

# Konrad Lorenz's epistemological