction between what is meaning-less and what is meaning-full. For semiotics, the implications are of capital importance, for this position allows us to define the discipline as the study of all forms of arbitrariness and their consequences. In fact, this is a definition that we reached last summer, together with Kalevi, at a discussion held in Ernst von Baer’s house in Tartu<sup>6</sup>. Let there be many more summers like that one, and many more years of fantastic discussions with Professor Kalevi Kull.

Happy birthday!

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<sup>5</sup> This is, to my view, a way of rephrasing Saussure’s two notions of absolute and relative arbitrariness (cf. Saussure 1916 [1995: 180-181]).

<sup>6</sup> A summary of this event will be published in Bennett *et al.*, forthcoming.

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**Le choix, l'arbitraire et les traces**

***Résumé:***

L'article explore les concepts de choix, d'arbitraire et de traces tels qu'ils sont présentés dans les travaux de Kalevi Kull, tout en plaidant pour une compatibilité entre la position de K. Kull et une sémiotique diachronique conçue d'un point de vue saussurien.

***Mots-clés:*** sémiotique générale, biosémiotique, agentivité, diachronie

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**Выбор, произвольность и следы**

***Аннотация:***

В статье анализируются концепты выбора, произвольности и следов, представленные в работах Калеви Кулля, а также говорится о совместимости позиции К. Кулля с положениями диахронической семиотики, представляемой с сосюррианской точки зрения.

***Ключевые слова:*** общая семиотика, биосемиотика, агентность, диахрония



# To know what Kalevi Kull knows

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***Abstract:***

This article considers Kalevi Kull's 2009 article, "Biosemiotics: To know, what life knows". It summarises the argument regarding  $\Sigma$ -sciences and  $\Phi$ -sciences. It argues that "knowing" in semiotics entails an epistemological impetus and an outlook on humans. The article concludes with a distinction between "knowledge" and "knowing" in the academy.

***Keywords:*** semiotics, biosemiotics,  $\Sigma$ -sciences,  $\Phi$ -sciences, knowledge

In 2012, soon after Daniel Chamovitz' popular volume *What a Plant Knows* was published, I pointed it out to Kalevi and he revealed that he had registered it already. We did not need to say much about it. There was a tacit understanding that we were referring to the title of the volume and the vagaries of phrasing in which the sciences could unwittingly employ the vocabulary of vitalism while desperately clinging to a conventional physicalist outlook. Put another way, like many perspectives caught between two stools of this kind, it did not consider its own epistemological basis. Put simpler, still, it needed semiotics.

The key feature of biosemiotics as a word and an intellectual pursuit is that it contains semiotics. It does not seek to retrospectively consider its own knowledge basis following unconsidered empirical research. Rather, it *always* embraces the problem of cognition that pervades all realms. As Sebeok stated<sup>1</sup>, “epistemology” is only ever a “midmost target of semiotics”; nevertheless, semiotics does devote itself to “the cognitive constitution of living entities”<sup>2</sup>.

In Sebeok's wake, nowhere has this problematic been more succinctly stated than in Kalevi's short paper for *Cybernetics and Human Knowing*<sup>3</sup> – perfectly placed, I remember, as one of the toilers on the journal when that paper came in. Søren Brier, editor-in-chief, sent me the paper, “Biosemiotics: To know, what life knows”, and asked “What do you think?”. Immediately, it struck me that Søren had asked the same question less than a decade earlier when we had received another paper that was out of the ordinary run of our usual submissions but went on to be a landmark in semiotic theory. That meant that we were momentarily to be delivered from the drudgery of journal editing; but, in a typical quest of criticality, even after refereeing, I looked for how the paper might be improved. One suggestion I made was that the paper was too short and that it could be expanded in scope and focus by incorporating empirical examples. Søren put this to Kalevi, but was won round by the latter's argument that the article could stand as it was. I thought this was an error, although I can see, thirteen years later, that the error was mine: less actually *was* more; the longer version would have made a very good article, but it would have been nowhere near as piquant.

The idea that Kalevi foregrounds in the paper is not his own; it is Vihalemm's<sup>4</sup> division of knowing into  $\Sigma$ -sciences and  $\Phi$ -sciences, the latter focused on universal laws and quantitative methods, the former concerned with local semioses and using qualitative research to investigate how organisms “know”. As is acknowledged in the paper, it is a division that also echoes Peirce's cenoscopic and idioscopic sciences. Yet, the distinction is deployed in decisive fashion. Biosemiotics is placed firmly on the side of

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<sup>1</sup> Sebeok 1991: 2.

<sup>2</sup> *Ibid.*

<sup>3</sup> Kull 2009.

<sup>4</sup> Vihalemm 2007.

$\Sigma$ -sciences, a science of knowing rather than a science of laws. It is not concerned primarily with the absolute ontology of species in the sense that physics is concerned with the universal materiality of its objects. Rather, it is concerned with the “knowing” of species, a “knowing” that does not occur in a vacuum. Non-anthropomorphic investigation in this frame does not entail the bracketing of motivation or purpose in the constitution of a non-human animal or plant, with the task of simply cataloguing the organism’s interactions with its environment. Indeed, even when this is attempted in biology, the approach “uses semiotically flavoured terms”<sup>5</sup>. Rather, the  $\Sigma$ -sciences carry a heavy burden, such that “empirical biosemiotics” is not the listing of physical attributes but “a study of relations, functions, distinctions that organisms make, communication, plurality of meaning, and so forth”<sup>6</sup>.

What this article reveals about the sciences is momentous in that the physicalist approach in biology colonizes that field in a conception of the “hard” sciences. The  $\Sigma$ -sciences’ real home, however, is in semiotics: “Semiotics as the science of knowing, i.e. knowing of knowing”<sup>7</sup>. Here, the midmost target of semiotics is roundly hit with the requirement to understand the basis of its own knowing. Yet, it is not just the discipline which is charged with an epistemological task. As becomes apparent on completing a reading of the article, followed by reflection, “knowing of knowing” is central to the bearing of what Deely has discussed in his formulations on the semiotic animal<sup>8</sup>. This is not just an article about “knowing” in the sciences. It is, in fact, about “knowing” itself. And it has implications for how humans practice knowing, particularly in its formal sense and in its institutionalization.

The relation of the  $\Sigma$ -sciences to the  $\Phi$ -sciences is congruent with the relation of “knowing” to commoditized “knowledge”. In one of the most well-known formulations of this argument, Nicholas Maxwell has shown that knowledge-inquiry, or the much-vaunted “knowledge for its own sake”, has become “an intellectual and humanitarian disaster”<sup>9</sup>. As he demonstrates<sup>10</sup>, the development of the natural sciences and then the social sciences, from the late eighteenth century and nineteenth century onwards, became geared to producing knowledge which would then beget further knowledge. Knowledge was not orientated towards the production of “wisdom” in the service of solving the problems of life and procuring what is ‘good’ for the world. Instead, it has vitiated knowing and betrayed the original principles of the Enlightenment. Its relation with quantification barely needs to be stated.

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<sup>5</sup> Kull 2009: 86.

<sup>6</sup> *Ibid.*: 87.

<sup>7</sup> *Ibid.*

<sup>8</sup> Deely 2010.

<sup>9</sup> Maxwell 2014: 20.

<sup>10</sup> Maxwell 2004; 2007; 2014.



As I discussed with Kalevi, across a table in Dresden, the role of water at the root of the war in the former Yugoslavia, or considered the role of biosemiotics in the environment we encountered as we stood at a Berlin crossroads a decade or so later, it became clear that knowledge can be an overvalued commodity in comparison with the pricelessness of the knowing that inheres in an other.

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### **Savoir ce que Kalevi Kull sait**

**Résumé:**

Cet article examine le travail de Kalevi Kull de 2009 intitulé «Biosemiotics: To know, what life knows». Nous y résumons son argument concernant les sciences- $\Sigma$  et les sciences- $\Phi$ , et affirmons que le «savoir» en sémiotique implique une impulsion épistémologique et un regard sur l'humain. L'article se termine par une distinction entre «savoir»-*knowledge* et «savoir»-*knowing* dans le monde académique.

**Mots-clés:** sémiotique, biosémiotique, sciences- $\Sigma$ , sciences- $\Phi$ , savoir

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### **Знать, что знает Калеви Куль**

**Аннотация:**

В этой статье рассматривается статья Калеви Куля 2009 года «Biosemiotics: To know, what life knows». Мы резюмируем его аргументы о  $\Sigma$ - и  $\Phi$ -науках и утверждаем, что «знание» в семиотике влечет за собой некий эпистемологический импульс и определенный взгляд на человека. Статья завершается разграничением «знания»-*knowledge* и «знания»-*knowing* в академическом мире.

**Ключевые слова:** семиотика, биосемиотика,  $\Sigma$ -науки,  $\Phi$ -науки, знание



# Lines penned and transcribed on Earth Day 2022

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***Abstract:***

This reflection on Kalevi Kull's singular contribution to contemporary thought focuses on the hidden tension in what for a growing number of theorists and inquirers is a commonplace and unproblematic term – biosemiotics. Prof. K. Kull's efforts to mediate in various ways, most of all in bringing the study of life and that of signs into harmonious union, have been extremely fruitful, but they bear witness, on one side, to biologists who are wary of semiotics and, on the other, to semioticians who are not deeply grounded in biology. The word biosemiotics has the resonance, depth, and salience it today possesses in large measure because of Kalevi Kull's indefatigable efforts and innovative proposals.

***Keywords:*** biology, biosemiotics, emergence, life, meaning

The word with which Kalevi Kull's name is most intimately associated – *biosemiotics* – is an especially apt symbol of his intellectual life. The conjunction of the prefix and suffix in their familiarity to an expanding circle of diverse inquirers hides a tension. On the one hand, *bios* as the concern of trained scientists and, on the other, *semiosis* as the focus of a much more diffuse aggregate of often unlikely collaborators threaten to tear apart. Many (perhaps most) biologists remain wary or simply ignorant of *biosemiotics*, while many semioticians insist on the life inherent in signs but are insufficiently interested in the phenomena of life in their own right. Other than Jesper Hoffmeyer's, no voice has been less tireless, insistent, and articulate than Prof. Kull's in rendering the study of life and that of signs – *biosemiotics* – into a seamless, harmonious word and indeed enterprise. His intellectual life has been itself a perfusion of signs in which the signs of life are seen for precisely what they are. The rigorous, analytic, and taxonomic character of Prof. Kull's approach is likely to obscure, for some, his sensitivity to what might be called the poetry of the phenomena at the center of his concern. He is manifestly appreciative of the irrepressible creativity at the heart of the biosphere. More than this, his theoretical inquiries are of a piece with the ever astonishing creativity of the surging impulses of living beings. At a certain level of emergence, not yet exactly identified, these impulses cease to be utterly blind and, in some instances, not only make sense but also provide resources for making ever wider and deeper sense of the matrix from which we sprung and the arena in which we are destined to live. The contributions of Kalevi Kull bear eloquent testimony to nothing less than the emergence and proliferation of meaning in the universe. He acknowledges that cultures are part of nature but also realizes that cultural life displays distinctive features not reducible to biological life *simpliciter*. That is, he at once avoids the bifurcation of nature and culture and the reduction of culture to nature in any simplistic or mechanist sense.

Human beings are social animals, however much our sociality has proven to be theoretically elusive and practically deformed. On both counts – that of framing an adequate theory of human sociality and that of working toward effective practices of human exchange – Prof. Kull's ceaseless labors have borne significant fruit. It is, for example, no slight accomplishment to convene, over many years, gatherings, fora, and symposia in which fruitful investigations unfold, because exchanges are as intense as they are civil, as deeply probing as they are human respectful. The singular contributions of solitary inquirers do not, in fact, compose the human face of experimental pursuits. Experimentalists and theorists are essentially social actors and their personal contributions are, to a degree impossible to measure, social achievements. Here, too, the life and work of Kalevi Kull are exemplary of this defining trait of human endeavor.

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### **Лignes tracées et transcrites le Jour de la Terre 2022**

***Résumé:***

Cette réflexion sur la contribution singulière de Kalevi Kull à la pensée contemporaine se concentre sur la tension cachée dans ce qui, pour un nombre croissant de théoriciens et de chercheurs, est un terme courant et à peine problématique: la biosémiotique. Entrepris de diverses manières, les efforts de médiation du professeur K. Kull qui visent en premier lieu à associer d'une manière harmonieuse l'étude de la vie et celle des signes, ont été extrêmement fructueux, mais ils témoignent, d'une part, du fait que certains biologistes restent méfiants vis-à-vis de la sémiotique et, d'autre part, que certains sémioticiens n'ont pas de connaissances approfondies en biologie. Aujourd'hui le mot biosémiotique a la résonance, la profondeur et l'importance en grande partie grâce aux infatigables efforts et aux propositions novatrices de Kalevi Kull.

***Mots-clés:*** biologie, biosémiotique, émergence, vie, sens

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### **Строки, написанные и переписанные в День Земли 2022 года**

***Аннотация:***

Эти размышления об исключительном вкладе Калеви Кулля в развитие современной мысли фокусируются на напряжении, скрывающемся в том, что для все возрастающего числа теоретиков и исследователей является обычным и не вызывающим проблем термином – биосемиотика. Усилия профессора К. Кулля различными способами способствовать прежде всего достижению гармоничного союза между изучением жизни и изучением знаков были чрезвычайно плодотворны, но они свидетельствуют, с одной стороны, о том, что некоторые биологи очень настороженно относятся к семиотике, а с другой стороны, о том, что есть семиотики, не слишком хорошо разбирающиеся в биологии. Слово «биосемиотика» сегодня обладает резонансом, глубиной и актуальностью в значительной степени благодаря неустанным усилиям и новаторским начинаниям Калеви Кулля.

***Ключевые слова:*** биология, биосемиотика, возникновение, жизнь, значение



# **Studying mathematics semiotically: Kalevi Kull's path forward**

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***Abstract:***

Mathematics has rarely been a target of interest among semioticians, perhaps because a semiotic path towards grasping what it is has never been laid down concretely. An essay by Kalevi Kull at a 2012 conference at the Fields Institute for Research in Mathematics lays such a path down for both mathematicians and semioticians to pursue. This article describes Kull's essay in a schematic way, suggesting that his ideas in this domain need to be explored in much more depth in the future.

***Keywords:*** mathematics, semiosis,  $\Phi$ -sciences,  $\Sigma$ -sciences



Jay Lemke<sup>1</sup> once asked: “What sort of a semiotic beast is mathematics?” Sporadic attempts to answer this question have typically been indirect or generically abstract<sup>2</sup>. A notable exception has been the work of mathematician René Thom<sup>3</sup>, who was among the first to deal with this question directly<sup>4</sup>. But, overall, Lemke’s question has hardly been answered. It was Kalevi Kull who tackled it in a coherent way in an essay that he delivered at the Fields Institute for Mathematical Sciences in 2012<sup>5</sup>.

In my view, that essay laid the groundwork for envisioning a semiotic path towards understanding what mathematics is and how it originates in the brain as a semiotic activity. It came forth to provide a parallel path to the one laid down by Lakoff and Núñez, which led to the now widely-accepted view that the cognitive source of mathematics is metaphor. But, as Kull argued, this may be only one of several intersecting paths leading to a veritable grasp of what mathematics is semiotically, given that solving the problem of mathematics cannot be approached from comparisons alone within a specific field. He refers to those sciences that deal with unambiguous semiosis as phi-sciences (physical sciences), whereas to those that deal with equivocal semiosis as sigma-sciences (semiotic sciences). Unraveling the origins of mathematics must involve both the phi-sciences and the sigma-sciences moving in tandem.

Thom had called the process of discoveries in mathematics “semio-genesis”, implying that they emerge by happenstance through contemplation and manipulation of semiotic models. As this goes on, every once in a while, a catastrophe occurs that leads to new insights, disrupting the previous modeling system. It is at that point that new ideas come into existence. Kull’s essay is a kind of follow-up to Thom’s classic study, which has never been pursued in any significant way by either mathematicians or semioticians, especially in terms of the relation between mathematics and existential phenomena. As Kull’s truly insightful essay indirectly suggests, it is critical to consider above all else what *existence* implies in mathematics. As Ian Stewart<sup>6</sup> observes, “In the real world, something exists if you can observe it, or, failing that, infer its necessary presence from things that can be observed... However, the number two is not like that. It is not a thing, but a conceptual construct”<sup>7</sup>. Understanding how this type of construct relates to existential aspects of reality is the primary challenge that Kull’s essay poses to both phi-scientists and sigma-scientists.

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<sup>1</sup> Lemke 2003: 216.

<sup>2</sup> For example, Marcus 1975; Rotman 1988.

<sup>3</sup> Thom 1975; 2010.

<sup>4</sup> Bockarova, Danesi 2014.

<sup>5</sup> Kull 2012.

<sup>6</sup> Kull 2012.

<sup>7</sup> Stewart 2013.

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**Étudier les mathématiques de manière sémiotique:  
la voie à suivre de Kalevi Kull**

**Résumé:**

Les mathématiques ont rarement été un centre d'intérêt pour les sémioticiens, peut-être parce qu'une voie sémiotique concrète pour saisir ce qu'elles sont n'a jamais été tracée. Un exposé de Kalevi Kull lors d'un colloque à l'Institut des recherches mathématiques Fields en 2012 ouvre une telle voie pour les mathématiciens et pour les sémioticiens. Cet article décrit l'exposé de K. Kull de manière schématique, suggérant que ses idées dans ce domaine doivent être explorées beaucoup plus en profondeur à l'avenir.

**Mots-clés:** mathématiques, sémiose, sciences- $\Phi$ , sciences- $\Sigma$

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**Изучение математики семиотически: путем Калеви Кулля**

**Аннотация:**

Математика редко вызывала интерес у семиотиков – потому, возможно, что конкретный семиотический путь к пониманию того, что она собой представляет, так никогда и не был проложен. В сообщении Калеви Кулля на конференции 2012 года в Филдсовском институте математических исследований такой путь предлагался как для математиков, так и для семиотиков. В статье мы схематически воспроизводим основные идеи этого сообщения К. Кулля, приглашая к более глубокому изучению его идей в этой области в будущем.

**Ключевые слова:** математика, семиозис,  $\Phi$ -науки,  $\Sigma$ -науки

# **Are macromolecular machines like viruses and ribosomes semiotic?**

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***Abstract:***

Are viruses, or the so-called “molecular machines” within cells, just the fossils of past semiosis that evolution has rendered merely mechanistic, or do they have properties that make them intrinsically semiotic?

***Keywords:*** molecular machines, viruses, origin of life, constraint, autogenesis

A few years back while wandering through a park together in Tartu, Kalevi and I got into a discussion about whether the highly automated molecular and cellular processes of organisms should be considered actively semiotic. Many of the molecular processes within living cells can be described as typical chemical processes that take place like ineluctable clockwork, made highly precise and reliable by billions of years of intense natural selection. So, assuming (for the purpose of argument) that there is no “choice” at this level, no freedom, should we instead think of these processes as “fossils” of former semiotic processes? Would it be accurate to say that the evolutionary process has sculpted them to such a fine degree that they are now essentially just dead mechanisms? Or are they still fundamentally semiotic?

As I reflected on Kalevi’s challenge I realized that it resonates with another topic of debate among semiotic theorists. That is, whether the dynamical processes within computing devices should be described as semiotic, or merely mechanistic. If we consider computations to be non-semiotic, does this mean that “molecular machines”, like ribosomes and splicosomes, are non-semiotic? Alternatively, if we consider these processes to be semiotic, are we then required to consider computer operations semiotic? And what about viruses? Are they a form of life with semiotic attributes or just non-semiotic fractions of life?

This subtle but fundamental question also parallels another discussion we had that still sticks with me. In 2008 at a resort near the blue streaked Saka cliffs on the coast of the Baltic Sea, Kalevi hosted a small intense workshop in which Jesper Hoffmeyer, Frederik Stjernfeldt, Claus Emmeche, Kalevi and I tried to hammer out a statement of common assumptions that characterize the biosemiotic perspective. The result of this intense workshop was eventually published as “Theses on biosemiotics: Prolegomena to a theoretical biology” in the journal, *Biological Theory*<sup>1</sup>.

Kalevi posed the following challenge to me as we walked as a group down to the beach. Although we had agreed that the origin of life and the origin of semiosis were coextensive, I argued that, to clearly address the question of the origins of semiosis, we would need a concept broader than life. Life, as we know it, is a special case of a form of existence characterized by its semiotic capacity that is likely widespread and diverse in the universe. I had proposed that a process I called autogenesis<sup>2</sup>, as an empirically testable thought experiment, might serve as a model for the transition from mere chemistry to semiotic chemistry in this more general sense. But an autogenic system is not alive in the sense of a bacterial cell, and is more like a non-parasitic virus. The fact that viruses and autogens are merely reactive and don’t actively “choose” among alternative adaptive options begs a similar question: are they below the threshold of semiosis? Are they more like inorganic chemistry or more like living chemistry?

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<sup>1</sup> Kull *et al.* 2009.

<sup>2</sup> Deacon 2021.

In our final “prolegomena” we compromised. We concluded that “There is no simple dividing line where all the interconnected properties of living systems, as we know them, emerge. Instead we observe what we call a threshold zone, probably involving incremental stages in which different component processes emerge”<sup>3</sup>. Although this is a compromise that I agree characterizes the origins of life, I remain committed to the idea that there is a fundamental and sharp discontinuity between semiotic and non-semiotic processes, not a continuous gradation from chemistry to semiosis.

Even though a virus (or autogen) can persist indefinitely as an inert bundle of molecules, it, nevertheless, has the capacity to adapt and evolve, as the recent pandemic has made us painfully aware. This is because its existence is not constituted by the molecules that are its material embodiment. The continued existence of each particular strain of virus depends instead on the holistic system of constraints that these molecular constituents embody. Constraint is what gets re-membered in each new replica, not any specific material constituent.

Constraints refer to causal processes that are prevented or minimized. Constraints don’t “determine” anything specific, they just restrict what is likely to happen. As a result there is a potentially unlimited class of “just good enough” molecules that can be recruited to facilitate the continuation of a viral or organism lineage. And like shapes or patterns, constraints are substrate transferrable. This is why they can provide links to other phenomena not immediately present or causally determined. It is this indirect causality that is the basis for the creative power as well as the potential weakness of semiosis.

So although the incredibly robust and predictable molecular processes that take place within cells (and which also characterize viruses) are vastly more reliable than the workings of even the most reliable of human machines, this intrinsic openness is critical. Causal incompleteness is essential to the possibility of being a building block in the evolution of semiosis, without which adaptation and evolution would not be possible.

But this is also why semiotic agents, whether viruses or frogs, are intrinsically at risk. Unlike rocks and machines, they must constantly recreate the interdependent constraints that constitute their very existence. They are inextricably entangled within and yet distinct from their environments. This fundamental incompleteness makes ontological grounding a defining feature of semiosis.

Semiotic agency is ultimately a function of this ontological imperative. The causal displacement enabled by constraint also creates the possibility of semiotic error. Simple physical causality cannot be in error. But semiotic error can have existential consequences. Unlike machine components, life’s macromolecular machines only persist as long as semiosis persists. They exist only as knots woven into a fabric of aboutness.

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<sup>3</sup> Kull *et al.* 2009: 168.

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**Les machines macromoléculaires comme les virus et les ribosomes  
sont-elles sémiotiques?**

***Résumé:***

Les virus, ou les soi-disant «machines moléculaires» au sein des cellules, ne sont-ils que les fossiles de la sémiose passée que l'évolution a rendus purement mécanistes, ou ont-ils des propriétés qui les rendent intrinsèquement sémiotiques?

***Mots-clés:*** machines moléculaires, virus, origine de la vie, contrainte, autogenèse

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**Являются ли макромолекулярные машины –  
подобные вирусам и рибосомам – семиотическими?**

***Аннотация:***

Являются ли вирусы (или так называемые «молекулярные машины» внутри клеток) не более чем «ископаемыми окаменелостями» имевшего место в прошлом семиозиса, которые эволюция сделала чисто механическими, или же у них есть свойства, делающие их по своей природе семиотическими?

***Ключевые слова:*** молекулярные машины, вирусы, зарождение жизни, ограничение, автогенез





# Elegance

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***Abstract:***

Scholars in general, and semioticians more specifically, often have to deal with complex subjects, terms and concepts. But complex does not necessarily mean difficult to read. The ability to make complex things clear and simple is called elegance.

***Keywords:*** elegance, interdisciplinarity, transmission

“If the semiotic and the living are the same, then it follows that the principles of semiotic should be true for biology, and also, that the laws of biology should be of interest for semiotics, since these are the laws of the functioning of texts”<sup>1</sup>.

“Ce que l’on conçoit bien s’énonce clairement, / Et les mots pour le dire arrivent aisément”<sup>2</sup>. “What is conceived well is stated clearly, and the words to say it come easily”.

Complexity is not necessarily an antonym of clarity. In mathematics and physics, when a complex theory, theorem or demonstration is written in a very short, clear and simple manner, we talk about “elegance”. This concept can seem far away from most considerations in the humanities, but it is not. Especially in disciplines like biosemiotics, where different fields, specialists, academics have to work together, and must understand very precisely the concepts used by the others, we are all craving for elegant articles.

When I first met with Kalevi Kull’s texts, I was still a PhD student. Being a semiotician in France is not always easy and is often confusing, as the distinction between semiotics and semiology is not exactly the same as the one between “sémiotique” and “sémiologie”, as the definitions of these two words differ also from the definitions of their English equivalents, and as biosemiotics references are almost non-existent. Encountering biosemiotics could have been confusing and obscure for a student like me – and sometimes, without doubt, it was. But articles by Kull have a characteristic that make them precious for the biosemiotics field: elegance. Challenging concepts – like the concept of “emon”<sup>3</sup> – and precise methodologies – like taxonomy of semiosis<sup>4</sup> – are described and explained in a way that makes complexity appear with clarity. Controversial definitions – like the one that occupied me during the three years of my PhD thesis, the definition of zoosemiotics<sup>5</sup> – and demanding theoretical works – like the difficult but necessary work of models’ comparison<sup>6</sup> – are, indeed, elegant in Kalevi Kull’s work.

Elegance is not an academic game, a scholarly fancy. It is a way to make concepts clear, and to improve how we understand each other, how we work together. Linguists, semioticians, specialists of language science, all know very well how the way to communicate influences the way to think and, in the case of scholars, the way to work. Elegance in the redaction of academic work is the politeness of science. And for that matter, every article of Kalevi Kull is a paper gentleman.

I honestly think that these kinds of texts are precious examples for improvement of a special aspect of research, very dear to my heart, which

<sup>1</sup> Kull 1998: 301.

<sup>2</sup> Boileau 1674: Chant I, v. 147-207.

<sup>3</sup> Kull 2019.

<sup>4</sup> *Ibid.*

<sup>5</sup> Kull 2014: 47.

<sup>6</sup> Kull 2012: 14.

has been present in biosemiotics since the very beginning of the field: interdisciplinarity. Working with various academic fields, with scholars without the same background or references, with colleagues that have sometimes no idea of what you are talking about, is a fascinating challenge. It requires texts of reference, clear, detailed and complete, that allow everyone to agree on terminology, on concepts, on methodology. It requires elegance in redaction. This is obviously not easy, as the vast majority of us, myself included at this very moment, are not writing in our mother tongue when we address our fellow colleagues. But, in solidarity with the lost student I was, who suddenly found enlightenment and clarity about a whole new field in some Kalevi Kull's papers, I strongly advocate for an academic world with more elegance.

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### **Élégance**

**Résumé:**

Les chercheurs en général, et les sémioticiens en particulier, doivent souvent traiter de sujets, de termes et de concepts complexes. Mais complexe ne signifie pas nécessairement difficile à lire. La capacité de rendre les choses complexes claires et simples s'appelle l'élégance.

**Mots-clés:** élégance, interdisciplinarité, transmission

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### **Элегантность**

**Аннотация:**

Ученым вообще и семиотикам в частности часто приходится иметь дело со сложными предметами, терминами и понятиями. Но *сложный* не обязательно означает 'трудный для чтения'. Умение делать сложные вещи ясными и простыми называется элегантностью.

**Ключевые слова:** элегантность, междисциплинарность, передача

# A Peircean approach to the Umwelt

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***Abstract:***

The concept of Umwelt has become so significant in biosemiotics that one may wonder whether Charles Sanders Peirce could conceivably have missed it within the broader logical and metaphysical context of his realist pragmaticist semiotic theory. This brief paper suggests that far from having missed it, Peirce tackled it front and center at a most fundamental level.

***Keywords:*** Umwelt, Charles Sanders Peirce, manifestation, indeterminate potential, phaneron

When Kalevi Kull observed recently that biosemiotics' central concept of Umwelt was not yet well integrated into semiotic theory, he expressed the need to work out the relationship between Umwelt and sign relations. My initial reaction was that this demanded a prior clarification of the semiotician's conception of reality – a metaphysical issue. But then it occurred to me that it entailed an even more fundamental question, which is that of the genealogy of any experiencing within any organism. A combined feeling of déjà-vu, déjà-lu, déjà-entendu led me back inevitably to Peirce. Indeed, if the concept of Umwelt is so fundamental to biosemiotics, would it at all be conceivable that Peirce would not have thought of it in one form or another, even fundamentally so? Clearly not.

Consider Jakob von Uexküll's stroll through the worlds of animals. Each meadow dweller is imagined to be ensconced in a soap-like bubble filled with perceptions specific to the creature's sensory apparatus and its ability to extract from them vital information that helps map and shape strategies of sustainment and exploration. Uexküll called it at first the *phenomenal world* or the *self-world* of the animal, the world within which they act and conduct their specific interactive life. And then he called it the Umwelt, a spherical word. Essential is the word *phenomenal*. The Umwelt is primarily a continuum of flowing appearances that depend on what gets sensed by specific sensory organs and on how the latter trigger the transmutation of what they convey into a complex of perceptions categorically distributed so that their experiencing gives continuous rise to the Umwelt, inflating the bubble with its selective panorama continuously projected all around on the inner walls of the spherical screen and throughout the sphere.

While appearances depend on sensory organs, they can be easily, even naturally, prescinded from them (in Peirce's sense), for it is not the organ that is being sensed, but whatever it is that it triggers through its inquisitive exposure and reaction to whatever suits its receptors. Umwelt-ing is thus the continuous generation of species-specific panaesthetics all across the spherical horizon. The "subject" inside the bubble is not a spectator watching the surround-sensing movie. It is rather itself the movie in action, utterly unaware of the sensory projectors themselves. In the world of raw manifestation, there are no spectators and no spectacles. The subject/object duality has no place in it. Manifestation is all there is, and it may well be species-specific, with infinite variations both within and across species. Umweltian bubbles may overlap one another to some extent, they may coalesce, but they never explode out of spherical existence. Sets of them may belong to (or be within) larger bubbles whenever they share plenty of common characters; in such cases those bubbles show permeability and may communicate with one another. That possibility of intercommunication, itself correlated to cooperation and community, is the stuff the larger bubble is made of. Indeed, manifestation is never a merely individual affair, for individualism implies a dualism that is not at work within phenomenality or phenomenalization. Where there is no subject

there are no subjects. The coming into seeming of otherness in all its forms is as *Umweltung* as any other appearing.

Peirce was not a biosemiotician despite his assiduous observation of his dog Zola. He was not a phytosemiotician despite his theoretical allusion to representational sunflowers. Therefore, any talk of something *Umwelt*-like in his writings would likely be found in essays vying for considerations more fundamental than in subfields of applied semiotics.

John Deely likened *Umwelt* to the “objective world”, by which he meant the physical world as transformed by semiosis: the world as stood for by signs to interpretants. But that is not fundamental enough. What is it, in Peirce’s writings, that is the permanent and all-encompassing sphere that conditions semiotizability without being, itself, semiotic? It is the uninterpreted bubble, the bubble that is the stuff experiencing is made of prior to any semiotization. The *Umwelt* that surrounds and encompasses semiosis cannot be itself semiosis – but without it there is no semiosis, at least not of the physio type. The argument is that if the *Umwelt* is a fundamental concept of semiotics, then its fundamentality originates in the non-semiotic ground of semiotics. Peirce is looking, in hindsight, not for the *Umwelt* of this or that natural species, but for the *Umwelt* in general, the *Umwelt* of all *Umwelts*, and thus the *Umwelt* of Semiosis herself.

What is it? It has to be that out of which any interpretation can unfold, thus that which is in need of semiosis – that which calls for semiosis, that which actually conditions and even provokes semiosis because it harbors within itself, thus within its potential, a power of determination whose form will end up being triadic. The source of semiosis has therefore to be potent indeterminacy. As Peirce put it, the logic of potentiality is that it shall annul itself because if it did not it would be utterly idle – but then it would not even be a potential, and therefore it cannot but annul itself. It follows that the *Umwelt* of Semiosis is that which cancels itself into Semiosis, continuously and encompassingly so. It is whatever has the power to enter directly any mind, at any time, in any sense, in anyway whatsoever, regardless of its mode of reality, regardless of its factuality, regardless of how it gets perceived or semiotized, and thus regardless of whether it will end up being part of Deely’s objective world, and thus regardless of whether it will become “known.”

Peirce coined a word for it out of ancient Greek language. He called it the *Phaneron*, which he capitalized because he thought there was only one *Umscheinung*, a single continuous spherical pouring of manifestation, which annuls itself into an infinity of tri-categorical implementations in an infinity of organisms. Out of its continuum arises semiosis. Any *Umwelt* is primarily phaneral, and so is semiosis. Its studious experiencing is called *phaneroscopy*.



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### **Une approche peircienne de l'Umwelt**

***Résumé:***

Le concept d'Umwelt est devenu si important en biosémiotique que l'on peut se demander si Charles Sanders Peirce aurait pu, effectivement, le manquer dans le contexte logique et métaphysique plus large de sa théorie sémiotique, réaliste et pragmatiste. Ce bref article suggère que, loin de l'avoir manqué, Peirce l'a abordé de front à un niveau des plus fondamentaux.

***Mots-clés:*** Umwelt, Charles Sanders Peirce, manifestation, potentiel indéterminé, phanéron

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### **Пирсовский подход к Умвельту**

***Аннотация:***

Понятие Умвельта стало в биосемиотике настолько значимым, что можно задаться вопросом о том, мог ли Чарльз Сандерс Пирс действительно упустить его из виду в более широком логическом и метафизическом контексте своей реалистическо-прагматической семиотической теории. В этой краткой статье речь заходит о том, что Пирс его не только не упустил, но и непосредственно с ним работал на одном из самых фундаментальных уровней.

***Ключевые слова:*** Умвельт, Чарльз Сандерс Пирс, проявление, неопределенный потенциал, фанерон



# Styles of dialogue and argument

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***Abstract:***

This short note is a musing on the existence of a distinct dialogue style or argument style characteristic of biosemiotics (in contrast to science in general), which emphasizes the importance of mastering abstract concepts and multiple theoretical perspectives, the ability to see advantages and limitations of all of them, and the ambition to use logic (semiotics) in analyses.

***Keywords:*** philosophy of science, styles of reasoning, scientific consensus, dialogism, metaphor

It is no art to think and speak rapidly, if you cut the slice of reality which you consider very thinly. But slow-thinking may be needed if you want to address not just a slice, but a broad spectrum of reality<sup>1</sup>.

Those granted the opportunities to converse, discuss, and argue about biosemiotic ideas with Kalevi Kull, at formal meetings and especially face to face over a beer after a long day of presentations, will likely have observed such dialogue to be not only pleasant and stimulating, but also captivating. There is something attentive, open-ended, and at the same time suggestive and creative in Kalevi's approach to dialogue. I have speculated whether this is a characteristic of the whole field of biosemiotics – as a way to do biology with other tools – though biosemioticians are very unlike. Having followed Kalevi and his work for many years, I have perceived slight changes, not in his style of thinking and dialoguing, but in his talk in English: Its speed has increased. I never forget the contrast between Kalevi and Sahotra Sarkar, both presenting papers at an *Ishh* session (*Ishh* is a byword for the International Society for the History, Philosophy and Social Studies of Biology) at Leuven, Belgium in 1996. They came to represent the two extremes of a wide spectrum of talk speed<sup>2</sup>.

Reflecting on this, I also think they represent two different styles of doing philosophy of biology, one analytical (Sahotra) and one that is more difficult to characterize (Kalevi). The Anglo version of philosophy of biology often aims at giving a rational argument for some thesis, in the same way science is often considered to do (remember the positivists thought that there is basically just one form of rationality, the one that belongs to them and to science); while biosemiotics is a more humanities inspired approach (to the extent one will call semiotics a science within the humanities; which is only a half-truth). If we lift the perspective from our embodiment of biosemiotics, Kalevi, to the whole field as such, how are we to characterize its mode of dialogue and argument?

Biosemiotics is a highly reflective field, and in that sense, more similar to philosophy than to science. I am reminded by a feed-back from a bachelor student of biology, who wrote, after an exam in my philosophy of biology course:

Having spoken to students from other faculties, I have become acquainted with classical scholastic argument structure. As I feel that this kind of argumentation was to some extent introduced in the exam, I wonder if students should not have been introduced to this kind of thinking. The problem, as I see it, lies not in the exam format and expectations for this course, so much as the more rigid exam format we are otherwise used to in biology courses, which is one-sided (often with good reason) in its "one question, one answer" structure. An introduction to this humanistic way of arguing would have been nice to have gotten acquainted with before the exam<sup>3</sup>.

<sup>1</sup> Hoffmeyer 2012: 179.

<sup>2</sup> For details of this story, see *ibid*.

<sup>3</sup> Unpublished anonymous student evaluation comments, University of Copenhagen.

The reference to scholasticism is a little puzzling, and I would neither call this course “scholastic” nor would I denote the biosemiotic style of discussion by that term. What is hinted at by the student is not, I hope, so much the connotations of being pedantic or overly subtle, but rather the significance of mastering abstract concepts and several theoretical perspectives, the capacity to see the advantages and limits of them all, and the ambition to use logic (and semiotics) in analyses. It is also prudently to abstain from wanting to settle discussions too quickly (to reach a definitive “consensus”). Scholasticism in its best form is “slow” thinking, pluralism, and the combination of speculation with tests and observations; in its worst form, it is going for dogmatic quick fixes.

The biosemiotic style of dialogue and argument may be best grasped by metaphors. In their *Metaphors We Live By*, George Lakoff and Mark Johnsen considered two conceptual metaphors for an argument (remember that an argument can both mean a heated dispute and the logic form connecting premises and conclusion): One is the “argument is war” metaphor emphasizing conflict, the other is the “argument is dance” metaphor emphasizing collaboration. These metaphors are not just two ways of describing “the same” (discussion, debate, conversation, dispute, argumentation) because such things can take many different forms. I guess that just as there are distinct *styles of reasoning* in science, as described by A. C. Crombie and Ian Hacking, there are also several different *styles of academic communication and discussion*.

Some years ago, I heard speculations over why so few women chose to study philosophy at the University of Copenhagen’s bachelor program. A hypothesis was that in this program, with a dominance of analytic philosophy, there was a tendency to have the discussions going as-if they were wars through words. Analytic philosophy inherited the presupposition that disagreements need to be “settled”, to arrive at “consensus” (as in science) in order to make progress. In contrast, continental philosophy has another style of debating, perhaps more dialogue-oriented, where the goal is not to end the conversation but to keep it open to increase understanding. And in this (so is my claim, not an argument) biosemiotics is closer to the open-ended dialogic style of continental philosophy.

In this simile, analytic philosophy is like the hedgehog who only knows “one big thing” (perhaps the definition of truth?) while continental philosophy, as well as biosemiotics – and definitely Kalevi himself – are like the fox, who “knows many things” – and loves to discuss them all. And it goes on like a dance, with an uneven rhythm, alternating slow and quick steps, a foxtrot!

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### **Styles de dialogue et d'argumentation**

***Résumé:***

Ce court texte est une réflexion sur l'existence d'un style de dialogue distinct ou d'un style d'argumentation particulier caractéristique de la biosémiotique (contrairement à la science en général), qui met l'accent sur l'importance de maîtriser des concepts abstraits et de multiples perspectives théoriques, sur la capacité de voir leurs avantages et leurs limites, ainsi que sur l'ambition d'utiliser la logique (sémiotique) dans les analyses.

***Mots-clés:*** philosophie des sciences, styles de raisonnement, consensus scientifique, dialogisme, métaphore

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### **Стили диалога и аргументации**

***Аннотация:***

В этой короткой заметке мы размышляем о существовании особого стиля диалога или особого стиля аргументации, характерного для биосемиотики (в отличие от науки в целом), где важное место отводится владению абстрактными понятиями и многочисленными теоретическими перспективами, способности видеть их преимущества и ограничения, а также стремлению использовать при анализе логику (семиотику).

***Ключевые слова:*** философия науки, стили рассуждения, научный консенсус, диалогизм, метафора





# Semiosis and environmental suicide

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***Abstract:***

Biosemiotics offers important tools to deal with the current global environmental crises. Of Kalevi Kull's many contributions, his work on semiotic ecology is especially fruitful here. He shows why climate change and threats to biodiversity must be understood holistically and systemically, and this is exactly what is missing from current efforts, which continue to build on a mechanistic, dualistic view of culture and nature.

***Keywords:*** globalization, semiosis, diversity, climate change

In his writings and teachings, Kalevi Kull consistently emphasizes the omnipresence of semiosis in living systems. He is one of the most lucid, prolific and consistent theorists of biosemiotics. His elaborations of the distinction between forms of semiosis – vegetative, animal and symbolic<sup>1</sup> – and their threshold zones are extremely productive, enabling some necessary distinctions in a world which is otherwise continuous. In this short contribution, I shall take as a point of departure Kull's perhaps most concise account of a semiotic ecology<sup>2</sup>, relating it to the current global crisis.

Distinguishing between an “artificial” and a “seminatural” perspective on ecology, Kull criticizes the former for establishing unproductive boundaries and relying on a mechanistic ontology. He shows that a reliance on purely physical properties of a system results in the “decontextualised use” of the elements comprising an ecosystem, as opposed to an approach which implies “the usage (management) of natural communities without changing these otherwise than via the usage itself (without adding or replacing the elements, only recycling them). This type of human impact means the building in into the contexts of cohabitants; this holds and adds codes”<sup>3</sup>.

The contrast between these modes of engaging in the world potentially has very radical implications. It is precisely the failure to approach environmental destruction and climate change with a ‘seminatural’ or semiotic epistemology that has led to the resounding failure of attempts to salvage biodiversity and curtail climate change.

The latest IPCC report on the physical realities of climate change (Section 1), its consequences (Section 2) and possible mitigation (Section 3) exemplifies this shortcoming<sup>4</sup>.

Nearly half of the world's population now live in areas which are severely vulnerable to the effects of climate change. Many of them are victims to the drying lands, the rising seas or the melting ice. In his presentation of the report, the UN General Secretary, António Guterres, spoke of a world on “a fast track to climate disaster”. Scientists still hold out the promise of a possible reversal, but increasingly speak of adaptation to climate change rather than its prevention. Although the growth rate in emissions has been reduced somewhat, they will have increased by 14 per cent at the end of this decade if present trends continue.

The latest report's suggestions for action are not new, and the authors mainly appeal to governments, organizations and the private sector. Local solutions are nearly absent, and alternative economic practices are barely mentioned. The implicit assumption is that the world needs reform, but not a total renovation. This is a questionable view, considering the failures of the current global system.

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<sup>1</sup> E.g. Kull 2009.

<sup>2</sup> Kull 2008, see also Kull 1998.

<sup>3</sup> Kull 2008: 3213.

<sup>4</sup> IPCC 2022.

The absence of nonhegemonic approaches to the global crises is not confined to the IPCC. The most recent GBF (Global Biodiversity Framework), also presented in 2022, recommends that 30 percent of the planet, marine and terrestrial, ought to be designated as protected areas free from human interference. This well-intentioned objective fails to take into account the interweaving of human lives and the wider ecology. There is general agreement that hardly any of the Aichi Biodiversity Targets from 2010 have been met. A main cause is the lack of a holistic systemic perspective encompassing the entire biosphere, including humans. Protecting wetlands, for example, is worthless in a context where infrastructural developments are simultaneously encouraged. The Human footprint is already noticeable everywhere. In the human world of overheated globalization, biodiversity will be seriously reduced regardless of protective measures, owing to emissions, pollution and erratic weather patterns. Conversely, people have always lived in ecologies, often without harming their surroundings irrevocably.

Biosemioticians have argued that evolutionary history has produced increasing complexity and variation in living systems<sup>5</sup>. Cultural history has, in a much shorter time, created a vast diversity among human groups. In other words, throughout natural and cultural history, there has been a steady increase in diversity, which entails greater flexibility or semiotic freedom; options and alternatives, the possibility to do things differently. At this historical moment, it seems as if this tendency is being reversed through homogenizing processes that affect all living and communicating systems. Species extinction and the simplification of ecosystems are accelerating. Likewise, languages disappear every month, and monetisation is becoming ubiquitous.

Scientific reports on climate change and biodiversity are important and valuable, but they are incomplete in so far as they are embedded in a single knowledge regime. The biosemiotic perspective can contribute a different understanding. It may demonstrate that the relevant unit of survival is neither the organism, the species, the factory, the city or the country, but the dynamic, processual relationships that connect them. Unless the entire system is taken into account, attempts to solve the problems of climate and diversity will inevitably be patchy, partial and temporary. Efforts to save a species from extinction will never save that species unless the wider conditions for its survival are satisfactory. The problem for policy-makers is that they like numbers, while complexity and diversity are difficult to quantify.

Ecological and human diversity are two sides of the same coin. As Bateson reminded us many years ago, the map is not the territory, and survival requires diverse answers<sup>6</sup>. Had these lessons from biosemiotics been taken on board by decision-makers, the proposed solutions to our

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<sup>5</sup> Hoffmeyer 1998.

<sup>6</sup> Bateson 1972.

current dilemmas would have been different and more constructive. As Kull concludes, as usual concisely and precisely: “[I]n order to live together with many other species, it is more important to know and take into account the local ecological codes (e.g., their needs and preferences in food and nesting habits) than to obtain detailed accounts on the universal laws of molecular structure of their body”<sup>7</sup>. Taking this insight into account may prove to be our greatest challenge in the current world of overheated, self-destructive globalization.

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<sup>7</sup> Kull 2008: 3213-3214.

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### **Sémiose et suicide environnemental**

***Résumé:***

La biosémiotique offre des outils importants pour faire face aux crises environnementales mondiales actuelles. Parmi les nombreuses contributions scientifiques de Kalevi Kull, son travail sur l'écologie sémiotique est particulièrement fructueux dans ce contexte. Il montre pourquoi le changement climatique et les menaces pesant sur la biodiversité doivent être compris de manière holistique et systémique, et c'est exactement ce qui manque aux efforts actuels, qui continuent de s'appuyer sur une vision mécaniste et dualiste de la culture et de la nature.

***Mots-clés:*** mondialisation, sémiose, diversité, changement climatique

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### **Семиозис и экологическое самоубийство**

***Аннотация:***

Биосемиотика предлагает сегодня важные инструменты для борьбы с глобальными экологическими кризисами. Среди многих работ Калевы Кулля особенно плодотворным в этом контексте представляется его исследование по семиотической экологии. В нем объясняется, почему изменение климата и угрозу биологическому разнообразию следует рассматривать целостно и системно – тогда как именно этого не хватает сегодняшним усилиям найти выход из сложившейся ситуации, усилиям, которые все еще основываются на механистическом, дуалистическом взгляде на природу и культуру.

***Ключевые слова:*** глобализация, семиозис, разнообразие, изменение климата



# Semiosis as an ode to joy

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***Abstract:***

In an offhand reply to an unexpected question, Kalevi Kull invites us to consider if there is any reason, besides inherited linguistic conventions from the Industrial Revolution, that we should continue seeing semiosis as “a tool to aid us in the struggle for survival”, and not instead see it as the fountainhead of joy during our journey here towards death.

***Keywords:*** value, survival, semiosis, *conatus*, joy



In 2010, as Morten Tønnessen and Riin Magnus were preparing to undertake an extended interview with Kalevi Kull for the journal *Hortus Semioticus*, they wrote to a number of his colleagues, asking for “statements and questions to ‘confront him with’ about his work”. I had long forgotten about the existence of this interview until I began preparing the present volume, but upon re-reading it again, I was both astounded and delighted anew by the answer that Kalevi provided in response to my own inquiry. The relevant section of that interview follows.

M.: Now you’ll get a chance to answer Don’s question. I am not sure you will accept its premises. The question is: “Since survival is impossible, what is the value of semiosis?”

K.: Very good question (laughs). The value of semiosis is joy. Joy. I could add to this that the value of semiosis is meaning – but I would not really use it in print, because everybody would connect it with a religious discourse. That’s why I would say joy. Or, as for humans – loving living.

M.: Now you are explicating what the value of semiosis is, but I think that inherent in Don’s question is also: How can it be that semiosis has value at all? Given that survival is impossible. And what do you think he means by stating that survival is impossible?

K.: It is impossible.

M: In the long run?

K.: Yes – we will die anyway! The semiosphere will end.

M.: Do you have a prognosis? When will it end?

K.: It does not matter! It does not matter at all!

M.: Doesn’t it matter whether life ends tomorrow or in a billion years?

K.: No, it does not... this is easy to explain using the example of one’s own life, as a person. What I say here and now will not be any different whether I happen to die in an hour, or years from now. It makes no difference! [...] It does not make a difference for what I say, for what I do, for what choices I make. [...] You know, this is what misleads humankind – our perception of time. It is one of the most misleading things. But this would lead us to a longer talk. My answer to Don’s question was brief: Meaning, or joy of life<sup>1</sup>.

This quote that “the value of semiosis for living beings is joy” is classic Kalevi: unapologetically provocative, disarmingly stated, and, of course, utterly outrageous sounding at first.

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<sup>1</sup> Magnus, Tønnessen 2010: 88-89.

My more than twenty-year association with him as a close friend and colleague, however, has taught me that even in his seemingly most off-handed and “perhaps not well yet thought out” pronouncements, it is not Kalevi, but I the listener who has not yet thought the matter out well enough. Kalevi’s pronouncements, I’ve come to understand – and *especially* the most initially “outrageous” sounding ones – are *always* well thought out, usually over decades, and refined over and over and over again, by one of the most deeply read and richly informed minds that I have ever encountered.

So what is it that Kalevi is trying to show us, in his inimitably aphoristic fashion, here?

First, of course, in his elaboration to Morten about the relationship between (a) “choice” and acting in the moment, on the one hand, and (b) our particular human difficulties in remembering the essentially symbolic nature of our conceptions of a virtual “past” and “future”, on the other, Kalevi is reminding us again that as the only species that we know of that have ever had the audacity to try to “describe nature”, the very tools that allow us the ability to do so, can often be what mislead us most<sup>2</sup>.

And perhaps nowhere more in our current modern understanding (or misunderstanding) of nature do we see this deformation imposed by our symbolic lenses than in the widespread acceptance of the vulgar Darwinistic notion that we all, animals and humans alike, daily “struggle” to survive.

Must all living beings continuously do what the 19th century physicists chose to call “work” in order to remain in negentropic being? Of course. But this seemingly modern scientific concept is but the latest articulation of a far more human understanding that finds its roots in the *conatus* of antiquity – i.e., the activity that living beings undertake to keep themselves in living being – and it weaves itself throughout the whole history of Western thought, manifesting in one era as “striving”, in the next as “tending” – and all the way through to the more recently re-imagined concepts of “homeostasis”, “*élan vital*”, “self-organization”, and “autopoiesis” in the scientific realm, and “innate drives”, “the will to power” and “the class struggle” in the social sciences and the humanities.

...“Signs grow”, indeed. But not always well, and not always in ways that don’t hold hidden dangers for us.

“We press our linguistic forms into the nature we are designing”<sup>3</sup> says Kalevi elsewhere in the interview – and we press them, too, into the nature we are describing. It indeed matters much, then, which forms we decide to press. For too long we have been pressing the “struggle for survival” and the “fight against self-annihilation” into our descriptions of life’s unique mode of being. Here, Kalevi asks us, instead, to now accept that “annihilation” – death, or at least a complete material re-organization into something drastically other – is a necessary and even, when understood correctly,

<sup>2</sup> Recall here, too, by Heisenberg’s reminder that “what we observe is not nature in itself, but nature exposed to our method of questioning” (Heisenberg 1958 [1962: 58]).

<sup>3</sup> Magnus, Tønnessen 2010: 88-89.

sublimely beautiful aspect of life itself. What new insights might be revealed to us, then, by instead of seeing life as a “fight” or a “struggle” that we cannot, by definition, ever possibly “win” – we understand it instead as a “joy” that we have temporarily been given the good fortune to fully inhabit and savor?

Indeed, what else *could* “joy” be, then, if not the engaged experience of feeling-being that is living? There may be pain and grief and misery and regret in the valleys of our symbolic consciousness, but the heart of what it is to be alive – one’s precious, provisional, full-being engagement with the feeling of existence, and of life itself – comes to us through semiosis.

For it is semiosis that adds to life’s incessant *conatus* the dimension that allows us not merely to stave off entropy (for a while), but, in addition: to *explore*, to *create*, to *learn*, and most importantly, to *know* of life as we interact with all of living and non-living nature, and to *feel* the tenderness and depth of our deep immersion as part of it. *Immersing* ourselves within our world’s relations and those of our fellow beings, *appreciating* them practically and aesthetically, *loving* them and being loved by them – and, as semiotically-equipped inquirers, knowing that there *are* such relations and then: *playing* with them, *interrogating* them, *finding out* what they will yield, *combining* them in new ways, *inquiring* into their nature ... these do not seem so much like a function built to “fight” or “struggle” with life, but to – dare one say – engage within it full-heartedly and to actively experience the *joy* of our participation in co-creating it<sup>4</sup>.

So once again, Kalevi, it seems, unlike so many of the rest of us, has seen straight into the heart of things. Semiosis is life’s ode to joy!

Few people in my life have given me more joy, not taught me more about life and semiosis, than Kalevi Kull. Yet the fact of his (and our) inescapable death – a “fact” which affords no “choice” – will be, we now understand by pondering his quote above, in one very true sense of the word, meaningless. And in Kalevi’s case, it will be even more so, as the life he chose to live was rich with meaning, and he used that life to spread the joy of meaning, which is to say the joy of life itself, to others<sup>5</sup>.

So thank you so much for all the joy, Kalevi! You are, as Jesper always said, “a force of nature”. And here you’ve shown us that the name of that natural force that you have been embodying all this time is “joy”.

We all have much to learn, I think, from both the wisely outrageous writings, as well as from the ever joyful example, of Kalevi Kull.

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<sup>4</sup> See, too, in this regard, Paul Copley’s insightful exposition on “enhancing survival by not enhancing survival” that he delivered at his inauguration as the Ninth Sebeok Fellow of the Semiotic Society of America in 2014 (Copley 2014).

<sup>5</sup> Thus I stand by the claim that I also proposed in Riin and Morten’s article to the effect that: “Kull claims: ‘Hoffmeyer is a therapist of biology, as semiotics is a therapist of culture’ (Kull 2009: 85). I would argue that Kull, in turn, is a therapist of biosemiotics (and of biosemioticians)” (Magnus, Tønnessen 2010: 85).

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### **Семiose comme une ode à la joie**

**Résumé:**

Dans une réponse désinvolte à une question inattendue, Kalevi Kull nous invite à nous demander s'il y a une raison, en plus des conventions linguistiques héritées de la révolution industrielle, pour que nous continuions à voir la sémiose comme «un outil pour nous aider dans la lutte pour la survie», au lieu de la voir plutôt comme la source de joie pendant notre voyage ici vers la mort.

**Mots-clés:** valeur, survie, sémiose, *conatus*, joie

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### **Семиозис как ода радости**

**Аннотация:**

В непринужденном ответе на неожиданный вопрос Калеви Куль предлагает нам поразмышлять над тем, есть ли какая-либо причина, помимо унаследованных нами от эпохи промышленной революции языковых условий, по которой мы должны продолжать рассматривать семиозис как «инструмент, помогающий нам в борьбе за выживание», – вместо того, чтобы считать его источником радости во время нашего путешествия к смерти.

**Ключевые слова:** значимость, выживание, семиозис, *конатус*, радость

# Vegetative semiosis

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## ***Abstract:***

In “An introduction to phytosemiotics”, a masterwork of integration, Kalevi Kull defended Martin Krampen’s notion of phytosemiotics. In doing so, he developed the notion of vegetative semiosis. In a later work, he argued that vegetative semiosis is not a branch of semiotics, and so should not be identified with phytosemiotics. Rather, vegetative semiosis is a basic form of semiosis and the condition for animal semiosis, which in turn is the condition for cultural semiosis. All multi-celled organisms, including plants, animals and humans, are characterized by vegetative semiosis. While clearly influenced by Aristotle (and Thomas Aquinas), this characterization of vegetative semiosis makes it easier to relate biosemiotics to current science, to integrate current science into biosemiotics, and thereby to greatly expand the research potential of biosemiotics.

***Keywords:*** phytosemiotics, vegetative semiosis, morphogenesis

In defending phytosemiotics, Kull critically examined Jakob von Uexküll's comments on plants, largely accepted by Krampen. Von Uexküll accorded meaning in the relationship of plants to their habitat, allowing choice of stimuli from the "dwelling-integument" [*Wohnhüller*], but denied that plants have specialized receptor organs, function circles or *Umwelten*. This claim led Krampen to conclude that plants only have "sensors" associated with feedback cycles, as understood in cybernetics. Kull rejected this, arguing that plants do have *Umwelten*, and in doing so, offered a detailed analysis of all that is implied in semiosis. To begin with, he pointed to what are now well known features of plants, that they move in a way that is coordinated with the life process of the individual, and have specialized cells or structures for recognizing external signals. This involves intercellular communication to effect coordination between individual cells, which have *Umwelten* of their own. It is in this context that he not only developed the notion of vegetative semiosis, but analysed the essential features of all semiosis.

A major part of vegetative semiosis is epigenesis, the differentiation of cells and the generation of biological form. It involves inter-organismal communicative structures, recognition, and symbiosis. The relatively primitive nature of such semiosis enabled Kull to identify what distinguishes semiosis from mere physical processes. Firstly, it is easy to see that such epigenesis cannot be the result of chance variations and selection resulting in a collection of cybernetic mechanisms that fortuitously work to support each other. As Kull noted, "in all plants [...] the permanence of the inter-cellular communication system is an obligatory requirement for the life cycle to run"<sup>1</sup>. Semiosis associated with the generation of form serves various ends, as when the shape of the crowns of trees, consisting of leaves shaped to channel water, along with the growth of roots, serve to maximize the trees' access to water. The output (for instance, the growth of roots) is not determined by the input as in a cybernetic mechanism, but is a response to the expected input. There is anticipation, as characterized by Robert Rosen, implying purpose. The forms grown are interpretants. To understand this it is necessary to recognize the reality of biological needs, whether necessary, useful or just desirable, as an essential aspect of semiosis.

For vegetative growth to constitute a sign relation, the same factor responded to must be able to cause different effects in the same system, and different factors must be able to lead to the same effects, since only then can a factor stand for something else. This is why they have to be conceived of as signs. As such, there must also be memory so that a current response can be a response to a previous effect. During the formation of a need, the connection between the input and output becomes canalized, but not determined. There is also a potential to seek and realize alternative possibilities. In the process of development and evolution, needs generate

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<sup>1</sup> Kull 2000: 337.

further needs, characterized as biological functions involving new sign relations. Kull suggested that all biological purposes originate in vegetative needs. Classification of components of sign systems has to be carried out through meronymy, not taxonomy, since such components are only identifiable as such in the context of systems of signs. "Information" in this case, is as Gregory Bateson characterized it, a difference that makes a difference, not a mere structural difference. Kull concluded: "Meaning is made by part-whole relations, and, therefore, semiotics is meronymy. There is no signification without functional differentiation"<sup>2</sup>.

The notion of vegetative semiosis aligns semiotics with C.H. Waddington's work on epigenesis through canalized paths of development, enabling a synthesis of semiotics with such work. Waddington's work inspired the development of the catastrophe theory of René Thom and helped advance complexity theory, including Prigogine's work in thermodynamics, hierarchy theory, Robert Rosen's work on anticipatory systems, and edge of chaos theory. The maintenance of paths of development involving downward causation has been made intelligible through the study of oscillations and their interactions, to begin with, by Waddington's student, Brian Goodwin and more recently by Denis Noble. Complexity theory led to Stuart Kauffman's work on organisms' exploration and utilization of "adjacent possibles" to solve problems, revealing at the same time the limits of mathematical models in science. These developments of science make intelligible final causes (eliminating energy gradients while maintaining and developing the forms that facilitate this), and thereby needs and purposes in organisms, the irreducible reality of functions and selection between alternative possibilities, just as Kull characterized them.

Explaining vegetative semiosis through these advances in science in turn brings into focus the distinctive nature of signs and what they make possible. Signs are not simply effects of what they signify but imply memory, anticipation and the possibility of creativity in their interpretance. Once this is understood in vegetative semiosis it is a relatively simple matter to explain animal and cultural semiosis while acknowledging their unique features, while seeing animal and cultural semiosis as grounded in vegetative semiosis frees us from any tendency to view culture, and minds, as disembodied.

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<sup>2</sup> *Ibid.*: 343.



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### **Sémiose végétative**

**Résumé:**

Dans le travail «An introduction to phytosemiotics», un chef-d'œuvre de synthèse, Kalevi Kull défend la notion de phytosémiotique de Martin Krampen. Ce faisant, il développe la notion de sémiose végétative. Dans un travail ultérieur, il soutient la thèse que la sémiose végétative n'est pas une branche de la sémiotique et ne devrait donc pas être identifiée à la phytosémiotique. La sémiose végétative est plutôt une forme basique de la sémiose et la condition de la sémiose animale, qui à son tour est la condition de la sémiose culturelle. La sémiose végétative est propre à tous les organismes multicellulaires, y compris les plantes, les animaux et les humains. Clairement influencée par Aristote (et Thomas d'Aquin), cette caractéristique de la sémiose végétative permet de relier plus facilement la biosémiotique à la science actuelle, d'intégrer la science actuelle dans la biosémiotique et ainsi d'élargir considérablement le potentiel de recherche de la biosémiotique.

**Mots-clés:** phytosémiotique, sémiose végétative, morphogenèse

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### **Вегетативный семиозис**

**Аннотация:**

В работе «An introduction to phytosemiotics» – настоящем шедевре научного синтеза – Калеви Куль выступает как сторонник концепта фитосемиотики Мартина Крампена. При этом он разрабатывает понятие вегетативного семиозиса. В более поздней работе он утверждает, что вегетативный семиозис не является областью семиотики и поэтому не должен отождествляться с фитосемиотикой. Скорее, вегетативный семиозис является основной формой семиозиса и условием животного семиозиса, который, в свою очередь, является условием культурного семиозиса. Вегетативный семиозис характерен для всех многоклеточных организмов, включая растения, животных и человека. Эта характеристика вегетативного семиозиса – где явно обнаруживается влияние Аристотеля (и Фомы Аквинского) – облегчает установление связи между биосемиотикой и современной наукой, интеграцию современной науки в биосемиотику, что значительно расширяет исследовательский потенциал биосемиотики.

**Ключевые слова:** фитосемиотика, вегетативный семиозис, морфогенез

# Life is based on choices

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***Abstract:***

Kalevi Kull has made us reflect on the importance of choosing to accede to *meaning-making*. Choices are inevitably linked to incompatible alternatives, due to their simultaneity. Therefore, taking a decision equals resolving their incompatibility and construing new habitation rules by learning how to interpret successful outcomes.

***Keywords:*** laws, rules, choice, incompatibility

I have always enjoyed reading Kalevi's papers. Over the years he has elaborated many of the ideas we now take as basic to our understanding of Biosemiotics. However, if asked to cite a key aspect of Kalevi's teaching, I would certainly identify it with the word *choice*<sup>1</sup>. Choice is a word that – when properly understood – may inevitably change our way of dealing with science and philosophy. As a biologist, I was brought up with the idea that pursuing science in Biology would necessarily entail treating any living process as if governed by specific laws. Due to this understanding, it had to be explained as inevitably determined, and possibly described in mathematical terms or, at least, validated by an appropriate statistical method.

However, whenever living creatures are approached this way, their history and specific individualities are lost or not properly accounted for. We treat them for what they are at the present and not for their capacity to evolve and generate new living forms through time. Any attempt to justify their biodiversity in mechanistic terms, i.e., studying the exclusive mechanisms that account for gene coding and self-reproduction, are considered unsatisfactory by many. And here comes one of Kalevi's seminal contributions that has helped us understand how explanation and meaning are differentially supported by *laws* and *rules*<sup>2</sup>. Laws are universal descriptions that, in principle, may be applied to any physical phenomenon regardless of where and when has occurred. They simply describe how things and events might happen, or have already happened, anywhere in space and time. From this standpoint, and in the absence of any alternative, knowledge of past events suffices to predict the probability of their future consequences. By contrast, rules are habits conventionally established, potentially fallible and locally constrained. They are proper of any subject capable of choosing, i.e., endowed with the capability to select different options whenever they are perceived as potentially accessible.

I honestly consider Kalevi's comparison between lawful events and choices a milestone contribution to the scientific and philosophical understanding of Biosemiotics. Lawful processes are sustained by diachronic events and their causal dependence established only *post-factum*, whereas choices can only take place amongst options perceived as simultaneous (synchronous). This last condition makes alternative options necessarily incompatible, suggesting that deciding between incompatible alternatives entails opting for one and leaving other out. As clearly indicated by the Latin verb *de-cidere*, to decide entails cutting, i.e., separating one option from the other. Therefore, if choices are inevitably linked to incompatible alternatives, taking a decision is already part of the solution for resolving their incompatibility!

But, what is even more important, solving incompatible options makes it also possible for sentient subjects to perceive *differences* and, as a result, to accede to *meaning-making* and meaningful communication. Kale-

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<sup>1</sup> Kull 2015; 2018.

<sup>2</sup> Kull 2014.

vi has wisely made explicit many of these differences. First, in the absence of alternatives, no meaning can ever emerge from a probabilistic determination since computational processes are necessarily compatible. The very act of choosing entails instead entering the space of possibility where new *habits* may be construed and eventually remembered as successful interpretations. Second, when remembered as successful choices, habits may be learned in the form of recurrent links between different regularities, and lastly, positive habituation makes it easier for sequential choices to attain meaningful objectives. These are just a few of the numerous implications that can be deduced from Kalevi's reflections. I am confident that, in the years to come, their intrinsic values will be made explicit in many research programs with great benefits for the entire biosemiotic community.

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### **La vie est basée sur des choix**

**Résumé:**

Kalevi Kull nous a fait réfléchir à l'importance du fait de choisir pour avoir accès à la *formation de sens*. Les choix sont inévitablement liés à des alternatives incompatibles, du fait de leur simultanéité. Par conséquent, prendre une décision équivaut à résoudre leur incompatibilité et à interpréter de nouvelles règles d'habitation en apprenant à interpréter les résultats positifs.

**Mots-clés:** lois, règles, choix, incompatibilité

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### **Жизнь основана на выборе**

**Аннотация:**

Благодаря Калеву Куллиу мы задумались о важности осуществления выбора, обеспечивающего доступ к «созданию смысла» («приданию значения»). Выбор неизбежно связан с несовместимыми альтернативами – из-за одновременности последних. Таким образом, принятие решения равносильно устранению их несовместимости и толкованию новых правил существования путем изучения того, как интерпретировать успешные результаты.

**Ключевые слова:** законы, правила, выбор, несовместимость

# **A brief review of an elaboration of the “Dirac diagram”: Speculative riffing on “To know what life knows” through an abductive “musement” on the dichotomy between the $\Phi$ - and the $\Sigma$ -sciences**

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## ***Abstract:***

In this paper, an extension of the distinction between the  $\Phi$ - and the  $\Sigma$ -sciences and proposed differentiation between the “physical” and “semiotic” scientific approaches is brought forward based on an expansion of Table 1 in Kull (2009) and the concepts presented in this seminal paper by Kalevi Kull. This extension is based on a very wide-ranging, speculative elaboration of the so-called “Dirac diagram” that has been attributed to Paul Dirac (1902-1984), a distinguished quantum physicist of the 20th century, which arose out of considerations arising from quantum physics. It is maintained that this distinction between the physical sciences and the semiotic sciences is far-reaching and fundamentally transdisciplinary, and is hinted at by the divergence of the basic principles of quantum physics from those of classical physics.

**Keywords:** biosemiotics, quantum physics, communication, meaning, philosophy of science

Blessed be the covenant of love between what is hidden and what is revealed<sup>1</sup>.

[...] our view of the world, which we get consciously or unconsciously from modern science, is *radically incoherent*... modern science is itself *radically incoherent*, not when it seeks to understand things and subhuman organisms and the cosmos itself, but when it seeks to understand man, not man's physiology or neurology or his bloodstream, but man *qua* man, man when he is particularly human... the sciences of man are incoherent<sup>2</sup>.

As Kalevi Kull has proposed, biosemiotics “studies what life knows”<sup>3</sup> and, as such, it is the study of “knowing” in all forms of living organisms. It is the “knowing about knowing” that is the study of how knowledge is “attained and communicated”<sup>4</sup>. It is the study of the manner in which meaning is extracted from experience, and, thus, is the study of *communication* understood as a real process, which can be grasped as a form of sign action, or “semiosis”. And, as Kull points out, “Meaning is not a molecule, but a relation. Accordingly, empirical biosemiotics is a study of relations, functions, distinctions that organisms make, communication, plurality of meaning, and so forth”<sup>5</sup>. As an aside, I think, the recognition of the reality and centrality of communication which is denied in conventional Cartesian nominalism, is key<sup>6</sup>. Communication is a fundament of nature and is ubiquitous and of critical importance throughout the natural world. And communication is a fundamentally semiotic process that involves the production and interpretation of encoded messages.

One can thus propose a form of science that is physicalist and assumes that the physical relata are primordial and the relations between them are derivative and mind-dependent, or one can alternatively propose a form of science that is relational, assuming that it is the relations that are primordial with the relata derivative. As Kull points out<sup>7</sup>, this point of differentiation between two major forms of science can be related to a different role that historical explanation, or the embedding of phenomena in “process”, has, as has been pointed out by Rein Vihalemm<sup>8</sup>. In the so-called  $\Phi$ -sciences, the basic assumption is that historical context is irrelevant, since they are, by definition, *context-independent*, and model the world as being governed by invariant universal laws that guide quantitative measurement as the explanatory method. These are the conventional physical sciences that constitute the dogma for what has come to be known as a

<sup>1</sup> Cohen 1984: Entry #14.

<sup>2</sup> Percy 1991: 271.

<sup>3</sup> Kull 2009: 87.

<sup>4</sup> Locke 1690 [2008: 463].

<sup>5</sup> Kull 2009: 87.

<sup>6</sup> Deely 2001: 589.

<sup>7</sup> Kull 2009.

<sup>8</sup> Vihalemm 2007.

mechanistic and reductionistic “faith” called “scientism”. But there is a whole other realm that tends to be ignored or overlooked in the context of modern science, as has also been recognized by Eastman<sup>9</sup>, in which context has a real and significant effect that cannot be discounted, and which, as a result, is dependent on historical explanation, and models the world through description using primarily qualitative experiential methods. In these semiotic  $\Sigma$ -sciences, observations are inherently *context-dependent* and thus vary with respect to contextual aspects.

As Kull points out, “at the stage of modelling and theory [...] the approaches diverge,  $\Phi$ -science [...] [involves] [...] a modelling based on quantitative convertibility, and  $\Sigma$ -science [...] [involves] [...] a modelling based on qualitative diversity”<sup>10</sup>.



Figure 3. The Dirac Fourier transform diagram. Source: Adapted from Pribram (2004b)

Figure 1. The original “Dirac diagram”

In this brief paper, we propose to significantly extend the table that Kull<sup>11</sup> includes – Table 1 on page 85 – beginning with a distinction initially made in a diagram formulated by the Nobel prize-winning quantum physicist, Paul Dirac. According to Joye<sup>12</sup>, the so-called “Dirac diagram” (see Figure 1) has appeared in several of the published papers of neuroscientist, Karl Pribram, for example, in Pribram<sup>13</sup>. Pribram reported having obtained this diagram during a presentation delivered by Geoffrey Chew who was the head of the physics department at University of California at Berkeley who relayed to Pribram that he had been given the diagram by another Berkeley physicist, Henry Stapp. And Stapp indicated that this diagram was attributable to Paul Dirac with whom he had studied, who never actually published it. The original Dirac diagram is shown in Figure 1, and has been adapted in Figure 2 with a horizontally flipped mirroring in order to match the

<sup>9</sup> *Ibid.*

<sup>10</sup> Kull 2009: 85.

<sup>11</sup> Percy 1991: 271.

<sup>12</sup> Joye 2017.

<sup>13</sup> Accessed 2022, see Figure 1: 230.



appropriately designated cerebral hemisphere in accordance to the theory of the Divided Brain of Iain McGilchrist<sup>14</sup>, so that, looking from the back of the head, the right hemisphere is located on the right side of the diagram and the left hemisphere is on the left side. This has also been done so that the diagram alignment corresponds to Table 1 in Kull<sup>15</sup> where the  $\Phi$ -sciences are shown in the left column and the  $\Sigma$ -sciences are shown in the right column.

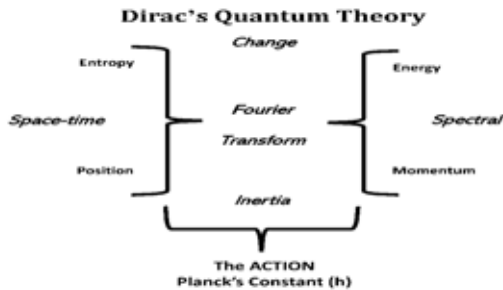


Figure 2. The Adapted “Dirac diagram” transformed with a horizontal mirror reflection

The modified and elaborated Dirac diagram is shown in Figure 3 (part A), Figure 4 (part B) and Figure 5 (part C). The original elements of the Dirac diagram are highlighted in gray in these figures to show how each of these figures maps back to the original. There are many details that appear in this elaboration of the original Dirac diagram and, unfortunately, there is no room available here for any further comment. A full description that includes an extended and detailed discussion of each line of these Figures will be forthcoming.

#### Additional Notes on specific Figures:

Figure 3: The distinction between the focal functions of the left cerebral hemisphere and the global functions of the right cerebral hemisphere are elaborated in the work of McGilchrist<sup>16</sup>. The distinction between the “Explicate” and “Implicate” orders is related to the work of David Bohm<sup>17</sup>, as is the proposed construct of “Soma-Significance”<sup>18</sup>. The distinction between an evolved non-veridical physical interface and a veridical relational connection to reality is due to Hoffman<sup>19</sup>. The left hemispheric specializa-

<sup>14</sup> McGilchrist 2009; 2021.

<sup>15</sup> Kull 2009.

<sup>16</sup> McGilchrist 2009; 2021.

<sup>17</sup> Bohm 1980 [2005].

<sup>18</sup> Bohm 2003.

<sup>19</sup> Hoffman 2019.

tion for event processing in the temporal domain with right hemispheric specialization for spectral processing in the frequency domain has been demonstrated in a paper by Albouy *et al.*<sup>20</sup> Ryle<sup>21</sup> (1945-1946) made a distinction between the propositional content of “knowing that” and the behavioral features of “knowing how”.

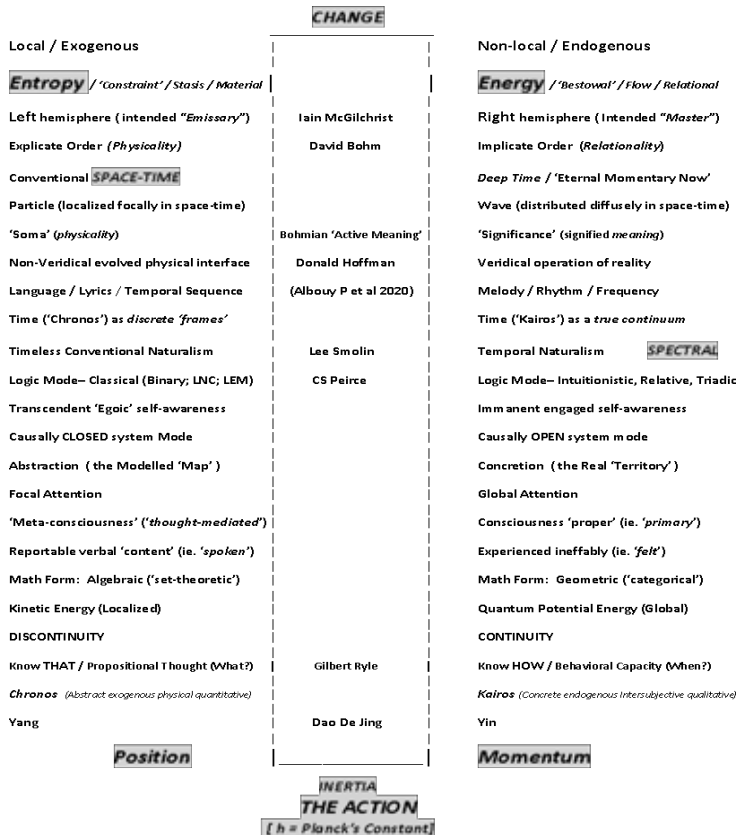
Figure 3: Modified and Elaborated ‘Dirac Diagram’ (Part A)

Figure 4: Reference is made to the possibilist/relativistic transactional interpretation of quantum mechanics developed by Ruth E. Kastner<sup>22</sup> and its distinction between material “actuality” and the hidden reality of possibility associated with the quantum world. Finally, Timothy Eastman<sup>23</sup> has described a new creative synthesis that he calls the “Logoi framework” that

<sup>20</sup> Albouy, Benjamin, Morillon, Zatorre 2020.

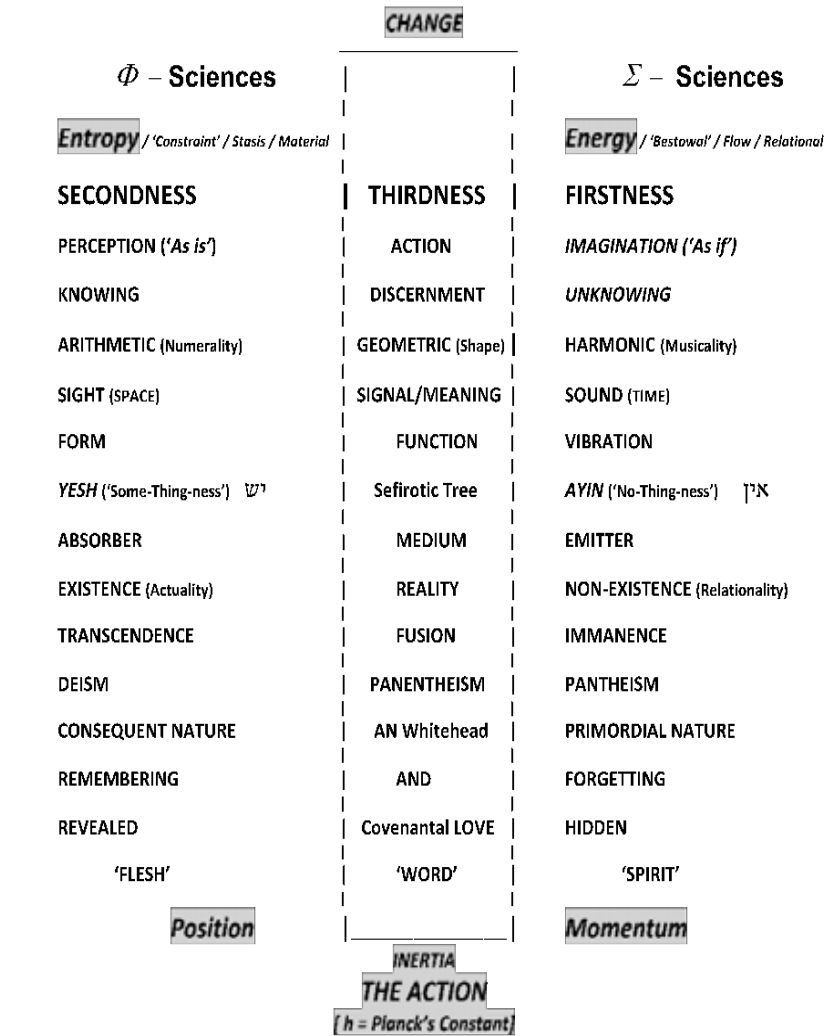
<sup>21</sup> Ryle 1945-1946.

<sup>22</sup> Kastner 2013.

<sup>23</sup> Eastman 2020.



Figure 5: Modified and Elaborated ‘Dirac Diagram’ (Part C)



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**Un bref aperçu d’une élaboration du «diagramme de Dirac»:  
riffing spéculatif sur «To know what life knows»  
à travers un «musement» abductif sur la dichotomie  
entre les sciences- $\Phi$  et les sciences- $\Sigma$**

***Résumé:***

Dans cet article, une extension de la distinction entre les sciences- $\Phi$  et les sciences- $\Sigma$  et une différenciation proposée entre les approches scientifiques «physiques» et «sémiotiques» sont avancées sur la base d’un développement du Tableau 1 présenté dans le travail Kull 2009, ainsi que des concepts élaborés dans cet article séminal de Kalevi Kull. Cette extension est basée sur une élaboration spéculative très large du soi-disant «diagramme de Dirac» attribué à Paul Dirac (1902-1984), un éminent physicien quantique du XX<sup>ème</sup> siècle, et qui est né de considérations découlant de la physique quantique. On soutient que cette distinction entre les sciences physiques et les sciences sémiotiques est d’une grande portée; elle est fondamentalement trans-disciplinaire et suggérée par la divergence des principes de base de la physique quantique avec ceux de la physique classique.

**Mots-clés:** biosémiotique, physique quantique, communication, sens, philosophie des sciences

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**Краткий обзор разработки «диаграммы Дирака»  
(спекулятивный риффинг на тему работы «To know what life  
knows» посредством абдуктивного «игрового размышления»  
о дихотомии  $\Phi$ - и  $\Sigma$ -наук)**

***Аннотация:***

В этой статье разработка положения о различии между  $\Phi$ - и  $\Sigma$ -науками и предлагаемая дифференциация между «физическим» и «семиотическим» научными подходами получают развитие на основе размышлений над Таблицей 1 в работе Kull 2009, а также над понятиями, представленными в этой основополагающей статье Калеви Кулля. Наша разработка основана на широкомасштабном спекулятивном развитии так называемой «диаграммы Дирака», приписываемой выдающемуся квантовому физика 20-ого века Полю Дираку (1902-1984) и возникшей из размышлений, восходящих к квантовой физике. Утверждается, что различие между физическими и семиотическими науками имеет важные последствия и является фундаментально трансдисципли-

плинарным; на него указывает расхождение основных принципов квантовой физики с принципами физики классической.

**Ключевые слова:** биосемиотика, квантовая физика, коммуникация, значение, философия науки

# Incompatibility and the double bind

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***Abstract:***

Kalevi Kull's recent work on logical incompatibility can be illuminated by parables and ideas from Gregory Bateson (and Lewis Carroll, via Bateson). Specifically, the double bind, especially as Bateson applied this idea to evolution, dovetails well with K. Kull's work on logical incompatibility and points to some of its potential implications.

***Keywords:*** logical incompatibility, double bind, habit, evolution



Kalevi Kull has had such a rich history in biosemiotics that one could be overwhelmed by the breadth of his body of work. Thus I decided to avoid the wide view of his *oeuvre* and instead narrow my focus and look only at one article from 2015, “Semiosis stems from logical incompatibility in organic nature: Why biophysics does not see meaning, while biosemiotics does”<sup>1</sup>. Reading through this article I found that its line of argument leads me to the conclusion that what Gregory Bateson called the double bind emerges out of semiotic inevitabilities which are fundamental to life itself.

Gregory Bateson with help from Lewis Carroll can provide us with a couple of relevant parables.

In a 1953 Metatalk, one of Bateson’s philosophical dialogues in the form of a father-daughter conversation, Bateson takes as a topic the croquet game in *Alice in Wonderland*<sup>2</sup>. In this game, flamingoes are used as mallets and hedgehogs as balls – and soldiers as hoops. But since these supposed playing pieces are alive, any or all of them can move and stymie any logical attempt at playing croquet. Daughter asks, “Did everything have to be *alive* so as to make a complete muddle?” And Father responds, “It’s curious but you’re right”<sup>3</sup>. If it were just a matter of a bumpy lawn or misshapen balls or wobbly mallets, the players could adapt; they could learn, consistently, how to deal with the altered game. They could develop habits with very high reliability. “But once you bring live things into it, it becomes impossible”<sup>4</sup>.

Bateson writes, “it’s just the fact that animals are capable of seeing ahead and learning that makes them the only really unpredictable things in the world”<sup>5</sup>.

Now to turn to Kull’s 2015 paper. The unpredictability Bateson mentions is a consequence of what Kull calls the “necessity of logical incongruence” in biology. A *logically congruent* system would be like a machine – would *be*, perhaps, in some sense a machine. Machines cannot make errors – because an error is only an error *for* a being who can err. Or as Heinz von Foerster put it, machines can answer all decidable questions, in the sense of questions to which logic can be applied impeccably to determine a unique and correct answer. This leaves only the *undecidable* ones to be the ones which we, living beings, have to decide<sup>6</sup>.

Kull notes that living systems make and preserve “arbitrary” connections among phenomena, in which “arbitrary” means that such a connection or link is “not deducible from the physical or chemical laws, but is *acquired* through history, evolution, learning, compiling”<sup>7</sup>. The making of such links is entailed by semiosis; the preserving of such links evolves into

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<sup>1</sup> Kull 2015.

<sup>2</sup> Carroll 1865 and 1896 [1960: 111].

<sup>3</sup> Bateson 1972 [2000: 30].

<sup>4</sup> *Ibid.*: 31.

<sup>5</sup> *Ibid.*

<sup>6</sup> Von Foerster 1992: 14.

<sup>7</sup> Kull 2015: 617.

habit. By becoming habit Kull argues that semiosis “loses its meaning making capacity”, “evolving into” what Umberto Eco called a “code”<sup>8</sup>.

Every living being, it can be seen, has a unique history, has its own semiosis, habit formation, and code. But this necessarily leads to “incompatibility”, among different organisms, or even within them. Examples of incompatibility for Kull are contradiction, non-translatibility, or even an organism’s own combination of its learned “operations” so as to become incompatible with itself.

This incompatibility is shown by Kull to be the only way dialogue can arise. Dialogue is only possible because of the difference, the incompatibility, among organisms with their own histories and codes. This is even so when dialogue means to push toward a solution to incompatibility, to arrive at some form of congruence or non-contradiction. The existence of choice or agency is also only possible because of incompatibility. “Choice assumes alternatives, possibilities as real, options which cannot be executed all together”<sup>9</sup>.

There is much more, but Kull concludes as follows. “Physical laws allow the formation of habits (i.e. acquired rules); habits allow for their incompatibility, thus there appear dilemmas or confusions for organisms. Dilemmas, or the situations of choice, presuppose the simultaneity of options, and thus they appear together with, and only in, the present. Choice presupposes the finite phenomenal now”<sup>10</sup>.

To say dilemma evokes what Bateson calls the double bind – a form of dilemma, but with special characteristics. His use of that concept is well known as regarding interpersonal relationships, but he also applies double bind to evolutionary theory writ large. In that context he again finds in the “Alice” books an *ur*-parable of double bind:

“Crawling at your feet”, said the Gnat (Alice drew her feet back in some alarm), “you may observe a Bread-and-Butterfly. Its wings are thin slices of Bread-and-butter, its body is a crust, and its head is a lump of sugar”.

“And what does it live on?”

“Weak tea with cream in it”.

A new difficulty came into Alice’s head. “Supposing it couldn’t find any?” she suggested.

“Then it would die, of course”.

“But that must happen very often”, Alice remarked thoughtfully.

“It always happens”, said the Gnat<sup>11</sup>.

Gregory Bateson always described this passage as a commentary on Darwinian evolution, as well as a subtle if mordant version of double bind (the

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<sup>8</sup> Eco 1976.

<sup>9</sup> Kull 2015: 618.

<sup>10</sup> *Ibid.*: 620.

<sup>11</sup> Carroll 1865 and 1896 [1960: 223].

contradiction is that the very act of feeding to perpetuate life, terminates it). But what it describes, in terms of Kull's article, is an incompatibility.

While the entire living world is pervaded, or perfused, by incompatibility in Kull's sense, nonetheless some incompatibilities can lead to extinction, by the formula, if *a* doesn't get you then *b* will. Some incompatibilities lead one or more organisms outside their "phase spaces" of viability<sup>12</sup>. In the case of our individual lives, indeed, eventually, "it always happens", as the Gnat says.

It can happen that the more stable or predictable its *umwelt* is, the less an organism needs to learn (or even to be semiotically active). Those aspects of the *umwelt* which are, as it were, taken for granted, become "hard wired" and less available for the immediacy of semiosis. But it is precisely when these change, that the organism is most stressed, having been, as the saying goes, "led up the garden path" by a previous history of learning which has now led to a fatal incompatibility with its changed *umwelt*. And this, for Bateson, is the evolutionary double bind – an inevitable outcome of the "incompatibility" inherent in semiosis, and in life.

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<sup>12</sup> Bateson 1962.

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### **Incompatibilité et double contrainte**

***Résumé:***

Le travail récent de Kalevi Kull sur l'incompatibilité logique peut être éclairé par des paraboles et des idées de Gregory Bateson (et de Lewis Carroll, via Bateson). Plus précisément, l'idée de la double contrainte, en particulier lorsque Bateson l'applique à l'évolution, concorde bien avec les réflexions de K. Kull sur l'incompatibilité logique et indique plusieurs de ses implications potentielles.

***Mots-clés:*** incompatibilité logique, double contrainte, habitude, évolution

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### **Несовместимость и двойная связь**

***Аннотация:***

Недавняя работа Калеви Кулля о логической несовместимости может быть прочитана в свете притч и идей Грегори Бейтсона (а также, через посредство Бейтсона, Льюиса Кэрролла). В частности, идея двойной связи, особенно в ее применении Бейтсоном к рассуждениям об эволюции, хорошо согласуется с размышлениями К. Кулля о логической несовместимости и указывает на некоторые из ее потенциальных следствий.

***Ключевые слова:*** логическая несовместимость, двойная связь, привычка, эволюция



# Romantic Biosemiotics

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***Abstract:***

The notion that there is a final answer that can be pegged down for all eternity is one of the (many) afflictions we inherited from Parmenides and Plato. Semiosis stems from a different tradition: one of movement. Following this Heraclitan impulse, I ground semiotics, and Kalevi Kull's biosemiotic innovations, in the Romantic tradition of science which embraced quantification and demarcation while respecting its limitations.

***Keywords:*** romantics, biosemiotics, Kalevi Kull, *Umwelt*, indeterminacy

I remember distinctly at the 2015 Biosemiotics Gathering Kalevi debating me over the agency of plant signaling I had advanced in my presentation, grilling me over the mechanisms. I was proffering argument after argument that good evidence exists (through subterranean mycorrhizal fungi, airborne volatile organic compounds, etc.) that plants are indeed semiotic rather than just at the mercy of biochemical determinism, and Kalevi at every turn questioned the evidence, assuring that I knew what I was talking about. Our conversation was convivial, but fierce. A few minutes later after we had ended, however, I overheard Kalevi speaking with another participant arguing *for* the position that all organisms, especially microbiota, are semiotic and agential. As in many other instances, it seems here Kalevi plays the contrarian, not for his own sake, but to tease out the embedded and implicit semiosis in worldviews. The dialogic form in his hands becomes a technique of liberation from attachments and ideologies. This motion of change, of consideration, of increasing and releasing tension, like a sigh, is a didactic tool wit-matching with Kalevi.

Kalevi is a Romantic, in the tradition of Goethe, Schelling, or Humboldt – a mammoth academic thinker who has not been lost in the certainties of science, but instead harnesses them towards higher purposes. The Romantics, historically speaking, were not against science, logic, or reason; indeed, they inhabited those disciplines and practices as well as any of their contemporaries. Goethe's color theory is no more glorious or germane to his *oeuvre* than his poetry or playwriting. But the Romantics did not pretend that signs could be finally traceable without moving the cursor in the act. They understood that experiments are influenced willy-nilly by the experimenter; and thus, the importance of tuning oneself to be an accurately-gauged instrument is the most valuable of methodologies. Like Antonio Demasio, Romantics understand that thought and understanding is emergent with and from emotion, requiring making peace with the passions. Like Whitehead, they agree that civilization advances by rendering the conscious unconscious. Like Chalmers, they acknowledge *qualia*, the hard problem of causation: that the map is not the territory, and never can be. The more we insist on exhaustively understanding all causation, the more we miss out on phenomena; the more violence we inflict.

As much as Kalevi argues that the question of what constitutes an organism's *Umwelt* is an empirical rather than a metaphysical one, I think if we return to Peirce's pragmatics, or Uexküll's *Umwelt* theory, self-knowledge lies at the core, rendering the experience of *Umwelt* phenomenological. Yet, phenomenology as a methodology presents its own limits; the *surréflexion* of Merleau-Ponty, for instance, can also default into an endlessly looping experience. And, at any rate, it is impossible to make the full totality of experience conscious (nor, I think, would it be pleasurable). The unconscious of the mind exists in the perception of the body; but that unconscious cannot ever fully be made aware. This is where metaphysics slides back in.

Semiosis exists as a process excessive of grasping, and yet our attempts at understanding aspects of it do shine a spotlight on certain moments of semiosis, foregrounded against a dark but moving background. Where we put our attention, and how we conceive of our semiotic experience changes the aperture of our awareness, rendering apperceptive, exteroceptive, and interoceptive capacities changed. As Philip Shepard writes, “By teaching its members a certain set of senses, a culture teaches them a certain way of being”<sup>1</sup>. Thus, attention leads to habits of being (ontology), which is malleable by both environment and culture. How we arrive at fixity in any one of these assessments brings us at best a spatiotemporally confined, non-generalizable knowledge, rather than transitive universals. Thus the metaphysics of *Umwelt* – and of semiotics – lies in the simultaneous under- and overdetermination of processes.

At first glance, Kalevi’s recent Target Article “The biosemiotic fundamentals of aesthetics: Beauty is the perfect semiotic fitting”<sup>2</sup> in our journal, *Biosemiotics*, steers far afield from the early days of his work focused on more hardcore biology and also very well cited, such as his “Dynamic modelling of tree growth”<sup>3</sup> or “Leaf weight per area and leaf size of 85 Estonian woody species in relation to shade tolerance and light availability”<sup>4</sup>. But a Romantic motif flows throughout Professor Kull’s work that cannot be denied. Questions of translation, of the issues arising with theoretical categorizations, speculative philosophy (at its highest caliber), and quibbling about demarcation are recurring themes. In addition to living his life as a work of art, Kalevi has always infused an artistic sense – no doubt part of his Estonian heritage – with his science, instead of becoming a boring positivist. This quintessence of the Romantic, to see the forest for the trees, is the best antidote to our era afflicted with simultanagnosia. It is also a pillar of cybernetic thinking.

Beauty, pedagogy, recursivity, distinction-making, continental philosophy of biology – all of these elements wind their way throughout Kalevi’s impressive career. It’s funny how one of the most renowned (bio)semioticians alive manages to wear so many hats, accommodating the attachments of so many different scholars. And yet, always giving himself a way out of a locked-in position, Kalevi embodies semiotics’ *esse in futuro*. As urgent as it is for biosemiotics as an interdisciplinary to develop a methodology and research program, for progress in biosemiotics, making predictions, and evaluating *how* biosemiotics is done, and what it achieves, we must never forget that the field’s insights are always the finger pointing to the moon; best not to get caught up looking at the finger and miss the beauty of the moon.

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<sup>1</sup> Shepherd 2017: 18.

<sup>2</sup> Kull 2022.

<sup>3</sup> Куль, Куль 1989.

<sup>4</sup> Niinemets, Kull 1994.



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### **Biosémiotique romantique**

**Résumé:**

L'idée qu'il existe une réponse définitive qui peut être ancrée pour toute l'éternité est l'une des (nombreuses) afflictions dont nous avons hérité de Parménide et de Platon. La sémiologie provient d'une autre tradition: celle du mouvement. Suivant cette impulsion héracléenne, je fais remonter la sémiotique, et les innovations biosémiotiques de Kalevi Kull, à la tradition romantique de la science qui a embrassé la quantification et la démarcation, tout en respectant les limites concernées.

**Mots-clés:** romantiques, biosémiotique, Kalevi Kull, *Umwelt*, indétermination

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### **Романтическая биосемиотика**

**Аннотация:**

Представление о том, что существует окончательный ответ, который можно зафиксировать на все времена, является одной из (многих) проблем, унаследованных нами от Парменида и Платона. Семиозис восходит к другой традиции – к традиции движения. Следуя этому гераклитовскому порыву, я возвожу семиотику – как и биосемиотические открытия Калеви Кулля – к романтической научной традиции, включавшей в себя квантификацию и демаркацию, при этом соблюдая соответствующие ограничения.

**Ключевые слова:** романтики, биосемиотика, Калеви Кулля, *Умвельт*, неопределенность



# **The depths of the surface: Between biosemiotics and aesthetics**

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***Abstract:***

This article reflects on some important linkages between biosemiotics and aesthetics in Kalevi Kull's intellectual trajectory. Starting from remarks from his and Ekaterina Velmezova's short communication on Jesper Hoffmeyer's "Signs of Life" exhibition in the Esbjerg Museum of Art in 2011, this article draws attention to the aesthetic scope of the notion semiotic fitting, the range and depth of the aesthetic dimension, the psyche as the most exciting surface, and supporting models of aesthetic experience with strong connections to biosemiotics.

***Keywords:*** biosemiotics and art, semiotic fitting, depths of the surface, psyche as excitable surface, order, harmony, congruence, models of aesthetic experience, John Dewey, Susanne Langer

Kalevi's and Ekaterina's "short communication", "Biosemiotics in a gallery", in *Biosemiotics*<sup>1</sup>, on Morten Skriver's and Jesper Hoffmeyer's 2011 "Signs of Life" exhibition at the Esbjerg Art Museum (Denmark), is important beyond its relevance to drawing our attention to a rich multisensory display that gave body and experiential thickness to the exhibition's creative project: to present core ideas of semiotics – semiosphere, sign, semiotic scaffolding, semiotic freedom, and depths of the surface – that our colleague and friend Jesper had explored and utilized in his *Biosemiotics*.

They cite a passage from the catalogue, written by Skriver and Inge Kjeldgaard to characterize the thrust of the exhibition, that can also apply to Kalevi's years-long theoretical concerns: to inspire "a new way of looking at biology, and possibly art as well"<sup>2</sup>. In the time since Skriver and Kjeldgaard wrote that sentence Kalevi has taken up directly and indirectly, and with moving poetic-analytical eloquence in "Ecosemiotics of art", links between aesthetics and biosemiotics and its ecosemiotic extensions and contexts<sup>3</sup>. And now, in a major article in *Biosemiotics*, on which I was invited to write a commentary, Kalevi has extended his attention in a systematic way to the "biosemiotic fundamentals of aesthetics", centered around his multi-relevant and layered concept of semiotic fitting<sup>4</sup>.

This concept, insightfully applied to an analysis of the nativeness of communities<sup>5</sup>, has now been extended to beauty as "perfect semiotic fitting", a constitutive dynamic and fulfilling complementarity between two poles: a lived context and beings endowed with diverse powers of grasping and being grasped by multiple levels and kinds of signs and objects. By means of this concept Kalevi has arrived at cognate fundamental concepts that match, indeed even go beyond, the range of those foregrounded in the Esbjerg exhibition. His work has taken a grounded step toward developing, with explicit reference to, and help from, a biosemiotic conceptual framework, fundamental aspects of aesthetics quite generally. Such an analysis, he shows, is itself substantially dependent upon a semiotic framework and its descriptive foundations that divide the semiotic continuum at its significant joints and then proceeds *downwards* to the dialectic of sign-defined interfaces in the biosemiotic realm of organisms and their interactions with and within their niches. Each interfacial level has its own Peircean semiotic logic and defining material quality<sup>6</sup>. Nature is the domain of semiotic emergences.

<sup>1</sup> Kull, Velmezova 2012.

<sup>2</sup> Skriver, Kjeldgaard (eds.), 2011: 80.

<sup>3</sup> Kull 2016.

<sup>4</sup> Before I was asked to contribute this article, I had already written and submitted an invited commentary (Innis, forthcoming) to be published along with Kalevi's article "The biosemiotic fundamentals of aesthetics" in *Biosemiotics*. Kalevi's article is a major work of synthesis, analytical precision, with broad scope and rich documentation. My remarks here have a different form and goal.

<sup>5</sup> Kull 2020.

<sup>6</sup> See Innis 2019.

Kalevi's work asks again and again in different contexts: How far down in nature is semiosis found? And what types? His answer: in realms not governed by matter and energy. The fifth room of the Esbjerg exhibition has the following precise yet paradoxical label: "the depths of the surface". A surface both separates and links an "inside" from an "outside". In their text Kalevi and Ekaterina cite approvingly a long text about surfaces and the assimilation of surfaces to a kind of dashboard or interface. The text goes on to claim that the psyche is "the most exciting surface" – an excitable surface, excited by a rich play of signs and waves of spontaneous and sought after, indeed, deliberately constructed experiential occasions that art exemplifies as well as does a walk in the woods<sup>7</sup>.

Kalevi, as a reflective naturalist, has brought our attention to the semiotic depths of the luring immanent beauty of the organic sensing surfaces at play in and as meadow, lake, forest, city park, or one's own garden. He has shown us that our relation to these sensing surfaces should not be solely the distanced analytical one of theory but a participatory engaging with the panorama by a contemplative dwelling in the perceived distinctiveness of these sensing surfaces and the communities they make up. Each of these communities has what Dewey, echoing Peirce, called its own aura or penetrating quality, rooted in the "blending" and "fusing" of its living elements and their potencies<sup>8</sup>.

Dewey wrote in his *Art as Experience* that it is "to esthetic experience [...] the philosopher must go to understand what experience is"<sup>9</sup>. The reach of the aesthetic goes deep, as Kalevi has shown in his work, and a philosophical aesthetics, attuned to biosemiotics, recognizes a manifold of aesthetic dimensions and strives to describe them. "In a world like ours", Dewey writes, "every living creature that attains sensibility welcomes order with a response of harmonious feeling whenever it finds a congruous order about it"<sup>10</sup>. Order, harmony, congruence are determining felt factors of semiotic fitting. At the same time, Dewey points out, "the organism craves variety as well as order"<sup>11</sup>, and nature supplies us with an abundance of both.

A passage in Langer's *Feeling and Form* echoes Dewey's point: "Sentient beings react to their world by constantly changing their total condition. When a creature's attention shifts from one center of interest to another, not only the organs immediately involved [...], but hundreds of fibers in the body are affected. Every smallest shift of awareness calls out a readjustment, and under ordinary circumstances such readjustments pass easily into another"<sup>12</sup>. Such events, *mutatis mutandis*, occur at all levels of

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<sup>7</sup> Kull 2016; see Innis 1994; 2022 and forthcoming for a treatment of this theme from different philosophical and semiotic angles.

<sup>8</sup> Innis 2022: esp. 55-82 and *passim*.

<sup>9</sup> Dewey 1934 [2005: 278].

<sup>10</sup> *Ibid.*: 13.

<sup>11</sup> *Ibid.*: 175.

<sup>12</sup> Langer 1953: 372.

living nature, but not always benignly. An aesthetically attuned biosemiotics, Kalevi teaches us, looks with a clear and accepting eye on living nature as a dynamic interlinking and mutual adjustment of living beings to one another and to their given and constructed ecosystems. These systems are evolving patterns of order and variety in which living beings have, either transiently or permanently, “found their place” or have lost it.

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**Robert E. Innis**

Université du Massachusetts à Lowell

### **Les profondeurs de la surface: entre biosémiotique et esthétique**

**Résumé:**

Dans cet article je réfléchis à certains liens importants entre biosémiotique et esthétique dans la trajectoire intellectuelle de Kalevi Kull. Partant de remarques tirées de son court texte co-écrit avec Ekaterina Velmezova sur l'exposition «Signs of Life» de Jesper Hoffmeyer au Musée des beaux-arts à Esbjerg en 2011, cet article attire l'attention sur la portée esthétique de la notion de correspondance sémiotique, sur la portée et la profondeur de la dimension esthétique, sur la psyché comme surface la plus excitante et sur les modèles de soutien de l'expérience esthétique fortement liés à la biosémiotique.

**Mots-clés:** biosémiotique et art, correspondance sémiotique, profondeurs de la surface, psyché comme surface excitable, ordre, harmonie, congruence, modèles d'expérience esthétique, John Dewey, Susanne Langer

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### **Глубины поверхности: между биосемиотикой и эстетикой**

**Аннотация:**

В этой статье я размышляю о некоторых важных связях между биосемиотикой и эстетикой в интеллектуальной траектории Калеви Кулля. Исходя из сказанного в опубликованном им совместно с Екатериной Вельмезовой небольшом тексте о выставке Йеспера Хоффмейера «Signs of Life» в Художественном музее Эсбьерга в 2011 году, я говорю здесь об эстетической сфере понятия семиотического соответствия, диапазоне и глубине эстетического измерения, психике как наиболее захватывающей поверхности и поддерживающих моделях эстетического опыта, тесно связанных с биосемиотикой.

**Ключевые слова:** биосемиотика и искусство, семиотическое соответствие, глубины поверхности, психика как возбудимая поверхность, порядок, гармония, конгруэнтность, модели эстетического опыта, Джон Дьюи, Сьюзен Лангер





# **Kalevi Kull and friendship**

Stuart KAUFFMAN  
*University of Calgary*

***Abstract:***

A personal memoir of a kind, loving and brilliant man.

***Keywords:*** compassion

I do not write about Kalevi's stunning leadership in Biosemiotics. This is a field long denied by molecular biology, yet central, literally, to meaning and life.

I write about Kalevi as a friend. In July 2012, I came with my wife, Elizabeth Kauffman, to a conference on Biosemiotics in Tartu, invited by Kalevi. The conference was, for me, transformational. I began to understand the issues. I have been engaged since, with puzzlement and pleasure.

I write about Kalevi and my wife. I had a position as a Finland Distinguished Professor in Tampere. Liz and I had arrived a few weeks earlier. She complained of mild abdominal pain and saw a good doctor in Tampere. He told us it was safe to travel to Tartu.

Her pain increased over the first few days in Tartu. She had some jaundice. Kalevi took us to the emergency room in Tartu. The suggestion was a possible gall stone blocked bile duct. Kalevi took us, concerned, to the local hospital in its 19th Century building. We left Liz off, with a hug from Kalevi and her husband's kiss. Kalevi and I went for lunch, only somewhat concerned, but confident.

An hour later we returned to the hospital. The woman doctor, half in Estonian and half in broken English, told us that there were no stones in her bile duct. She might have pancreatic or bile duct cancer.

I was stunned. I went to the room where Liz had awakened and told her, "Liz you have no stones in your bile duct. You may have pancreatic or bile duct cancer. We must get back to Santa Fe as soon as possible and work this up. I love you. I will always be here for you. I will always tell you the truth. It will always be your decision".

We cried. Kalevi talked with the doctor, then took us back to the hotel. For the next several days Kalevi's love surrounded and sheltered us.

That was Kalevi – loving, kind, brilliant. He still is.

Liz and I returned, frightened, to Santa Fe. She already had two liver metastases. This ruled out surgery. Liz lived with courage, kindness, and dignity and died April 6, 2013 – age 70.

I miss her. And I love and admire Kalevi Kull, at age 70 and onward.

Warmly,  
With Admiration and Affection  
Stuart Kauffman  
May 9, 2022.

© Stuart Kauffman

**Stuart Kauffman**  
Université de Calgary

**Kalevi Kull et l'amitié**

***Résumé:***

Un souvenir personnel d'un homme gentil, aimant et brillant.

***Mots-clés:*** compassion

**Стюарт Кауффман**  
Университет Калгари

**Калеви Кулль и дружба**

***Аннотация:***

Личные воспоминания о добром, любящем и блестящем человеке.

***Ключевые слова:*** сострадание



# Experiment and problem-solving: Semiotics as a practice of inquiry

Kaie KOPPEL

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***Abstract:***

Innovation is at the very core of semiosis, driven by the free choice among simultaneously available options. Even more, “semiosis itself is an experiment”, says Kalevi Kull. In this paper, I explore the process of social innovation as a practice of semiotic inquiry and how it relates to semiotic learning, experimentation, and habituation as explained by K. Kull in his recent work.

***Keywords:*** social innovation, inquiry, experiment, semiotic learning, choice

Gregory Bateson<sup>1</sup> wrote that his entire scientific work has been an attempt to find an answer to the Riddle of the Sphinx: What does it mean to be human? What are the other systems that we encounter and how are they connected?

It is of first-class importance that our answer to the Riddle of the Sphinx should be in step with how we conduct our civilization, and this should in turn be in step with the actual workings of living systems. A major difficulty is that the answer to the Riddle of the Sphinx is partly a product of the answers that we have already given to the riddle in its various forms. [...] And along with this self-validation of our answers, there goes something still more serious – namely that any answer which we promote, as it becomes partly true through our promoting of it, becomes partly irreversible<sup>2</sup>.

In 1970, Bateson made a presentation to the State Senate of Hawaii about the roots of our ecological crises naming epistemological “hubris” as one of the key factors<sup>3</sup>. Most of the assumptions and beliefs that form the core of the hubris are very much alive today, fifty years later, and driving the ecological deterioration and social marginalization in many places around the world.

Working with our epistemologies therefore seems still relevant as a form of social and environmental activism. This describes well my position in the social innovation field and Kalevi’s impact on my work has been immense in this regard.

Firstly, it is the culture and mindset of learning and inquiry that Kalevi has instilled in his students. Secondly, it is almost surgical precision in the exploration of abstract concepts and semiotic models.

This culture has always been there, but Kalevi’s most recent writings on choice and learning<sup>4</sup> also reveal how such a culture of inquiry could work as a personal practice and discipline. It is the unfolding of scaffolding<sup>5</sup>, unyielding to habits<sup>6</sup>, and making the aspect of choice in semiosis visible again.

Semiotics, seen and experienced this way, is both a theory and practice of inquiry.

Kalevi has had an immense impact on both. Much can be said and has been said about the academic modes of inquiry. In the following, I would like to relate some of his recent writings<sup>7</sup> to the field of social innovation.

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<sup>1</sup> Bateson, Bateson 1987 [2005].

<sup>2</sup> *Ibid.*: 178.

<sup>3</sup> Bateson, Bateson 1972 [2000].

<sup>4</sup> Kull 2015; 2018.

<sup>5</sup> “Under scaffolding we mean the kind of structures that carry traces of some earlier experience, what have been built by life, by semiosis” (Kull 2015: 229).

<sup>6</sup> “If traces (i.e., memory) strongly constrain or canalize behaviour in certain situations, then the behaviour is called ‘habit’” (Kull 2018: 461).

<sup>7</sup> Kull 2015; 2018.

In his perspective, semiotic learning starts with a problem – a situation of incompatibility or indeterminacy – which is solved via making a choice. Learning occurs when this decision leaves traces that could influence further choices (in an analogical situation). Habituation means further crystallization of these traces<sup>8</sup>.

Often, the incompatible or conflicting options present in any current problem-solving situation are themselves previously formed semiotic habits. They bring the past experience to the present and work as anticipations<sup>9</sup>.

Social innovation as a form of semiotic inquiry can be seen as rehabilitating that stems from the recognition of discrepancy, from the feeling that existing socially mediated and often institutionalized habits no longer serve the purpose, is followed by an intentional exploration and experimentation, and at one point, new habits are formed<sup>10</sup>.

This process has a much deeper counterpart in the model of semiosis as proposed by Kalevi: “Semiosis is the process in which the formal consistency interrupts, where it is not determined what happens next, where parts of the model do not fit each other. Semiosis is the process that takes place in the condition of incompatibility”<sup>11</sup>.

In other words, semiosis is driven by a problem, perceived as “the crucial situation of confusion, of certain logical conflict, incompatibility, inconsistency or contradiction”<sup>12</sup>.

Social innovation as inquiry begins at the moment when habits break down. It can be local or global, involve a small group or multiple stakeholders – it starts from the moment when the trajectories anticipated in the forms of habits and scaffoldings no longer serve while the alternative options may not be obvious yet.

The inquiries start not so much from knowing where we want to go but from the recognition that there is a discrepancy in the habitual ways of thinking and doing things that no longer serve the purpose.

Again, this process has a deeper counterpart in the mechanism of semiosis: “Without any additional goal defined, the logical conflict or incompatibility itself is the source of intention”<sup>13</sup>.

Kalevi distinguishes between three main stages in the process of learning. And they also characterize well the practice of semiotic inquiry in the social innovation:

(1) incompatibility: functional change is induced by a semiotic conflict, incongruency, or untranslatability that appears in the phenomenal subjective present.

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<sup>8</sup> Kull 2018.

<sup>9</sup> *Ibid.*

<sup>10</sup> See Kotov, Pedanik 2016.

<sup>11</sup> Kull 2015: 227.

<sup>12</sup> *Ibid.*

<sup>13</sup> *Ibid.*



(2) innovation: making a choice among the simultaneously available options, while the source of innovation can be found in the perceived discrepancy or logical conflict itself. Here, earlier experience in the form of habits can play a big role<sup>14</sup>.

(3) habituation: new connections become stabilized through the process of mediation and remediation<sup>15</sup>.

Innovation is at the very core of semiosis, driven by the free choice among simultaneously available options. In Kalevi's own words: "Semiosis is itself an experiment"<sup>16</sup>.

This is where semiotic theory and practice of semiotic inquiry can be made to merge in the field of social innovation. And this, as a practice, may be the most important thing that I have learned from Kalevi.

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<sup>14</sup> In the social innovation setting the facilitators use deliberate incentives to disrupt the existing habit sets and experiment with alternatives that were previously unexplored or unavailable.

<sup>15</sup> Kull 2015: 229.

<sup>16</sup> *Ibid.*

**Kaie Koppel**

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**Expérimentation et résolution de problèmes:  
la sémiotique comme pratique d'enquête**

***Résumé:***

L'innovation se trouve au cœur même de la sémiose, portée par le libre choix entre des options disponibles simultanément. Plus encore, «la sémiose elle-même est une expérience», déclare Kalevi Kull. Dans cet article, j'explore le processus d'innovation sociale en tant que pratique d'enquête sémiotique et comment il se rapporte à l'apprentissage sémiotique, à l'expérience et à l'accoutumance, comme l'explique K. Kull dans un travail récent.

**Mots-clés:** innovation sociale, enquête, expérience, apprentissage sémiotique, choix

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**Эксперимент и решение проблем:  
семиотика как исследовательская практика**

***Аннотация:***

Инновации лежат в основе семиозиса, движимого свободным выбором из одновременно доступных вариантов. Более того, «семиозис сам по себе является экспериментом», – говорит Калеви Куль. В этой статье я исследую процесс социальной инновации как практику семиотического исследования, а также то, как он соотносится с семиотическим обучением, с экспериментированием и с привыканием, как объяснил К. Куль в своей недавней работе.

**Ключевые слова:** социальная инновация, исследование, эксперимент, семиотическое обучение, выбор



# Learning: For the future, from the past

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***Abstract:***

Evolution has invented more and more effective ways of learning in living organisms, and has lately taken another step, triggering the invention of machine learning methods implemented in computers by human programmers. Does a unified definition for learning exist, to cover both machine learning and (semiotic) learning in living organisms? This text was inspired by several of the many exciting discussions with my father Kalevi Kull – thank you!

***Keywords:*** semiotic learning, machine learning, dynamical systems

Learning is about getting better at something. That something could be finding food, escaping threats, or perhaps less useful, playing tic-tac-toe. We learn in order to use the learned knowledge or skill and perform better than we would have done without having learned. Let us dig deeper into who can learn, and when a process can or cannot be called learning.

With living organisms it seems simple – it is always an individual who learns. Or is it? If a bacterial population learns to be resistant to an antibiotic drug, we still might be able to attribute this to the first individual with the required trait. But if a population of whales learns to use a new kind of sound in communication, then it must be more than an individual achievement. Who can then be a learner, in this example as well as in general?

In machine learning, the process of learning typically involves: (1) a dataset or environment that provides the content from which learning (also called model training or model fitting) needs to happen; (2) a learning algorithm that is run on these data or in this environment; and (3) the resulting trained model which can be applied on new data or in an environment to exploit the learned patterns or skills or knowledge. Who is learning in the process of machine learning?

Both in living organisms and in machine learning, the learner is some subsystem within a bigger dynamical system which we could call the environment. Let us now make a bold attempt at trying to define learning in the context of any dynamical system, in the mathematical sense. Ideally, such a definition would allow us to consider any subsystem of the universe and decide whether this subsystem is learning or not.

First of all, the learner needs a memory to store some information about the environment.

However, almost any subsystem that is interacting with the rest of the system inevitably stores some information in its state. For example, temperature inside a boulder is a memory storing the temperature of the surroundings for quite a long time. To call it learning seems questionable though.

Perhaps we could define learning as not only about storing information about the environment, but also about exploiting this information in order to perform some task better than before. However, now a rock on the sauna stove is learning, since it is certainly serving the purpose of vaporizing water much better after it has “learned” from the environment to be hot, in the process of heating the sauna.

Instead of a rock on the sauna stove, we could even take any physical object that is colder or hotter than its environment. Curiously, we could see any such object as implementing a machine learning algorithm in the following sense. The task that it could be viewed as solving is to predict the temperature of its environment. Physical interaction events between the object and the environment can be seen as the training data, and the object's internal dynamics as the learning algorithm. Since the temperature of the object gradually equalizes with its environment, the object “learns” to be

better at using its own temperature as a “predictor” of the temperature of the environment.

This example illustrates that from the machine learning perspective, even a very simple physical system could be seen as implementing some learning algorithm. Thus, learning in the sense of machine learning is a much wider concept than learning in a biological or semiotic sense. It seems that almost any dynamical system could be seen as learning, from the machine learning perspective. At the same time, nobody seems to have succeeded yet in mathematically defining a dynamical system that is learning in the semiotic sense.

The mathematical gap between machine learning and semiotic learning highlights that there is definitely a lot yet to be learned about learning. We can confidently say though, that in both cases, learning is for the future and from the past.

© Meelis Kull

**Meelis Kull**  
Université de Tartu

### **Apprendre: pour le futur, depuis le passé**

**Résumé:**

L'évolution a inventé des méthodes d'apprentissage de plus en plus efficaces dans les organismes vivants, et a récemment franchi une autre étape, en déclenchant l'invention de méthodes d'apprentissage automatique mises en œuvre dans les ordinateurs par des programmeurs humains. Existe-t-il une définition unifiée de l'apprentissage, couvrant à la fois l'apprentissage automatique et l'apprentissage (sémiotique) dans les organismes vivants? Ce texte a été inspiré par plusieurs des nombreuses discussions passionnantes que j'ai eues avec mon père Kalevi Kull – merci!

**Mots-clés:** apprentissage sémiotique, apprentissage automatique, systèmes dynamiques

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### **Обучение: для будущего, из прошлого**

**Аннотация:**

Эволюция изобретала все более и более эффективные способы обучения живых организмов, а в последнее время сделала еще один шаг вперед, связанный с изобретением методов машинного обучения, заложенных в компьютеры программистами-людьми. Существует ли единое определение обучения, охватывающее как машинное, так и (семиотическое) обучение, свойственное живым организмам? Этот текст был вдохновлен некоторыми из многочисленных захватывающих дискуссий с моим отцом Калеви Куллем – спасибо!

**Ключевые слова:** семиотическое обучение, машинное обучение, динамические системы

# Choice-making, learning and teaching

Ludmila LACKOVÁ  
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***Abstract:***

In this paper I present a short overview of the choice-making semiotic process as proposed by Kalevi Kull and I connect it to the C Space theory by Umberto Eco.

***Keywords:*** choice-making, Kalevi Kull, learning, semiosis, Umberto Eco



By “semiosis” we mean the process of choice-making between simultaneously alternative options<sup>1</sup>.

Kalevi Kull defined semiosis as choice-making in many places<sup>2</sup>. This is partially related to S. Kauffman’s theory of the multiple options and the adjacent possible and partially related to U. Eco’s concept of interpretation and the lower threshold.

Umberto Eco’s approach to non-cultural modes of semiosis was, at the beginning of his career, marked by skepticism. His attitude changed somehow after he started to cooperate with Italian biologist and immunologist Giorgio Prodi<sup>3</sup>. Eco proposed the concept of *natural primary iconism* in order to study the semiotic competence of life forms at the lower level. Even though the concept of natural primary iconism – attributed to the genetic code and immune cells – represented a step towards the recognition of semiosis at the cellular level, Eco still remained very prudent and placed primary iconism below the lower semiotic threshold, defining it as a simple dyadic relation between a stimulus and a response<sup>4</sup>. One might see an inconsistency here, in fact, the admitting of a certain level of semiosis for life forms while at the same time describing it as dyadic does not solve the problem.

Fortunately, there is another concept developed by Eco from his Italian version of *The Limits of Interpretation* which can help in solving the paradox of the lower semiotic threshold: the concept of *C Space*<sup>5</sup>, an interpretive space to guarantee thirdness and some kind of primordial choice-making. Eco himself applied this concept to the simplest life forms, even though this passage is not well known because of the fact that it was not translated into English. As is the case of many translations of Eco’s books, the English translation of *The Limits of Interpretation* contains a different text from the Italian original. As a consequence, the chapter on C Space is only present in the Italian original of the book. C Space is to be understood as the interpretive space of different dimensions, depending on the level of interpretive capacities of the interpreting subject. Lower organisms and immune cells, Eco admits, might also have some C Space, even if this space is very narrow.

Inspired by Eco and his definition of choice as related to interpretation<sup>6</sup>, Kull extended the concept of choice-making with the semiotic concept of learning. Thus, semiosis is choice-making and learning. In other words, choice-making and learning are interconnected processes. Kull in

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<sup>1</sup> Kull 2018a: 454.

<sup>2</sup> Kull 2015; 2018a.

<sup>3</sup> See Eco 2018, a text of Umberto Eco’s presentation from 1988, translated from Italian and edited by Remo Gramigna, footnotes added and edited by Kalevi Kull.

<sup>4</sup> The dyadic nature of primary iconism is very clearly delineated in Eco 2007.

<sup>5</sup> Eco 1990.

<sup>6</sup> Eco 2018: 346-347; Kull 2018b.

his latest paper on the choice-making<sup>7</sup> distinguished four types of choice-making based on four types of learning (imprinting, conditioning, imitation, instruction). These types of choice-making are accordingly: (1) picking a “point”, (2) picking two “points” that are co-present, (3) picking a track between some “points” that are co-present, (3) picking made on the basis of the form recognized.

I would like to extend even further to add to the pair choice-making and learning a third component, the component of *teaching*. Semantically, the difference between learning and teaching is interesting, we can define it as a reciprocal act of giving and receiving. In Czech language, the grammatical difference between learning and teaching lies only in one small reflective pronoun “se”: *učit* (‘to teach’) vs *učit se* (‘to learn’). “Se” is a clitic form of the pronoun *sebe* (meaning all of itself, myself, yourself, herself or himself) in accusative case, making the act of learning a reflexive counterpart of teaching, to make the teaching accepted by someone’s self, to switch the agency.

I believe that Kalevi Kull’s semiosis is composed of choice-making, learning and *teaching* with many possible further future choice-makings of prof. Kull’s students between alternative options of his many texts and theories, consequent learning and teaching next generations of students to come. In this way, contributors to this volume made a choice from the corpus of Kalevi Kull’s texts according to their best semiotic choice-making capacities, texts from which they learned and continue learning and teaching their own students, whether it be by picking a point, picking two points or whatever possible choice-making process. Thank you, prof. Kull, for giving us such a vast C space for interpretation and choice-making.

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<sup>7</sup> Kull 2018a: 462.

**Eudmila Lacková**  
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**Faire des choix, apprendre et enseigner**

***Résumé:***

Dans cet article, je présente un bref aperçu du processus sémiotique de prise de choix tel que proposé par Kalevi Kull et je le relie à la théorie de l'espace C d'Umberto Eco.

***Mots-clés:*** prise de choix, Kalevi Kull, apprentissage, sémiologie, Umberto Eco

**Людмила Лацкова**  
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**Выбор, обучение и преподавание**

***Аннотация:***

В этой статье я представляю краткое изложение семиотического процесса выбора, предложенного Калеву Куллем, и связываю его с теорией C-пространства Умберто Эко.

***Ключевые слова:*** выбор, Калеву Кулль, обучение, семиозис, Умберто Эко

# The feeling that it escapes

Dominique LESTEL  
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***Abstract:***

From Kalevi Kull's suggestion that every living system is a translator rather than a duplicator, I suggest that every organism is a paradoxical text that other agents must constantly not only interpret but constantly reinterpret and that it follows that every living agent is haunted by a form of semiotic obscurity that is part of its very identity.

***Keywords:*** translator, duplicator, evolution of meaning, semiotic obscurity

In a major text published in 2000<sup>1</sup>, Kalevi Kull shows that living systems must be thought of as *translators* and not as *duplicators* as claimed by functionalist evolutionary theorists such as Richard Dawkins<sup>2</sup>. Through this paradigm shift, evolutionary thought is entering a space of extraordinary richness that has only been partially explored. I would like to briefly mention one of its most interesting consequences. In a semiotic perspective that attributes a central place to meaning in the evolution and ecology of the living, every living organism becomes an agent of which it is impossible to give a finite and exhaustive description. Every organism must be thought of as a paradoxical text that exceeds the space of writing and that other living agents must not only interpret but constantly reinterpret. Living exceeds the functional space of a simple survival in purely functional ecologies and is concretized in a complex world in which every encounter becomes an existential adventure that is woven in a mutual interlacing of crossed semiotic readings<sup>3</sup>. The question is not only to know what an animal, a plant or a fungus is, but also to be able to engage it in all that such organisms express – and in all that they express for the other singular organisms with which it must deal. A fundamental characteristic of any living agent is precisely that it can never be totally unmasked. Not because it would have something to hide, but because it constitutes itself as a living being according to folds, some of which remain forever inaccessible, and many of which emerge in the very movement of the readings that are given by other organisms whose reading grids are irreducible to each other. The peoples of the forests or the savannahs have always known that every living agent is a space of overflow whose dynamics are all the more unexpected because they are not written in advance but depend on the creativity of the person who tries to read them. A *semiotic obscurity* haunts any living agent that is never a pure metabolic, anatomical or even cognitive device but is also a privileged mediator with other worlds. We always have the feeling that something essential escapes with any living agent and what each one is for us remains a space still largely undeveloped. In such an eco-semiotic perspective, the researcher's objective is no longer to make each individual organism transparent but to account for the multiplicity of its meanings and their continuous dynamics.

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<sup>1</sup> Kull 2000.

<sup>2</sup> Dawkins 1976.

<sup>3</sup> This is why I have suggested that the current collapse of biodiversity is leading to a semiotic drying up of the world, see Lestel 2013.

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**Dominique Lestel**

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### **Le sentiment qu'il s'échappe**

**Résumé:**

À partir de la suggestion de Kalevi Kull selon laquelle chaque système vivant est un traducteur-translateur plutôt qu'un duplicateur, je suggère que chaque organisme est un texte paradoxal que d'autres agents doivent non seulement constamment interpréter, mais aussi constamment réinterpréter. Il s'ensuit que chaque agent vivant est hanté par une forme d'obscurité sémiotique qui fait partie de son identité même.

**Mots-clés:** traducteur-translateur, duplicateur, évolution du sens, obscurité sémiotique

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### **Ощущение ускользающего**

**Аннотация:**

Исходя из предположения Калеви Кулля о том, что каждая живая система является скорее не дубликатом, а переводчиком-транслятором, я полагаю, что каждый организм представляет собой парадоксальный текст, который другие агенты должны не только постоянно интерпретировать, но и постоянно переинтерпретировать. Как следствие, каждого живого агента сопровождает форма семиотической неясности, сама являющаяся частью его идентичности.

**Ключевые слова:** переводчик-транслятор, дубликатор, эволюция значения, семиотическая неясность

# **Semiosis as choice, learning, and memory**

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***Abstract:***

A triadic relationship is proposed: in semiosis, learning by making a choice constrains (constituting as memory) future interpretations. Memory is not for preserving the past, but for anticipating the future.

***Keywords:*** semiosis, choice, learning, memory



By “semiosis” we mean the process of choice-making between simultaneously alternative options. We define “semiotic *learning*” as the leaving behind of such traces by choices, which could influence further choices. These traces of choices will be called “memory”<sup>1</sup>.

In several of his more recent essays<sup>2</sup>, Kalevi has taken up the study of “learning” as to how it could be conceptualized within the theories of semiotics, biosemiotics, and life sciences more broadly. While the concept of learning has been central to several disciplines, each of these have attempted to conceptualize learning in regards to their respective interests, and a principled understanding has been missing. This understanding could be of great value for avoiding pitfalls brought on by various kinds of reductionist thinking and for accomplishing productive complementarity, rather than contradiction, among disciplines within the natural sciences and the humanities that deal with questions of development.

In order to characterize what Kalevi calls “the semiotic concept of learning”<sup>3</sup> on such a broad scale, he has suggested a set of related concepts, including “choice” and “memory” (among others), in order to help bring the concept of learning to terms with Peirce’s concept of semiosis. In biosemiotics, “semiosis”, i.e., meaning-making, is seen as overarching, as characteristic of all phenomena of life. The concepts in this set could be related in a triadic manner. Perhaps the following discussion is not far from Kalevi’s thinking.

The first concept in the set is that of (free) choice. As Kalevi argues<sup>4</sup>, the concept of choice lies at the core of any interpretation. An interpretation is a suggestion to take some “thing” (itself a choice, e.g., simultaneously not another “thing”, not “not thing”), which thus becomes a representamen, as something (else), i.e., an object (and not “any” thing). This suggestion – a decision, in fact –, is the interpretant. Hence, semiosis irreducibly involves choice. Without choice, the effect between parts could only be of a brute kind, and likewise, something reduced to a brute kind cannot include a choice. Thus, Kalevi goes as far as to identify semiosis with choice-making<sup>5</sup>, although the question arises then, can semiosis be reduced to choice-making? Be that as it may, it is possible to study the choices that particular organisms have and make within their environments, and by that, their meaning-making, including what cognitively constitutes for these organisms as temporal present, which is the moment of making the choice, and of creating a relationship.

Thus, for a semiotic concept of learning, the matter of choice becomes central. Learning is making a connection, creating a relationship between the representamen and an object. As Kalevi argues, a spontaneous

<sup>1</sup> Kull 2018: 454.

<sup>2</sup> Kull 2015; 2018.

<sup>3</sup> Kull 2018: 457.

<sup>4</sup> *Ibid.*: 455.

<sup>5</sup> *Ibid.*

physico-chemical process cannot constitute as learning, which is something that is rather “made” than, say, passively acquired. Both Piaget<sup>6</sup> and Vygotsky<sup>7</sup> have stressed the active role of the organism, a child – in creating something new during the process of learning. Kalevi argues<sup>8</sup> that learning occurs if the decision to make a certain connection leaves traces for further choices (a choice that makes a choice, in some later event, to paraphrase the famous Bateson’s “rule”<sup>9</sup>). In other words, learning takes place if a connection is preserved in some manner (a constraint, in the broadest sense of the term).

Thus, Kalevi identifies memory with the traces left by making the relationship, the learning process, which consequently become constraints within new acts of interpretation<sup>10</sup>. As constraints (past), memory is something that progressively carries on over to new interpretations, while making ever new signs, as the initial sign relationship becomes the ground for any further interpretations (present) as semiosis progresses over to the next sign (future).

These constraints should not be seen as passive entities. Memory should not be taken as a passive “thing” that is restricted to and situated inside a particular organ – its existence and restrictions lie within interpretation itself. As new connections are established, new relationships progressively made, the constraints become parts of ever new sign relationships. Memory is something that grounds the identity of semiosis within new analogous situations, while “learning is the process of building and of modifying memory”<sup>11</sup> while continuously making new choices. In a cognitive present, memory relates a past choice with future interpretations. From that point of view, memory is not for preserving the past, but for anticipating the future.

Thus, choice is the first, learning the second, memory (including its various types, various forms of scaffolding) the third. By using these concepts that Kalevi suggests, the Peircean approach to studying meaning-making could be brought to comparison with those of developmental psychology.

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<sup>6</sup> Piaget 1963.

<sup>7</sup> Vygotsky, Luria 1994: 145.

<sup>8</sup> Kull 2018: 457.

<sup>9</sup> Bateson 1971: 231.

<sup>10</sup> Kull 2018: 454.

<sup>11</sup> *Ibid.*: 457.

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**Lauri Linask**  
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### **La sémiotique comme choix, apprentissage et mémoire**

***Résumé:***

Un rapport triadique est proposé: dans la sémiotique, apprendre en faisant un choix contraint (constituant comme mémoire) les interprétations futures. La mémoire ne sert pas à conserver le passé, mais à anticiper l'avenir.

***Mots-clés:*** sémiotique, choix, apprentissage, mémoire

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### **Семиотика как выбор, обучение и память**

***Аннотация:***

Предлагается триадное отношение: в семиотике обучение посредством выбора ограничивает (конституируя как память) будущие интерпретации. Память предназначена не для сохранения прошлого, а для предвосхищения будущего.

***Ключевые слова:*** семиотика, выбор, обучение, память



# **Why nature reserves are a cultural heritage without becoming a second nature**

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***Abstract:***

This article argues that nature reserves can be considered cultural heritage in the Lotmanian sense, due to their boundedness, hegemonic core and inner homogenisation. However, this does not mean that the environment in these places loses their semiotic richness.

***Keywords:*** nature protection, semiosphere, Juri Lotman, cultural heritage

In February 2022 I presented a paper in which I argued that from the Lotmanian perspective nature reserves or national parks are essentially cultural heritage<sup>1</sup>. Kalevi strongly objected. We never managed to sort out the disagreement, but I have a suspicion that I may have left an impression that if a nature reserve is a cultural heritage, its biological diversity and semiotic richness would be compromised, and that the old ecosystems within the reserve – always so dear to Kalevi – would somehow lose their value. In the following I will argue that this is not the case.

Heritage “is a group of resources inherited from the past which people identify, independently of ownership, as reflection and expression of their constantly evolving beliefs, knowledge and traditions”<sup>2</sup>. As such, much of what Lotman writes about semiosphere, memory and history can be applicable to its analysis. Particularly important for this text are notions of a hegemonic core, boundaries, and the artistic text<sup>3</sup>.

It is useful to distinguish non-institutionalised and institutionalised heritage, the first of which is a spontaneous process of identity creation and remembrance, whereas the latter implies state institutions, fixed procedures and cultural values dominated by the culture’s hegemonic core. National parks and nature reserves are always institutional heritage sites, defined through expert evaluations rather than community practice.

The core of any institutionalised heritage site are its value and authenticity statements that specify why this or other site is taken under protection. From a myriad of different values, uses and memories, only a certain core set is chosen to represent the value that needs to be preserved, may it be a unique baroque chimneypiece or a rare meadow plant.

This core value (like the core of a semiosphere) will dominate all processes at the heritage site<sup>4</sup>. The value to be protected is dependent on what kind of environment is considered valuable at each historical period. Early nature conservation emphasised scenic beauty and had as much to do with the desire of the governments to control peripheral territories as it had to do with its environmental values. Japan’s first natural parks, promoted by railway companies, needed to be both beautiful but also have a good access for metropolitan visitors who wanted to experience the territory of a new modern Japanese nation. Estonia’s first nature reserve, Vaika Aviary reserve, doubled conveniently as a bird reserve and a military outpost. Militaries have in general played an important part in creating and enforcing nature reserves. Lahemaa National Park, nesting a major military complex, was established in 1977 in Soviet Estonia with an imagination that closely coupled ethnos with natural environment and sought to protect “the typical natural complexes of north Estonia” together with nostalgic ethnographic objects such as fishing sheds, and “culturally valuable activities”<sup>5</sup>.

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<sup>1</sup> Lindström 2022.

<sup>2</sup> *Council of Europe*, 2011.

<sup>3</sup> See, e.g. Lotman 2000; 2009; Lindström 2010.

<sup>4</sup> Lindström, forthcoming.

<sup>5</sup> “Lahemaa Rahvusparki sisekorra eeskirjad. (Visand, 25.II.)”, 1975.

Unfortunately, when the majority of important heritage instruments developed, the specialists had no opportunity to read Kalevi's work and showed limited understanding of how deeply human culture is embedded into surrounding ecosystems<sup>6</sup>. The result is that many nature reserves exclude human activities that may have sustained it for centuries. "Bird King" Artur Toom of the Vaika Aviary Reserve fiercely fought off the locals who came to collect birds' eggs and ended up with overpopulated islands where he had to feed the birds himself<sup>7</sup>. Particularly controlled fires, so widely practised by native populations of Australia and the Americas, have been shunned by European conservationists, with a result of disappearing species and increased risk of dangerous uncontrolled wild-fires.

As a cultural phenomenon, nature reserves have difficulties with changes in the societal framework, because they lead to redefining their basic values. This is particularly salient in the case of indigenous landscapes that have been first protected as "natural sites" and whose deeply cultural character was previously not acknowledged by colonial conservationists. A famous example here is Uluru rock of Australia whose World Heritage nomination had to be entirely rewritten as a result of decolonial processes in Australia<sup>8</sup>.

Every heritage site has a boundary – just like semiosphere, ecosystems or Lotman's artistic text<sup>9</sup>. The characteristic of boundaries is that they project unity and structural coherence within the system. When a nature protection area is designated, its geographical boundaries are defined so as to include all the necessary and sufficient elements to demonstrate the chosen environmental value, whereas "unnecessary" or "contaminated" parts will be excluded.

This does not mean that the place loses natural diversity or that natural mechanisms such as semiotic fitting do not work, but no natural park stands without management that is geared towards the imagined authentic value of the place. The result is a certain homogenisation of the environment, where all activities are either desirable or forbidden depending on their perceived impact on the value. The ideal image defines which natural or cultural processes can and should be intervened within the borders of the site. For example, we require hand mowing of wooded meadows, but restrict heavy machinery. Amelioration, ditching and logging were always allowed in Lahemaa National Park. All these restrictions or regulations reduce the pre-designation heterogeneity of spaces as we go removing species and activities that we think damage the protected value. As a result, the nature reserve develops into a purer representation of its value than it would without the limiting boundaries.

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<sup>6</sup> Kull 1998.

<sup>7</sup> "Lindudekuningas kapten A. Thom jutustab oma elutööst", 1937.

<sup>8</sup> Palmer 2016.

<sup>9</sup> Kull 2015.



I argued that boundedness, homogeneity and hegemonic values contribute to low changeability, high rigidity and low resilience of the heritage. I suspect that for Kalevi it might amount to a direct attack on his beloved wooded meadows and old ecosystems. Indeed, it is the old ecosystems that are the ecologically and semiotically richest, where nature achieves its utmost semiotic beauty in perfect fitting<sup>10</sup>. But at the same time, it is a fragile state, because it depends fully on human intervention through restriction of external influences. Due to artificial exclusion from surrounding social and environmental processes, these areas have lost their resilience – as soon as the limitations are lifted, the ecosystem of the reserve is bound to be profoundly disturbed and destroyed by rapid changes and outside pressures. This makes them particularly valuable, and beautiful.

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<sup>10</sup> Kull 2020; 2022.

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**Kati Lindström**

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**Pourquoi les réserves naturelles sont un patrimoine culturel  
sans devenir une seconde nature**

***Résumé:***

Cet article soutient la thèse que les réserves naturelles peuvent être considérées comme un patrimoine culturel au sens lotmanien, en raison de leur délimitation, de leur noyau hégémonique et de leur homogénéisation interne. Cependant, cela ne signifie pas que l'environnement dans ces lieux perd sa richesse sémiotique.

***Mots-clés:*** protection de la nature, sémiosphère, Youri Lotman, patrimoine culturel

**Кати Линдстрём**

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**Почему заповедники являются культурным наследием,  
не становясь второй природой**

***Аннотация:***

В этой статье утверждается, что заповедники могут считаться культурным наследием в лотмановском смысле из-за их ограниченности, гегемонистского ядра и внутренней гомогенизации. Однако это не означает, что среда в этих местах теряет свое семиотическое богатство.

***Ключевые слова:*** охрана природы, семиосфера, Юрий Лотман, культурное наследие

# **To leave no traces by leaving the traces**

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***Abstract:***

Kalevi Kull has pointed out that all organisms leave traces that disappear naturally, but only humans can leave irreversible traces. This essay further argues that the human ability to wilfully mask semiotic as non-semiotic and vice versa, is one of the reasons why human traces are not subjected to similar disappearance as those of other organisms. As traces also inevitably induce change, the essay further asks, what kind of traces, and thereby changes, of organisms would allow for a local multispecies habitat to persist.

***Keywords:*** traces, semiosis, human semiotic capabilities, multispecies habitats

Of course every step leaves a trace, but a trace left on the sand is washed away by next rain, the trace on the grass disappears with the growth of the blades. Having lived a life, one can turn to Earth again. Those that are not wise to make, are irreversible traces<sup>1</sup>.

In fact, only an open mind should be taught, the will to notice, to recognise<sup>2</sup>.

Living beings inevitably leave traces, sometimes involuntarily and sometimes through will and effort. Sometimes traces are triggered, they then are shaped as a response, sometimes they are left behind, they then evoke memory, and sometimes they are hidden, and they then induce exploration. An organism, in order to leave no irreversible traces, has to withdraw from them – to let life continue beyond oneself. If traces are not clung to and are left behind, they then might become pieces of food for someone else, and thereby naturally transform from signs to objects. The decomposers or hungry ones will thereby get their due. To leave traces, both in the sense of setting a mark and in the sense of letting go, means to set them free – free to serve as grounds of choice, as guides of interpretation, as shelters from confusion, as meeting and departure points, but also grounds free for disappearing and forgetting.

Semiosis by default generates traces. Relations leave traces and the organisms, as the “derivates of (sign) relations”<sup>3</sup> would be mere conglomerations of those traces, if they were not able to meet and shape the signs with their own interests and selectivity. Luckily, living beings also possess the means to erase the traces that obstruct the acquisition of the new ones that uphold life as meaningful. Yet, and by the means of humans, effort is needed to not turn a flourishing of signs into an expansion<sup>4</sup>, and wisdom is needed to not change the world with human semiotic abilities<sup>5</sup>, just like it is needed to abstain from producing inedible things<sup>6</sup>. There is a need to put on the brakes, but when? Are there signs out there that give guidance? Indeed, there are, but care is needed before they come to matter. Further, do signs themselves have the power to raise care and attention? I believe they do, but only if they are recognised as signs. Yet, often they are not, and that is another human semiotic peculiarity – the ability to willfully mask the semiotic as non-semiotic and vice versa. The symbolic can be easily masked as non-semiotic, as based on a necessity, at the same time, the proliferation of needs can be masked under the auspices of the proliferation of (semiotic) freedom – the flipping coin of consumerism. In other words, signs can be easily explained away, just as easily as they can be set up for the sake of leaving a trace just for its own sake.

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<sup>1</sup> Kull 2005 (our translation, *R.M.*).

<sup>2</sup> Kull 2008a (our translation, *R.M.*).

<sup>3</sup> Kull 2010: 353.

<sup>4</sup> Maran, Kull 2014.

<sup>5</sup> Kull 2003.

<sup>6</sup> Kull 2008b.

A change that allows not to change – this can be an outcome of the Red Queen’s race, but likewise of autopoiesis and self-organization. The competitive game then is replaced by a self-sustaining play. There might be no need to take on the hurry of a race, but only to maintain the pace suitable for a local multispecies habitat, for a semiotic fitting<sup>7</sup>. That might help to avoid irreversible traces. To change through the choices made, the questions received, and the others encountered. An Ural owl howling before sunrise, receiving a human response of “Huuu-houa-houa”<sup>8</sup>.

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<sup>7</sup> For semiotic fitting as an alternative mechanism to natural selection for building ecosystemic relations see Kull 2020.

<sup>8</sup> Kull 2012: 20.

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### **Ne laisser aucune trace en laissant des traces**

**Résumé:**

D'après Kalevi Kull, tous les organismes laissent des traces qui disparaissent naturellement, mais seuls les humains peuvent laisser des traces irréversibles. Cet essai soutient en outre que la capacité humaine à masquer volontairement le sémiotique comme non sémiotique et vice versa, est l'une des raisons pour lesquelles les traces humaines ne sont pas soumises à une disparition similaire à celles d'autres organismes. Comme les traces induisent aussi inévitablement des changements, l'essai demande en outre quel type de traces, et donc de changements, d'organismes permettrait à un habitat multi-espèces local de persister.

**Mots-clés:** traces, sémiose, capacités sémiotiques humaines, habitats multi-espèces

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### **Не оставить следов, оставляя следы**

**Аннотация:**

Согласно Калеви Куллиу, все организмы оставляют следы, исчезающие естественным образом, но только люди могут оставлять следы необратимые. В этом эссе также утверждается, что человеческая способность сознательно маскировать семиотическое под несемиотическое (и наоборот) является одной из причин, по которой человеческие следы не исчезают подобно следам других организмов. Поскольку следы также неизбежно вызывают изменения, мы задаем вопрос о том, какие следы и, следовательно, изменения организмов позволили бы сохранить местную многовидовую среду обитания.

**Ключевые слова:** следы, семиозис, семиотические возможности человека, многовидовая среда обитания

# **Why the current disenchantment with semiotics?**

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***Abstract:***

I'm very glad to offer to Kalevi Kull a text that I promised him a long time ago, about the current “désamours pour la sémiotique”, as a continuation (but hopefully not as a final conclusion!) of our debates.

***Keywords:*** scientific pretense, meta-language, critique, universalism, neo-liberalism



As is often the case, the advantages and contributions turn into disadvantages and obstacles.

This is perhaps the fate of any new science: sooner or later, fatigue, weariness, inflation appear. In this case, it is more disappointment than disenchantment. Disappointment that semiotics has not been able to realize the dreams it aroused.

What dreams?

1) Scientific character.

Semiotics was not the first to pretend to it. Marxism and phenomenology before had the same claims. It is no longer a good selling point. Science has lost much of its status. Seriously claiming to be scientific is no longer possible given the divergence between various theories. There is no minimal theoretical consensus: “it is impossible for two semioticians taken at random to agree on anything”<sup>1</sup>. Semiotics is not a science, but a family quarrel (as it was already once with phenomenology, not saying a word on Marxism). The esoteric language has turned into a “scholasticism” (similar to the one Husserl’s early students reproached him with). If scientificity could once be considered a guarantee of success for the new discipline, then today, one can hear that it is, on the contrary, anarchism and freedom of spirit (and philosophical knowledge) that semiotics lacks.

2) Semiotics was proposed as a meta-language for all the human, social (and even natural?) sciences.

Peirce saw his project as the universal algebra of relations. The analogy with mathematics for the natural sciences seems obvious. This dream turned into a rejected claim. No new *regina scientiarum* is wanted any more! There is a similarity between phenomenology and Soviet Marxism: both are imperialist and totalitarian, since they cannot be “falsified” in the Popperian sense. Semiotics joins them in its omni-englobalizing claims: *everything* – from music and body movements to scientific theories – can become its object.

3) Semiotics wanted to be the *Scientia perennis*.

This is no longer a very good selling point either! We want more frequent but less radical Studies and turns: Information, Communication, Infrastructure, Material, Visual, Narrative, Rhetoric, Media, Spatial...

In its desire to perpetuate itself, semiotics too often speaks *pro domo*, “forgetting” to criticise itself. Roland Barthes has rendered famous Julia Kristeva’s thesis: “All semiotics can only be done as a critique of semiotics”<sup>2</sup>. Such a proposition should not be understood as a pious and hypocritical wish (“let’s criticise the semioticians who precede us”), but as the affirmation that in its very discourse, and not at the level of a few clauses, the work of the science of semiotics is woven of destructive returns, of thwarted coexistences, of productive disfigurations. This lack of critical

<sup>1</sup> Angenot 1985: 13.

<sup>2</sup> Kristeva 1969 [1978: 83].

spirit results in a sad admission by Denis Bertrand: semiotics no longer bothers anyone<sup>3</sup>.

4) Semiotics wanted to present itself as radical as it is perennial.

In the end, it demonstrated a rather outdated way of setting itself up as a tradition: we leaf through the anthologies and university textbooks of semiotics, and we find the same familiar references: again Plato's "Cratylus", the same texts from Rousseau to Benjamin. In order to establish itself as a respectable discipline, semiotics wanted to insist that it "always" existed, or, as we liked to say in those years, after Freud, that it was *always already there* (*schon immer da, toujours-déjà là*). However, it was by imitating its big sisters (linguistics, philosophy, logic) that it "invented" its tradition. In this, semiotics was faithful to or in conformity with its predilection for synchronicity to the detriment of diachronicity. After all, semiotic relations (sign-sense) are proper to all human and social phenomena (and even more: to all natural phenomena, to the totality, to the Great Whole). But today, we prefer more attention and sensitivity for history, instead of the immutable Universe.

The prosperity of semiotics has been seriously undermined by institutional reasons, too, especially by the strong relationship with linguistics, mostly in the French-speaking world. Accepting semiotics would mean giving linguists additional power and funding (oh no!). Result: a few "centers" or "labs", but no stable sections: faculties, departments... (even in Limoges, the French capital of semiotics, where there is only a Research Center). Besides, many linguists confess that they feel no need for semiotics. Semiotics may be taught as a propaedeutic (in cultural studies, etc.), but national and European nomenclatures do not contain the name "semiotics", even if they welcome much more minor disciplines such as "medieval Serbo-Croatian"). Today, among semioticians, there are many *non-linguists* (some say it is good, others, e.g. linguists, say it is a disaster). Someone can qualify oneself as a Semiotician – in addition to something else. This devalues *pure* linguists, historians, literary scholars, etc.

Let's finish with political reasons. Semiotics was directed against ideology (however with a dramatic discrepancy between France and the USSR). This clarity was clouded by the change of deal (in France the new discourse of the "*nouvel esprit du capitalisme*", the new neoliberal language instead of the old good spiritualism; in Russia, the fall of communism, with a theoretical disarray and heavy damages for sciences and for the status of science itself). At the Tartu-Moscow school, semiotics was clearly anti-political, subversive by delicately calculated ignorance of ideological codes. By ignoring these codes, by focusing its gaze not on *those* codes, but on the deeper, textual ones, it aimed at the Universal (after all, Brezhnev's speech was only one text among millions of others), it pretended not to grasp its "privileged" status). This ultimately worked against semiotics, since it consciously unlearned to deal with the political in the

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<sup>3</sup> Bertrand 2000: 49.

text. This logically led to the accusation that “semiotics is fascist” (following Barthes), since it serves ideology instead of criticizing it.

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**Pourquoi le désenchantement actuel vis-à-vis de la sémiotique?**

***Résumé:***

Je suis très heureux d'offrir à Kalevi Kull un texte, que je lui avais promis il y a longtemps, sur les «désamours [actuels] pour la sémiotique», comme une continuation (mais pas comme une conclusion définitive, je l'espère!) de nos débats.

***Mots-clés:*** prétention scientifique, métalangage, critique, universalisme, néo-libéralisme

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**Откуда сегодняшнее разочарование в семиотике?**

***Аннотация:***

Я очень рад предложить вниманию Калеви Кулля текст, который я давно ему обещал, о нынешних «дésamours pour la sémiotique» – как продолжение наших дискуссий (но, надеюсь, не как окончательный из них вывод!).

***Ключевые слова:*** претензия на научность, метаязык, критика, универсализм, неолиберализм



# Translation in biosemiotics

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***Abstract:***

This contribution considers Kalevi Kull's contribution to translation theory. It focuses on the implications of biological data on theorizing translation. One of the implications of this debate is that interdisciplinary interaction seems to be to the advantage of deeper theoretical understanding.

***Keywords:*** translation, semiotics, biosemiotics

When I was asked sometime around 2013 to write a chapter with a biosemiotician on translation and biosemiotics for an edited volume on the interdisciplinarity of translation studies, I gathered all my courage and e-mailed Kalevi Kull to ask if he would be interested in writing this chapter with me. At that point, I had never met him, so the only knowledge I had of him was his work. He was extremely gracious in accepting and, to my amazement, when we physically met in London in 2014, he recognized me before I had even introduced myself. I assumed later that he must have googled me – and I felt quite embarrassed that I did not think about googling him as he is such a well-known scholar.

Over a beer in the evening, we conceptualised our chapter and found that we agreed on much concerning translation in biosemiotics. Being able to talk to a “real” biologist was an enriching experience. It showed me how my own thinking about translation was biased towards my humanities background.

It was inevitable that we would also hold different views on certain points, but in our case, these differences were actually enlightening to me. In his views on translation in biosemiotics, Kalevi works with what would be called a “conservative” view of translation in translation studies<sup>1</sup>. In his view, there is always some correspondence between source and target semiotic system. One could also say that he suggests that there is something that remains unchanged between source and target semiotic system. In traditional translation studies, this view of correspondence or similarity between source and target became known as the equivalence debate. Based on philosophical, semiotic and pragmatic arguments, equivalence was rejected as the goal (or the effect) of translation. Activist pressures played a significant role in this rejection as scholars in the humanities looked to study the change potential that translation could have in societies and cultures<sup>2</sup>.

From my perspective, I therefore always felt a bit uncomfortable with Kalevi’s insistence on some correspondence or equivalence in translation. That was, however, until I started reconsidering the biosemiotics perspective a while ago. I then realised that biosemioticians do not work with symbolic communication only<sup>3</sup> but also with various kinds of protosemiosis. In these cases, such as translation processes in microbiology, the process requires a fair amount of stability. It therefore made sense for someone like Kalevi to insist on correspondence.

This insistence also made me rethink some of my ideas about translation in symbolic communication. While it is theoretically true that no two signs have exactly the same meaning and that no translation is therefore fully equivalent to its source text, it is pragmatically also true that many translations function as equivalents. One could think about all kinds of,

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<sup>1</sup> Kull 2015; Marais, Kull 2016.

<sup>2</sup> Tymoczko (ed.), 2010.

<sup>3</sup> Maran 2020.

what Nord<sup>4</sup> calls, instrumental translations where the function of the translation is to replace the source text – and actually to erase it. The translation does not function as a translation but as an original. While there were very good reasons for translation studies to question assumptions about equivalence, Kalevi's work, among others, reminds us that things are never as simple as we would like to make them. While in symbolic communication absolute equivalence is never possible, there are many instances in which pragmatic equivalence is found. The translation of international treaties, laws, constitutions or even motor vehicle manuals attest to this.

The moral of my story with Kalevi is, I think, that interdisciplinary discussions are crucial for deepening our understanding of our world and the problems we face. As translation studies has shown, the relation between any two signs or sign systems is a tenuous affair. As biosemioticians like Kalevi have shown, there is often fruitful potential in the relation between two sign systems, here taken to be academic disciplines, despite its tenuous nature.

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<sup>4</sup> Nord 2018.



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### **La traduction en biosémiotique**

***Résumé:***

Dans cet article, nous réfléchissons à la contribution de Kalevi Kull à la théorie de la traduction. L'article se concentre sur les implications des données biologiques dans la théorisation de la traduction. L'une des implications de ce débat est que l'interaction interdisciplinaire semble être à l'avantage d'une compréhension théorique plus approfondie.

***Mots-clés:*** traduction, sémiotique, biosémiotique

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### **Перевод в биосемиотике**

***Аннотация:***

В этой статье рассматривается вклад Калеви Кулля в теорию перевода. Основное внимание уделяется тому, насколько при теоретизировании перевода учитываются данные биологии. Одним из выводов этой дискуссии оказывается то, что междисциплинарное взаимодействие, по-видимому, способствует более глубокому теоретическому пониманию.

***Ключевые слова:*** перевод, семиотика, биосемиотика

# On diversity

Timo MARAN  
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***Abstract:***

A central concept in Kalevi Kull's ecosemiotic writings is diversity. This short paper maps the meaning-connections surrounding the diversity concept. For K. Kull, diversity is an essential property of the semiotic processes occurring on a local scale, one that may become endangered by the standardized meaning-making of humans. There is an intriguing connection in Kull's writings between diversity and happiness. This connection enables diversity to become subjective, immediate, and experiential.

***Keywords:*** diversity, Kalevi Kull, ecosemiotics, happiness

It is very challenging to measure the diversity of plant communities. We have not yet found the universal measure among many metrics of diversity and species richness. This is so because diversity itself is diverse<sup>1</sup>.

It appears that, in Kalevi Kull's semiotic thinking, there are two dominant modes. On the one hand, he has focused on developing biosemiotic theory by making conceptual statements and establishing typologies (e.g., distinguishing between vegetative/iconic, animal/indexical, social/emonic, and cultural/symbolic semiosis). Aside from this formalist approach, on the other hand, he has also praised the indeterminacy, plurality, and freedom found in semiotic processes, notions related to choice, creativity, and self-regulation (like in the opposition between the physical and semiotic sciences). This second way of thinking is clearly present in Kalevi's ecosemiotic writings, and I must admit it has always felt more inspirational.

An essential notion in Kalevi's ecosemiotic writings is *diversity*. The interest in biodiversity probably relates to Kalevi's earlier research in botany, plant physiology, and ecology. He was part of the research group at the Institute of Zoology and Botany that studied the structure of and species-distribution in plant communities, wherein he discovered that Estonian wooded meadows have extraordinary species-richness<sup>2</sup>. He also participated in research on rare orchid species. For contextual background, in the 1980s and 1990s, biodiversity was the central concept in global nature protection discourse (as exemplified by the international Biodiversity Convention held in Rio de Janeiro in 1992).

Kalevi's discussions on diversity usually include value-judgments and normative assertions. Diversity, for him, is a fundamental property of living and semiotic systems, and those semiotic systems with high diversity are more valuable<sup>3</sup>. This makes diversity also a conceptual foundation in or for Kalevi's thinking. Interestingly, the common equivalent to biodiversity in the Estonian language is *elurikkus* (literally the *richness of life*). Thus, the connection between diversity and quality of life is a part of Estonian ecological discourse: Immanently speaking, (the/a) diverse life has more value.

In the following, I will map some connections surrounding the concept of diversity based on Kalevi's writings:

- *Diversity is a constitutive property of the semiosphere that is based on non-reducible differences and non-convertibility*: "semiosphere is the space of qualitative diversity"<sup>4</sup>; "Diversity means

<sup>1</sup> "Taimekoosluse mitmekesisust on väga raske mõõta. Mitmekesisuse ja liigirikkuse paljude erinevate mõõtude hulgast pole veel leitud seda ühte ja universaalset. Ju vist sellepärast, et mitmekesisus on mitmekesine" (Kull 1992: 416).

<sup>2</sup> Kull, Zobel 1991; Kull *et al.* 2003.

<sup>3</sup> Kull 2011: 71.

<sup>4</sup> Kull 2005: 179.

the existence of non-reducible differences, a lack of a common measure that would enable converting one into another”<sup>5</sup>.

- *Diversity derives from communication itself defined by partial incompatibility and non-translatability (following Juri Lotman’s communication model):* “Anywhere, where a communication in the living occurs, in the semiosphere *sensu lato*, it creates diversity, the species and cultures and subcultures etc., that hold together and separate themselves from the else. This is the diversity of signs systems that lays on the basis of biodiversity, as well of cultures, a difficulty of translation accompanying this diversification, which turns out to be the major value in the world of life at the same time”<sup>6</sup>.
- *Diversity relates to an organism’s semiotic capacities and the process of semiotic fitting:* “Diversity results from the capacity of living beings to make a difference, to recognise, to distinguish”<sup>7</sup>; “Everything in life, all its diversity of forms and processes, is a result of a continuous search with dialogues and negotiations during millions of years”<sup>8</sup>; “Diversity of a semiotic system is strongly dependent on the mutual fitting of the agents that give form to the semiotic system itself”<sup>9</sup>.
- *Extensive communication destroys diversity, as does unification and standardization:* “too much communication can be described as a general reason for many ecological problems that lead to homogenization of the world and loss of diversity”<sup>10</sup>; “Culture is a powerful system for generating diversity, it has, especially during Modernity, extensively eradicated heterogeneity and increased uniformity”<sup>11</sup>.
- *Preserving diversity through keeping culture non-cumulative avoids environmental problems and increases happiness:* “Although environmental problems are varied, it generally holds that if diversity is preserved, most other problems are avoided”<sup>12</sup>; “In order to preserve zest for life, the world does not have to be progressively changed; rather, the preservation (non-alteration) of the world should be chosen. [...] Such choices are only for, and come from, creating happiness”; “The deepest choice humans face is about creating happiness”<sup>13</sup>.

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<sup>5</sup> *Ibid.*: 185.

<sup>6</sup> Kull 2009: 509-510.

<sup>7</sup> Kull 2011: 71.

<sup>8</sup> Kull 2021: 11.

<sup>9</sup> Kull 2020: 15.

<sup>10</sup> Kull 2005: 186.

<sup>11</sup> Kull 2011: 71.

<sup>12</sup> *Ibid.*: 74.

<sup>13</sup> *Ibid.*: 71.

These various points form an interconnected body of arguments. Kalevi understands diversity as an essential property and outcome of the semiotic processes occurring on a local scale. At the same time, generalized and unified meaning-making endangers diversity, and thus the very conditions on which semiotic systems' vitality and endurance are based. Kalevi's writings make "diversity" an essential term of the bio-/ecosemiotic glossary. The most intriguing of Kalevi's notions is the connection between diversity and happiness, as we choose the non-cumulative path in culture. "Happiness" is an unusual and surprising term to be found in semiotic metalanguage. If diversity is usually considered as a property of the entire system (as in an ecosystem, for example), then happiness, on the contrary, is a feeling (subjective, preverbal, all-encompassing). Kalevi's relating of the two is an ingenious move, one that has the potential to change diversity into a characteristic that is oddly subjective, experiential, and immediately present.

Let us rely on happiness, value what is diverse, and think in many ways!

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### **Sur la diversité**

***Résumé:***

Un concept central dans les écrits écosémiotiques de Kalevi Kull est la diversité. Ce court article cartographie les liens de sens entourant le concept de diversité. Pour K. Kull, la diversité est une propriété essentielle des processus sémiotiques se produisant à l'échelle locale, une propriété qui peut être mise en danger par la formation du sens standardisée chez les humains. Il existe un lien intrigant dans les écrits de K. Kull entre la diversité et le bonheur. Cette connexion permet à la diversité de devenir subjective, immédiate et expérientielle.

***Mots-clés:*** diversité, Kalevi Kull, écosémiotique, bonheur

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### **О разнообразии**

***Аннотация:***

Центральным понятием в работах Калеви Кулля по экосемиотике является понятие разнообразие. В этой короткой статье говорится о смысловых связях, окружающих понятие разнообразия. Для К. Кулля разнообразие является важным свойством семиотических процессов, происходящих в локальном масштабе, свойством, которое может оказаться под угрозой из-за стандартизированного «придания значения» («создания смысла») людьми. В работах К. Кулля указывается на интересную связь между понятиями разнообразия и счастья. Эта связь позволяет разнообразию стать субъективным, непосредственным и эмпирическим.

***Ключевые слова:*** разнообразие, Калеви Куллер, экосемиотика, счастье



# Prague report on the consequences of environmental Kulling

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***Abstract:***

Our contribution pays tribute to our friend and great biosemiotician, Kalevi Kull. Based on our longstanding collaboration with the Department of Semiotics at the University of Tartu, we recall a few memories in which Kalevi Kull played a cardinal role.

***Keywords:*** Czech-Estonian friendship, Kalevi Kull, meaning of life, Danish beer, smoke sauna



We are grateful to Kalevi Kull for his long-standing support of our “Prague School”, warm relations, and friendship. Kalevi visited us several times to give a lecture, review our theses, and share his intellectual wealth. But how did we meet him?

In 1998, Anton Markoš participated in a conference in Freiburg im Breisgau (Germany). Wandering aimlessly about the poster session, he came across two Estonians, Kalevi Kull and Tom Tiivel. As happily orphaned children of the Soviet era, they had much to discuss. Anton then also received several books, proceedings of theoretical biology seminars that had taken place in Tartu in the 1980s. Anton could not have known that he would meet Kalevi when he went to a conference in years to come. In biology, we call this *sympatry*.

In the spring of 2000, while browsing the internet (Alta Vista – do you remember?), Anton found a conference call for anyone interested in the semiotic properties of living beings; the meeting was to take place in Copenhagen and it was organised by Jesper Hoffmeyer, Claus Emmeche – and Kalevi. Anton was just finishing his book on hermeneutics of the living, so he did not hesitate. At the meeting, he met many friends who by now knew his work well.

In 2002, the Gathering took place in Tartu – a good opportunity for linking it with a vacation. Anton and his wife Fatima travelled to Estonia in their car. At the Gathering, they met a new strong personality, Marcello Barbieri, who has remained the main critic of Anton’s thinking ever since. Vivid discussions with Marcello remain forever in the minds of people who participate in them.

In 2003, it was Copenhagen again: an expedition from Prague with five tall men in a small Škoda Felicia car (Anton and Karel included). Only two of us had a driving license, but the second driver did not sleep before our departure at 5am (last-minute finishing some manuscript), so all of the 900 km was up to Anton (with a break on the Rostock – Gedser ferry). We lived in a dormitory that was in a converted former tram depot, so it had a high ceiling and hundreds of partitions open at the top. The Rolling Stones had a concert nearby, so the place was full and *quite* noisy. After arriving, Anton was most keen on the idea of some beer, and so were his companions. In short, he spent most of his pocket money on the very first night in Denmark! Karel and others drank many beers with Anton’s money. The day after, all the guys went to the Gathering on time – only Karel was late due to a serious hangover. Obviously, there was something wrong with Danish beer because something like that could never happen after imbibing Czech beer. This was the first time Karel met Kalevi ... though on Karel’s side, memories are somewhat blurry, for obvious reasons. As always, Kalevi was cool, and probably for the first time we heard his most substantial question “What is the meaning of the meaning?” At the Gathering, Anton enjoyed a clash with Marcello, whose shouting, “This is not a discussion!” still resonates in our skulls. During a heated part of the discussion, Marcello ended up jumping over a desk and in the process, he kicked

(accidentally, of course) one of our colleagues in his head. Needless to say, that colleague never became a faithful biosemiotician. In those times, bio-semiotics was a dangerous business!

Since then, we have met Kalevi many times and we frequently visit him and his colleagues in Tartu, too. For example, during the summer term of 2010, Jana spent three months in Tartu visiting the department of Semiotics. Tartu proved itself to be such a nice place to live, and our Estonian friends have an amazing workplace with a truly international vibe. Once we were even all invited to a garden party at Kalevi's beautiful house... in short, our hosts made sure that we felt welcome and at home.

In the autumn of 2012, Jana defended her dissertation, and Kalevi was willing to oppose it and come to Prague for the defence. He sent the review together with some questions and Jana carefully prepared her answers. We still remember how Kalevi stood up during the defence and started asking questions rather like a lawyer in a courtroom. It was a beautiful whirlwind of exchange of views. Kalevi did not ask a single question from his review but that did not matter. Kalevi did not give Jana his blessings for free and on top of that, he gave us a great lecture on organic evolution without natural selection later that afternoon.

It is not generally known that Kalevi is also a pioneer of gender equality and proponent of "gonochoristic re-union". We remember how he invited all conference participants to a traditional "smoke sauna" in the countryside near Tartu. Some lady asked whether there are some special hours for ladies and for gentlemen. Kalevi's answer was: "No, it is simply for people".

Dear Kalevi, we wish you firm health and lots of happiness. But we also wish you to never find a clear answer to your seminal question "What is the meaning of the meaning" because we believe that such questioning makes your life meaningful. Of course, here in Prague, we already know the answer to your Question. We just can't share it with you. Trust us, it's for your own good.

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**Anton Markoš, Jana Švorcová, Karel Kleisner**  
Université Charles de Prague

**Le rapport de Prague sur les conséquences  
du Kulling environnemental**

***Résumé:***

Notre contribution rend hommage à notre ami et grand biosémioticien Kalevi Kull. Sur la base de notre collaboration de longue date avec le Département de sémiotique de l'Université de Tartu, nous rappelons quelques souvenirs dans lesquels Kalevi Kull a joué un rôle capital.

***Mots-clés:*** amitié tchéco-estonienne, Kalevi Kull, sens de la vie, bière danoise, sauna à fumée

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**Пражский отчет о последствиях экологического Куллинга**

***Аннотация:***

В этом тексте мы отдаем дань уважения нашему другу и великому биосемиотику Калеви Куллю. Основываясь на нашем многолетнем сотрудничестве с Кафедрой семиотики Тартуского университета, мы делимся несколькими воспоминаниями, в которых Калеви Куллю отводится ключевую роль.

***Ключевые слова:*** чешско-эстонская дружба, Калеви Куль, смысл жизни, датское пиво, баня по-черному

# **A fantastic semiotician and where to find him (if you don't know where, don't worry, he will tell you)**

Dario MARTINELLI  
*Kaunas University of Technology*

***Abstract:***

The intervention focuses on Kalevi Kull's career, contribution to, and love for semiotics, Estonia and his fostering of new generations of scholars.

***Keywords:*** Kalevi Kull, semiotics, biosemiotics, Tartu, Estonia

I insist: the spelling is wrong.

It's C, O, O, L. Kalevi Cool.

I don't know why the ending sounds like a double L, but it must be one of those Finno-Ugric phonetic businesses you don't want to mess around with.

No no. It's "cool" – believe me.

It's "cool" because Kalevi is that kind of colleague (and friend, I'm honored to add) who is able to inspire you at every level.

Career achievements, of course. He is already one of the three or four most important, most "central", biosemioticians on the planet, one who has been able to forge a unique scholarly path that does not cease to impress, and that does not cease – period. What I mean is that there seems to be a point in many colleagues' careers where, understandably, a sense of full circle-ness suggests to them to stop exploring new theoretical territories and instead lovingly tend their garden. In the best cases, that develops into a meaningful and (particularly for the young students) helpful consolidation of the existing material; in the worst ones, we witness an endless repetition of the same paper with an increasingly aggressive self-referentiality.

Not Kalevi. Kalevi is the ultimate "work in progress" scholar. He is interested in "full circles" only when he speaks about von Uexkuell. The spelling may not be "Kull", but definitely it is not "Full". Kalevi prefers roads that lead forward, no matter how many obstacles there may be on the way. In fact, from the ardor he puts on when he discusses some theoretically-sensitive matter, you'd say that he enjoys obstacles, because he enjoys the feeling of knocking them down. Like a bull. Kalevi Bull.

Actually, that ardor, that temper, is another of the inspirations I would like to talk about. I come from the working class, and that has always been a reason of pride for me. When you come from the working class you know very well that your position in society will only be achieved through your work. Not through your family name, not through your properties, not through your money. The work is what defines you, so – simply put – you'd better love it. The passion, the commitment, the enthusiasm that Kalevi puts in his work is a spectacle of its own. Find a person who looks at you like Kalevi looks at semiotics and marry them. If you are not interested in semiotics, just watch him – don't listen. His body language is enough: the way he moves around with that slightly bending posture, the hands often reaching his forehead as if checking the temperature of his brain in action, that facial expression of someone mulling over the various possibilities and implications of what he says. Kalevi Mull.

But let us return to the issue of "self-referentiality", because this is another important level of inspiration that one can learn from Kalevi. In a world, the academic one, where, let's face it, we are all a bunch of narcissists to some extent (as the great Italian comedian Giorgio Gaber once said, "I hate those people who think they are the center of the world and don't realize that the center of the world is ME!"), Kalevi will inspire you also

for the healthy humility of his ego. Browsing his bibliography, one can already notice how much room he gives to others, rather than projecting the attention to himself: von Baer, von Uexkuell, Hoffmeyer, Lotman... he flies over the ocean of past and contemporary biology/biosemitotics with the elegance of a specimen of the *Laridae* family. Kalevi Gull.

Even more significantly, he will also make space for those who have just started sailing in that ocean. I have seen Kalevi doing this on many occasions, from the way he co-authors papers with his students, making sure that he is not the only (nor the main) “face” of these works, to how enthusiastically he recommends them to his colleagues. I still remember how he introduced me to three of them, many years ago. “Dario! Dario! Come here! – with that mixture of gentle and intimidating ways he has about him, like there’s nothing more important in the world at that moment – I want to present to you the best brains in Tartu: Kaie, Ester, Riste!”. He left me no choice: I had to befriend these three young ladies (and it was an absolute honor, as they were, indeed, great brains).

I am totally convinced that scholars, no matter how good they can be, will never be “great” unless they pave the way for the younger generations, thus providing the word “legacy” with the noblest of meanings. Keeping up with the ocean metaphor, Kalevi has many times placed himself on the front of this ship of younger scholars, doing his unselfish best to make their navigation safer and easier. Yes, another pun is coming – brace yourselves: Kalevi Hull.

If anything (there’s no celebration without a bit of roasting, right?), instead of putting himself in the middle of attention, he chooses the alter ego of his beloved country, Estonia. Find a person who looks at you like Kalevi looks at Estonia and marry them. He has the power to turn into Estonian anything he touches. Any scholar from the present or from the past, no matter where from, will acquire Estonian citizenship as long as they lived or worked there for a period. In the rare cases when this is not possible, he will still attribute an intrinsically-Estonian quality to the given colleague. Like that famous time when he introduced me to his class during a guest-lecture: “Dario also uses a lot of humor in his writings, thereby displaying a truly Estonian quality”.

One day, I promise, I will understand what Estonian humor is, and that day my jokes will certainly improve from the level exhibited here. Happy birthday, my friend. The name is Cool. Kalevi Cool.

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**Dario Martinelli**

Université de technologie de Kaunas

**Un sémioticien fantastique et où le trouver  
(si vous ne savez pas où, ne vous inquiétez pas, il vous le dira)**

***Résumé:***

Le texte se concentre sur la carrière de Kalevi Kull, sa contribution à la sémiotique, son amour pour la sémiotique et l'Estonie, et sur la formation de nouvelles générations de chercheurs qu'il a favorisée.

***Mots-clés:*** Kalevi Kull, sémiotique, biosémiotique, Tartu, Estonie

**Дарио Мартинелли**

Каунасский технологический университет

**Фантастический семиотик и где его найти  
(если не знаете, где – не волнуйтесь, он вам подскажет)**

***Аннотация:***

Текст посвящен карьере Калеви Кулля, его вкладу в семиотику и любви к ней, Эстонии, а также воспитанию К. Куллем новых поколений ученых.

***Ключевые слова:*** Калеви Куль, семиотика, биосемиотика, Тарту, Эстония

# **Kalevi Kull, a force of nature**

Daniel C. MAYER-FOULKES  
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***Abstract:***

Kalevi Kull, a force of nature, disseminates biosemiotics through papers in Academia that take root in the world and in minds, fields of seeds.

***Keywords:*** Kalevi Kull, biosemiotics, academic activity



Biosemiotics seems.

A long way from San Diego, California, Tartu and Copenhagen are many hours flight away.

On this shore biosemiotics doesn't often knock on your door.

But there is Kalevi Kull.

Jesper Hoffmeyer maintained: Kalevi is a force of nature.

And this force shows up through his postings in Academia.

(You can be sure Kalevi knew something was up with his seventieth birthday. As the date approached, Academia must have insistently signaled of people around the world downloading his papers.)

How, I wondered, to avoid Academia tittle-tattling to him that I was looking at his profile? But then Academia advised of his posts these last four weeks.

Kalevi's papers discuss aesthetics as semiotic fitting; the semiosphere as the relational biosphere; *umwelten* of learning; texts, not signs, are alive.

So, biosemiotics alights at my door.

What does this all signify?

What is the message of this medium?

Kalevi, an Estonian elm, sets paper-thin seeds to flight.

Airborne, swept far and wide, they touch down, germinate.

Sprout into seedlings.

And then this Buddhist idea:

Mind is a field of seeds.

Mind, seeds, a force of nature.

Semiotic fitting, relational biosphere, *umwelt* for learning.

Living texts about living being.

Scattering

Propagating

sowing

of

signs

tokens

marks.

Dissemination of biosemiotics.

Biosemiotics of dissemination.

Sem sem

The root: *\*sem-*

**Daniel C. Mayer-Foulkes**  
Université ibéro-américaine

**Kalevi Kull, une force de la nature**

***Résumé:***

Kalevi Kull, telle une force de la nature, diffuse la biosémiotique dans le milieu académique à travers d'articles qui s'enracinent dans le monde et dans les esprits, tels des champs de graines.

***Mots-clés:*** Kalevi Kull, biosémiotique, activité académique

**Дэниел С. Майер-Фоулкс**  
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**Калеви Куль, сила природы**

***Аннотация:***

Калеви Куль – «природная сила» – распространяет биосемиотику через статьи в академическом сообществе, которые, подобно семенам на полях, укореняются в мире и в умах.

***Ключевые слова:*** Калеви Куль, биосемиотика, академическая деятельность



# Snapshots of a Professor

Oscar S. MIYAMOTO

*University of Tartu*

***Abstract:***

A written portrait of Kalevi Kull, as my teacher, supervisor, and colleague. I accompany it with some of his spoken quotes, as captured in my personal notebook.

***Keywords:*** Kalevi Kull, Tartu, biosemiotics, semiotic freedom

Semiotic rules always have exceptions.  
(Kalevi Kull, autumn 2018, Tartu)

If you visit Kalevi's office, he will greet you with a Japanese-like bow, and offer you candy. Should you be in luck, Kalevi will insist that you take home any books that catch your eye: he has a special bookshelf overflowing with spare volumes of *Sign Systems Studies*, *Biosemiotics*, and publications edited by the Semiotics Department.

If you are there to discuss semiotic ideas, Kalevi will enter a serious mode and listen very carefully to what you have to say. You can tell he is being insightful when he touches his forehead as if he was having a headache, or when he brings his hands together in front of his nose, as if he was "plotting" the evildest plan. After you are done talking, he will proceed to say "very good!"

Most likely Kalevi will know who already researched the particular question you are asking, and he will recall the exact title and year of their work. As a thesis supervisor, Kalevi allows complete semiotic freedom, but he will make you constantly come back to the very basics. According to him, clearly *defining* your elementary concepts is the most important step in any groundbreaking research.

Biological evolution is a trend towards increased semiotic freedom.  
(Kalevi Kull, autumn 2018, Tartu)

I came to Estonia in 2018 to study for an MA in Semiotics at University of Tartu. Little did I know that Kalevi would become my supervisor. To be honest, I had no idea of who Kalevi was. I just knew that he was in charge of the biosemiotics lecture. However, his course would quickly deepen my understanding of how semiosis works as an embodied and extended process. So much so, that his work influenced my thesis topic (the phenomenology of episodic memory). Since then, I identify my research as being part of biosemiotics, zoosemiotics, and cognitive semiotics.

In his classroom, every lecture is more interesting and complex than the last one. According to my handwritten notes, some of the subjects he discussed in his 2018 course were: analogue and digital codes; "species" as a communicational category; RNA translation; intercellular spaces and bodily interfaces; stereochemical affinity; semiotic thresholds; code-based arbitrariness and choice-based arbitrariness; epigenetic inheritance; neo-Darwinian and post-Darwinian theories; and a lot of untitled topics. By the end of that semester, I remember thinking that Kalevi's brain had three "hemispheres": an Uexküllian one, a Peircean one, and a Lotmanian one, all working at the same time.

It is the quirkiest thing to see Kalevi entering his classroom. During my MA, every week, he would bring a pile of old and new books. They were relevant materials for the ongoing lecture. Some of them came from the department's library, and others came from his personal archive. We would pass them around and browse their indexes while Kalevi introduced

the lesson. It was common that some of those volumes were autographed by the authors themselves (e.g. Jesper Hoffmeyer, Terrence Deacon, Donald Favareau, Paul Cobley, Frederik Stjernfelt, Thomas Sebeok, John Deely), all friends of Kalevi. I remember once holding a book with Umberto Eco's signature and thinking "this person is a true fanboy of semiotics!".

Needless to say, I was not ready for this "explosive" moment in my education. Even today, as a doctoral student, I am barely realizing what biosemiotics encompasses as an interdisciplinary field. I am glad to say that Kalevi was my gateway to a network of researchers, minds that are equally puzzled by the mystery and awe of life. The "takeaway" message I learned from Kalevi as a teacher is that life thrives by *cooperation* rather than by competition, making semiosis almost a synonym of *symbiosis*.

In living systems truthfulness has no priority, but maybe mistakes have.  
(Kalevi Kull, autumn 2018, Tartu)

In one informal occasion I asked Kalevi, jokingly, "is there someone in the semiotic world who doesn't know you?". "I do not know", he replied. We were speaking about upcoming academic conferences. An Estonian colleague of ours then added, "the only ones that didn't get to know Kalevi are all dead, like Peirce". We all laughed. We were in front of Jakobi 2 (Tartu), where it is common to see semiotics students having a smoke between lectures.

On a different occasion, in 2019, Kalevi was discussing abiogenesis with Terrence Deacon over lunch. Some classmates and I were present, listening to the 'casual' conversation that was taking place. I bet none of us really understood a thing about which they were hypothesizing. It felt, however, as if Kalevi and Terry were treating us as real colleagues, always answering our questions with seriousness.

I visit Juri Lotman at Raadi graveyard every now and then. There, on a summer afternoon of 2021, Kalevi came out of the blue and asked me "enjoying the weather?". As he spoke, he opened his arms and hands, looking up, as if referring to all the ecosemiotic glory of Tartu. He then led me to his parents' and brother's beautiful tombstones. He explained that these are made of local whole rocks. They are engraved not with regular letters, but with a replica of his family's handwritten signatures. "I will be here too. My rock is going to read "Kalevi Kull, biologist and semiotician".

Life does not require evolution. Evolution just happens.  
(Kalevi Kull, autumn 2018, Tartu)

A friend of mine says that Kalevi draws his distinctive energy from trees. I could not agree more with this silly metaphor. This seems to be especially the case when Kalevi leads field trips into Estonian forests. He would comment on the species inhabiting the ecosystem, and would signal the safe spots where you can drink fresh water.

Let me finish by reminding us that Kalevi has shared with us, among other things, a genuine enthusiasm for asking deeper questions. He can be the harshest critic of our work, but also a very passionate advocate of awe and wonder through semiotics. Thank you, Kalevi, and happy birthday!

Better semiotic awareness means asking better questions.  
(Kalevi Kull, autumn 2018, Tartu)

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**Oscar S. Miyamoto**  
Université de Tartu

**Instantanés d'un professeur**

***Résumé:***

Ceci est un portrait écrit de Kalevi Kull, mon professeur, superviseur et collègue. Je l'accompagne de quelques-uns de ses propos, tels que notés dans mon carnet personnel.

***Mots-clés:*** Kalevi Kull, Tartu, biosémiotique, liberté sémiotique

**Оскар С. Миямото**  
Тартуский университет

**Снимки профессора**

***Аннотация:***

Это словесный портрет Калеви Кулля, моего профессора, научного руководителя и коллеги. Я сопровождаю его некоторыми из его реплик, записанных в моем личном блокноте.

***Ключевые слова:*** Калеви Куль, Тарту, биосемиотика, семиотическая свобода





# **Kalevi Kull's virus semiotics**

Winfried NÖTH  
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***Abstract:***

The paper discusses Kalevi Kull's answers to the questions whether viruses are living beings, and if not, whether they can be considered as semiotic agents.

***Keywords:*** virus, semiotics, semiosis, meaning, life, Kalevi Kull

In an interview granted to the Brazilian *Digital Journal for Cognitive Technologies (TECCOGS)* only a few months after the beginning of the COVID-19 pandemic in 2020, Kalevi Kull presented the outlines of a theory of virus semiosis<sup>1</sup>. Since the interviewee's ideas on the semiotics of viruses are hitherto only accessible in Portuguese, as published in this journal, their great relevance to biosemiotics may justify the attempt to make at least a few of their main points accessible to readers of English here<sup>2</sup>.

The point of departure, whether viruses are semiotic agents at all, concerns the scope of biosemiotics. For, if biology is the study of life and living organisms, and viruses are not living beings, as some biologists argue<sup>3</sup>, viruses cannot be considered semiotic agents, for agency presupposes an agent and semiotic agency presupposes the interpretation of signs.

That semiotic agency presupposes life was the argument of “the architect of biosemiotics, Thomas A. Sebeok”, as Kull writes in his chapter for a volume dedicated to Sebeok<sup>4</sup>. ““Semiotics is the story of life itself” says Sebeok”, summarizes Kull<sup>5</sup> one of Sebeok's major premises, the argument that semiosis is “the phenomenon that distinguishes life forms from inanimate objects”<sup>6</sup>.

In the writings of the one who first introduced the term “semiosis” into modern semiotic terminology, Charles S. Peirce, we likewise find the scenario of a living organism in the center of semiotic agency. The agent is a microorganism in the focus of a “microscopist [who] looks to see whether the motions of a little creature show any purpose”<sup>7</sup>. The motions observed under this microscope exemplify semiosis, provided they are guided by a purpose: “The being governed by a purpose or other final cause is the very essence” of semiosis, concludes Peirce<sup>8</sup>. Whether life was a necessary and sufficient criterion of semiosis for Peirce cannot be discussed here<sup>9</sup>.

But what is life for a contemporary biologist? Kull answers this question with a caveat: “The question discussed over and over again whether viruses are living or nonliving beings lacks its final answer, not only because we do not know what viruses are, but also because it is not clear – or rather, because there is no general agreement on – what life is”<sup>10</sup>.

Is it not self-replication distinctive feature of life? Peirce once saw a parallel between organisms and the self-replication of symbols and other

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<sup>1</sup> Kull 2020.

<sup>2</sup> The interviewee had submitted his answers to the questions of TECCOGS in English so that they can be quoted in the following from Kull's original manuscript.

<sup>3</sup> See Villareal 2005.

<sup>4</sup> Kull 2011.

<sup>5</sup> *Ibid.*: 235.

<sup>6</sup> *Ibid.*: 236.

<sup>7</sup> Peirce CP 1.269.

<sup>8</sup> *Ibid.*

<sup>9</sup> But see Nöth 2018.

<sup>10</sup> Kull 2020.

legisigns (types), as they replicate in their tokens. Symbols are types and as such unique in the semiotic system of which they are elements. They replicate as tokens in their use, but whenever a token of a type is used, it is guided by a semiotic purpose. “The whole purpose of a sign is that it shall be interpreted in another sign”, Peirce argued<sup>11</sup>.

This is undoubtedly a parallelism with the self-replication of cells and organisms in their production of identical or similar copies of themselves. Viruses also replicate, but Kull warns against attributing life to them. Self-replication is not a sufficient criterion of life since lifeless computer viruses replicate, too. In addition, Kull argues with Peirce, semiosis must be purpose-driven. The above-quoted microorganism acts by final and hence semiotic causality only since it pursues a purpose. Kull also reminds us that

there can be multiplication and spreading without any final causality, without any semiosis. There are well-known examples of mechanical multiplication or simple automatic copying processes. For instance, photons in a laser multiply. Neutrons in a nuclear bomb multiply. There are also chemical chain reactions, autocatalytic processes. [...] A lesson we learn from these examples is that multiplication, however generally necessary for both living and semiotic systems, by itself is not sufficient for semiosis<sup>12</sup>.

If processes of self-replication require purposes to qualify for semiosis, such purposes call for a thorough semiotic scrutiny. Kull defines the purpose of semiosis as “meaning-making”. This is his essential bridge between semiotics and biology: “If semiosis is the meaning-making process, then we could define life as a process involving semiosis. [...] This intuition may well contribute to a definition of life”<sup>13</sup>.

Can meaning be made? In a way, it cannot. Signs *have* meaning; they may even be without meaning, but the meaning of a sign cannot simply be *made*<sup>14</sup>. What is produced in the process of semiosis is not meanings but interpretants, which are signs, too, but Kull’s account of semiosis comes closer to Peirce’s, when he describes semiosis as a “process of acquiring knowledge [...] in which at least a little piece of new information appears”<sup>15</sup>. This argument concerns Peirce’s doctrine of semiotic growth<sup>16</sup>. Peirce even uses vital images when he describes how scientific terms grow

<sup>11</sup> Peirce CP 8.191; see also Nöth 2014b.

<sup>12</sup> Kull 2020.

<sup>13</sup> *Ibid.*

<sup>14</sup> Neither Peirce nor Saussure would admit that meaning could be “made”. For Saussure (Saussure 1916 [1959: 113]), the meaning (signified) of a sign is as indissolubly linked to its signifier as the recto and verso of a sheet of paper: “thought is the front and the sound the back; one cannot cut the front without cutting the back at the same time”. For Peirce (CP 1.339), this indissoluble connection between the sign and its meaning is a matter of the representation of the meaning of the sign in its immediate object (cf. Nöth, Santaella 2011: 253).

<sup>15</sup> Kull 2020.

<sup>16</sup> See Nöth 2014a.

through interpretants that clarify their meanings: “It is, in fact, the process of nutrition of terms by which terms get all their life and vigor and by which they put forth an energy almost creative since it has the effect of reducing the chaos of ignorance to the cosmos of science. [...] They are new bodies, animated by that same soul. I call them the *interpretants* of the term”<sup>17</sup>.

Viruses proliferate, but they do so without a semiotic purpose, argues Kull: “A virus particle outside a cell consists of a strand of nucleic acid and protein molecules covering it. This particle does not move by itself. It has no metabolism but is completely passive. There is certainly no life and no semiosis going there”<sup>18</sup>. Nevertheless, viruses have a “life cycle from reproduction to reproduction”, participate in metabolism, and consume “energy and material, which means, they are related to respiration and nutrition”<sup>19</sup>. Hence, they are semiotic hybrids. According to Kull, viruses also lack another distinctive feature of semiosis, the capacity of choice: “For a process to be an interpretation, it should have the freedom to occur in alternative ways. Interpretation should include at least a primitive possibility for choice and decision-making [...]. Such a process can be identified as learning”<sup>20</sup>. The incapacity of viruses to choose between semiotic alternatives and to acquire new information excludes them from semiotic agency, but Kull admits that in the interaction of viruses and living cells, learning may not be entirely impossible.

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**La sémiotique du virus de Kalevi Kull**

***Résumé:***

L'article discute des réponses de Kalevi Kull aux questions de savoir si les virus sont des êtres vivants, et, si ce n'est pas le cas, s'ils peuvent être considérés comme des agents sémiotiques.

***Mots-clés:*** virus, sémiotique, sémiose, sens, vie, Kalevi Kull

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**Калеви Куль о семиотике вирусов**

***Аннотация:***

В статье обсуждаются ответы Калеви Кулля на вопросы о том, являются ли вирусы живыми существами и – если нет – можно ли их считать семиотическими агентами.

***Ключевые слова:*** вирус, семиотика, семиозис, значение, жизнь, Калеви Куль

# **Biosemiotic models must recognize many levels of evolution**

Howard PATTEE  
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***Abstract:***

Biosemiotics asserts that life depends on the interpretation of signs, but the concept of “interpretation” is not clearly defined by Charles Sanders Peirce, or anyone else, in any empirically testable sense. It is unreasonable to expect that “interpretation of signs” means the same thing over 4-billion years of evolution.

***Keywords:*** interpretation, symbol grounding, levels of evolution



Over 22 years ago Kalevi Kull, who was unknown to me at the time, asked me to write a paper on a subject I had never heard of, for a journal, *Semiotica*, that I had never heard of. I declined, claiming ignorance of the subject. This was clearly a “two-culture” problem and Kalevi convinced me that I had something to say about his culture. With Kalevi’s urging and with some intense study of semiotics I was able to write what I called *Irreducible and complementary semiotic forms*<sup>1</sup>. Years later, Kalevi’s enjoyable visit with me and my wife at our retirement home resulted in a paper that represented both cultures: *A biosemiotic conversation: Between physics and semiotics*<sup>2</sup>. My later discussions with Kalevi have been about the meanings of “interpretation”, which we agree are not clear.

This science-humanities cultural gulf still exists; but I see another related cultural problem within biosemiotics itself. It is the 4-billion year evolutionary gulf between the origin and semiotics of cells and the semiotics of brains. We know the brain achieves its speed and capacity to learn and communicate by a coherent dynamics of distributed processing in fast electrical networks with many millions of neurons. This neural net processing is entirely different from the molecular sequential reading of the genetic instructions. The parallel processing along with fast neural circuitry gives natural language a type of expressive power far beyond the much simpler and slower linear genetic language processing. The essential semiotic functions of writing, reading, and interpreting symbols in genetic language and in the brain’s language have different material substrates, different functions, and operate by completely different processes. Consequently, the domain of human interpretations and meanings is far removed from the domain of genetic operations. These structural and functional evolutionary differences between the molecular language of genes and neuronal languages of nervous systems make it unlikely that molecular semiotics and neural semiotics will find models with common observables or terminologies. The recent biosemiotics group originated in a culture associated with human language, and it has more of a philosophical outlook than the empirical chemical focus of the molecular biologist. As I argue in a recent paper<sup>3</sup>, the language of C.S. Peirce on which much of semiotics is based is gratuitous at the molecular level. If biosemiotics hopes to have any influence on biology it will need to find more compatible models at the molecular level.

One motto of the new biosemiotics group, “the sign is the basis of life, not the molecule” is provocative; but physicists and biologists will rightly claim it is a half-truth that obscures the most important question of all: *How can signs become executable instructions?* At higher levels the question becomes: *How do instructions become an open-ended language?* At the molecular level we can see how symbol sequences construct en-

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<sup>1</sup> Pattee 2001.

<sup>2</sup> Pattee, Kull 2009.

<sup>3</sup> Kull 2021.

zymes, but in my view, at higher levels these fundamental biosemiotic questions have not been adequately answered or even addressed. The questions arise at the origin of life, but the same questions occur over all of evolution – enough to keep the members of several cultures fully occupied.

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**Les modèles biosémiotiques doivent reconnaître  
de nombreux niveaux d'évolution**

**Résumé:**

La biosémiotique affirme que la vie dépend de l'interprétation des signes, mais le concept d'«interprétation» n'est pas clairement défini par Charles Sanders Peirce, ou qui que ce soit d'autre, dans un sens empiriquement vérifiable. Il est déraisonnable de s'attendre à ce que «l'interprétation des signes» signifie la même chose sur 4 milliards d'années d'évolution.

**Mots-clés:** interprétation, fondement des symboles, niveaux d'évolution

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**Биосемиотические модели  
должны признавать многие уровни эволюции**

**Аннотация:**

Биосемиотика утверждает, что жизнь зависит от интерпретации знаков, но понятие «интерпретация» четко не определено Чарльзом Сандерсом Пирсом или кем бы то ни было другим в каком-либо эмпирически проверяемом смысле. Неразумно ожидать, что «интерпретация знаков» означала бы одно и то же на протяжении 4 миллиардов лет эволюции.

**Ключевые слова:** интерпретация, обоснование символов, уровни эволюции

# **Kalevi Kull's biosemiotic aesthetics: Toward a domain-general theory of evolution**

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***Abstract:***

Kalevi Kull's recent proposal for a biosemiotic aesthetics opens up a new gathering point, or forest glade (to borrow one of K. Kull's own favourite metaphors), with much promise. As the theory continues to develop, I propose that it is itself destined to grow more beautiful – further enhancing compatibilities and resolving incompatibilities with related theories through time. After a brief review of K. Kull's account, I note that analogous (if not identical) processes have already been described in semiotic accounts of language evolution, suggesting that the aesthetics of evolutionary causation will eventually move us to recognize a general, unified theory of linguistic, cultural, and biotic evolution.

***Keywords:*** semiosis, evolutionary theory, Charles Sanders Peirce, biology, linguistics

## KULL'S BIOSEMIOTIC AESTHETICS

Over the course of the past seven years, Kalevi Kull's process of inquiry has been building toward a biosemiotic account of aesthetics<sup>1</sup>. An early stage of this process can be noted in his discussion of Juri Lotman's observations on resemblances between the structural organisation of living organisms and the construction of works of art<sup>2</sup>. Around the same time, he was also developing ideas on relationships between art, ecology, and eco-criticism<sup>3</sup>. These connections eventually dovetailed with his work on the necessary relationship between semiosis, learning and choice<sup>4</sup>, which then blended with his theory of "biosemiotic fitting"<sup>5</sup>. Now all of these strands are interwoven in a *Biosemiotics* target article entitled "The Biosemiotic fundamentals of aesthetics: Beauty is the perfect semiotic fitting"<sup>6</sup>. Here Kull identifies choice, fitting, and beauty as crucial aspects of semiosis.

Choice is necessary for semiosis since it introduces a degree (however limited) of freedom or agentiveness, without which there would be no habit taking (and, hence, no semiosis) – only automation and repetition. Fitting is necessary for semiosis since it slowly resolves incompatibilities between organism and environment through time (at both individual and community levels) by modifying habits based on memories of what is compatible and incompatible. What is most compatible is also most beautiful. Hence, "omnirelational semiotic fitting" works "in parallel with habit-taking"<sup>7</sup>, and beauty can be defined as "multirelational fittedness"<sup>8</sup>.

In this key move, Kull makes a clean break with Darwinian accounts of aesthetics as a mere epiphenomenon of sexual selection. He also demotes anthropocentric perspectives to a derivative status and integrates the account with multiple layers of theory, practice, and explanatory power. But, just as what is most beautiful about a forest glade is also what is most hidden from view (a point that Kull makes in the same article), what is most beautiful about Kull's theory of aesthetics may be its hidden relationships with Peircean evolutionary theory – and with compatible empirical evidence from cultural and linguistic evolution. These implicit connections suggest a promising future for realizing a domain-general theory of evolution.

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<sup>1</sup> Kull 2022.

<sup>2</sup> Kull 2015: 256-257.

<sup>3</sup> Kull 2016.

<sup>4</sup> Kull 2018.

<sup>5</sup> Kull 2020.

<sup>6</sup> Kull 2022.

<sup>7</sup> *Ibid.*: 1.

<sup>8</sup> *Ibid.*: 17.

## TOWARD A DOMAIN-GENERAL THEORY OF EVOLUTION

To catch a glimpse of this subterranean under-glade, we can mine Kull's own words for clues. He observes that, "as a result of semiotic fitting which resolves incompatibilities and tends to find the compatible, there exists a tendency in living nature to become beautiful. The nature of this quality identified as beautiful is *more in process than in form*, or rather in morphogenesis"<sup>9</sup>. The process in question is clearly entangled with final causation: i.e., "that kind of causation whereby the whole calls out its parts"<sup>10</sup>, requiring a "habit of taking and laying aside habits"<sup>11</sup>. This process informs Peirce's third mode of evolution: evolutionary love, or "Agapasm", which he describes as "recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely"<sup>12</sup>. Not only is Peirce's evolutionary account compatible with Kull's processual aesthetics of semiotic fitting, the two seem to be describing the same process – a pervasive process that is equally notable in linguistic and cultural evolution.

I have identified this mode of evolution with future-oriented pattern solving processes that are apparent in language change<sup>13</sup>, drawing heavily on Michael Shapiro's<sup>14</sup> insightful applications of Peircean semiotic to the discovery of diagrammatization processes in language evolution: "a process by which unconformities in languages are reduced or eliminated over time", leading to an explanation of linguistic evolution as "a kind of goodness (of fit)"<sup>15</sup>. Other linguist-semioticians have also begun to draw attention to related dynamics<sup>16</sup>, providing further impetus for rethinking language evolution as an aesthetically driven process at every level: from language acquisition in early childhood development, to on-the-fly adjustments of comprehension and pronunciation in live conversation, to generational semantic shift, to the long-term systematization of irregular paradigms.

Adjusting to such insights would require a paradigm shift of its own, in linguistics and biology alike, with ripple effects potentially spreading into many other domains. Such a paradigm shift would seem natural and inevitable if we understood with Hoffmeyer that language is simply "a special case of a more general biosemiosis"<sup>17</sup>; but the shift would also have major consequences for our approach to life and language since it would require us to see that "there is no sensation, nor esthesis or poesis without

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<sup>9</sup> *Ibid.*: 13, emphasis mine.

<sup>10</sup> Peirce CP 1.220.

<sup>11</sup> *Ibid.*: 6.101.

<sup>12</sup> *Ibid.*: 6.289.

<sup>13</sup> Pelkey 2013; 2015; 2019.

<sup>14</sup> Shapiro 1991; 2002.

<sup>15</sup> Shapiro 2002: 118.

<sup>16</sup> See, e.g., Lacková 2018; Robuschi 2021.

<sup>17</sup> Hoffmeyer 2008: 299.

semiosis, and aesthetic process is their aspect, driven by semiotic fitting”<sup>18</sup>. Above ground and below, the glade beckons.

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<sup>18</sup> Kull 2022: 12.

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**L'esthétique biosémiotique de Kalevi Kull:  
vers une théorie générale de l'évolution**

**Résumé:**

La récente proposition de Kalevi Kull concernant une esthétique biosémiotique ouvre un nouveau point de rassemblement, ou *forest glade* (pour emprunter l'une des métaphores préférées de K. Kull), ce qui est très prometteur. Au fur et à mesure que la théorie continue de se développer, je propose qu'elle soit elle-même destinée à s'embellir – renforçant encore les compatibilités et résolvant les incompatibilités avec les théories apparentées au fil du temps. Après un bref examen de ce que K. Kull a proposé, je note que des processus analogues (sinon identiques) ont déjà été décrits dans des explications sémiotiques de l'évolution du langage, suggérant que l'esthétique de la causalité d'évolution finira par nous amener à reconnaître une théorie générale et unifiée de l'évolution linguistique, culturelle et biotique.

**Mots-clés:** sémiologie, théorie de l'évolution, Charles Sanders Peirce, biologie, linguistique

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**Биосемиотическая эстетика Калевы Кулля:  
к общей теории эволюции**

**Аннотация:**

Недавнее предложение Калевы Кулля относительно биосемиотической эстетики дает начало новой «точке сбора» – или *forest glade* (если воспользоваться одной из любимых метафор самого К. Кулля), что очень многообещающе. По мере того, как теория продолжает развиваться, я предлагаю, чтобы она сама непременно становилась все более красивой – со временем все более совместимой с родственными ей теориями, несовпадения с которыми будут все более сходиться на нет. После краткого обзора предложенного К. Куллем я отмечаю, что аналогичные (если не идентичные) процессы уже были описаны в семиотических описаниях языковой эволюции, предполагая, что эстетика каузальности эволюции в конечном итоге приведет нас к признанию общей, единой теории лингвистической, культурной и биотической эволюции.

**Ключевые слова:** семиозис, эволюционная теория, Чарльз Сандерс Пирс, биология, лингвистика

# Human semiosis between inventiveness and reiteration

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***Abstract:***

Noteworthy is how Kalevi Kull recovers the concept of *language*, human species-specific primary modelling, distinct from *speech*, from Thomas Sebeok's global semiotics. Primary modelling has syntactics, thus the capacity to organise the same elements into new and different combinations, Aristotle's *katà suntheke*, and ensues in *inventiveness*, *innovation*, the *play of musement* (Peirce), "poetic logic" (Vico).

***Keywords:*** innovation, inventiveness, listening, responsibility, syntactics

“Arbitrariness and the forms of semiotic indeterminacy”<sup>1</sup> and “Choosing and learning: Semiosis means choice”<sup>2</sup> are two essays by Kalevi Kull that make a significant contribution to the problem of meaning. Terms regarding the “nature” of the sign, particularly verbal signs, often cause confusion and demand clarification. The following considerations are from an ideal dialogue with Kalevi on his 70th birthday.

With Kalevi we believe that Thomas Sebeok’s conception of the human species-specific capacity for (primary) modelling, or *language*, is centrally important in semiotics, linguistics and philosophy of language today<sup>3</sup>. With Kalevi and Paul Cobley we participated in a project for Tom piloted by our dear John Deely, *Semiotics Continues to Astonish: Thomas A. Sebeok and the Doctrine of Signs*<sup>4</sup>. Like Kalevi we are bonded to Tom Sebeok by friendship and warm memories, besides his teachings. Kalevi’s research-time in Bloomington with Tom was probably one of the most seminal events of the late 20th century for future developments in biosemiotics.

*Language* (modelling) in Sebeok<sup>5</sup> is associated with the “play of musement”, it explains the multiplicity of languages and cultures, and was *originally a mute language*. This is Giambattista Vico’s “*lingua mutola*”, which he tags the “language of the Gods”, “almost completely mute, hardly articulate”, followed by the “language of the heroes”, “articulate and mute”, and “the language of mankind, almost completely articulate and hardly mute”.

Verbal language origin is connected to the human species-specific modelling device. The notion of “modelling” is developed by Sebeok from the Moscow-Tartu school. With his “poetic logic”, Vico not only offers a correct approach to the question, but focuses on the “Enigma of Babel”: the “great difficulty: how is it that there are as many different vulgar languages as there are peoples?”<sup>6</sup>. Why many languages and not just one, as instead the idea of origin “by convention”, *secundum placitum*, or as deriving from a common “innate universal grammar”<sup>7</sup> would have us believe?

The multiplicity of languages (and plurilingualism internal to each language) is a manifestation of the human modelling capacity to invent multiple worlds, the propensity for the “play of musement”, Vichian “poetic logic” proper to humans.

Other traits that distinguish humans, “semiotic animals”<sup>8</sup> relatedly to language (writing *ante litteram*) include “creativity”, a capacity for inventiveness and innovation, composition, decomposition and recomposition,

<sup>1</sup> Kull, forthcoming.

<sup>2</sup> Kull 2018.

<sup>3</sup> Danesi *et al.* 2004; Petrilli, Ponzio 2002; Petrilli 2012.

<sup>4</sup> Cobley *et al.* (eds.), 2011.

<sup>5</sup> Sebeok 1991; 2001.

<sup>6</sup> See Vico 1725 [1976].

<sup>7</sup> Chomsky 1986.

<sup>8</sup> Deely *et al.* 2005.

the *semiotic* character of human semiosis, that is, capacity for *metasemiosis*, for using signs to reflect upon signs, thus for awareness, deliberation, choice, and consequent “condemnation” to responsibility<sup>9</sup>.

Regarding the notion attributed to Aristotle of language (*langage*) and languages (*langue*) as convention: *a placito*, by convention is mistakenly used to translate Aristotle’s *katà suntheke*. The expression has reached us through Ammonius and Boethius and is present in Peter of Spain<sup>10</sup>. As Lo Piparo observes<sup>11</sup>, translation of Aristotle’s *katà suntheke* as “by convention” privileges one sense of the expression sacrificing another, the “syntactical,” the sense of *composition*, *assembling to create something new*.

“Meaningful by convention” should be translated as “meaningful by composition”: “meaningful voice by composition”, *katà suntheke*<sup>12</sup>, *sunthetété*<sup>13</sup>. In Aristotle this explains the iconic, creative character of verbal language<sup>14</sup>. Syntactics, primary modelling is not only present in the “syntax” of natural languages, but also in the “phonology” (combination of phonemes), enabling use of a finite number of elements variously combined to produce different meanings at each occurrence.

Thanks to syntactics, writing distinct from transcription, humans not only produce the world they inhabit like other animals, but an infinite number of possible worlds.

However, through imposition, prejudice, subordination to dominant ideo-logic, the *doxa*, it so happens that deliberation, choice is often understood in terms of an alternative between two possibilities, a *paradigm*, opposition between two terms to choose between: coercion to the paradigm, its reiteration, its reproduction.

In *Le Neutre* Barthes tags *neutral* what eludes the paradigm, *déjoue* opposition between two virtual terms imposing a choice. The neutral is closely connected to *desire*: Barthes’s lessons are dedicated to the *desire of the neutral*. Desire of the neutral is otherwise from neutrality: a standpoint against the order of discourse, dominant ideology, conflict; against arrogance, guilt, power. Paradigms involve contraposition, hostility to the point of violence and oppression, as repeated today even in the form of war.

The Neutral claims the right to silence, to not respond despite being forced to say. Language compels us to speak, as Barthes avers in *Leçon*, his inaugural lesson held at the Collège de France, 7 January 1977.

Mikhail Bakhtin describes many forms of silence: parody, allegory, metaphor. Bakhtin describes the writer as the one who uses language staying outside it, clothed in silence and literary writing as a modality of silence, “indirect speech”. As such literary writings recovers the connection

<sup>9</sup> Petrilli 2010; Petrilli, Ponzio 2005; Ponzio 2020.

<sup>10</sup> Peter of Spain 1230.

<sup>11</sup> Lo Piparo 2003: 72-87.

<sup>12</sup> Aristotle 2021, 2, 16a: 19-29.

<sup>13</sup> Aristotle 1998, 1457a: 10-12.

<sup>14</sup> Lo Piparo 2003.

with the unconditional, free, un-self-interested inventiveness of *ante litteram* writing, modelling. As Barthes says, writing through metaphors, allegories, parodies of “official discourse” eludes the paradigm, the relation of opposition and transcends the “logosphere”, thereby avoiding stereotypes and ideologies associated with the doxa.

But besides “poetry” broadly understood as literary writing, this should also occur in life: not freedom of the word (freedom of speech), but the word’s freedom; silence as the condition for listening and for “responsive understanding”<sup>15</sup>; not listening as wanting to hear, *applied listening*, but listening as desire of the neutral, as desire of alterity, outside the paradigm<sup>16</sup>.

These reflections are a response to Kalevi Kull’s essays cited above and the suggestiveness of his considerations, hence our desire to write these words and write them for him.

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### **La sémiologie humaine entre inventivité et réitération**

**Résumé:**

Il convient de noter comment Kalevi Kull comprend le concept de *langage*, modélisation primaire spécifique à l'espèce humaine, distincte de la *parole*, et cela à partir de la sémiotique globale de Thomas Sebeok. La modélisation primaire a une syntaxe, donc la capacité d'organiser les mêmes éléments dans des combinaisons nouvelles et différentes, le *katà suntheke* d'Aristote, et résulte dans l'*inventivité*, l'*innovation*, le *jeu du musement* (Peirce), la «logique poétique» (Vico).

**Mots-clés:** innovation, inventivité, écoute, responsabilité, syntaxe

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### **Человеческий семиозис между изобретательностью и повторением**

**Аннотация:**

Обращает на себя внимание то, как Калеви Кулл понимает концепт *языка*, свойственную человеку как виду первичную моделирующую систему, отличную от *речи*, исходя из глобальной семиотики Томаса Себеока. По отношению к первичной моделирующей системе можно говорить о синтактике, то есть о способности организовывать одни и те же элементы в различные новые комбинации (ср. *katà suntheke* Аристотеля), из чего следуют *изобретательность*, *новаторство*, «*игровое размышление*» [*musement*] (Пирс), «*поэтическая логика*» (Вико).

**Ключевые слова:** новаторство, изобретательность, слушание, ответственность, синтактика

# **Estonian theory revisited**

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***Abstract:***

This article addresses the epistemological challenges of the concept of “Estonian theory” proposed by Kalevi Kull and Marek Tamm. The author argues that the geographical and diachronic concept (the theory’s spatial unity in its temporal evolution) should be supplemented with a extraterritorial and synchronic concept (the theory’s simultaneous presence in various geocultural contexts).

***Keywords:*** “Estonian theory”, travelling theory, reterritorialization



By Estonian theory we mean a local episteme – a territorialised web of epistemological associations and rules for making sense of the world that favours some premises while discouraging others<sup>1</sup>.

My previous articles on this subject address the epistemological status of terms such as the “French”, “Russian”, “Czech”, etc. theories in the humanities<sup>2</sup>. What can serve as a structuring field and a frame of reference for the theory – a language, an ethnos, a territory? Or a territory as an ecosystem inhabited by different ethnic groups speaking one or more languages, as suggested by Kalevi Kull<sup>3</sup>? The schools that develop such theories can be described as specific geographically located “crystallizations”<sup>4</sup> or “condensations”<sup>5</sup> of wider methodologies favoured in particular cultures and societies. The concept of “Estonian theory” proposed by Kalevi Kull and Marek Tamm<sup>6</sup> belongs to this category. Kalevi Kull has also discussed specifically yet another phenomenon of this kind, known as “Italian theory” (and called my attention to it)<sup>7</sup>.

A global “transcultural trajectory”<sup>8</sup> of conceptual transfers from linguistics to literary theory and structural anthropology and further to semiotics and cultural studies can be schematically divided into several stages of ex-, de- and re-territorialization: from Russian formalism (“Russian theory”) to Prague structuralism (“Czech theory”), with its export to the U.S. during WW2 and then to France (French structuralism), its re-import back to USSR (the Tartu-Moscow School), and further to the French poststructuralist reaction exported to the U.S. as “French theory”, with the New Tartu School<sup>9</sup> (“Estonian theory” or one of “Estonian theories”<sup>10</sup>) as part of this process<sup>11</sup>.

In order to evolve, a theory needs “to travel, to emigrate, to remain in a sense in exile”<sup>12</sup>. Referring to Edward Said’s “Travelling theory”, Galin Tihanov emphasizes “the enormous importance of exile and emigration for the birth of modern literary theory in Eastern and Central Europe”<sup>13</sup>. Emigration, exile or retreat function as “a contact zone”<sup>14</sup> where important transfers and encounters happen. The regime of displacement and academic mobility<sup>15</sup> – either voluntary or forced – was also relevant for

<sup>1</sup> Tamm, Kull 2020: 30.

<sup>2</sup> See footnote 11 below.

<sup>3</sup> E-mail (7.06.2021).

<sup>4</sup> Steiner 1982: xi.

<sup>5</sup> Tamm, Kull 2020: 31.

<sup>6</sup> Tamm, Kull 2015; 2016; 2020.

<sup>7</sup> Kull 2018: 143; Pilshchikov 2022a: 89-90, 97-98.

<sup>8</sup> Tamm 2020: 143-144.

<sup>9</sup> Torop 2000; Kull 2012.

<sup>10</sup> Sooväli, Ott 2020.

<sup>11</sup> Pilshchikov 2019; 2022a; 2022b.

<sup>12</sup> Said 2000: 451-452.

<sup>13</sup> Tihanov 2019: 12.

<sup>14</sup> Pratt 1991: 34.

<sup>15</sup> Greenblatt 2009.

the birth of the Tartu-Moscow School of Semiotics. After Juri Lotman moved to Estonia from Leningrad due to the anti-Semitic campaign (1950) and semiotics was suppressed in Moscow (1962), the center of semiotic research was transferred to Tartu (1964).

The “travelling theory” is constantly reterritorialized and recontextualized: it strengthens (or dissipates) in changing contexts, when its pre-suppositions cease to be taken as granted by the new intellectual milieu, when it has to defend, justify and assert itself – and eventually transform itself thanks to the acquired awareness of what was irrelevant before but becomes a *sine qua non* in the new circumstances.

The geographical and diachronic concept of a “national” theory (the theory’s spatial unity in its temporal evolution) should be supplemented with an extraterritorial and synchronic concept (the theory’s simultaneous presence in various geocultural contexts). At the discussion of my paper at the workshop, *The Global Reception of Estonian Semiotics*, held at Tallinn University on 20 December 2019<sup>16</sup>, Kalevi Kull called these two axes of the evolution of theory “vertical” and “horizontal” and noted that the narrow definition of “Estonian theory” suggested by him and Marek Tamm was limited to the “vertical” axis and should be expanded.

Yet another intriguing and challenging question is the following: When and where may a theory be (re)territorialized? In an unpublished article of the early 1970s, Juri Lotman elaborated on the concept of “cultural areals [...] where cultures of different types have co-existed and found themselves in close spatial communication for a long time. Examples of such regions are Transcaucasia, the Baltic countries, the Mediterranean, and Central Europe”<sup>17</sup>. In such “contact zones”, “cultures meet, clash and grapple with each other, often in contexts of highly asymmetrical relations of power”<sup>18</sup>. Despite these tensions and historical cataclysms, new theories, usually of a symbiotic nature<sup>19</sup>, develop there “at the intersection between national enthusiasms and a cultural cosmopolitanism that transcend[s] local encapsulation and monoglossia”<sup>20</sup>.

In the Circum-Baltic space, we can speak of “Estonian theory” and perhaps “Polish theory”, with its distinctive combination of Baudouinian linguistics, an idiosyncratic version of formalism, structuralism, and semiotics, and, last but not least, the domestic logical-philosophical tradition. Should we expect the emergence of Latvian theory or Finnish theory? Or – expanding our horizon to the entire East European region – Ukrainian theory, if it does not exist already?

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<sup>16</sup> <https://www.tlu.ee/ht/uudised/workshop-global-reception-estonian-semiotics>.

<sup>17</sup> Quoted in Pilshchikov 2022b: 107.

<sup>18</sup> Pratt 1991: 34.

<sup>19</sup> Jakobson 1934: 8; 1938: 233.

<sup>20</sup> Tihanov 2019: 11-12.

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### **La «théorie estonienne» revisitée**

***Résumé:***

L'article aborde les enjeux épistémologiques du concept de «théorie estonienne» proposé par Kalevi Kull et Marek Tamm. L'auteur soutient que le concept géographique et diachronique (l'unité spatiale de la théorie dans son évolution temporelle) devrait être complété par un concept extraterritorial et synchronique (la présence simultanée de la théorie dans divers contextes géoculturels).

***Mots-clés:*** «théorie estonienne», théorie voyageuse, reterritorialisation

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### **Новый взгляд на «эстонскую теорию»**

***Аннотация:***

В данной статье предлагается эпистемологический анализ концепта «эстонская теория», предложенного Калеви Куллем и Марекком Таммом. Автор показывает, что географический и диахронический концепт (пространственное единство теории в ее временной эволюции) должен быть дополнен концептом экстерриториально-синхроническим (одновременное присутствие теории в различных геокультурных контекстах).

***Ключевые слова:*** «эстонская теория», «странствующая теория», ретерриторизация

# The multiple and the contradictory

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***Abstract:***

This article briefly contemplates the conjunction between three theses: 1) semiosis stems from logical incompatibility; 2) semiosis means choice; 3) to mean is to be plural. At the centre of the discussion is the multiple and paradoxical nature of semiosis, which problematises the understanding of choice as reduction of possibilities.

***Keywords:*** semiosis, multiplicity, incompatibility, problem, paradox

A thought or two on incompatibility and multiplicity. Perhaps incoherent, definitely incomplete. Thoughts stemming from three of Kull's theses: 1) semiosis stems from logical incompatibility in organic nature<sup>1</sup>; 2) semiosis means choice<sup>2</sup>; 3) to mean is to be plural<sup>3</sup>. We have a triadic structure: logical incompatibility-choice-multiplicity. How are the aspects of this structure related to each other?

The paradigmatic case of logical incompatibility is, of course, contradiction. It is impossible for there simultaneously to be  $p$  and not- $p$ . If  $p$  and not- $p$  happen to coexist, we have a paradox. Now, it would seem that choice is the resolution of this contradictory situation: only  $p$  or not- $p$  will be actualised, while beforehand, prior the decision, both were possible. This trajectory describes a movement from the many to the one, from several incompatible possibilities to the actualisation of an act. Here, semiosis – choice – appears in the form of resolution of conflict.

However, it is extremely difficult to think of logical incompatibility in the form of contradiction without – or existing in advance of – choice, decision. For the actualised choice is precisely that which retroactively produces the unactualised possibilities. Even though choice appears as a limitation and reduction of possibilities, it is rather the condition of the emergence of its own past (im)possibilities. As Henri Bergson says, “it is reality that makes itself possible, and not possibility that becomes real”<sup>4</sup>. Otherwise, the (paradoxical) field of (im)possibilities would appear as a refiguration or a “mirage” of the future existing in the past. Now, if semiosis stems from logical incompatibility and if it means choice, it would lead to the conclusion that semiosis is a limitation of incompatible (im)possibilities and that choice is a resolution of paradox, a constitution of unity. From the many to the one.

However, in this case: what to do with the thesis that “to mean is to be plural”? Semiosis is not plural simply in the sense that it would contain several elements in a single unifying container. Rather, the unity of semiosis is multiple. The structure of semiosis is itself paradoxical. Semiosis is not self-identical; rather, it is its difference (from itself): it is what it is not. This is its most fundamental characteristic (meaning, interpretability, translatability is secondary and stems from this paradoxical multiplicity). But the paradoxical structure of semiosis does not appear in the form of contradiction awaiting to be resolved. Rather, semiosis works against resolution. Or in other words, reification. If semiosis begins to resemble a thing – become a habit, automatise –, then it already tends towards its end, it ceases to require its inherent paradox which constitutes its nature as semiosis. It becomes the sign-artefact. Infinite semiosis has the paradoxical multiplicity as its motor.

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<sup>1</sup> Kull 2015.

<sup>2</sup> Kull 2018.

<sup>3</sup> Kull 2009: 82.

<sup>4</sup> Bergson 1938: 115.

Thus, semiosis is a multiplication machine operating against unification. To mean is never to say *one thing*, but always presenting potentialities for responding, taking action, making a choice... The interpretant presents a potentiality. Semiosis asks: who will take this interpretant and do something with it? Who will keep me alive? This is the potentiality and demand of semiosis: what can be done with it and by whom? The subject or agent responding to this problem does not limit logical possibilities, but is tasked with the imperative to keep multiplying, to actualise potentiality. In this sense, the subject is a response to the problem posed by semiosis. It participates in making differences, proliferating incompatibilities. Semiosis-as-a-problem, described in this way, is not a logical contradiction, but a problematic structure to be effectuated.

Now, if semiosis means choice, then making this choice entails keeping the problem of semiosis (uniting presence and absence, rendering the absent present while underlining the necessity of its absence; repeating: “I am not me, I am not me...”; calling: who will be my response?) alive. The decision is to begin multiplying... From this perspective, Deleuze writes, “contradiction is only the appearance or the epiphenomenon, the illusion projected by the problem, the shadow of a question which remains open [...]”<sup>5</sup>. Does not logical incompatibility also presuppose semiosis as the real process which makes it possible? This would, I think, be in accord with the understanding that *umwelt* is (also) synchronic: the real and the possible co-constitute each other.

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<sup>5</sup> Deleuze 1994: 64.



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### **Le multiple et le contradictoire**

**Résumé:**

Cet article envisage brièvement la conjonction entre trois thèses: 1) la sémiose découle d'une incompatibilité logique; 2) la sémiose signifie choix; 3) signifier, c'est être au pluriel. Au centre de la discussion se trouve la nature multiple et paradoxale de la sémiose, qui problématise la compréhension du choix comme réduction des possibilités.

**Mots-clés:** sémiose, multiplicité, incompatibilité, problème, paradoxe

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### **Множественность и противоречивость**

**Аннотация:**

В этой статье кратко рассматривается совокупность трех положений: 1) семиозис проистекает из логической несовместимости; 2) семиозис означает выбор; 3) означать – значит быть во множественном числе. В центре дискуссии – множественный и парадоксальный характер семиозиса, проблематизирующий понимание выбора как редукции возможностей.

**Ключевые слова:** семиозис, множественность, несовместимость, проблема, парадокс

# Processes, artifacts, and semiosis

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***Abstract:***

Recent developments in a semiotics of processes and in niche construction theory based on cognitive artifacts have benefited enormously from discussions with Kalevi Kull, and from readings of his articles.

***Keywords:*** process, artifacts, creativity, habit

It is a truism to assert the importance of Kalevi Kull for the recent development of semiotics, in general, and biosemiotics, in particular. Just before the pandemic, I visited, as a guest speaker, the Institute of Philosophy and Semiotics (University of Tartu). On this occasion, I presented several ideas about “semiosis as a process”, and “intersemiotic translation as a cognitive artifact” to “pump” creativity. I discussed these ideas at length with Kalevi, and with other members of the department. On the first topic, I started to develop it many years ago, in collaboration with Floyd Merrell, with the philosopher of biology Charbel El-Hani, and more recently with Pedro Atã, my former advisee in Sweden (Linnaeus University). On the second topic, I have approached it initially with the choreographer and dance researcher Daniella Aguiar, in the scope of contemporary dance and music, and later with many students (undergraduate and graduate).

The idea of semiosis as a process is evidently not new among Peircean scholars. Max Fisch had already recommended attention to this thesis<sup>1</sup> – “the fundamental conception of semeiotic is not that of sign but that of semeiosis; and semeiotic should be defined in terms of semeiosis rather than of sign...”. In recent years it has gained new impetus through recent research on the Peircean notion of habit<sup>2</sup>. I have emphasized this aspect, tried to frame it in the wider domain of a philosophy of processes, and suggested that it has (or can have) many consequences in different domains of semiotics, (biosemiotics and cognitive semiotics). Process philosophy is concerned with dynamicity, complexity, and emergence as fundamentals of explanation<sup>3</sup>. Peirce’s process philosophy is the basis for a semiotic theory that focuses on semiosis, the action of signs, in contrast to theories of meaning which focus either primarily on the sign itself (formalist and structuralist approaches) or on the sign-user (psychological, neurocognitive, anthropological and sociological approaches). For Peirce, semiosis is process, and this is in tune with a number of recent investigators in Cognitive Science that maintain that meaning must be considered in terms of complex emergent properties, in self-organizing adaptive systems.

Another topic I discussed with Kalevi during this visit was the phenomena of mind-tools and cognitive artifacts. It is already a very explored topic in Distributed Cognitive Science, but still little explored in Art and Cognitive Aesthetic Studies. Humans couple bodies with paraphernalia of tools in order to augment cognitive competencies. Cognitive artifacts are a constitutive part of our lives. Various tools such as pen and paper, calendars, maps, notations, models, computers, shopping lists, traffic signals, measurement units, etc., are considered non-biological elements of a cognitive system. These cognitive artifacts shape cognition: when we alter our environments of artifacts, we can open new cognitive (and/or semiotic) niches, giving rise to new patterns of semiotic activity in a cumulative pro-

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<sup>1</sup> Fisch 1986: 330.

<sup>2</sup> Atã, Queiroz 2016.

<sup>3</sup> Seibt 2018.

cess of niche construction. Humans are niche builders, extending the mind into the space to think better. If this thesis is correct, and human cognitive achievements are highly dependent on the use of artifacts, what about artistic creativity? I have defended the idea that intersemiotic translation is a cognitive artifact that scaffolds creativity in arts in different time scales. This implies that an artifact is not necessarily a physical thing. Procedures, methods, techniques are also seen as artifacts. I have explored the idea of intersemiotic translation as a cognitive artifact taking advantage of many examples in contemporary dance, music, literature and poetry.

Many of these ideas originate, as is certainly the case with many colleagues and friends, in readings of Kalevi's works, and in many discussions with him (in the last 3 decades!). The encounters with Kalevi, and with his texts, provided, on all occasions, an enormous amount of insights, reading indications, and direct clashes between new ideas and perspectives.

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**Processus, artefacts et sémiose**

***Résumé:***

Les développements récents d'une sémiotique des processus et d'une théorie de la construction de niche basée sur des artefacts cognitifs ont énormément bénéficié des discussions avec Kalevi Kull, et des lectures de ses articles.

***Mots-clés:*** processus, artefacts, créativité, habitude

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**Процессы, артефакты и семиозис**

***Аннотация:***

Недавним разработкам в области семиотики процессов и теории создания ниши, основанной на когнитивных артефактах, в значительной степени способствовали дискуссии с Калевом Куллем и чтение его статей.

***Ключевые слова:*** процесс, артефакты, творчество, привычка

# Selfless multiplicity

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***Abstract:***

It is commonly assumed that umwelts are inaccessible and thus unamenable to scientific study. However, it is also commonly assumed that there is nevertheless a singular, unitary umwelt there to begin with. The latter assumption is brought into question.

***Keywords:*** umwelt, biosemiotics, subjectivity, multiplicity, swarms

Probably the most frequently asked question from anyone who explains that they are interested in *umwelts*, the subjective worlds of animals, is the question of access to said subjective worlds. Indeed, this is presented by Kalevi Kull and colleagues as one of the fundamental questions of biology seen as biosemiotics: “How does the world in which any individual organism finds itself appear to that organism?”, about which they go on to rightly note that this question “has been often perceived as inaccessible to scientific investigation and has therefore been left unresolved by reductionist biology”<sup>1</sup>. Indeed, what does it actually mean to do biosemiotics when *umwelts*, one of our main objects of study, seem inaccessible?

When faced with this question, I am often tempted – and often fail the temptation – of noting, in an admittedly facile manner, that no physicist has ever been an elementary particle, and no sociologist has ever been a society, yet this is not thought of being a hindrance to research. We find ourselves in a peculiar position of thinking that the distant stars, or social institutions, are in some sense clear and understandable, and thus amenable to straightforward research, whereas nonhuman animals, many of whom are very similar to us, are as if so distant and alien to us that the question of how the world appears to them seems to be unanswerable.

But the issue goes further than that. For it is easy to assume that while the subjectivity of a nonhuman animal is impossible to access directly, it is just as easy to assume that there is a *singular* subjectivity there to be accessed in the first place. Why should that be? Take, for example, the animals in which the various behavioural patterns do not form a unity, of which there are untold numbers, from marine worms, sea urchins, to starfishes, and so on. As Uexküll famously says, “when a dog runs, the animal moves its legs; when a sea urchin runs, the legs move the animal”<sup>2</sup>. There is no cohesive singularity, subjective unity in such cases. The semiotic self, too, comprises many *reflex persons*, as Uexküll describes in cases where a single organism has many mutually independent reflex arcs, and even a *reflex republic* where “despite the utter independence of each reflex person, absolute domestic peace reigns”<sup>3</sup>. A given semiotic subject does not need any cohesive unity to function successfully.

This is a perennial philosophical theme, and also a theme for biosemiotics: the unity of consciousness, or subjectivity – the semiotic self. What is the “self”, for example when it is fractured, such as in cases of sleep, coma, anaesthesia? What then constitutes its continuation, the “you”? But rather than rushing to philosophical speculation about the return to a conscious self, imagine instead colonial organisms, such as the Portuguese man o’ war (*Physalia physalis*, also known as the “floating terror”), made up of many distinct, specialised parts, which are physiologically integrated but nevertheless genetically distinct. They are an assem-

<sup>1</sup> Kull, Emmeche, Favareau 2008: 43.

<sup>2</sup> Von Uexküll 1934 [1992: 343].

<sup>3</sup> *Ibid.*: 345.

blage, united yet separate. Would a thought about the unity of consciousness even occur to colonial organisms, to philosophical man o' wars?

All this is not a matter of the conscious and unconscious, of the thoughtful or automatic, or of reflexes and learning. It is about selfless multiplicity. Whatever the cognitive mechanisms which create, in us, the feeling of the singular first-person conscious awareness, they are just another semiotic phenomenon, running parallel to all the others. As Kull writes, "A living system is a multi-level self-organizing anarchic (chaotic) hierarchy of communicative systems or swarms"<sup>4</sup>; "no centre is required for phenomena to occur, or for decision-making"<sup>5</sup>. Semiotic subjectivity, into which we try to gain insight by trying to grasp the living world's myriad umwelts, is not singular. Every living creature is a perpetually changing multiplicity, and thus it is right to say, as Nietzsche does, that "the world has once again become infinite to us: insofar as we cannot reject the possibility that it includes infinite interpretations"<sup>6</sup>. And in the many years that I have known Kalevi, this has been my experience of him as well: as if his thinking is itself a colonial organism full of conceptual personae, an infinity of interpretations, all together in a peaceful thought republic, with every day a new theme, a new concept, a new insight. In Deleuze's words, "The philosopher is the concept's friend; he is potentiality of the concept"<sup>7</sup>. And much like the legs move the sea urchin, so does semiotics move Kalevi.

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<sup>4</sup> Kull 1998: 307.

<sup>5</sup> Kull 2015: 619.

<sup>6</sup> Nietzsche 1882 [2001: 239].

<sup>7</sup> Deleuze, Guattari 1994: 5.



**Silver Rattasepp**  
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### **Une multiplicité privée de soi**

**Résumé:**

Il est communément admis que les *umwelt* sont inaccessibles et donc impossibles à étudier de manière scientifique. Cependant, il est également communément admis qu'il existe néanmoins à l'origine un *umwelt* singulier et unitaire. Cette dernière hypothèse est remise en question.

**Mots-clés:** *umwelt*, biosémiotique, subjectivité, multiplicité, essais

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### **Множественность, лишенная «я»**

**Аннотация:**

Обычно считается, что *умwelt*ы недоступны, что они – тем самым – не поддаются научному изучению. Однако также принято считать, что изначально все-таки существует некий особенный, единый *умwelt*. Последнее предположение мы ставим под сомнение.

**Ключевые слова:** *умwelt*, биосемиотика, субъективность, множественность, рои

# Signifying beyond logic

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***Abstract:***

Semiotics builds on notions of logic and communication to develop theories of general signification. Yet, semiotics deals with learning, creativity and unexpectedness. Kalevi Kull's work takes a bold step in humbly redefining just what is possible for signs to do.

***Keywords:*** emon, creativity, logic, learning, subjectivity

Traditional views of biosemiotics, if they can be described that way, strongly rely on a logical picture of semiosis. These are perfectly serviceable for describing the flow of information and reaction cycles that may originate in the perceptual description of the life cycle of organisms as agents. Yet, this picture does not seem to fully encapsulate the point of a semiotic description of an organism's world. The perceptual picture of biosemiotics, when relying on the received classification of sign types, sharpens our view of what happens when organisms of any kind are faced with elements in their world by constructing a logical picture of possible value relations between the organism, its present and its future. There are, however, ways in which such a picture leaves us unsatisfied: We hardly see the subjective or personal level in the subpersonal description of semiotic events.

Semiotics has inherited the problems of subjectivity that stem from the way we understand how meaning arises. That is, one of the central hurdles of building a semiotic understanding of life lies in the inevitable separation between the physical and non-physical properties of living beings, and more centrally, on how meaning is causally effective in light of its apparent lack of necessity for physical forms. The drier language of semiotic logic contains some relevant steps towards untying this knot, but there is a sense of incompleteness in how this language allows us to describe the spontaneity of semiosis without actually *showing* it.

Learning and sensing or feeling are without a doubt part of the bio-semiotic landscape. However, making these central features is in no small part due to Kalevi's contribution to the field. The radical idea of proposing a sign type that does not fully emerge from the received view while still being logical in its own right comes in a humble (yet knowingly audacious) form: The emon is an unorthodox, yet more than reasonable requirement for a semiotic description of meaning.

If "semiosis as interpretation differs from deterministic (or even algorithmic processes) by the potential for innovation"<sup>1</sup>, the emon comes to solve the problem of how that innovation is naturally given. Emons denote aesthetic, emotional, imitative conditions in organisms, specifying how abductive processes do not require a deductive unfolding to be effective. Moreover, as a consequence to the idea that semiosis stems from logical incompatibility<sup>2</sup>, the issue at stake is how meaning can be understood from semiotic premises when these obtain in logical order.

At a first level, the proposal can be met with some confusion, as the logic of the sign seems robust enough not to admit different types of signs among its ranks. The emon may, one may discreetly assume, show up as an adjectival variation of the other signs. Yet, the implications are much too profound to dismiss. When taken to its extreme, emons may provide the semiotic glue to the perceptual chain of signs. Abduction may provide a

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<sup>1</sup> Kull 2019: 96.

<sup>2</sup> Kull 2015.

description of unexpected change, but it does not entail learning. For semiotic scaffolding to be effective, emons provide a point of departure from just describing the scaffold itself. Instead, if Kalevi is right – and we may do well to listen – the emon, by being a sort of in-between kind of sign, provides a narrowing of semiosis into constrained variables that result in the retention of past features towards further signs.

It is somehow poetic that it would be Kalevi himself who would propose such an option for biosemiotics. A kind of sign that builds on learning and empathy, two characteristics that go so well with the mention of his own name. Many of us have in fact entered through the door of biosemiotics by learning from Kalevi. Many of us owe it to his empathy that we are able to converse, sometimes even passionately, about how signs may do this or that, his patience to openly entertain ideas that others would find outlandish, always bringing a new, improved sense for what the original idea wanted to do.

In his own special way, Kalevi has embodied for many of us the very idea of biosemiotics. One can only wish that even a fraction of his inquisitive, thoughtful and kind way of acting as both a mentor and friend gets transferred to those of us still trying to understand the wealth of his ideas. Kalevi has laid a foundation for biosemiotic theory that takes it a step further into understanding choice and learning, unfettered by the past and wide open for the future. As we learn, so we build.

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### **Signifier au-delà de la logique**

***Résumé:***

La sémiotique s'appuie sur les notions de logique et de communication pour développer des théories du sens général. Pourtant, la sémiotique traite de l'apprentissage, de la créativité et de l'inattendu. Le travail de Kalevi Kull franchit une étape audacieuse en redéfinissant humblement ce que les signes peuvent faire.

***Mots-clés:*** émon, créativité, logique, apprentissage, subjectivité

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### **Значение за пределами логики**

***Аннотация:***

Семиотика опирается на понятия логики и коммуникации для разработки теорий общего значения. Вместе с тем, семиотика имеет дело с обучением, творчеством и неожиданностью. Работа Калеви Кулля – это смелый шаг вперед в скромном переопределении того, что могут делать знаки.

***Ключевые слова:*** эмон, творчество, логика, обучение, субъективность

# Physicality

John SCHUMANN  
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***Abstract:***

Kalevi Kull's insights on the notion of "nowness" shed important light on the issues of physicality and physicalism.

***Keywords:*** physicality, symbolic reference, non-exclusively physical concepts

For a number of years, I've been interested in notions of physicality. In biosemiotics, icons and indexes accrue meaning by reference to entities in the physical world, whereas symbolic reference is often made to concepts that are not exclusively physical because they lack mass, energy, and observability, but nevertheless have physical effects on the world. These are words such as mind, soul, emotion, motivation, and purpose, democracy etc.<sup>1</sup>

When we were invited to contribute to a Festschrift in honor of Kalevi Kull's 70th birthday, I pulled out an article by Kalevi, "Choosing and learning: Semiosis means choice"<sup>2</sup>. I began reading it for a second time, and what popped out were some very interesting observations related to physicality.

Kalevi discusses the "nowness" of semiosis and he goes on to say, "[...] semiotics is incompatible with the physicalist concept of time, and with physicalism altogether – 'there is no present or nowness in fundamental physical theories'<sup>3</sup>. Since the finite present is a fundamental and universal feature of subjectivity, it follows that free choice, semiosis, and subjectivity are coextensive. The present moment is the quantum of semiosis. Semiosis stops time – in the sense that the Now emerges in symbiosis. Semiosis is choice-making"<sup>4</sup>.

I downloaded a copy of the Franck and Atmanspacher article and found a number of interesting observations related to physicality. They distinguish between mental time and physical time. They note that mental time encompasses present, past, and future whereas physical time is tenseless, and therefore the fundamental laws of physics are Independent of the present/nowness. They argue that experimental physics lacks characteristics of subjective experience/phenomenal content/quale.

This led me to a Google discussion of substance physicality versus process physicality. This distinction relates to the physicality of concepts such as "democracy" which is a process and "food" which is a substance.

Physicalism has a strong grip on science, but it would appear that the physical human brain is capable of producing symbolic concepts that are not exclusively/fully physical. This indicates that there are varieties and degrees of physicality that may be overlooked in the strictly physicalist view of the world.

So, the takeaway for me is, if you are working on a problem/issue in biosemiotics and you want some inspiration, read something by Kalevi Kull.

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<sup>1</sup> Schumann 2021.

<sup>2</sup> Kull 2018.

<sup>3</sup> Franck, Atmanspacher 2009: 212.

<sup>4</sup> Kull 2018: 455.

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**Physicalité**

**Résumé:**

Les idées de Kalevi Kull sur la notion de «maintenant» [*«nowness»*] jettent un éclairage important sur les questions de physicalité et de physicalisme.

**Mots-clés:** physicalité, référence symbolique, concepts non exclusivement physiques

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**Физическость**

**Аннотация:**

Идеи Калеви Кулля о понятии «сейчасности» проливают важный свет на вопросы физическости и физикализма.

**Ключевые слова:** физическость, символическая референция, не исключительно физические понятия

# **A central topic in Russian semiotics: The third element between world and thought (A. Potebnja's inner form of the word)**

Patrick SÉRIOT  
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***Abstract:***

All the semiotic interpretations of the problem of the sign can be reduced to two solutions: a couple or a triad. The history of semiotics in Russia is a breathtaking example of this twofold approach.

***Keywords:*** philosophy of language, Russian semiotics, René Descartes, Charles Sanders Peirce, Aleksandr Potebnja

Long live the Tartu semioticians, with Kalevi Kull as their inspirator, for all they brought to the intellectual world. Here I propose a small contribution to the history of semiotics in Russia.

## 1. COUPLE OR TRIAD?

The philosophy of language has dealt with three entities since ancient Greece: thought, the world, and language, the latter for a long time being only regarded as the dressing of thought. Gradually, the thought / world couple was transformed into a triad, where a *third term* came to be inserted: language as such. This triad can take various forms: thought / language / world, or concept / word / thing. It takes a canonical form in Peirce<sup>1</sup>:

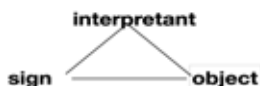


Figure 1

The dual conception has a long and blurred history due to the fact that duality sometimes concerns the language / thought relationship and sometimes the language / world, or word / thing, or form / content, from Saint Augustine (for whom the definition of the sign is *aliquid stat pro aliquo*: “somethings stands for something else”) to the theory of reflection in Lenin. It remains to identify, in the dual conception, what comes first: language or thought, which is the whole issue of the romantic reversal against Cartesianism. Descartes had posited the existence of extralinguistic thought and considered natural language as “one of the causes of our errors”, reproaching languages with having “confused meanings”. The universe being divided into “things” and “ideas”, language became a clutter, a useless and superfluous intermediary.

The sign/thing or sign/idea dual conception asserted that the content has an existence independent of the form. Thus, in the Port-Royal Logic, the sign is a redoubling, a substitute which “stands for” something else that pre-exists: “The sign contains two ideas, one of the thing which represents, the other of the thing represented, and its nature consists in exciting the second by means of the first”<sup>2</sup>.

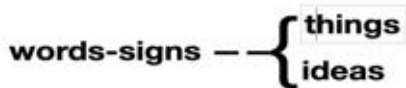


Figure 2

<sup>1</sup> See Peirce n.d.

<sup>2</sup> See Arnault, Nicole 1662, I, IV.

For Descartes *language is derived from the faculty of thought*: we are speaking beings only because we are thinking beings. The thinking subject conceives his objects directly, without resorting to words; language plays *no role* in the elaboration of thought; its only role is communicating an idea if it is formed clearly in the mind. Language is a tool that man uses: it is part of our panoply and not of our very being. This principle supposes a precise motivation to speak: we speak to communicate ideas, because we have something to say. Communication is a rational and utilitarian activity.

## 2. SOMETHING WAS MISSING

It is against this mechanistic dualism that little by little a third element slips in: the dimension of language as such, which blurs the reassuring but difficult to maintain order of both the theory of thought as a reflection of the world and of that of language as dressing, or serving thought. To the dual, instrumentalist conception of language as a sign, which implies that the object of the semiotic relation exists independently of its sign, Humboldt opposes a triadic conception: the *third element* that he introduces between words and things is language (in the sense of *langue*, not of *language*), and, more exactly, its internal form. Language, for him, is neither a *sign* of the world nor of thought. What was only a means becomes a necessary intermediary. J. Trabant<sup>3</sup> spoke of an “antisemiotic” in Humboldt.

Against “the idea that the different languages only designate the same mass of things and concepts existing independently of them with different words and juxtapose the latter according to other laws which, apart from their influence on understanding, have no other importance”, Humboldt exposes his fundamental position: “The real importance of the study of languages lies in the participation of language in the formation of representations”<sup>4</sup>.

The word “is in no way a member of the class of signs, because [in the sign] what is designated exists independently of its sign, whereas [in language] the concept finds its completion only in the word, and the two cannot be separated from each other”<sup>5</sup> “the sum of all words, language, is a world situated in the middle, between that which appears outside of us and that which acts within us”<sup>6</sup>.

This triad places language between thought and the “world”, constituting that *Zwischenwelt* [‘intermediate world’ (or ‘other world’?)] which forms the basis of the entire Humboldtian line in the philosophy of language. Languages are thus historical ways, each time different, of appropriating the world intellectually.

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<sup>3</sup> Trabant 1992: 67.

<sup>4</sup> Von Humboldt 1967, VI: 119.

<sup>5</sup> *Ibid.*: 428.

<sup>6</sup> *Ibid.*, III: 167.

Note that *thought* has changed sides: it no longer precedes the sign that denotes it, as in reasoned grammars of the 18th century, since it is now “indissolubly linked” to the word:

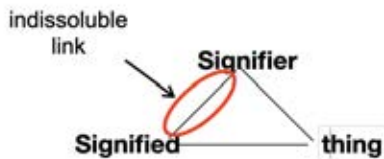


Figure 3

### 3. HUMBOLDT'S SEMIOTICS IN RUSSIA

The introducer of Humboldt's philosophy of language in Russia was the great Russian-Ukrainian thinker A. Potebnja (1835-1891).

What is thinking for Potebnja? In the Port-Royal Grammar men conceive (by the name) in order to then be able to judge (by the proposition) and reason (by the discourse). In Potebnja's *Thought and Language*<sup>7</sup>, on the contrary, they neither judge nor reason properly speaking, they do not hold a discourse, they only represent things, animated beings or events to themselves by taking them by a small end: the feature selected by the lexicon of their language, based on a process of apperception, a mediator between what is already known and what *is* to be known, the participation of the “mass of representations” already there in the configuration of new thoughts. But Potebnja makes no distinction between form of thought and content of thought. Thought seems to be reduced to a lexicon tinged with metaphors. The problem of the truth of a proposition is not addressed.

In Potebnja, in fact, the third element is a double object: a representation (psychological term, the way in which one mentally represents an object), but at the same time a lexical unit (linguistic term), a double nature where the two entities merge into one.

Studying the history of Russian semiotics is a way of bringing to light some poorly known specificities of Russian thought through its tight links with German romanticism. Thanks to the Tartu semioticians for their work on the edge of East and West!

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<sup>7</sup> Потебня 1862.

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**Un thème central de la sémiotique russe: le troisième élément entre le monde et la pensée (la *forme interne du mot* chez A. Potebnja)**

**Résumé:**

Toutes les interprétations sémiotiques du problème du signe peuvent être réduites à deux options: un couple ou une triade. L'histoire de la sémiotique en Russie est un exemple époustouflant de cette double approche.

**Mots-clés:** philosophie du langage, sémiotique russe, René Descartes, Charles Sanders Peirce, Aleksandr Potebnja

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**Центральная тема русской семиотики: третий элемент между миром и мыслью  
(внутренняя форма слова у Александра Потебни)**

**Аннотация:**

Все семиотические интерпретации проблемы знака можно свести к двум решениям: пара или триада. История семиотики в России – захватывающий пример такого двоякого подхода.

**Ключевые слова:** философия языка, русская семиотика, Рене Декарт, Чарльз Сандерс Пирс, Александр Потебня

# Relationality

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***Abstract:***

We are living in an age of Post-Cartesian heroics. In this little paper, we celebrate two of those heroes who are using quite different topics and approaches and sensibilities to get to the same place – the inevitability of relationality.

***Keywords:*** semiotics, relationality, Kalevi Kull, Leonard Cohen



One of the most persistent assumptions of the Cartesian worldview is that things exist as individual things, and these things can then be related to other things (or not). For the Semiotic worldview, a thing is not a thing unless and/or until it is related to something else. This is the principle of Relationality, and it holds that everything is fundamentally and irreducibly relational, no matter what else is. Just for fun, let's look at how two disparate (but brilliant in their own way) individuals (if there really is such a thing) approach this concept.

Kalevi Kull has directed our attention to relationality within semiotics and particularly within biosemiotics. Kull states: "A relation is anything that cannot by itself affect, neither be directly recognized by, anything except another relational system. This is exactly what is true for a meaning – meaning exists only for other meanings, or a sign only for other signs"<sup>1</sup>.

Along another spectrum, Leonard Cohen's music has been infused with investigations of relationality via the concept of covenant. Pally, writing about Leonard Cohen's struggle with the notion of covenant between the person and other persons, and the person and God, lays out the necessity of relationality:

Relationality means we are constituted by our relations, in contrast to the picture where we are individuals and somewhere down the line we opt to relate to other people. Rather than a Cartesian and post-Cartesian view of the individual who opts to relate, relationality holds that we get to be who we are through layers and networks of relations with other persons, with the transcendent, with our environment<sup>2</sup>.

Both Cohen and Kull are "singing" about the same thing – relationality is not some extra property that things utilize but is a necessary and irreducible condition of reality.

Descartes, of course, tried to free the individual from the requirement of being related to at least something, if not everything, else, as Pally<sup>3</sup> intimates in her comment earlier. The Cartesian worldview creates a picture of the individual choosing to be in relation, for instance, with some people and not others. It also instantiates the notion that, as we study natural phenomena, we need to pay attention first to what they are, and then to those things they are related to.

Kull and Cohen give us different paths to the same destination: Whatever a thing might be otherwise, it is, from atoms to atomic scientists, necessarily relational. Kull reminds us that no matter how humble a biological entity is, from viruses to Primates, we will always find that it does not and cannot exist in isolation. This upends the reductionistic and categorical biology forged from the Cartesian worldview to a biology that is constantly

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<sup>1</sup> Kull 2014: 93.

<sup>2</sup> Pally 2021: 38.

<sup>3</sup> *Ibid.*

shifting and evolving to spin ever more complex and comprehensive webs of relations.

As for Leonard Cohen, his relationality is grounded in the necessity and impossibility of relating so that relating is all that really matters. In the lyrics of perhaps his most famous song, Cohen stands, both triumphantly and brokenly, in the face of the revealed depth of relationality itself, and Pally challenges us to free ourselves by turning to face relationality head on:

You say I took the name in vain  
I don't even know the name  
But if I did, well really, what's it to you?  
There's a blaze of light in every word  
It doesn't matter which you heard  
The holy or the broken hallelujah<sup>4</sup>.

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<sup>4</sup> *Ibid.*: 82-83.

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### **Relationnalité**

***Résumé:***

Nous vivons à une époque d'héroïsme post-cartésien. Dans ce petit article, nous célébrons deux de ces héros qui utilisent des sujets, des approches et des sensibilités assez différents pour arriver à la même chose – à l'inévitabilité de la relationnalité.

***Mots-clés:*** sémiotique, relationnalité, Kalevi Kull, Leonard Cohen

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### **Относительность**

***Аннотация:***

Мы живем в эпоху посткартезианской героики. В этой небольшой статье я воздаю должное двух таким героям, использующим достаточно разные темы, подходы и чувства, чтобы прийти к одному и тому же – к неизбежности относительности.

***Ключевые слова:*** семиотика, относительность, Калеви Куллер, Леонард Коэн

# Is life beautiful?

Alexei A. SHAROV

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***Abstract:***

Bio-aesthetics theory is one of the major contributions of Kalevi Kull to biosemiotics, where beauty is interpreted as perfect fittedness. This theory needs further to focus on objective components of beauty and on how organisms learn to recognize beauty and couple it with their emotional life.

***Keywords:*** objective beauty, learning, emotions

Among contributions of Kalevi Kull to biosemiotics, the most original and intriguing is his theory of bio-aesthetics presented in the Target Article this year, where he defined beauty as “perfect semiotic fitting”. Here I present some thoughts inspired by Kull’s paper.

According to Kull, learning tends to increase semiotic fitting of organisms, change them towards perfection, and higher levels of perfection represent beauty. In particular, “Compatibility in many aspects and from many perspectives, i.e. the multiplicity of meanings (or maybe polysemy), seems to be an important feature of beauty”<sup>1</sup>. Kull argues that beauty is species-specific (i.e., relative), and it is not limited to organisms with emotions. The notion of species-specificity of beauty is however debatable because flowers evolved to attract insects but unexpectedly they also appear attractive to humans, and thus David Deutsch defended the notion of objective beauty because “aspects of beauty exist outside cultural fads or sexual selection”<sup>2</sup>. This does not mean that Kull is wrong because he wrote in the context of the umwelt theory of Jakob von Uexküll, where “species-specific” means both objective and subjective (it can be also called “inter-subjective”): species-specific habits are objective and reproducible within the species, but they are subjective in relation to the whole Animal kingdom. Perhaps, it is better to say that some aspects of beauty are species-specific, and others are more widely perceived.

The paper of Kull is focused on the process of semiotic fitting in organisms that generate beauty, whereas observers of beauty are not discussed. Both issues of species-specificity and involvement of emotions should be considered separately in relation to a generator and observer of beauty, even in the case of self-observation or perception of organisms of the same species. In particular, emotions are not required for generators of beauty (e.g., flowers), but they seem necessary for observers of beauty (e.g., cognitive animals). Mechanical perception (e.g., a knee reflex) should not qualify as feeling beauty. Emotions are generally defined as intensive mental experiences with high hedonic content<sup>3</sup>; they are observed in many vertebrate animals and some invertebrates (e.g., insects or mollusks). However, non-emotional organisms can take advantage of emotions and beauty feeling in other species around them.

Kull<sup>4</sup> noted that *learning* is a necessary component of aesthetic value in generators of beauty. Semiotic fitting is established via making informed choices between multiple options, which needs to be learned and remembered before taking action. At higher levels of perfection (beauty), choices become interdependent and some of them appear incompatible. Then, semiotic fitting is achieved via negotiation between multiple needs and finding a context-dependent best strategy of action. Kull defined learn-

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<sup>1</sup> Kull 2022.

<sup>2</sup> Deutsch 2015.

<sup>3</sup> Cabanac 2002.

<sup>4</sup> Kull 2022.

ing in an unusually broad sense as “acquiring and rearranging sign relations”<sup>5</sup>. Even heritable variation with natural selection would fit this definition. A more traditional approach is to define learning as a process where new memory content is acquired as a result of individual experience. Such a “strong” version of learning is not necessary for generators of beauty, but it seems necessary for observers of beauty. Observers would not be able to perceive semiotic fitting in other organisms if they don’t learn in the “strong” sense. Also, learning is needed to develop and improve emotions.

Now let’s return to the question in the title: is life really beautiful? Kull’s paper<sup>6</sup> answers positively to this question, however the observer should be competent enough to perceive manifold aspects of semiotic fitting and understand the ways conflicts and incompatibilities are resolved. Perhaps our competence is still not sufficient and the full beauty of life will become clear only to the future generations.

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<sup>5</sup> *Ibid.*: 2.

<sup>6</sup> Kull 2022.

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### **La vie est-elle belle?**

**Résumé:**

La théorie de la bio-esthétique est l'une des contributions majeures de Kalevi Kull à la biosémiotique, où la beauté est interprétée comme une adéquation / adaptation [*fittedness*] parfaite. Cette théorie doit davantage se concentrer sur les composantes objectives de la beauté et sur la façon dont les organismes apprennent à reconnaître la beauté et à la coupler avec leur vie émotionnelle.

**Mots-clés:** beauté objective, apprentissage, émotions

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### **Жизнь прекрасна?**

**Аннотация:**

Теория биоэстетики – важный вклад Калевы Кулля в биосемиотику; красота интерпретируется им как идеальная приспособленность [*fittedness*]. Эта теория должна в дальнейшем сосредоточиться на объективных компонентах красоты и на том, как организмы учатся распознавать красоту и сочетать ее со своей эмоциональной жизнью.

**Ключевые слова:** объективная красота, обучение, эмоции

# **Biosemiotics as ironic sophology: The study of wisdom from its origins**

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***Abstract:***

Years ago, Kalevi Kull urged me to mention biosemiotics in my writing for a general public. Here's an example in the spirit of K. Kull's project to identify functional biological behavior as aesthetic. This suggests that functional interpretation is proto-wisdom, a perspective developed through my biosemiotic work with Terrence Deacon.

***Keywords:*** interpretation, wisdom, serenity prayer, biosemiotics, irony, fallibilism



Psychology is the study of “psyches” or minds. Biology is the study of life. “-ology” means ‘the study of’.

And then there’s philosophy, “philo-” meaning ‘love of’, and “-sophy” meaning ‘wisdom’. Philosophers, therefore, are ‘lovers of wisdom’, which is a fairly shady thing to declare about oneself.

“Wisdom” sounds virtuous. Any doofus can claim to love a virtue without giving a thought to what it is. Without clarity about how to distinguish the wise from the unwise, “love of wisdom” becomes a free-for-all, everyone claiming to have and love wisdom without ever wondering what wisdom is.

Sophology would be the study of wisdom, research aimed at figuring out what wisdom is. I’m a sophologist. I can’t claim to be a philosopher – a lover of wisdom. I have to admit that I’m ambivalent about wisdom. I’ve been known to ignore wisdom when it’s disappointing or forces me to compromise my appetites. My ironic mantra is “No matter how hard I pursue wisdom it will never catch me”.

Still, I study wisdom from the ground up in biology. I’m a biosemiotician. Semiotics is the study of interpretation, grounded in the recognition that interpretation isn’t just a human thing. All organisms have habits of wise interpretation. They’re called adaptations. Wisdom emerges with life, beings doing work that works to keep them working in their work settings. Even microbes engage in wise effort, effort that works to keep them working, effort that’s good for their struggle for existence.

Interpretation isn’t just observing or registering facts. We aren’t passive couch potatoes. Wise interpretation is responding differently to differences in our environment – our work setting.

Interpretation is not synonymous with cause and effect though we often confuse the two, for example talking about how the writing on the wall “caused” us to change our minds.

A stop sign doesn’t cause you to stop unless you crash into it. Rather you interpret it by acting differently as you roll up to one. Stopping at stop signs is a wise work habit. It works to keep you working given that not stopping at them could get you sideswiped and killed.

Biosemiotics studies the emergence, evolution and nature of wise interpretation. Only living beings interpret, though we can also program our interpretations into our machines, for example programming a self-driving car to stop at stop signs.

Without the capacity to think or feel, even plants have wise innate interpretive work habits. Humans have these too, for example shivering in response to a drop in temperature, a wise move if we want to keep working as our work setting drops to dangerously low temperatures.

Like all animals, we humans can learn new wise interpretive work habits. We also have language which enables us to think, imagine, wonder and learn in ways no other organism can.

Is wisdom just having wise habits? That’s what the serenity prayer suggests: “Grant me the serenity to accept the things I can’t change, the

courage to change the things I can, and the **wisdom to know** the difference”.

By the serenity prayer’s standard, wisdom is simply knowing what to do differently in response to unchangeable vs. changeable circumstances. All organisms have to accommodate what they can’t improve, and try to improve what they can. Take beavers: They wisely grow fur to insulate themselves from the cold which they cannot change, but they also change trees to build dams.

Though the serenity prayer has broad biological application, the “wisdom to know” seems a simplifying overstep when applied to organisms that learn. For learners, I would suggest that wisdom is wanting to know. Wisdom is the prayer or quest to get ever better at noticing the differences that make a difference to what work works to keep us working in our work environments.

Very few things in life are labeled plainly as unchangeable or changeable. We must guess what’s changeable based on often ambiguous cues. We can guess wrong in two ways: Having the courage to change the unchangeable, or the serenity to accept what could be beneficially changed.

Human wisdom is thus an ongoing quest to minimize two opposite kinds of errors. Minimize, not eliminate – even for the wisest among us, there will be ironic situations in which we try to improve what we can’t or give up on improving what we could.

That’s why, in addition to being a sophologist and a biosemiotician, I’m an ironic fallibilist. Stopping or not stopping at a stop sign could get you killed. I think it’s wise to have a tragicomic attitude toward life’s ineluctable ironic situations.

Life is dire but it’s also slapstick. It’s ironic to be rear-ended at a stop sign, doing the right thing and it turning out wrong. The wise try to minimize misinterpretations. They take the challenge seriously, and they can also laugh at their failures.

As an ironic sophologist biosemiotician, my equanimity comes of being equally anxious about opposite errors, for example having too much or too little courage for a given situation. I think of it as like driving some winding, uncertain ridge road, attentive to steep shoulders on opposite sides. As an ironic fallibilist, my mantra is “no matter how confident I am in a bet, I must remain still more confident that it is a bet”. Living this tension between self-confidence and self-doubt feels like living the ineluctable yet undecidable liar’s paradox “I am lying”.

© Jeremy Sherman

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**La biosémiotique comme sophologie ironique:  
l'étude de la sagesse depuis ses origines**

***Résumé:***

Il y a des années, Kalevi Kull m'a exhorté à mentionner la biosémiotique dans mes écrits destinés au grand public. Voici un exemple dans l'esprit du projet de K. Kull pour identifier comme esthétique le comportement biologique fonctionnel. Cela suggère que l'interprétation fonctionnelle est proto-sagesse, une perspective développée à travers mon travail biosémiotique avec Terrence Deacon.

***Mots-clés:*** interprétation, sagesse, prière de sérénité, biosémiotique, ironie, faillibilisme

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**Биосемиотика как ироническая софология:  
изучение мудрости начиная с ее истоков**

***Аннотация:***

Много лет назад Калеви Куль предложил мне упомянуть биосемиотику в моих работах, предназначенных для широкого круга читателей. Вот пример в духе проекта К. Куля по определению функционального биологического поведения как эстетического. Это приводит к мысли о том, что функциональная интерпретация представляет собой «протомудрость»; эта точка зрения была разработана в ходе моих биосемиотических исследований, проводившихся вместе с Терренсом Диконом.

***Ключевые слова:*** интерпретация, мудрость, молитва о спокойствии, биосемиотика, ирония, фаллибилизм

# **Literary scholars taking up theoretical biology**

Ene-Reet SOOVIK, Kadri TÜÜR  
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***Abstract:***

This contribution offers a comparative study of *Spring* (1912), the classic work of Estonian literature by Oskar Luts and Kalevi Kull's transdisciplinary engagement with semiotics-influenced strands of environmental humanities.

***Keywords:*** Estonian literature, ecocriticism, theoretical biology, ecosemiotics

“When Arno reached the schoolhouse with his father, the day’s lessons had already begun”. This is the opening sentence of *Spring* (1912), an Estonian literary classic by the author Oskar Luts that is familiar to everybody who has grown up in Estonian culture. The story spans an academic year at a school in a provincial parish – students’ coming together, communication, self-inspection, love, friendship, hostility and practical jokes, until they part company in spring. A central character in the book is Schoolmaster Laur – a kindly man who guides his pupils towards knowledge, but also facilitates their growth as human beings. There is no denying that Kalevi has recognisable similarities with this chrestomathic literary figure.

When we reached the annual Spring Schools in Theoretical Biology in the late 1990s, Kalevi’s lessons had been going on for nearly a quarter of a century. We came from a humanities background, but were interested in nature, had recently become acquainted with the theory of ecocriticism and were organising a series of seminars called *Text and Nature*. We very much felt that literary critics studying nature writing would be best off with some elementary (but even better if thorough) knowledge of biology, of the workings of nature, and thus joining the Spring Schools seemed a logical step to take – and was met with Kalevi’s staunch support.

Naturally, he may have had a little plan of his own – to introduce perspectives from the humanities into life sciences, even though initially the former may have consisted in mere tentative questions voiced from the margins. Still, the contacts forged at the meetings did contribute to an increased transdisciplinary comprehensibility of the discussions on the theory of biology and would later lead to launching and developing of research projects in bio- and ecosemiotics that involve people from various disciplinary backgrounds.

A retrospective glance confirms that quite a few contacts and collaborative relations have been born out of these events. These may not always have been based on complete and absolute mutual understanding, a full translatability that, according to Juri Lotman, would mean the end of semiosis<sup>1</sup>, but at least many representatives of Tartu humanities and natural sciences do not shy away from making enquiries if they do not understand each other, which may well lead on to constructive debates and discussions. These need not always result in a seamless agreement or a publication of high scholarly value, but the ongoing communication is certainly conducive of the participants’ growing as people and as scholars attuned to one another’s points of view. And Kalevi, the Teacher Laur figure in this process, has had a major role in achieving this.

Kalevi’s contribution to advancing the knowledge of nature among theoretical biologists as well as humanities scholars, including semioticians, has been significant if not downright invaluable. Ever since the Spring Schools started, they have involved early-morning “eye-opening walks” that aim to take note of the natural diversity of the event’s location

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<sup>1</sup> Lotman 1999: 22.

in the particular year, ranging from lichens and insects to plants, birds and seminatural communities. Spending an hour determining various grasses soaked in dew and listening to the dawn chorus while trying to identify the bird species by their song makes a difference to the day that follows. It also helps us not to forget that no spinning of nice theories and neat models can explain the world as a whole: nature is bigger and more various than any of us can fathom. Kalevi has initiated the same tradition at the Summer Schools in Ecosemiotics he has brought to life with the help of like-minded students and colleagues. On one occasion the participating ecosemioticians attempted to produce texts of nature writing on the basis of what they had experienced during the eye-opening walk. It was by no means easy, and it was Teacher Laur, that is to say Kalevi, who could best rise to the challenge. No wonder, though – he has been practising<sup>2</sup>.

And last, but not least, we should mention the heights into which ecosemiotics has soared, and the promise it holds for our engagement with the surrounding world. “What lies at the core of ecosemiotics is how people, via their imagination, actually shape the world”, Kalevi tells us in his afterword<sup>3</sup> to Timo Maran’s book-length discussion of the subject. Kalevi’s imaginative power, his enthusiasm, his apparently inexhaustible energy have certainly helped shape the world into a friendlier, more diverse as well as more exciting place.

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<sup>2</sup> Kalevi has published an essay on the plant cover on a beach in Northern Estonia, as it appears to a vacationer, in 1980s, the exact reference of which we failed to find.

<sup>3</sup> Kull 2022: 142.

**Ene-Reet Soovik, Kadri Tüür**

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### **Quand des spécialistes de la littérature font de la biologie théorique**

**Résumé:**

Cette contribution propose une étude comparative de *Printemps* (1912), l'œuvre classique de la littérature estonienne d'Oskar Luts, et de l'engagement transdisciplinaire de Kalevi Kull dans des courants des humanités environnementales influencés par la sémiotique.

**Mots-clés:** littérature estonienne, écocritique, biologie théorique, écosémiotique

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### **Литературоведы, занимающиеся теоретической биологией**

**Аннотация:**

В этой работе предлагается сравнительное исследование *Весны* (1912), созданного Оскаром Лутсом классического произведения эстонской литературы, и междисциплинарной вовлеченности Калеви Кулля в направления экологических гуманитарных наук, подвергшиеся влиянию семиотики.

**Ключевые слова:** эстонская литература, экокритика, теоретическая биология, экосемиотика

# The semiotic window

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***Abstract:***

Sign exchanges take place in a brief spatio-temporal window – that proved to be a surprising meeting point for Kalevi Kull and myself.

***Keywords:*** sign exchange, specious present, co-localization, semiotics



When I first met Kalevi Kull somewhere in the late 1990's, I had the immediate flash experience of communicating with a kindred soul. Across all differences, I immediately realized we were on the same track, semiotically speaking, and I fancy he did the same. Having maintained contacts with Kalevi ever since, we have met with shifting intervals in Tartu, Copenhagen, and elsewhere, and only a few years ago, something surprising happened which gave further substance to this original feeling of immediacy.

Kalevi and I made a parallel move, without either of us knowing about the connection. Kalevi began taking interest in the actual process of sign exchange, across human and non-human species. He observed that sign exchange takes place in *the present now*, yea, that the temporal scope of such exchange may even provide a sort of definition of the extension of that present now. This does not mean it takes place in an instant, in an infinitesimal time slice, rather that it takes place in a small temporal window, possibly of a size specific to the characteristic capabilities and Umwelts of different species. This also does not mean that all things semiotically relevant takes place in that window; the establishment of structures, patterns, cognitive artifacts, general signs forming prerequisites to actual sign use may take place over far more extended periods, in the days, months, and years of ontogenetic development and learning, shading into the longer stretches of cultural evolution and further into the millennia or millions of years of phylogenetic evolution.

But the very exchange of information via actual physical sign tokens, realizing those deeper, more extended structures in actual communication, takes place typically in the matter of seconds. The temporal extension of animal cognition, of linguistic sentence structure, of film shots, of logical inferences, and much more, are located in a characteristically restricted time window. There are, to be sure, mechanisms for synthesizing such elementary sign exchanges into larger entities, by means of all sorts of anaphora and internal references, stable enunciation, thematic coherence, and much more, so the claim is not that all sign complexes or significant entities and phenomena are confined to the window. But all of them must pass through this window, so Kalevi's idea which I render here in my own brief paraphrase.

Chance had it that at the same time I myself was approaching a related issue, not from the temporal perspective, but from the spatial one. Digging into Peirce's mature theory of propositions, named Dicisigns, I noted how his generalization of the age-old *Term-Proposition-Argument* triad to one of *Rheme-Dicisign-Argument* made the category of Dicisigns include all signs able to state truths, not only linguistically articulated signs. Thus, a picture with a legend would be a multimodal Dicisign, possibly true or false. This raised, to Peirce, the issue of what would now connect the Subject and a Predicate of such multimodal propositions. It could no longer, obviously, be the task of linguistic syntax. Peirce observed how the Subject and Predicate of such signs must be somehow juxtaposed in order to fuse into one Dicisign – like the title of a painting must be present-

ed in some important sense *close* to that painting. That made me propose the technical term of “co-localization” for the elementary syntax of multi-modal propositions. The Subject, pointing out the objects referred to, and the Predicate, describing some aspect of those objects, must be presented in the same connected, topologically defined area – if the interpreter is assumed to be able to connect them.

At one of many great conferences in Tartu, Kalevi and I each presented our papers, maybe four or five years ago. I was stunned to discover the parallel. Kalevi insisted that sign use take place in a phenomenological temporal window; I insisted that sign use unite partial signs in a spatial window. I think both of us immediately realized this called for a synthesis. Temporal connexity and spatial connexity, moreover, in many cases may shade into each other.

Illness interfered, however, and Covid-19 restricted the movements and meetings of researchers. But one fine day, in a time window hopefully not too far into an uncertain future, I hope Kalevi and myself are going to fuse our insights into a comprehensive doctrine of the spatio-temporal window framing the syntax of sign exchange. If not, the idea is hereby passed on to some future semiotician.

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**La fenêtre sémiotique**

***Résumé:***

Les échanges de signes se déroulent dans une brève fenêtre spatio-temporelle – ce qui s'est avéré être un point de rencontre surprenant pour Kalevi Kull et moi-même.

***Mots-clés:*** échange de signes, présent illusoire, co-localisation, sémiotique

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**Семиотическое окно**

***Аннотация:***

Обмен знаками происходит в коротком пространственно-временном окне – что оказалось неожиданной точкой встречи для нас с Калеви Куллем.

***Ключевые слова:*** обмен знаками, иллюзорное настоящее, ко-локализация, семиотика

# **Semiotics at the age of the Anthropocene**

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***Abstract:***

The aim of this short article is to outline the importance of Kalevi Kull's work, especially in the field of ecosemiotics, for rethinking the current economy of knowledge at the age of the Anthropocene. His work can be used as a most useful guide to transcend the old-fashioned distinctions between nature and culture, human and non-humans, local and planetary.

***Keywords:*** Anthropocene, ecosemiotics, ecosphere, more-than-human semiotics, Kalevi Kull

My key argument in this short anniversary piece is that Kalevi Kull's main contribution to the semiotics can be considered as a conceptual preparation for our landing in the age of the Anthropocene. Among contemporary semioticians he has been one of the most prolific and influential to shape semiotics into a discipline that suits our age of major ecological transformations, or, to put it differently, to build something I would call "more-than-human semiotics".

The Anthropocene, popularised as a concept by Paul Crutzen and Eugene Stoermer<sup>1</sup>, was coined to apprehend the growing realisation that human impacts on essential planetary processes have become so profound that they have fundamentally altered the state of the Earth system and have driven our planet out of the Holocene epoch. While the Anthropocene has not yet been approved officially by relevant scientific bodies as a new geological time unit, the data assembled so far clearly shows "that the Anthropocene is geologically real and represents a substantial change in the Earth System from Holocene conditions"<sup>2</sup>.

This does not mean that the Anthropocene refers to something that has only recently been discovered, but rather that it denotes "a new way of organizing knowledge pertaining to the relationship between humans and nature"<sup>3</sup>. The notion that collective human action is altering the Earth has been debated since the early modern period and the idea of the "human epoch" is as old as geology<sup>4</sup>. But it is only during the last decade that we have witnessed the extent to which the idea of the Anthropocene is challenging the ontological and epistemological certainties upon which the human world-making project reposes.

The impact of the Anthropocene on human understanding is multiple and only partially graspable. In many respects, the Anthropocene has opened a new situation for humanity, "a new human condition"<sup>5</sup> or "a new way of being-in-the-world"<sup>6</sup>. Most fundamentally the dawning of the Anthropocene blurs and even scrambles some crucial categories by which we have made sense of the world and our lives. More specifically, "it puts in crisis the lines between culture and nature, fact and value, and between the human and the geological or meteorological"<sup>7</sup>.

I would argue that each discipline in the present economy of knowledge must reappraise its boundaries and assumptions in the Anthropocene's shadow. The Anthropocene compels us to work out a new notion of humanities that radically decentres humans and positions our actions in the multispecies entanglements and in the configuration of multiple times. In other words, the Anthropocene forces a radical shift in how we under-

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<sup>1</sup> Crutzen, Stoermer 2000.

<sup>2</sup> Zalasiewicz, Colin, Waters, Summerhayes (eds.), 2019: 285.

<sup>3</sup> Charbonnier 2017: 201.

<sup>4</sup> Lewis, Maslin 2018.

<sup>5</sup> Bonneuil, Fressoz 2016: 24.

<sup>6</sup> Horn, Bergthaller 2020: 31.

<sup>7</sup> Clark 2015: 9.

stand our relationship to the more-than-human world. Bruno Latour has succinctly captured the main lesson of the Anthropocene: “It gives another definition of time, it redescribes what it is to stand in space, and it reshuffles what it means to be entangled within animated agencies”<sup>8</sup>.

In the humanities, semiotics has probably been the best prepared for redefining our relationship with the more-than-human world<sup>9</sup>. Since the days of Jakob von Uexküll, semiotics has been interested in other-than-human semiotic processes, culminating in the establishment of ecosemiotics as an extension of semiotics to investigate the “human relationships to nature which have a semiotic (sign-mediated) basis”<sup>10</sup>. In the footsteps of Juri Lotman, Kalevi Kull<sup>11</sup> has coined the useful concept of “ecosphere”, arguing that the Lotmanian “semiosphere”<sup>12</sup> goes beyond humans and incorporates both the semiotic activities of other species as well as semiotic potentials of inanimate nature<sup>13</sup>. I can hardly see a better guide for living (and surviving) in the age of Anthropocene than Kalevi’s numerous articles, helping to transcend and to merge the old-age distinctions between nature and culture, human and non-humans, local and planetary, etc.

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<sup>8</sup> Latour 2017: 48.

<sup>9</sup> Cf. Whitehouse 2015; Clark 2017; Petitimberty 2017.

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### **La sémiotique à l'ère de l'Anthropocène**

***Résumé:***

L'objectif de ce court article est de souligner l'importance des travaux de Kalevi Kull, notamment dans le domaine de l'écosémiotique, pour repenser l'économie actuelle du savoir à l'ère de l'Anthropocène. Son travail peut être utilisé comme un guide très utile pour transcender les distinctions démodées entre nature et culture, humain et non-humain, local et planétaire.

***Mots-clés:*** Anthropocène, écosémiotique, écosphère, sémiotique plus-qu'humaine, Kalevi Kull

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Таллиннский университет

### **Семиотика в эпоху Антропоцена**

***Аннотация:***

Цель этой небольшой статьи – подчеркнуть важность работ Калеви Кулля (и особенно его работ в области экосемиотики) для переосмысления современной экономики знаний в эпоху Антропоцена. Его работы можно использовать как полезнейшее руководство для преодоления устаревших различий между природой и культурой, человеческим и не-человеческим, локальным и планетарным.

***Ключевые слова:*** Антропоцен, экосемиотика, экосфера, выходящая-за-пределы-человеческого семиотика, Калеви Кулля





# **My Kalevi Kull – a summary**

Toomas TIIVEL  
*Estonian Naturalists' Society*

***Abstract:***

Kalevi Kull is now for more than 50 years close to the University of Tartu. Theoretical biology and understanding of living systems are some of his key interests.

***Keywords:*** Kalevi Kull, University of Tartu, theoretical biology

I first met Kalevi Kull more than 50 years ago, when we were both school-boys with an interest in nature. We participated, in Tartu, in the national biology Olympics. He was attracted to plants – for me it was insects. He was from Tartu – I was from Tallinn. We had both communicated with many biologists, written review-papers, participated in field studies, read a lot of literature on natural sciences. We became even closer in 1970, when we both started biology studies at Tartu University. I recall attending lectures, sitting in the library, participating in the Tartu cultural life, but also, for example, the more unusual fact of us both studying Japanese in order to understand what a language of hieroglyphs might look like. In any case, the two of us were closer than most other fellow students – we were friends.

Among what I remember about Kalevi are his interest and skills in mathematics; his great knowledge of nature but also of philosophy. No doubt we also became close as the both of us wanted something more than that which the official study program provided; something more than just regular lectures and seminars for discussing life sciences. In any event, already at the start of the third semester, in 1972, together with a couple of course mates we launched a seminar for the discussion of relevant scientific problems, theoretically and philosophically. This led to the grouping “Theoretical Biology Group” (TBG) in which students from various disciplines as well as professors participated. We held review-lectures and invited professors to discuss various theoretical issues of biology. This helped to fuel our interest in the relevant literature and we examined the libraries in Tartu and Tallinn, went to Moscow and Leningrad, corresponded with some of the leading biologists of the time all over the world. A key moment was no doubt the arrival of a parcel of books from Scotland, containing four volumes of material from theoretical biology symposia, called *Towards a Theoretical Biology*, edited by Conrad Hal Waddington. From then on, things really took off.

In 1974, Kalevi Kull, Tiit Paaver and I had the idea to create a theoretical biology multi-day spring school at my summerhouse in Rutja on the North coast. The school took place in May 1975 and became a pleasant annual tradition, being organised all over Estonia, with the 48th one having just taken place this year. The start of this tradition was somewhat wild and secretive, not secret, with certain rituals and traditions, a mixture of seriousness with a certain degree of playfulness. We were not registered in any way to start with, despite the style of the times, but things just happened.

The pair of words – “theoretical” and “biology” are probably those that best describe the activities that united Kalevi and myself over the coming years and decades. And it still does, even if our areas of activity have somewhat changed. He remained faithful to Tartu – I live in Tallinn. There is 186 km between us. Nevertheless, we have jointly edited a number of articles and books on theoretical biology and the history of biology; participated in the awarding of two self-created awards: “Estonian Renaissance award” and “Keeper of Estonian Culture of Biology award”; made many natural science texts available in Estonian; attended conferences together.

If I should try to briefly characterise Kalevi then such a description would have to include many elements that jointly form a very interesting and pleasant whole: The ability to think in a non-traditional manner, wide-ranging interests, and the desire to understand anything new, a systematic mind, the ability to formulate problems, to explain complicated matters, to see new and relevant connections, to value the local without losing site of the big picture. To this may be added his interest in culture and great sense of humour! He has an extraordinary ability to inspire and activate people, to give them good ideas while remaining in the background. When we meet, he tends to say, “So what shall we decide to do this time?” and whatever that is, it normally gets done.

I have heard the lectures and presentations of Kalevi for more than 50 years and it has never been boring! I do not think this is because of me.

Thank you for being as you are, Kalevi! Happy 70th!

© Toomas Tiivel

**Toomas Tiivel**

Société estonienne des naturalistes

**Mon Kalevi Kull – un résumé**

***Résumé:***

Kalevi Kull est depuis plus de 50 ans maintenant lié à l'Université de Tartu. La biologie théorique et la compréhension des systèmes vivants sont quelques-uns de ses principaux intérêts.

***Mots-clés:*** Kalevi Kull, Université de Tartu, biologie théorique

**Тоомас Тиивель**

Эстонское общество естествоиспытателей

**Мой Калеви Куль – аннотация**

***Аннотация:***

Вот уже более 50 лет как Калеви Куль связан с Тартуским университетом. Среди его основных интересов – теоретическая биология и понимание живых систем.

***Ключевые слова:*** Калеви Куль, Тартуский университет, теоретическая биология

# Kalevi Kull and historical integration

Peeter TOROP  
*University of Tartu*

***Abstract:***

The history of science can be a source of innovation in many different ways. One is the disciplinary-internal historical integration in the semiotics of culture as a professional attitude to reconstruct the tradition, and to connect itself to forgotten or repressed cultural-scientific achievements. Another is the external, transdisciplinary historical integration in biosemiotics as a broadening conceptual base via the active involvement of thinkers from different fields of knowledge. What these two innovations have in common, is the work of Kalevi Kull.

***Keywords:*** historical integration, Juri Lotman's semiotics of culture, Kalevi Kull's biosemiotics, innovative development

One mission of Juri Lotman, as one of the leaders of the Tartu-Moscow School, was the knowing and mediating of a forgotten heritage. Yet because of the situation of censorship at the time, many contacts between Lotman and that heritage were not visible. Thus, we can find intensive implicit dialogue between Lotman, on the one side, and Tynianov, other formalists, Bakhtin, Vygotzky, Eisenstein, on the other. And what is important for future semiotics is that the synthesis of Lotman, Tynianov, Bakhtin, Vygotzky, Eisenstein and others can be the basis for the formation of the next stage in the investigation into the semiotics of culture.

Similarly, one mission of Kalevi Kull, as one of the leaders of the contemporary Tartu School, is the knowing and mediating of all possible historical sources for supporting the identity of biosemiotics. In his conceptual article “Biosemiotics in the twentieth century: A view from biology”, he emphasized:

This article attempts to touch on some contexts and associations of the semiotic view in biology, by making a short review of the history of the trends and ideas of biosemiotics, or semiotic biology, in parallel with theoretical biology, over a one-century period, as viewed from the side of biology. The latter is an important restriction, since the picture may look considerably different from the viewpoint of, and within the context of, semiotics. It is important to emphasize this, since biosemiotics, although now accepted as a distinct branch in semiotics, has still not found its place in biology<sup>1</sup>.

Kalevi Kull integrated into biosemiotics names like Baer and Uexküll in the framework of Estonian theory. He believes also that there are many similarities in between some of the most general methodological problems in biology and in cultural research, and he supports the eventual integration between biosemiotics and cultural semiotics as “the application of cultural semiotic models for the study of biological systems”<sup>2</sup>. In another article, “Towards biosemiotics with Yuri Lotman”, he takes next step toward such an actual integration: “Lotman did not treat biosemiotics in any great detail, but he formulated several important questions and proposed some new concepts (semiosphere, sphere of behavior, relation between symmetry and asymmetry, dialogue and independence of individuals, the assumptions for the creation of new text, etc.), which are a good basis, and possibly a framework, for further analysis of biosemiotic problems”<sup>3</sup>.

Lotman’s mission of integration was based on the historical coherence in the development of the semiotics of culture as discipline. Kull’s mission of integration is based on the transdisciplinarity, conceptual-historical integration of historical sources for the future development and dialogical power of biosemiotics – which is why he is one of the undisputed leaders in this field.

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<sup>1</sup> Kull 1999a: 385.

<sup>2</sup> Kull 1999b: 117.

<sup>3</sup> *Ibid.*: 127.

I wish him continued good luck in this fine mission.

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**Peeter Torop**  
Université de Tartu

### **Kalevi Kull et l'intégration historique**

**Résumé:**

L'histoire de la science peut être une source d'innovation de nombreuses différentes manières. L'une de ces manières est l'intégration historique «disciplinairement interne» dans la sémiotique de la culture en tant qu'attitude professionnelle pour reconstruire la tradition et se connecter à des réalisations scientifiques et culturelles oubliées ou refoulées. Une autre est l'intégration historique externe et transdisciplinaire dans la biosémiotique en tant que base conceptuelle élargie à travers l'implication active de penseurs de différents domaines du savoir. Ce que ces deux innovations ont en commun, c'est l'œuvre de Kalevi Kull.

**Mots-clés:** intégration historique, sémiotique de la culture de Youri Lotman, biosémiotique de Kalevi Kull, développement innovant

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### **Калеви Куль и историческая интеграция**

**Аннотация:**

История науки может быть источником инноваций по-разному. Один из таких путей – историческая внутридисциплинарная интеграция в семиотику культуры как профессиональная установка на реконструкцию традиции, на присоединение к забытым или вытесненным культурно-научным достижениям. Другой – внешняя, трансдисциплинарная историческая интеграция в биосемиотику как расширяющуюся концептуальную базу посредством активного привлечения мыслителей из разных областей знаний. Работа Калеви Кулля объединяет две эти инновации.

**Ключевые слова:** историческая интеграция, семиотика культуры Юрия Лотмана, биосемиотика Калеви Кулля, инновационное развитие

# Translating mind to text (and back)

Morten TØNNESEN  
*University of Stavanger*

***Abstract:***

As a guide to the biosemiotic landscape, Kalevi Kull stimulates reading, thinking and writing skills. But how does mind translate into text? And how do texts translate into mind? For better or worse, K. Kull does not have a simple answer to the problem of translating mind to text (and back).

***Keywords:*** mind, reading, text, thinking, translation, writing

Kalevi was my first and most important guide to the biosemiotic landscape. We got in touch once I started planning a study visit to Tartu during my master degree work at University of Oslo, after having gotten on track of biosemiotics by reading the six pages about Uexküll's Umwelt theory in Peter Wessel Zapffe's 600-page main work *Om det tragiske* 'On the tragic'<sup>1</sup>. In January 2000, Kalevi welcomed me to the Jakob von Uexküll Centre. He had things organized so that I could stay at the Estonian Naturalists' Society in Wilhelm Struve 2, facing the university library. The Jakob von Uexküll Centre had been established in 1993, and contributed to "a decade of a new wave of academic contacts between eastern Europe (including Estonia) and western scientific communities"<sup>2</sup>.

During the study visit, Kalevi guided me from bookshelf to bookshelf at the Jakob von Uexküll Centre, Naturalists' Society, the university library, and Department of Zoology and Botany, pointing me to texts he considered important, in German and English. It dawned on me that this was a man capable of using the history of science as raw material for the development of a future science of biology. In the intellectual atmosphere of Tartu semiotics, which I was about to be socialized into, studying historical texts induced a sense of discovery and insight, but also had a vibe of pointing forward towards possible future paradigms.

In this way, what we could perhaps call *Kalevi's method* influenced me from the outset of our relationship. As I have later realized, however, the way that texts can influence minds is just the first step of this method. As important as it is to be a qualified *reader*, as a starting point for scholarly activities, scholars are also expected to be qualified *writers* of texts. But how does mind translate into text? This question is the counterpoint to a similar question that concerns the intellectual utilization of texts for the purpose of thinking: How do texts translate into mind?

We have now gone full circle in establishing the problem of this little text, namely that of translating mind to text (and back). To get something written is not the hardest part. But how can we assure that the words we use to express our thoughts stick to the paper, as it were? How do we successfully capture thoughts in words, in a way that does not all too easily let the thoughts escape, and start taking on new and unpredictable forms?

I am not sure Kalevi would accept my phrasing of the problem – in fact, I am quite sure he wouldn't. I once asked him how much he worked; he replied with a counter-question: "What do you mean by work? Am I working when I think about something while I tend my garden?" My impression is that Kalevi has always resisted the sort of conventional thinking that amounts to little more than repeating something read or said. His point of view seems to be that to really *think* about something, the raw material that texts and such can provide must be *digested* and not simply swallowed whole.

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<sup>1</sup> Zapffe 1941 [1996].

<sup>2</sup> Magnus *et al.* 2004: 375.

For better or worse, this implies that Kalevi does not have a simple answer to the problem of translating mind to text (and back). As with any scholar, it happens that Kalevi stays committed to something he has written. But most often he does not, because he tends to prefer to develop the thought further. If there is such a thing as Kullian semiotics, it is alive and ever changing – a *process* rather than a *product*. In considering his body of thought as unfinished in principle, Kalevi proceeds down the same path as other restless minds, Peirce and Husserl included.

Despite the principally fluid nature of his thinking (which, ironically, cannot be bottled), Kalevi has no doubt succeeded in establishing a school of thought in Tartu semiotics and beyond. For the last three decades or so, he has cultivated young generations of zoosemiotics, ecosemiotics and biosemiotics scholars<sup>3</sup>. It is not by chance that the school of thought he has inspired is dynamic and diverse, given the free spirit with which Kalevi has himself instructively approached basic scholarly activities such as reading, thinking and writing. More than two decades ago, Kalevi and his colleague Peeter Torop addressed *translation* as a more general issue than is commonly acknowledged<sup>4</sup>. They suggested to define translation as “transmission between Umwelten”, thus going beyond the more common definition of translation as “transmission between languages”<sup>5</sup>. If this is what translation amounts to, all animals translate, and humans translate a lot more than we usually think we do.

Acknowledging that transmission of signs from text to mind, and from mind to text, also involves translation, takes the concept of translation one step further. As Kalevi has noted elsewhere, translation generally occurs “within living systems only, from one person to another, or from one language to another”<sup>6</sup>. But translation arguably occurs also whenever one and the same person with an educational inclination struggles to transform his or her mindset and thoughts into words, or vice versa.

I think Kalevi is correct in stating that “a biosemiotician can turn into a translator — making professional translations from the sign systems of other species into the human languages”<sup>7</sup>. Intriguingly, in its professional versions translation is, as Kalevi has stated, “a method semiotics is using as scientific”, and “it is important to recognize that translation can be a valid method for acquiring scientific knowledge. And yet you find little about translation as a method in the textbooks of philosophy of science”<sup>8</sup>. This needs to be rectified. But as readers, writers, and thinkers, we are already translators, whether we are professional or amateurs in our pursuit of life and understanding.

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<sup>3</sup> See Maran *et al.* 2016 for a collection of output in form of texts.

<sup>4</sup> Kull, Torop 2000.

<sup>5</sup> *Ibid.*: 33.

<sup>6</sup> Magnus, Tønnessen 2010: 85.

<sup>7</sup> *Ibid.*: 89-90.

<sup>8</sup> *Ibid.*: 85.

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### **Traduire la pensée en texte (et inversement)**

***Résumé:***

En tant que guide du paysage biosémiotique, Kalevi Kull stimule les compétences de lecture, de réflexion et d'écriture. Mais comment les pensées sont-elles traduites en texte? Et comment les textes sont-ils traduits en pensées? Quoi qu'il en soit, K. Kull n'a pas de réponse simple au problème de la traduction de la pensée en texte (et inversement).

***Mots-clés:*** pensées, lecture, texte, réflexion, traduction, écriture

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### **Перевод мышления в текст (и обратно)**

***Аннотация:***

Сопровождая по биосемиотическому ландшафту, Калеви Куль стимулирует навыки чтения, мышления и письма. Но как мысли переводятся в текст? И как текст переводится в мысли? Как бы то ни было, у К. Куля нет простого ответа на проблему перевода мышления в текст (и обратно).

***Ключевые слова:*** мысли, чтение, текст, мышление, перевод, письмо



# **A set of signs as a basis for successful semiosis in animal interactions**

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*Tallinn Zoo*

***Abstract:***

Signs function in the perception of the beholder. As the ability to choose signs in the context of their interactivity is central to animal behavior, it is advisable to allow the counterpart to choose the most significant interpretation, offer them a set of multifarious signs, negative or positive, to make sure the chooser won't let you down.

***Keywords:*** semiosis, multifarity, Kalevi Kull, dragon



*Qui vult decipi, decipiat.*

One of my best-beloved writers E.T.A. Hoffmann in his satiric fairytale fantasy novel “Little Zaches called Cinnabar” describes a magic present that a benevolent but highly irresponsible fairy bestows on a little midget misfit in order to allow him to pursue a brilliant career. The trick makes everything wonderful thought, said or done by someone else in the recipient’s presence appear to have instead been thought, said or done by him. Field zoologist that I am, especially one involved with ethology and parasitology, my first thought upon reading this goes to animals, species whose appearance and behavior combine aposematic or attractive signs of many other species. My favorite example is *Extatosoma coronatum* – a stick insect whose sizeable body resembles a brown curled up leaf but at the same time a scorpion ready to defend itself and a praying mantis poised to strike. When the insect is clinging to a branch, it looks exactly like a dead piece of vegetation. When it’s in plain sight and senses the presence of a potential predator, it assumes an extremely expressive pose, offering its enemies, of which it has no shortage, a choice of who they would perceive as the most dangerous – a mantis preparing to strike or perhaps an alert scorpion.

Polygamous colonial icterids in Brazil take refuge in deep woods at night, leaving their large hanging nests unprotected. In the morning, the male bird is the first to return and proceeds to very accurately imitate the sounds of birds of prey of many different species. This trick is likely to scare off competitors and predators of many species (excluding snakes who are practically deaf). So much on the use of combined signs for the purposes of defense.

Predators also use multifarious sets of signs as lures or disguise: African wild dogs, who are among the most successful mammalian predators, communicate when hunting by using sounds that imitate a flock of small birds, adding an olfactory symphony of signs on their bodies by rolling in the dung of large herbivores, such as rhinos, elephants or even hippos (smelly indeed). Drongos in Africa, as great imitators, use the sounds made by various birds of prey, those of jackals and hyenas and specific warning sounds of meercats (suricates) in order to make the latter run and hide in their underground holes just when they have excavated something scrumptious (bugs, a lizard or scorpion) from the hard soil of the Kalahari. It is interesting that drongos use sounds marking several different signs of danger in rapid succession instead of only using the meercats’ own warning calls. This is likely a precaution meant to anticipate the latter, clever as they are, figuring out the ruse.

*Love thy fellow man but don't let him fool you*  
(K. Prutkov).

It is very tempting now to travel to the realm of mystical myxomorphic creatures and ponder the principles that conceptualize the most striking of them – dragons, both occidental and oriental. It is very difficult for me to believe that the human notion of dragon follows meeting a crocodile. The latter exists as a separate zoomorphic classifier both in the Far East and Egypt. It appears to me that in the pattern and essence of a dragon controversial animal signs are combined, such as the ability of flight (bird) and the body of a snake or lizard; the toes and claws of a tiger and a cow's ears and camel's lips (Bao Lun – the great Chinese dragon). The semiotic synergy found in the contrasting abilities and traits is likely to blame. On the other hand, myxomorphic mythical creatures make one ponder a potential pleiotropy of signs: a single sign (such as horns or wings) can probably emphasize and amplify the impression left by a myxomorphic phenomenon in very different ways.

Many years ago, somewhere between the monument to Juri Lotman and the University of Tartu Library, Kalevi Kull and I agreed, during a conversation, on a working definition for semiosis – interpretation / translation adapted for the manipulation of the attention of living things in accordance with the context of interactivity. In other words, the aim of the sign is in the eye of the beholder, which is why it is advisable to give the participant ample choice in interpretation of signs and their variations. Then you can be sure they will choose the one that is most impressionable and effective for them, both in the conditions of positive and negative manipulation.

It was Kalevi who saw in me, a field zoologist, a semiotician, and because my experience firmly states that Kalevi is rarely wrong, I believed him and I still do.

© Aleksei Turovski

**Aleksei Turovski**  
Zoo de Tallin

**Un ensemble de signes comme base pour une sémiose réussie  
dans les interactions animales**

***Résumé:***

Les signes fonctionnent dans la perception du spectateur. La capacité de choisir des signes dans le contexte de leur interactivité étant centrale dans le comportement animal, il convient de laisser l'autre partie choisir l'interprétation la plus significative, de proposer un ensemble de signes multiformes, négatifs ou positifs, pour s'assurer que celui qui choisit ne vous laisse pas tomber.

***Mots-clés:*** sémiose, multifarité, Kalevi Kull, dragon

**Алексей Туровский**  
Таллиннский зоопарк

**Набор знаков как основа успешного семиозиса  
во взаимодействиях между животными**

***Аннотация:***

Знаки функционируют в восприятии наблюдающего. Поскольку способность выбирать знаки в контексте их интерактивности занимает центральное место в поведении животных, целесообразно позволить другой стороне выбрать наиболее значимую интерпретацию, предложить набор многочисленных разнообразных знаков, отрицательных или положительных, чтобы убедиться, что выбирающий вас не подведет.

***Ключевые слова:*** семиозис, множественность и разнообразие, Калеви Куллер, дракон

# The importance of +

Jaan VALSINER  
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***Abstract:***

Kalevi Kull is an intellectual genius pretending to be an ordinary person. His theory of choice is fundamental both for biology and semiotics. Jubilees do not matter, he continues in full intellectual creativity.

***Keywords:*** humanity, semiotics, perseverance, choice, theory

We are all liars when we congratulate people on their birthdays. Like the famous Achilles who could not win in the race with the Tortoise, we are necessarily late in our best wishes for a birthday. This classic paradox applies to birthday celebrations. Once the day has arrived and our congratulations reach the jubilee, the latter is already beyond the magical number we use to create the grand occasion – even if by a few minutes or hours.

So – by the time Kalevi gets to read these words, he is already N+ years of age. The N does not matter here, but the + does. The active eagerness to continue one's intellectual search once the nominal milestone of N is past – in other terms, it is the + that really matters. And in his case it matters in a number of ways. He lives in the + zone, while various N-s just pass by.

The obvious first way is that Kalevi never stops in his intellectual inquiry and in his careful, cautious, and considerate molding the future of international semiotics – using both the historical place and its well established tradition of Juri Lotman on the one hand, and his biological theoretical interests on the other. But this is the social and organizational side of the +. It matters – but it is not the main part of the +.

Kalevi's major playground of the + is in the innovation of biological evolutionary thinking with the notion of semiosis. This starts from the central notion of *choice* – a concept that is relevant at all levels of biological to socio-political organization. It is a funny concept – it can be considered “free” – yet “free choice” without any contextual constraints is a biological and sociological impossibility. It can be considered “given” – but then – who is the agent that is supposed to provide that pre-given possibility? Gods are outlawed as functioning agents from biological sciences while folklores of the biological scientists can embrace their mystical functions very easily. Semiosis is possible in the biological domain making a seemingly solid functional agent – the interpretant – into a god-like busybody who rushes around helping the person to create ever new meanings. We are biologically destined to be cultural innovators of our otherwise *Umwelt*-dependent lives where we *create* – rather than *take* – choices. And – we do our best to eliminate choices as we move ahead! We create the world of uncertainties and then create tools – signs – to overcome them (Figure 1):

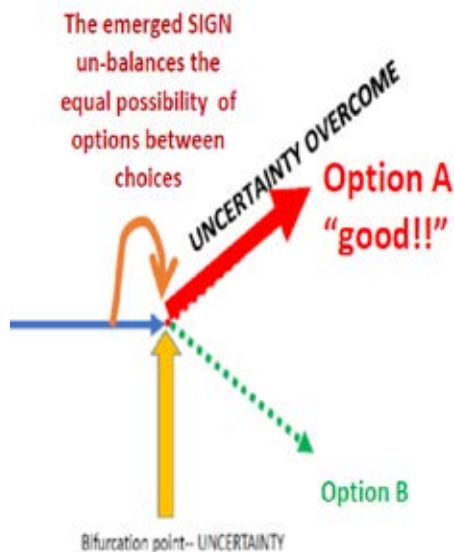


Figure 1: Creating and overcoming uncertainties

Yet there is a mystery in semiosis – one that even our highly revered almost-Estonian Baron von Uexküll might find hard to resolve – under which conditions is the choice-eliminating sign born? What conditions lead to its emergence? The role of the midwife in that birth process might be clear – the sign makes oneself play that role. Constructive agency is inevitable in the process of semiosis – and maybe here is the key to overcoming the myriads of applications of quasi-Darwinian evolutionary accounts to the miracles of human living. Kalevi's + until the next round N arrives can unravel that mystery.

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**L'importance de +**

***Résumé:***

Kalevi Kull est un génie intellectuel se faisant passer pour une personne ordinaire. Sa théorie du choix est fondamentale tant pour la biologie que pour la sémiotique. Peu importe les jubilé, il continue en pleine créativité intellectuelle.

***Mots-clés:*** humanité, sémiotique, persévérance, choix, théorie

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**Важность +’а**

***Аннотация:***

Калеви Кулль – интеллектуальный гений, притворяющийся обычным человеком. Его теория выбора является фундаментальной как для биологии, так и для семиотики. Юбилей не имеют значения, он продолжает свое интеллектуальное творчество в полной мере.

***Ключевые слова:*** человечество, семиотика, настойчивость, выбор, теория

# How subjective is subjective – subjectiveness of the objects of *Umwelt*?

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***Abstract:***

Kalevi Kull has for a long time promoted Uexküllian biosemiotics that has *Umwelt* in its central concept. *Umwelt* is understood typically as a subjectively accessible world of an organism and it is suggested that the sense of subjectiveness here should be limited to *subjective access* and *subjective contents* belong to *Innenwelts* that should be redefined and distinguished from *Umwelts*.

***Keywords:*** *Umwelt*, *Innenwelt*, functional circle, object, subjectiveness



I first met Kalevi Kull in June 1998 when attending my first biosemiotic meeting in Imatra, Finland. I cannot anymore recollect the topic of Kalevi's talk, but my own one was about combining the universal Darwinism of evolutionary epistemology to my then recent findings, biosemiotics. Kalevi was not very fascinated of my views and rightly so while being nevertheless very supportive as always. One restriction of the selectionist paradigm is its tendency to treat organisms or other units of selection mostly as the passive targets of external forces. In biosemiotics, instead, the treatment of organisms as the active agents of their life is emphasized. At these early times, I was not yet fully acknowledged the difference, but reading and meeting Kalevi, along with Jesper Hoffmeyer and Claus Emmeche, gave me the further push to abandon evolutionary epistemology and orient more fully towards biosemiotics.

To the developing biosemiotic community, Kalevi provided an "Estonian connection" as a representative of the Tartuan biological-semiotic lineage from Karl Ernst von Baer (1792-1876) and Jakob von Uexküll (1864-1944) to Juri Lotman (1922-1993). Of them, von Uexküll is clearly the most central to biosemiotics, and Kalevi has been the major if not the initiative force behind the Uexküllian clan of biosemiotics bred in Tartu University and spread all over the world.

Until recent years, my focus in biosemiotics was not so much on Uexküll but on Peirce's concept of sign, its limitations and possible non-representational substitutes. I have occasionally referred to the Uexküllian concept of *Umwelt*, but the way it was often employed in biosemiotics have appeared to me susceptibly vague or imprecise, although this has been a common vice in all stripes of biosemiotics. While Kalevi and the other Uexküllians have divided the concept of *Umwelt* into several different concepts (e.g. *Umwelt* as a species specific capacity, individual actual *Umwelts*, and even momentary *Umwelt*), my take has rather been to consider the structure and applicability of the concepts.

*Umwelt* is typically characterized as the *subjective* or phenomenal world of an animal, which distinguishes it from the *objectively* described or observed environment, *Umgebung*. As Kalevi puts it "*Umwelt* is the self-centred world of an organism – the world in which an organism lives, the one that it recognizes and makes"<sup>1</sup>. It is important to acknowledge that "Umwelt does not mean just a recognition of objects in the world, [...] it is just as much a *manufacturing* of the world. The objects are not only sensed and perceived, or represented and imagined; the objects are also *produced*"<sup>2</sup>.

The production of objects can be understood in two different ways that may sometimes be confused. In one sense the perception of an object means also its making of it by the perceiving subject. Perception can be seen as an *act* of identification and distinguishing the object. However,

<sup>1</sup> Kull 2010: 43.

<sup>2</sup> *Ibid.*: 46.

such an idea, familiar in representational and social constructionisms, does not really affect the world itself (except perhaps indirectly), but only the internalised *content* in the *Innenwelt* of the organism. The other sense in which some objects of *Umwelt* are seen as really produced by the organism, comes from the more precise definition of the concept of *Umwelt* in terms of *functional circle*. An *Umwelt* does not consist only of subjectively perceivable objects, but also of the *objects of action*, of both *Merkwelt* and *Wirkwelt*<sup>3</sup>. Within *Wirkwelt*, the real active construction of world steps into the picture. If *Umwelt* is characterised as a subjective world, in which sense are its objects subjective?

The perceptual objects are *per definitionem* phenomenal objects, but the action objects do not necessarily be such. When an action is aimed to the perceived object as in eating and mating, the perceptual and action objects coincide, but when a perception of an object launches an escape or a look for a shelter, the perceptual and action objects typically differ, and the organism does not have to have any knowledge or cognition on what it is doing. It is enough that the perception launches the action and that there is also a causal connection between perceptual and action objects so that the functional circle becomes closed. If the organism is not able to perceive its action objects, their identification cannot be made but objectively, from the observer's perspective.

In modern usage, Uexküll's early distinction between *Innenwelt* and *Umwelt*<sup>4</sup> is often abandoned and the idea of *Innenwelt* is fused into the *Umwelt*. I think it would be useful to rehabilitate the idea of *Innenwelt* so that it could be constituted by the internal halves of the functional circles. Then the *Umwelt* would be constituted by the external halves, and the distinction between the *Umwelt* and *Innenwelt* would correspond to the distinction between *subjective access* and *subjective content*. The objects of *Umwelts* would then be those objects of scientifically or objectively describable *Umgebung* that the organism has subjective *access* to. To which extent we can talk about the content of its *Innenwelt*, its subjective *content*, depends then on the precise way of its redefinition, on the complexity of the cognitive structure of the organism, and on the means we have in order to know these contents. Uexküll himself did not see many prospects for the last one: "[...] in investigating animals, we can never hope to attain a knowledge of their sensations. All we can determine by experiment is the number and the nature of the indications in the sensed world to which the animal reacts"<sup>5</sup>.

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<sup>3</sup> Uexküll 1934 [2010].

<sup>4</sup> Uexküll 1928.

<sup>5</sup> *Ibid.*: 69.

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**Dans quelle mesure le subjectif est-il subjectif –  
la subjectivité des objets de l'*Umwelt*?**

***Résumé:***

Kalevi Kull a longtemps promu la biosémiotique uexkülliennne dont le concept central est l'*Umwelt*. L'*Umwelt* est généralement compris comme le monde subjectivement accessible d'un organisme; il est supposé que le sens de la subjectivité devrait être ici limité à l'*accès subjectif* et que les *contenus subjectifs* appartiennent aux *Innenwelt* qui devraient être redéfinis et distingués des *Umwelt*.

***Mots-clés:*** *Umwelt*, *Innenwelt*, cercle fonctionnel, objet, subjectivité

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**Насколько субъективно субъективное –  
субъективность объектов *Умвельта*?**

***Аннотация:***

В течение долгого времени Калеви Кулль способствовал распространению биосемиотических идей Я. фон Иксюля, центральным понятием доктрины которого является *Умвельт*. *Умвельт* обычно понимается как субъективно доступный мир организма; предполагается, что смысл субъективности здесь должен ограничиваться *субъективным доступом*, а *субъективное содержание* относится к *Инненвельтам*, которые должны быть заново определены и отделены от *Умвельтов*.

***Ключевые слова:*** *Умвельт*, *Инненвельт*, функциональный цикл, объект, субъективность



## **“*Oma valguses, oma ilmas...*”: science meeting poetry**

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### ***Abstract:***

Kalevi Kull communicated a lot with the famous Estonian poet Jaan Kaplinsky, who managed to express reflections on ecology, as well as some ideas on biosemiotics, in his literary texts. The article discusses some aspects of the communication of these two intellectuals through their participation in the same conferences, their texts and dialogues.

***Keywords:*** biosemiotics, Umwelt, Kalevi Kull, Jaan Kaplinski, poetry

Discovering Jaan Kaplinski's poetry, I could hardly imagine that, many years after, I'd enjoy reading his poetic texts listening to Kalevi Kull's comments. Kalevi was of invaluable help to provide explanations when they were needed when I began to translate Kaplinski's poetry from Estonian into Russian: in particular, I owe him much in my work on the translation of the book *Tule tagasi helmemänd* 'Come back, amber pine'<sup>1</sup>. One of Jaan's texts from this book that we read together with Kalevi ("Männi juured ja madara juured..." 'Pine roots and bedstraw roots...') attracted Kalevi's attention particularly, especially the following lines:

*mesilane mõlemas silmas  
vaatab ja lendab ja korjab mett  
oma valguses oma ilmas  
ainult suud joovad sama vett<sup>2</sup>*

It could be translated into English as follows:

*a bee with both eyes  
looks, and flies, and gathers honey  
in its own light in its own world  
only the mouths drink the same water*

We all, all living beings, drink water – all living beings have something in common, but at the same time, every living being has, in a sense, its own "light", its own world, its own perception of the surrounding world, its own *Umwelt*: "Umwelt is the semiotic world of organism", wrote Kalevi in a well-known review of his friend Jesper Hoffmeyer's book *Signs of Meaning in the Universe*<sup>3</sup>, published more than twenty years ago, when biosemiotics was not so well institutionalized yet as it is today<sup>4</sup>. Indeed, in a way, all living beings are different, we all interpret the world in our own ways and therefore one can speak about different *signs*, which immediately leads to the very idea of *biosemiotics*. This biosemiotic idea was expressed in the quoted above poetic text of one of the best-known Estonian poets, Jaan Kaplinski: "*Oma valguses, oma ilmas...*"

The study of intellectual relationships between these two friends – biosemiotician Kalevi Kull and poet Jaan Kaplinski – is still to be undertaken<sup>5</sup>. So far, the following are just a few notes on this topic, gathered mainly from my conversations with Kalevi and Jaan.

For the first time, Kalevi Kull met Jaan Kaplinsky at the Spring school on theoretical biology that took place in Puhtu (in western Estonia)

<sup>1</sup> Kaplinski 1984. The Russian translation of this book (my "poetic variations") was published in 2021 (Каплинский 2021).

<sup>2</sup> Kaplinski 1984: 16.

<sup>3</sup> Hoffmeyer 1996.

<sup>4</sup> Kull 1998: 304.

<sup>5</sup> Kalevi has already written about Jaan Kaplinski's "relations" with semiotics (see in particular Kull, Velmezova 2018; Velmezova, Kull, Soovik 2021).

from May 6 to 9, 1977. The very place of their meeting was remarkable: the school was organized at the ornithological station in the house which in former times had belonged to the classic of biosemiotics Jakob von Uexküll. It was to Jakob von Uexküll that the biological school of 1977 was dedicated; its main theme was the theory of the organism<sup>6</sup>. Jaan Kaplinsky did not present any paper there, but he came to listen to others. Even if Kalevi had not met Jaan Kaplinski before, the name of Kaplinsky at that time was already very well known in Estonia: Kaplinski had already published several collections of poetry and was an important figure in the intellectual life of Tartu. Philologist by education, in 1978 Jaan Kaplinski participated in the conference “Biology and linguistics” which Kalevi organized in Tartu in 1978 together with several colleagues – Toomas Tiivel (also from Tartu), Alexander Levich (from Moscow) and Sergei Chebanov (from Leningrad); he also participated in several schools on theoretical biology, sometimes presenting papers there, sometimes just listening to the others and taking part in the discussions<sup>7</sup>. Subsequently, according to Kalevi, his relationships with Jaan Kaplinsky were important to him as an intellectual dialogue of “an equal to an equal” (“none of us was either a disciple or a teacher for the other”)<sup>8</sup>. Moreover, they did not always adhere to the same views (in particular, Kalevi was much more reserved than Jaan about the idea of spreading of the so-called “exotic species” in Estonia). Although these conversations, as Kalevi said, did not particularly influence the evolution of his own scientific thought<sup>9</sup>, Kaplinsky’s texts were undoubtedly important for him already because the poet “managed to convey scientific thinking in his poetic language”. One of the subjects of their discussions was ecology, and in 1997 Kalevi published a review of Jaan’s book *See ja teine* ‘This and that’<sup>10</sup>. Later, in 2009, Kalevi composed an afterword to Kaplinski’s book *Jää...* ‘Ice...’<sup>11</sup> in which Kaplinski also reflected about nature and ecology<sup>12</sup>.

And yet – Kalevi’s favorite lines by Jaan Kaplinsky are not those connected with “scientific” or “academic” thinking, but those reflecting the universal human principles, which Kalevi was able to transfer to his relations with his friends-researchers:

*Kerge on raske olla  
raske on kergeks saada...*

<sup>6</sup> See Tiivel, Parik, Kull (eds.), 2018 on the history of the first 15 schools (1975-1989).

<sup>7</sup> *Ibid.*

<sup>8</sup> One of such conversations, in which I was lucky to take part, took place in Jaan’s house in Mutiku (some 40 kilometers south from Tartu) in January 2018 (Kull, Velmezova 2018).

<sup>9</sup> Nevertheless, several times Kalevi invited Jaan to deliver lectures at the Department of Semiotics at the University of Tartu; Jaan also presented a plenary paper at the World Congress of Semiotics that took place in Helsinki and Imatra in 2007 (*ibid.*: 196-197), etc.

<sup>10</sup> Kaplinski 1996; Kull 1997.

<sup>11</sup> Kull 2009.

<sup>12</sup> Kaplinski 2009.



*It is easy to be hard  
it is hard to get easy...*<sup>13</sup>

In fact, as for academic communication, I have never met a more easy, positive, open and friendly person than Kalevi. This is evidenced already by a large number of his works written in collaboration with his friends – as well as of academic events organized jointly with them. Today biosemiotics as a discipline is certainly very lucky to have such a leader.

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<sup>13</sup> The problem of complexity (vs simplicity) was touched upon by Jaan in some of his papers presented at the schools on theoretical biology that Kalevi organized – for instance, in 1978 and in 1981 (Tiivel, Parik, Kull [eds.], 2018).

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**«*Oma valguses, oma ilmas...*»: quand la science rencontre la poésie**

**Résumé:**

Kalevi Kull s'est beaucoup entretenu avec le célèbre poète estonien Jaan Kaplinski, qui a réussi à exprimer des réflexions sur l'écologie, ainsi que quelques idées sur la biosémiotique, dans ses textes littéraires. L'article aborde certains aspects des rapports qu'ont entretenus ces deux intellectuels à travers leur participation aux mêmes conférences, leurs textes et leurs dialogues.

**Mots-clés:** biosémiotique, Umwelt, Kalevi Kull, Jaan Kaplinski, poésie

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**«*Oma valguses, oma ilmas...*»: встреча науки и поэзии**

**Аннотация:**

Калеви Куль много общался с известным эстонским поэтом Яном Каплинским, в литературных текстах которого отражены размышления об экологии, а также некоторые идеи биосемиотики. В статье рассматриваются некоторые аспекты общения двух этих интеллектуалов: их участие в общих конференциях, тексты и диалоги.

**Ключевые слова:** биосемиотика, Умвельт, Калеви Куль, Яан Каплинский, поэзия



# The space for choice in semiotic threshold zones

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***Abstract:***

This essay presents Kalevi Kull's characterization of Semiotic Threshold Zones by emphasizing the role of choice in the action of signs, or semiosis. The richness of the notion of Semiotic Threshold Zones lies in the possibility of describing fuzzy phenomena that do not belong to a well-defined qualitative level of semiosis. The reader is invited to reflect on Semiotic Threshold Zones in the context of information and communication technologies, to inquire the extent to which machine learning algorithms can be described as derived semiosis from human reasoning processes.

***Keywords:*** semiotic threshold zones, choice, codes, derived semiosis, machine learning

Semiotics, the study of signs and sign relations, considers the conditions of meaning-making processes that provide the possibility for agents to interpret reality and learn from experience<sup>1</sup>. Semiosis, or the action of signs, is a continuous process of interpretation which enables habit change and habit formation when organisms face a real possibility of choice<sup>2</sup>. If semiosis is a continuous process, which would be precisely the conditions for semiosis to emerge in the first place? Would there be a conceptual threshold that distinguishes semiosis from non-semiosis, or that allows a relevant characterization from which we could describe different kinds of semiosis based on different kinds of learning processes?

During the fall of 2017, in the charming city of Tartu, I had the opportunity to reflect upon these questions under Kalevi's supervision at the Department of Semiotics. The friendly environment of semioticians made me realize that characterizations of signs such as icons, indexes, and symbols can be interpreted slightly differently from my Peircean perspective, providing a great opportunity for the ideas – or signs – to grow. A common agreement in Semiotics is that meaning-making processes require the possibility of *choice* based on *codes* or *habits*: “What is the difference between an automatic sensor that opens the door when detecting a person, and an employee hired to open the same door under the same conditions?” Kalevi rhetorically asked, then continued: “The employee still has the possibility to *choose* not to open that door”. In general terms, the process of semiotic interpretation of perceptual stimuli, which enables organisms to choose between opposite kinds of behavior in the context of uncertainty or real doubt, is mediated by the agent's habits or codes acquired in the short or long-term: “[a] habit, as a product of semiosis, is always, to a certain extent, instructional. Semiosis is a learning process that produces scaffolding or habits that may ultimately become established as codes”<sup>3</sup>.

Semiosis implies learning based on a *space for choice* that lies between the constraints of previous habits and the creative enablement of codes that offers a direction for action. Kull explains that the “incompatibility of operations (or codes) is the reason for (negotiation and) choice. Scaffolding, which is the building produced by former choices, provides help to make decisions”<sup>4</sup> by reducing the degree of a system's freedom. It is precisely the *space for choice based on codes* that opens the doors for semiotic learning. Eco stresses that, unlike deterministic processes, “a semiosis process is always triadic: either A or B are absent and it is possible to see one as the sign of the other on the grounds of a third element C, call it the code”<sup>5</sup>. Semiotic learning, as a condition for semiosis, lies between a lower and an upper threshold. The lower threshold indicates “the

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<sup>1</sup> Peirce CP 2.227.

<sup>2</sup> Kull 2015.

<sup>3</sup> *Ibid.*: 230.

<sup>4</sup> *Ibid.*: 227.

<sup>5</sup> Eco 1988: 8-9.

point where semiotic phenomena arise from something non-semiotic”<sup>6</sup>. The upper threshold, in turn, is relative to the level of description of phenomena that are not recognized as such in a given state of information. In addition, Kull explains that the upper threshold could also be placed “between living and ‘zombies’, or between organisms and man-made machines”<sup>7</sup>.

By broadening the boundary between what can (and cannot) be considered semiosis, Kull<sup>8</sup> deepens the understanding of semiotic threshold by proposing the notion of *semiotic threshold zones*: that is, an area which encompasses a transition process from one qualitative level of semiosis to another (e.g., between non-semiosis and semiosis, vegetative and animal semiosis, non-human and human semiosis). Kull highlights that “[a]ll semiotic boundaries are more than yes/no – to at least a tiny extent they allow a third. The border has some area, some width or thickness. This means, each semiotic boundary or threshold is a zone”<sup>9</sup>. In other words, there is no sharp, clear, or precise demarcation that separates different kinds of semiosis, but fuzzy areas that allow contradictory conditions for semiosis to coexist.

Currently, with the development of Artificial Intelligence algorithms such as machine and deep learning, the discussion about what should be considered as semiotic learning becomes even more relevant. If machine learning algorithms can make choices based on codes, would they be capable of semiotic learning? Kull answers negatively, advocating that “[a] machine is a scaffolding without semiosis. Externally, its behaviour may look very similar to the behaviour of an organism, despite of the fact that the machine does not make choices [...] while an organism does”<sup>10</sup>. Machine learning algorithms, as we know today, would still not be considered capable of semiotic learning because, even though they have scaffolding rules that support their functioning, they cannot make aim-directed choices to solve their own problems or real doubt (they cannot experience a surprising fact that triggers abduction).

In a world where scientific research is increasingly undertaken with the use of artificial intelligence, it might be relevant to consider machine learning algorithms as being in a *semiotic threshold zone* between human semiosis and machine non-semiosis: as derived semiosis from human reasoning. Furthermore, to consider the idea of a derived machine learning semiosis within a semiotic threshold zone might also provide fruitful background to inquire the extent to which the development of information and communication technologies might induce humans to trespass the upper semiotic threshold, entrapping societies in non-semiotic surroundings.

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<sup>6</sup> Eco 1976: 21.

<sup>7</sup> Kull 2017: 45.

<sup>8</sup> Kull 2009; 2017.

<sup>9</sup> Kull 2017: 42.

<sup>10</sup> Kull 2015: 232.

Reflecting upon semiotic threshold zones highlights the relevance of perceiving the existence of a space for choice that welcomes uncertainty, incompleteness, vagueness, opening to the diversity of the plural world of semiosis. It reverberates the importance of discussing borders in times of polarization in order to make responsible choices that direct action. I'm very grateful for Kalevi's dedication of discussing semiosis and its threshold zones with great epistemic generosity and honesty, making explicit the collective effort in the development of ideas and the limits of our own knowledge<sup>11</sup>.

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### **L'espace de choix dans les zones de seuil sémiotique**

**Résumé:**

Cet essai présente la caractérisation, par Kalevi Kull, des zones de seuil sémiotique en mettant l'accent sur le rôle du choix dans l'action des signes, ou sémiose. La richesse de la notion de zone de seuil sémiotique réside dans la possibilité de décrire des phénomènes flous qui n'appartiennent pas à un niveau qualitatif de sémiose bien défini. Le lecteur est invité à réfléchir sur les zones de seuil sémiotique dans le contexte des technologies de l'information et de la communication, afin de demander dans quelle mesure les algorithmes d'apprentissage automatique peuvent être décrits comme une sémiose dérivée des processus de raisonnement humain.

**Mots-clés:** zones de seuil sémiotique, choix, codes, sémiose dérivée, apprentissage automatique

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### **Пространство выбора в пороговых семиотических зонах**

**Аннотация:**

В этом эссе говорится о данной Калеву Куллем характеристике пороговых семиотических зон; особое внимание при этом уделяется роли выбора в действии знаков, или семиозисе. Богатство понятия пороговых семиотических зон заключается в возможности описания нечетких явлений, не принадлежащих какому-то четко определенному качественному уровню семиозиса. Читателю предлагается поразмышлять о пороговых семиотических зонах в контексте информационных и коммуникационных технологий, чтобы задаться вопросом о том, в какой степени алгоритмы машинного обучения могут быть описаны как семиозис, производный от процессов человеческого мышления.

**Ключевые слова:** пороговые семиотические зоны, выбор, коды, производный семиозис, машинное обучение





# Empathy as a sign

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***Abstract:***

When discussing the distinction between semiotic fitness and semiotic *fittedness* a few years ago with Kalevi Kull, it was agreed that human semiosis required a process of learning that adjusted into the realm of others and the world. A new sign has since emerged in Kull's theories: the emon. This emotive sign changes the previously conceived organization of the triadic sign taxonomy and introduces the need for a mereological understanding of signs... and an important human trait: that of empathy.

***Keywords:*** mereology, emon, empathy, semiotic learning

In preparing an article for *Routledge's Handbook of Existential Human Science*, my co-author Dana Osborne and I agreed that Kull's biosemiotics was the missing link to understanding the role language plays in developing our necessary cohesive human traits. With empathy central to our discussion, I wanted to investigate the meaning and the interpretation of empathy. Was it a sign? A process? A bi-product of meaning altogether even, perhaps?

As I discovered, Kull's examination not only provides details on a mereological exploration of such a sign, he also explains all sign categories and functions via this mereological enquiry. What results are new distinctions between sign-types, their actions, and a review of previously ambiguous taxonomies.

In "Steps towards the natural meronymy and taxonomy of semiosis: Emon between index and symbol"<sup>1</sup> Kull argues that the widely accepted (and derived from logic), taxonomy of signs (icon-index-symbol) is insufficient for identifying semiosis, the action of the sign. The trichotomy references the typology of the sign and does not sufficiently explore the action of the sign. Instead, Kull suggests a mereology of signs.

According to Kull, when an emotive sign is perceived as carrying meaning via mimicry, this particular sign should be referred to as an emon. Citing Wiedermann<sup>2</sup> and Panksepp<sup>3</sup>, Kull argues that the emon "may thus be related to emotions, empathy, imitation. Note that imitative learning assumes the capacity of analogization, and accordingly, the processes of amplification, which can possibly be identified with emotions. Perhaps the mechanisms of imitation employ mirror neurons"<sup>4</sup>. Thanks to this important mereological work (for semiotics broadly), Kull offers a sign relation that explains (via the processes of biosemiotics) the empathic sign very specifically.

Emon is therefore the sign that is acquired by emotive recognition. The process by which it is acquired is referred to as emonic. The learning process requires the recognition of a previously established state. More specifically, the emonic process is special to vertebrates as "[m]ost invertebrates cannot use emons due to the lack of the relevant mechanism of learning. Emons are accrued via imitation or social learning"<sup>5</sup>. The transition from non-imitating to imitating animals would be the emonic threshold zone.

As demonstrated by Kull, thanks to the fundamental triadic sign, we can now locate a very human trait, that of empathy, and locate it with specificity – through mereology – empathy and the empathic sign. Situated somewhere between secondary and tertiary models<sup>6</sup>, emons are signs that

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<sup>1</sup> Kull 2019.

<sup>2</sup> Wiedermann 2003.

<sup>3</sup> Panksepp 2011.

<sup>4</sup> Kull 2019: 95.

<sup>5</sup> *Ibid.*

<sup>6</sup> In reference to Sebeok and Danesi's Modeling Theory (Sebeok, Danesi 2000).

are both iconic and indexical, providing complex information that will give rise to more symbolic factors. According to Kull's mereology, that would place the 3rd sign of emon and its process, emonic, as an intermediary. As such, and thanks to this dialogical understanding, empathy resides somewhere between language and speech, with its primary form of mimicry extending throughout all iterations.

Recognition and interpretation of emonic signs resides in the realm of connective modeling, internal schemas and into empathy / emons and the emonic process via secondary modeling systems.

Biosemiotics and semiotics more broadly would be well served in widely accepting the emon in its sign-function and sign-action categories, most especially when wanting to uncover important elements of human semiosis.

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### **L'empathie comme signe**

**Résumé:**

Lors d'une discussion, il y a quelques années, avec Kalevi Kull, sur la distinction entre la correspondance [*fitness*] sémiotique et l'adéquation / l'adaptation [*fittedness*] sémiotique, il a été convenu que la sémiose humaine nécessitait un processus d'apprentissage qui s'adaptait au domaine des autres et au monde. Un nouveau signe est depuis apparu dans les théories de K. Kull: l'emon. Ce signe émotif change l'organisation précédemment conçue de la taxonomie triadique des signes et introduit la nécessité d'une compréhension méréologique des signes... et d'un trait humain important: celui de l'empathie.

**Mots-clés:** méréologie, emon, empathie, apprentissage sémiotique

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### **Эмпатия как знак**

**Аннотация:**

При обсуждении с Калеви Куллем несколько лет назад различия между семиотическим соответствием и семиотической *приспособленностью* [*fittedness*] было решено, что человеческий семиозис требует процесса обучения, который приспособливается к сфере других и к миру. С тех пор в теориях К. Кулля появился новый знак: эмон. Этот эмотивный знак меняет существовавшую до этого организацию триадной таксономии знаков и ведет к необходимости мереологического понимания знаков... и важной человеческой черты: эмпатии.

**Ключевые слова:** мереология, эмон, эмпатия, семиотическое обучение

# Talking to Kalevi Kull means exploring old-growth forests

Andreas WEBER  
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***Abstract:***

Kalevi Kull's conversational style opens up mutual creative potentials of interlocutors in unforeseeable ways, just as the pathways of ecological history do. Chatting with Kalevi Kull means to agree to being immersed in subboreal wildness.

***Keywords:*** Kalevi Kull, surprise, old-growth forests, thought, wilderness, wooded meadows

The chats I had with Kalevi are among the particularly inspiring exchanges of my life. Sitting down and thinking back, the experience that comes up and connects it all is surprise. Surprise at the turn of a talk, surprise at the scope of its topics, surprise at my own contributions, surprise at what Kalevi originally had had in mind without giving a sign, surprise at the settings and the conversation partners that suddenly showed up in the chat. So this, bringing in surprise, is one of Kalevi's profound ways of being, one of his ways to relate, to make others relate, to exist and explore. That's a way to help birthing, to help newness into life, and therefore it is something primordially fertile.

What were these surprises? Thinking about them, I realized that most of the talks we had took a turn into the unexpected, and often I took it myself, following some choreography of Kalevi's about which I obviously had had no clue. We first met in the legendary Finnish resort town of Imatra. I was a doctoral student, just having arrived back in Hamburg from a year in Paris with Francisco Varela. In Imatra I presented a paper, was very nervous, and so relieved when I was finished that I joined in the friendly clapping of hands of the small academic public.

Later, we were all sitting on some wooden terrace of the venue's restaurant when Kalevi asked me to join him in the meadow below. He wanted to show me a plant. A minute before everybody had been talking philosophically, and now we were there, in the cold Finnish early June grass, and he singled out that rare little plant (I forgot which it was), and smiled over his whole face. So we had a chat there, lying on the earth, and the plant joined in as well. At the end Kalevi spoke to me about something that I would need to remember on my future track as a nature philosopher. How did he know that there *was* such a future? I actually had big doubts about pursuing this path. I lay there on the meadow and thought, wow, does he actually now? Or does the plant know it?

The next surprise I remember was when I came to Estonia for the first time. I had to write about the then very stylish Estonian Genome Project for the German newspaper *Süddeutsche Zeitung*, a long feature story, that allowed me to travel in Estonia for a week. That was the time when money was made by money, when it seemed to some that the end of history had come and capitalism would make everyone rich – and some just because they gave their genes to a national project intended on revolutionizing medicine. I wrote a story that was skeptical of that (I guess I was right in hindsight), and that also tried to sneak in my ideas about organisms as feeling selves. Nobody really realized that, among the German readers at least, but Kalevi did. I had also just finished my doctoral thesis that had come out of my work with Varela in Paris.

So when I was wrapping up my journalistic research on the gene project and finally was looking at a relaxing day in Tartu before flying back, Kalevi said to me:

“So – you have just finished your thesis”.

“Yes, indeed”.

“So you have it all here.” And he pointed to his head.

“Well, more or less”.

“So you can give a talk about your thesis to our students!”

I was shocked. I was still very shy about speaking about my stuff in front of an audience. But it worked. I wrote it all down on one paper the night before, and then put it right before them. I was surprised at what I could do in that short time. Kalevi had been right.

Remembering these times, and also another trip to Estonia in summer in order to write about the Genome Project again, for another magazine, makes me realize how grateful I am to have tasted all this – to walk into deep Estonia when it was still a very remote country recovering from Russian occupation. And again and again what came through was Kalevi’s wish to let the nonhuman beings partake in these discoveries, to let animals and particularly plants in, to show them, to let them welcome me and let me be welcomed by them. After all, he had trained as a Botanist. I remember the wooded meadows of Saaremaa. I remember the ice-cold water, still half frozen, of a little lake close to his summer house in the countryside, with a huge beaver dam. I also remember his friend Aleksei Turovski, then the director of Tallinn zoo, who showed me around and had the habit of speaking to the animals. I still see him standing and talking to a huge male wild goat.

In the end, my Estonian experience has all been about the unexpected. Kalevi opened the door to it. He is a very good representative of it. Of what, actually? Should we say of the wild, of that which is not yet manifest but waiting around the corner as a potential to be realized? The “adjacent possible”, as Stuart Kauffman would have it, who also has been lead around Estonia by Kalevi and has been surprised by him numerous times, I am sure. Although Stu has his share of being able to surprise others too.

One of Kalevi’s ways to chat is to sit there, say nothing, make a Sphinx face, and then ask a simple question. Something like, say, “How do you define life?” I’ve experienced this various times, and never really knew if he wanted to pick my brain, or if he wanted to check my knowledge, or if he wanted to tell me something of his own knowledge. I now think it is probably all of this. He knows where he is, but in a preliminary way, and then lets the other build a bridge that Kalevi can walk over or demolish and reconstruct. In any case, you’ll come out changed, with more in your pockets, richer in experience, and he does as well.

Where Kalevi leads you is into thought as an old growth forest (of which there still are some in Estonia, I’ve been there, and even the second growth woods are pretty wild). It’s thought as an ecosystem continuously establishing itself, thought not re-tracing the map, but creating the territory.

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**Parler à Kalevi Kull, c'est explorer des forêts anciennes**

**Résumé:**

Le style conversationnel de Kalevi Kull ouvre de manière imprévisible des potentiels créatifs mutuels d'interlocuteurs, tout comme le font les voies de l'histoire écologique. Discuter avec Kalevi Kull, c'est accepter de s'immerger dans la nature sauvage subboréale.

**Mots-clés:** Kalevi Kull, surprise, forêts anciennes, pensée, nature sauvage, prairies boisées

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**Разговор с Калев Куллем: изучение древних лесов**

**Аннотация:**

Разговорный стиль Калев Кулля непредвиденным образом раскрывает взаимный творческий потенциал собеседников, как это делают и пути экологической истории. Разговор с Калев Куллем подобен погружению в суббореальную дикую природу.

**Ключевые слова:** Калев Куль, удивление, древние леса, мышление, дикая местность, лесолуга

# Dialogues, episodes, habits

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***Abstract:***

Charles Sanders Peirce's notion of habit (particularly virtual habit) constitutes the catalyst for semiotic and semiotic paradigms. It is the vehicle by which new beliefs permeate the potential truth-value of propositions / arguments and compel others to think accordingly; humans, canine, even those subjects brutally drenched in "Kul-liphrastic" assertions.

***Keywords:*** habit, Tartu semiotics, dialogue, human / animal interaction

In elevating abductive rationality via the Final Interpretant, C.S. Peirce has redefined the active nature of inquiry into sign-object-meaning relations. Peirce's use of "verb" to define the insight of building new habits<sup>1</sup> establishes the active and indispensable role of abduction – explaining how cause-effect relations culminate into beliefs and behaviors. These new habits constitute verb-like projections of thought and conduct, particularly in dialogue. The process begins with intrasubjective dialogue in which dreams, or virtual habits become initiated and settled; and afterward these virtual habits are presented to others via dialogue, often as imperatives. Virtual habits are new belief paradigms / new aspirations imagined so strongly that they are equivocal to the experiences themselves, and may elicit even more intense responses than an actual / direct experience. Moreover, feelings and hunches emanating from imagined experiences are more influential in generating abductions than actual ones<sup>2</sup>.

Despite the absence of intersubjective dialogue present in virtual habits, their Energetic Interpretants (single effects) validate their status as signs. Peirce's exemplar in 1909 of the "touch" which Milton's Adam "felt" was obviously associated with an agent and a purpose, namely, the divine. In turn, Adam's feelings of being chosen have potential bearing in action schemes. In short, virtual habits can be so convincing to the originating mind that the image itself is indistinguishable from its actuality, and may well elicit an effect of far greater magnitude. Dialogic effects of virtual habits can affect a change in the experiencer's own beliefs / conduct or that of an interlocutor, compelling adherence to the founding belief / action: "The effectiveness of the virtual habit relatively to that of a real habit, is [...] unquestionably far greater than in proportion to the vividness of the imaginations that induce the former [virtual habit] relatively to the vividness of the perceptions [...] when we strain, in some obscure way, to influence our future behavior [...]"<sup>3</sup>. Sharing these emergent habits with others often verifies their legitimacy, further promoting the habit itself.

Consonant with the effects of dialogue to compel habit-change, Kalevi has created a new semiotic order. His influence innervating the only doctoral program in Semiotic studies keeps alive the succession of abductive rationality through continued dialogue among emerging scholars. The graduate program at the University of Tartu has become a beacon – a forum for enlightenment, to carry on scholarly advances.

To this same end, Kalevi has tirelessly edited *Sign System Studies* in which meritorious manuscripts promote further dialogue. Hosting the biannual Tartu Summer School has further brought together semioticians from five continents. I personally recall the lengthy trek from the U.S. to Tartu in 2016 and 2019. There I organized symposia on Peirce's concept of habit

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<sup>1</sup> Peirce CP 6.286.

<sup>2</sup> See Peirce *Manuscripts* MS 620; also Bergman 2016; West 2017; West, forthcoming.

<sup>3</sup> Peirce *Manuscripts* MS 620: 26.

(with Myrdene Anderson) and Peirce's notion of consciousness, respectively. Kalevi's review (in *Sign System Studies*) of our Springer anthology: *Peirce's Concept of Habit: Before and Beyond Consciousness* (edited by Myrdene Anderson and me in 2016) constitutes one of the accomplishments wrought from the Tartu dialogues. On another occasion in 2018 (at the Cognitive Semiotics biennial conference in Toronto), I was the target of Kalevi's supreme fascination with animal-human sign-dialogue; in the end, I had to nearly give up my dog guide to Kalevi. He was so utterly intrigued by our communication process that I feared having to prosecute a dognaping. Alas, I rescued my Chocolate Labrador, Mocha, from the plight of a die-hard semiotician!

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**Dialogues, épisodes, habitudes**

***Résumé:***

La notion d'habitude de Charles Sanders Peirce (en particulier l'habitude virtuelle) constitue le catalyseur des paradigmes sémiotiques et sémiosiques. C'est le véhicule par lequel de nouvelles croyances imprègnent la valeur de vérité potentielle des propositions / arguments et obligent les autres à penser en conséquence: humains, canins, même ces sujets pénétrés par les affirmations «kulliphrastiques».

***Mots-clés:*** habitude, sémiotique tartusienne, dialogue, interaction homme / animal

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**Диалоги, эпизоды, привычки**

***Аннотация:***

Понятие привычки (особенно привычки виртуальной), по Чарльзу Сандерсу Пирсу, представляет собой катализатор семиотических и семиозических парадигм. Это средство, с помощью которого новые убеждения проникают в потенциальную истинностную ценность предложений / аргументов и заставляют других думать соответствующим образом: подвергнуты «куллифрастическим» утверждениям могут быть люди, собаки и т.д.

***Ключевые слова:*** привычка, тартуская семиотика, диалог, взаимодействие человека и животного

# Kalevi Kull in Oregon

Louise WESTLING  
*University of Oregon*

***Abstract:***

Kalevi Kull introduced Juri Lotman's cultural theories to an American audience at the Biosemiotics and Culture Conference, May 2013, at the University of Oregon. This important humanistic dimension of biosemiotics still remains to be fully explored.

***Keywords:*** Juri Lotman, biosemiotics, semiotics of culture, incompatibility, modeling

In May 2013, the first American conference on Biosemiotics and Culture was held at the University of Oregon, bringing together an international group of leaders in Biosemiotics: Kalevi Kull from Tartu, Jesper Hoffmeyer and Søren Brier from Copenhagen, Donald Favareau from Singapore, and John Deely and Terrence Deacon from the United States. Organizers Wendy Wheeler and I, both literary scholars, sought to introduce the humanistic value of biosemiotics to an American audience, and Kalevi's presentation on "A semiotic theory of life: Lotman's principles of the Universe of the Mind" was central to that goal. The conference proceedings were published as a special issue of *Green Letters: Studies in Ecocriticism*<sup>1</sup>.

Kalevi provided a key insight into the similarities between the life of an organism and a literary work by explaining that like a cell that is a complex functioning self-accommodating system, a literary work "is also a complex self-accommodating system". The life of a cell is impossible to discover through dissection by an anatomist, and similarly the life of a literary work cannot be anatomized outside its whole being. Lotman's humanitarian approach thus reveals culture to be an organic semiotic system in parallel to the life of biological organisms<sup>2</sup>. Kalevi's discussion of Lotman may also remind us of Maurice Merleau-Ponty's assertion that "Literature, music, the passions, but also the experience of the visible world are – no less than is the science of Lavoisier and Ampère – the exploration of an invisible and the disclosure of a universe of ideas"<sup>3</sup>. These function according to codes built by living systems. They are the products of semiosis and are codes that are incompatible so that the future of the system is indeterminate in a situation of freedom and creativity. They are systems that are ways of modeling the world, "or ways of translating (thus 'mapping' and 'knowing' the world, the *umwelt*)"<sup>4</sup>.

The fruitful possibilities suggested in this presentation have yet to be fully explored by literary scholars and environmental humanists, but gradually efforts are being made in that direction. Wendy Wheeler's 2016 book, *Expecting the Earth: Life, Culture, Biosemiotics*, offers a powerful demonstration of intellectual traditions supporting cultural congruence with biological life and the understandings provided by biosemiotics. Another example is the Cambridge Elements series in Environmental Humanities which includes texts such as Timo Maran's *Ecosemiotics*<sup>5</sup>, Almo Farina's *Ecosemiotic Landscape*<sup>6</sup>, and Serenella Iovino's *Italo Calvino's Animals*<sup>7</sup>.

Finally, on a more personal note, Kalevi's ebullient spirit and intellectual generosity were memorable elements of our conference in 2013. He

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<sup>1</sup> Wheeler, Westling (eds.), 2015.

<sup>2</sup> Kull 2015: 257, 263.

<sup>3</sup> Merleau-Ponty 1968: 149.

<sup>4</sup> Kull 2015.

<sup>5</sup> Maran 2020.

<sup>6</sup> Farina 2021.

<sup>7</sup> Iovino 2021.

insisted on walking around and exploring our town of Eugene between the speakers' hotel and the university, rather than being driven in a car. The distances are not great, but Americans are not accustomed to walking so energetically if a car can take them. As Jesper Hoffmeyer said at the time, this was typical of him as a uniquely Estonian force of nature. More importantly, I am grateful to Kalevi for endowing our university library and me with the gift of a number of books: *Sign Systems Studies*<sup>8</sup>, *A More Developed Sign*<sup>9</sup>, *Semiotics in the Wild*<sup>10</sup>, and *Gatherings in Biosemiotics*<sup>11</sup>. These were riches from a world that was unknown to me and certainly nowhere to be found in our library. They will eventually be part of the library collection, but I have not yet been able to give them up because they have been so invaluable for my own work.

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<sup>8</sup> Kull et al. (eds.), 2009.

<sup>9</sup> Favareau et al. (eds.), 2012.

<sup>10</sup> Maran et al. (eds.), 2012.

<sup>11</sup> Rattasepp, Bennett (eds.), 2012.



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**Louise Westling**  
Université de l'Oregon

### **Kalevi Kull dans l'Oregon**

**Résumé:**

Kalevi Kull a présenté les théories de la culture de Youri Lotman à un public américain lors du colloque *Biosemiotics and Culture* qui a eu lieu en mai 2013 à l'Université de l'Oregon. Cette importante dimension humaniste de la biosémiotique reste encore à explorer pleinement.

**Mots-clés:** Juri Lotman, biosémiotique, sémiotique de la culture, incompatibilité, modélisation

**Луиза Вестлинг**  
Орегонский университет

### **Калеви Куль в Орегоне**

**Аннотация:**

В мае 2013 года на конференции *Biosemiotics and Culture* в Орегонском университете Калеви Куль представил американской аудитории теории культуры Юрия Лотмана. Это важное гуманистическое измерение биосемиотики еще только предстоит полностью изучить.

**Ключевые слова:** Юрий Лотман, биосемиотика, семиотика культуры, несовместимость, моделирование



# **Biosemiotics, biocommunication and natural genome editing**

Guenther WITZANY  
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***Abstract:***

Thure von Uexküll introduced me into the biosemiotic research community in the early 1990s. Later on Kalevi Kull offered a publication opportunity to me, that helped me to leave a disunited biosemiotic community and develop a theoretical direction that helps to understand biology as a social science.

***Keywords:*** pragmatic turn, communication, sign-mediated interactions

Thure von Uexküll invited me in 1993 to discuss my recently published book and his endosemiotic approach<sup>1</sup>. The following years he supported my “theory of communicative nature” by various invitations to meetings where I could present my theory. This theory integrates the pragmatic turn as a result of the philosophy of science discourse between 1920 and 1980. In investigating natural languages and codes within communicative interactions, the crucial level to identify any kind of meaning is the real life context in which sign users are involved: It determines the meaning of used signs, not its syntax. All empirical facts indicate that in living nature no natural language speaks itself as no natural code codes itself. In all cases there are sign-using agents that use signs in sign sequences within communicative interactions to commonly coordinate and organize their behavior.

When I published my theory in an English translation in 2000 and received an invitation to present the theory in 2003, I was astonished to find Kalevi Kull and Claus Emmeche in the audience, since their reviews of my book suggested they were not convinced<sup>2</sup>. But it led to some discussions at the opening of the Jakob von Uexküll Center in Hamburg in 2004, the following gatherings in biosemiotics in Prague in 2004, Urbino in 2005 and Salzburg in 2006. Importantly Kalevi Kull and Dario Martinelli then helped me to find an appropriate publisher for a book for which I assembled various articles on the foundation of a three-leveled biosemiotics and a following book with a first program of biocommunication adapted to all organismic kingdoms<sup>3</sup>. I further developed my theory of communicative nature into a theory of biocommunication investigating sign-mediated interactions within and between organisms.

Similarly to the much broader field of semiotics, biosemiotics has not integrated the results of the pragmatic turn, i.e. the crucial role of pragmatics, and seems dominated by solipsistic theories of knowledge (subject-object dichotomy, information transfer explained by sender-receiver narratives). Parallel with this, biosemiotics is represented by diverse concepts such as mechanism, physicalism, materialism, objectivism, information theory, systems theory as well as other metaphysical constructions such as ontology or even a Peirce-derived pansemioticism (everything is a sign). Most empirical biosemiotic investigations are focused on signs or the ontology of the relationship between signs or between signs and the signified something (ontosemantic realism). The crucial role of pragmatics, i.e. the role of the real sign-user being part of the identity of a community of sign-users which is essential for meaning functions of signs as well as the cultural background knowledge is for interpretation processes until now has not been part of biosemiotic investigations.

In 2010 at the Gatherings in Braga, it was clear to me that the pragmatic turn could not be integrated within biosemiotics and therefore misses

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<sup>1</sup> Witzany 1993a; Uexküll *et al.* 1993.

<sup>2</sup> Witzany 2000.

<sup>3</sup> Witzany 2006; 2007.

a coherent method that unequivocally could lead biosemiotic investigations. For me this was the main reason why biosemiotics was mentioned very rarely in the main disciplines of biology.

The theory of biocommunication and its focus on pragmatic action theoretical aspects of sign-using agents in their real life worlds should better explain what the various directions in biosemiotics could not, namely describing the everyday prerequisites for successful communication:

- the simultaneous understanding of identical meanings in two interacting partners, as expressed in successfully coordinated activity;
- the differentiation and investigation between deep and superficial grammar of an utterance.

In contrast to the various biosemiotic approaches there is no need to further discuss the levels of signs, signifiers, interpretants and further categories of the metaphysical universe of Charles Sanders Peirce. It is necessary only to become clear about how communication functions, and what happens if it does not function. This means a turn from metaphysical thinking to empirical sociology, which investigates the communicative interactions of viruses. RNA-networks, akaryotes, protozoa, fungi, animals and plants<sup>4</sup>.

In parallel my interest focused on the emergence and function of the genetic code. It was clear to me, that if the genetic code is really a natural code there must be agents that edit this code, which means, agents that generate nucleotide sequences *de novo*, insert and delete in host genomes, rearrange and edit this code. This means the genetic code cannot be an assembly of randomly derived nucleotides. Evolution of new species cannot be the result of randomly occurring replication errors (mutations). Since the first publication on this I looked for such agents, but could not really identify them<sup>5</sup>.

That changed dramatically in 2005 with the book of one of the most respected virologists Luis Villarreal (Villarreal 2005). Here I found my agents, being the essential drivers of evolution in all organisms of this planet. Viruses and related infectious genetic parasites such as mobile genetic elements are the most abundant biological agents on this planet. They invade all cellular organisms and are key agents in the generation of adaptive and innate immune systems. They colonize host genomes in a non-lytic but persistent way and most often remain as defectives such as the abundance of non-coding RNAs that drive nearly all regulatory processes within living cells<sup>6</sup>.

From 2010 to 2020 I edited more than ten books in which I applied this program to all organismic kingdoms, (including viruses and RNA networks) with more than 450 experts in their field. The crucial input I got from the years involved in biosemiotics was that without sign-use no bio-

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<sup>4</sup> Witzany 2010.

<sup>5</sup> Witzany 1995.

<sup>6</sup> Villarreal, Witzany 2010.

logical function would be possible<sup>7</sup>. Kalevi Kull helped me to transport the early program of my theory of biocommunication to the public and therefore successfully leave biosemiotics or to cite Ludwig Wittgenstein “throw away the ladder, after he has climbed up on it”<sup>8</sup>.

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<sup>7</sup> Witzany 1993b.

<sup>8</sup> Wittgenstein 1921 [1922: 187].

**Guenther Witzany**  
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### **Biosémiotique, biocommunication et édition du génome naturel**

***Résumé:***

Thure von Uexküll m'a introduit dans la communauté de la recherche biosémiotique au début des années 1990. Plus tard, Kalevi Kull m'a offert une opportunité de publication, ce qui m'a aidé à quitter une communauté biosémiotique désunie et à développer une direction théorique qui aide à comprendre la biologie en tant que science sociale.

***Mots-clés:*** tournant pragmatique, communication, interactions par intermédiaire des signes

**Гюнтер Витцани**  
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### **Биосемиотика, биокommunikация и редактирование природного генома**

***Аннотация:***

Туре фон Икскуль познакомил меня с сообществом исследователей биосемиотики в начале 90-ых годов прошлого века. Позже Калеви Куль предоставил мне возможность публиковаться, что помогло мне покинуть разобщенное биосемиотическое сообщество и развить теоретическое направление, помогающее понять биологию как социальную науку.

***Ключевые слова:*** прагматический поворот, коммуникация, взаимодействия посредством знаков





# How do we “acquire” a truly pluralist view of the world?

Hongbing YU  
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***Abstract:***

Meaning making is seldom anchored in single codes ready to be decoded objectively. According to Kalevi Kull, what lies at the core of meaning making is that meaning emerges as a result of interpretation and this fact underlies the inescapable indeterminacy of semiosis, which goes far beyond such simplistic approaches to meaning in relation to single codes. The ramifications of placing interpretation at the center of inquiry can hardly be overstated, as they are pivotal to the 21st-century understanding of not just the human condition but also human existence in general, in other words, how we see ourselves and how we view the world.

***Keywords:*** Kalevi Kull, semiotics, Chan Buddhism, meaning making, modeling

In Chan Buddhism, as with most other major branches of Buddhism, the problem of “objective reality” is fundamentally an “illusion”, in a manner of speaking, and we live by, in, and for this illusion. In this line of thought, Chan Buddhism has much in common with semiotics, especially biosemiotics, and may inform each other in pointing to the semiotic nature of being. In this way, meaning making, the very foundation for our senses of existence, significance, and purpose in this universe, is ultimately an activity, carried out and fulfilled in signs of all sorts, or borrowing a Sebeokian umbrella term, models, which compose the “illusion”. These models themselves are not grounded in things, as the objectivists would argue, but rather in relations and their semiotic constraints<sup>1</sup>. In this sense, both Chan Buddhism and semiotics go beyond the rigid objective-subjective dichotomy, which is itself a model! It is also in this sense that meaning making is seldom anchored in single codes ready to be decoded objectively, like a parcel, which, once opened, reveals meaning.

What is outlined above is not a display of anti-intellectualism, but rather intended to be an invitation that promises to validate precisely the scientific spirit (open-minded criticality) and reject scientism that has been rampant in academia for decades. Relatively speaking, natural sciences aim chiefly to search for a form of regularity in the bewildering complexity of the world, that is, to simplify what is complex, whereas the humanities and social sciences, in addition to their own necessary search for a quasi-regularity, can “complicate” what seems simple. It is in the latter that the genuine significance of semiotic inquiry as a methodology lies. Being a methodology, semiotics has never been just another buzz word in academia, but a self-referential and self-validating meta-theory and practice. This is unparalleled by any other socially established disciplines, hence the power of semiotics. It should therefore be perfectly legitimate for us to state that semiotics is as much an art as it is a science.

But what are we talking about when we talk about the art of semiotics? As Gombrich aptly observed, “there really is no such thing as Art. There are only artists”<sup>2</sup>. We may as well apply this observation to semiotics, which would lead us to this: “there really is no such thing as Semiotics. There are only semioticians”. And the key to this art is to genuinely appreciate the position of interpretation in the whole business. The inspiration comes from Kalevi Kull, who has indeed been a virtuoso semiotician in Estonian and global semiotics since Juri Lotman. Kull has successfully and skillfully examined, applied, mixed and developed crucial insights from key forerunners of contemporary semiotics, thus continuing to inspire new generations of students of the art. According to Kull, what lies at the core of “meaning making” is that meaning emerges as a result of interpretation and this fact underlies the inescapable indeterminacy of semiosis, which goes far beyond such simplistic approaches to meaning in relation to single

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<sup>1</sup> Favareau 2015: 235.

<sup>2</sup> Gombrich 1995: 15.

codes. The ramifications of placing interpretation at the center of inquiry can hardly be overstated, as they are pivotal to the 21st-century understanding of not just the human condition but also human existence in general, in other words, how we see ourselves and how we view the world.

Even Kalevi Kull himself might not remember this, but it was he who emphasized why semiotics was particularly relevant and important for today’s world at the 33rd Annual Meeting of the Semiotic Society of America in 2008<sup>3</sup>. Kull insightfully pointed out that we study semiotics to make the world pluralistic. Living out the idea of interpretation being the core of semiosis, I would like to propose an interpretation of Kull’s observation: to make the world pluralistic does not presuppose that the world in itself is an unchanging monolith, which would be the complete opposite of Kull’s intention. On the contrary, it reveals the inherently pluralistic nature of the world, or *umwelt*. In other words, when we say that we study semiotics to make the world pluralistic, the statement should not be taken at face value, but better be interpreted as using an intrinsically pluralistic method of academic inquiry, most notably semiotics, to understand our *already* pluralistic world, the understanding of which is often clouded and misled by human predisposition to essentialism. In a world with increasing rifts and struggles between antithetical modes of cognition and between either-or socio-cultural frames, semiotics provides a much-needed antidote. So, how do we “acquire” a truly pluralist view of the world? Perhaps the question should be rephrased as “how do we restore and/or maintain a truly pluralist view of the world?” The answer, among other things, lies in the magical word “interpretation”.

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<sup>3</sup> Zhang, Yu 2018: 133.

**Hongbing Yu**

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### **Comment «acquérir» une vision véritablement pluraliste du monde?**

**Résumé:**

La formation du sens est rarement ancrée dans des codes uniques prêts à être décodés de manière objective. Selon Kalevi Kull, ce qui se trouve au cœur de la formation du sens, c'est que le sens émerge à la suite d'une interprétation et ce fait sous-tend l'inévitable indétermination de la sémiotique, qui va bien au-delà des approches simplistes du sens par rapport à des codes uniques. Les ramifications du placement de l'interprétation au centre de l'enquête ne peuvent guère être surestimées, car elles sont essentielles à la compréhension, au XIX<sup>ème</sup> siècle, non seulement de la condition humaine mais aussi de l'existence humaine en général, en d'autres termes, de comment nous nous voyons et comment nous percevons le monde.

**Mots-clés:** Kalevi Kull, sémiotique, bouddhisme chán, formation du sens, modélisation

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### **Как прийти к истинно плюралистическому взгляду на мир?**

**Аннотация:**

Придание значения [«создание смысла»] редко основано на единичных кодах, готовых к объективной расшифровке. Согласно Калеву Кулло, в основе этого процесса лежит тот факт, что значение возникает в результате интерпретации, и это лежит в основе неизбежной неопределенности семиозиса, выходящего далеко за рамки упрощенных подходов к значению по отношению к единичным кодам. Последствия того, что интерпретация становится центром исследования, трудно переоценить, поскольку они имеют ключевое значение для понимания в 21-ом веке не только человеческой ситуации, но и человеческого существования в целом – иными словами, того, как мы видим себя и как мы воспринимаем мир.

**Ключевые слова:** Калеву Кулло, семиотика, чань-буддизм, придание значения [«создание смысла»], моделирование

## Brothers: Olevi and Kalevi Kull

Donald FAVAREAU  
*National University of Singapore*

Biosemitotics is the study of meaningful relationships. The brotherhood of Kalevi and Olevi Kull was a particularly meaningful relationship for both of them. Sons of the applied mathematicians Lembit and Hilja Kull, both brothers developed a life-long interest in the science of life. Three years younger than Kalevi, Olevi worked together with Kalevi at Toomas Frey's Plant Ecology Group in the Systems Ecology Section of the Institute of Zoology and Botany, and both brothers defended their doctoral dissertations, under the supervision of Frey, at the University of Tartu on their mother's birthday in 1987<sup>1</sup>.

In 1989, they collaborated on a monograph on the dynamic modeling of tree growth<sup>2</sup>, and the following year, Olevi became head of the Tartu branch of the Estonian Institute of Ecology, while Kalevi was named president of the Estonian Naturalists' Society the year after.

Both brothers maintained a life-long interest not only in the empirical data of the natural world, especially that of plant communities, but in the philosophy of science and in the differences in between scientific communities and the nature of their questions and methodologies<sup>3</sup>. After graduation, each brother would go on to pose a series of novel and deeply-informed questions and answers in their respective fields: Olevi in forest ecology<sup>4</sup> and physiology, and Kalevi in biosemitotics<sup>5</sup>.

Perhaps their mindsets were not so far apart, however. Olevi's fellow forest ecosystems researcher, Ram Oren, recounts the following conversation with him: "What do you see when you look at a leaf?" he asked me once, nearly twenty years ago. After listening for a short while to my technical and rather standard answer, he interposed "I think we best view it as a parcel of ocean kept alive in a dry atmosphere"<sup>6</sup>.

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<sup>1</sup> Oren, Kull, Noormets 2008: 487.

<sup>2</sup> Куль, Куль 1989.

<sup>3</sup> Kull 2007; Kull 2009.

<sup>4</sup> Kull 2007; Püttsepp (ed.), 2015.

<sup>5</sup> Maran *et al* 2012.

<sup>6</sup> Oren, Kull, Noormets 2008: 488.

Olevi passed away on January 31, 2007, and the Professor Olevi Kull Memorial Fund was established by donations in his memory, to provide travel stipends to students in the fields of plant ecophysiology, forest ecology and ecosystem ecology<sup>7</sup>. Were Olevi with us here today, we know that he would have certainly contributed to this volume. We take this opportunity to honor this meaningful brotherhood instead, then, by the reproduction of the following photographs provided to us by Olevi's widow, Thea Kull, at the request Kalevi's son, Meelis Kull.



Olevi, Kalevi, Hilja and Lembit Kull, circa 1962.

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<sup>7</sup> <http://www.ut.ee/sihtasutus/index.php?lk=13&stipendium=61>.



Olevi and Kalevi in 1972.



Olevi and Kalevi in 1981.





Defending their doctoral dissertations on their mother's birthday in 1987.



Olevi and Kalevi in 1956.

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## Birthday greetings from around the world

*Due to the last-minute nature of the decision to create this volume at a time when the world was just beginning to slowly work its way back from a two-year long global pandemic, a considerable number of Kalevi's friends and colleagues who fervently wanted to submit contributions to this festschrift volume were ultimately unable to complete their submissions in time to do so. A good number wanted to make sure that at least their well wishes for him were included in some way, and many more are sending such wishes without being here identified by name.*

*Below, then, are the testimonials and warm wishes from over a dozen more of Kalevi's admirers around the globe, bringing the total number of contributors to this volume well over the "70 for 70" that we originally were hoping for. We take this as supporting evidence that Kalevi's notion of "species (co)recognition via family resemblance and semiotic fitting" is also operative in the human world. Following are some words from his "community that has become real" this way:*

Kalevi, you are one of a rare breed who are still able to think independently! This former characteristic of academic learning is increasingly giving way to conventional and dogmatic attitudes in science, where the all-dominating question has become "what do I need to say in order to receive more money for my research?" A system rewarding this behavior by necessity promotes mainstream postures. You, by contrast, have questioned many of the received ideas and theoretical assumptions that underlie standard positions in science, and I hope that you will be able to continue your distinctive approach for a long time to come. Writing these lines in the cradle of western science and philosophy, I wish you "*chrónia pollá!*" – **Gerd B. Müller, University of Vienna and Konrad Lorenz Institute for Evolution and Cognition Research**

I was fortunate to have made Kalevi's acquaintance in conferences in the 1990s and through talking with him and reading his publications I got a deeper understanding of biosemiotics and in particular the concept of an *Umwelt* that I found very useful in developing my approach to the emergence of life. When David Depew and I organized a conference on the Baldwin effect at Bennington College in 1999 we were sure to include Kalevi who made a major contribution to the discourse. Our thoughts and our lives have been enriched by Kalevi Kull. Happy Seventieth Birthday Kalevi! Best wishes, Bruce – **Bruce H. Weber, California State University**

INSPIRATION FOR THE THIRDDWAY: 2016 was a watershed, fed from the enthusiasm of Kalevi. My little lyrical essay, *The Music of Life*, appeared as *Elu Muusika* (<https://www.denisnoble.com/estonian/>), a New Trends meeting occurred at The Royal Society in London, co-sponsored by the British Academy, and I had the privilege of appreciating the deep insights of Kalevi. Two years later, in 2018, the THIRDDWAY group met for dinner and discussion in Oxford (<https://www.thethirdwayofevolution.com>). I don't think the world of evolutionary biology will ever be the same again. The 2016 meeting was the last and most spectacular occasion on which the diehard supporters of the dogmatic, hardened, form of the Modern Synthesis tried to exert their hegemony by challenging the right of their opponents to hold a Discussion Meeting. That attempt failed spectacularly as we were all harangued with the mantra: "There are no new trends, they are all in the text books". Well, we now know they are not. The Emperor has few or no clothes. In fact, the key assumptions can be argued to be illusions (<https://www.denisnoble.com/illusions/>). Through bringing his insights on the biosemiotic approach to evolution, Kalevi has achieved a remarkable opening-up of the debate. Many happy returns, Kalevi, and many decades to come! – **Denis Noble, University of Oxford**

From the day onwards when I first met Kalevi at the first Biosemiotic Gathering in Copenhagen, the imprint of his being and thinking – this unique combination of connectedness and freedom – was so inextricably fused with the ageless image of Nature that it feels incongruous to count it by the years. I celebrate his birthday with the joy of the eternal unfolding of Life, which Kalevi always inspires me with. – **Yagmur Denizhan, Bogazi-ci University**

Happy birthday, dear Kalevi! I am grateful for your kindness, mentorship, and engagement with my philosophizing. I was inspired first by your writing from your back porch about the four orders of natures – "life in every leaf and blade" (1998), again by the community you inspire and sustain, and then once more through my introductions to you in person by Myrdene Anderson. To me, you are the wise grandfatherly bear of biosemiotics, and you continue to inspire. My own work in biosemiotic ethics connects a deeply personal biology to a richly universal sense of value and responsibility, seeking out ways for meaning to matter in a complex and changing world. That work, like so much of my thinking, would not exist were it not for how meaningful thinking with you and this community has been. So I send me very warmest wishes for your seventieth birthday, and look forward to our life-worlds to cross again. – **Jonathan Beever, University of Central Florida**

Dear Kalevi, It is a true pleasure to be able to know you and share some nice meetings with your bold and original ideas. You're a breath of fresh

air in the academic world. All the best – **Charbel El-Hani, Federal University of Bahia**

Dear Kalevi, It is semiotically fitting to thank you for your inspiring work and your support! – **Alin Olteanu, RWTH Aachen University, Germany**

Dear Kalevi, Many birthday greetings. This note takes me back to the time a couple of years ago when I ushered myself into a board meeting and you did not throw the uninvited guest out. I learned a lot from that event, so much that I did not want to leave and ended up being late for my own lecture to the waiting society. At that time you were discussing sending Bio-semiotics to Russia – which was a big gamble then. But in the light of subsequent events was a momentous decision. As I think was your next decision – one which I particularly cherished, was to hold the first ever Zoom biosemiotics with its central organization stemming from the Bateson Institute. Both mean that we have an adventurous person to take us all onwards since the totally tragic death of Jesper. Biosemiotics is very lucky. I am sorry I cannot send at this time a longer note as since April 1st. I have been restricted by “don’t do this” – and “don’t do that” following an eye operation. Thankfully, the operation has been very successful so far, and my last check – in with the surgeon occurs tomorrow. I am sure, under your guidance, that the society will turn much more to the deplorable state of the environment, and begin to study what Jesper called “semiotic fitness” in the environment and the various biological levels and communicative networks both in the ground and on top of the ground (i.e. insects and birds) that support this concept. With very best wishes for your future success. – **Peter Harries-Jones, York University**

Dear Kalevi, I wish you a Happy Birthday! And a happy continuation of being one of the vital processes weaving modern Biosemiotics! – **Joanna Rączaszek-Leonardi, University of Warsaw**

Dear Kalevi, Happy Birthday and warm wishes on your 70. Surprising because you seem such a spring chicken. Thank you for warmest welcome into the Biosemiotic fold and for the illuminating discussions. I am consistently learning from you through your papers and presentations. Raising a glass to you. All very best, Tim. – **Tim Ireland, Sheffield School of Architecture**

I feel privileged that I’ve “met” Kalevi many years ago (must have been in the late-1980s), first in writing only, but soon also face-to-face. Even though biosemiotics is not among my own research fields, we never lacked a topic to talk about, and – equally important – to laugh about. Kalevi, you’ve always been a dear and true friend, especially in tough times, and this is one of the rare occasions to thank you in public for your friendship. I wish you a very Happy BDay and hope we’ll meet many many times in the

future at one or the other semiotic conference. Many happy returns. – **Gloria Withalm, University of Applied Arts Vienna**

Kalevi's charisma and cheerfulness inspired me immediately when I met him in 2005, my first year of studies at University of Tartu. His encouragement and enthusiasm were the reason I chose biosemiotics as my speciality. Now I am very happy to call him my colleague, and must say, he is still a great source of inspiration – the way he talks, the way he thinks and the way he writes is really exceptional. Kalevi, I wish you the best birthday ever! – **Nelly Mäekivi, University of Tartu**

Dear Kalevi, With best birthday wishes, I thank you for your never-ending ideas and your support! – **Andres Luure, Tallinn University**

Meetings with Kalevi are never dull. Whatever is being discussed, his enthusiasm is genial and infectious. Moreover, he listens with something of the same energy with which he speaks. His writing has a similar character, clear, direct and open. For scholars of biosemiotics who also teach about it, he's the ideal colleague. The images in his texts, perhaps reflecting those in his mind, are simple powerful and productive, even when the reader might want to question them. For example, his "Ladder, tree, web: The ages of biological understanding" helped me to expand my view of what biosemiotics could actually contribute to making, my discipline, psychology, more realistically integrated with the wider sciences of living systems. It helped my students too. He will be, in fact he already is, recognised as one of the principal founders of the postmodern age of biological understanding. Long may he continue to lead the way! – **John Pickering, Warwick University**

Kalevi Kull has significantly expanded the boundaries of Tartu semiotics. This concerns both the expansion of its geography – Kalevi Kull is one of the creators and founders of the Copenhagen-Tartu school – and the introduction of a fundamentally new problem into its paradigm. The phenomenon of life, which is based on various semiotic processes, is an important challenge not only for biosemiotics, but also for general semiotics. Kalevi Kull is a scientist who is in the prime of his creative powers, an excellent teacher who has brought up a whole galaxy of students, as well as a wonderful colleague. Dear Kalevi, I wish you a long and fruitful life! – **Mihhail Lotman, Tallinn University – University of Tartu**

Kalevi surprises everyone, even his old friends, with his deep knowledge of almost everything in biology. His polymath knowledge, combined with unquenchable energy, explain why Kalevi is so highly valued as a co-author of a scientific monograph in biosemiotics, or a panelist around a discussion table on Estonian green transition. Keep going the same way, dear friend! – **Andres Koppel, friend and ecologist, Tartu, Estonia**

Dear Kalevi, I wish you happy birthday and many years of further creative thinking! – ***Boris Uspenskij, National Research University “Higher School of Economics”, Moscow***

Flocks of birds taking off and returning  
Rivers flooding the meadows and drying  
These nights when nightingales sing  
In the hackberry trees, remember.

Sound of cold snow or icicles dripping,  
Beaver splashing or humid smell of soil,  
Calling out to owls under meteor shower,  
These values to cherish, rejoice.

Thank you  
for inspiring us to think and to understand,  
for encouraging to be positive,  
for teaching to see the colors of the world.  
Happy birthday, dear Paps!  
We wish you a lot of healthy, energetic, and productive years!

Yours,  
***Tuule, Tiia, Meelis, Karli***





# **An extensive bibliography of the works of Kalevi Kull from 1982 to 2022<sup>1</sup>**

Compiled by Riin MAGNUS, with the assistance of several friends

## **In English**

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<sup>1</sup> We have titled this contribution an “extensive”, rather than a “comprehensive” bibliography of Kalevi Kull, for while every effort has been made to make this bibliography as comprehensive as possible, we feel far from certain that it is yet 100% complete, given Kalevi’s prodigious output over the last four decades, written in several languages and appearing in journals and periodicals, not all of which have left a digital trace. Thus, the final complete and comprehensive bibliography of Kalevi Kull still awaits to be written – but these 500+ entries, we fill, should be representative enough of the man and his thinking... at least until his 80th birthday, when we hope to try again! (Editors’ note.)

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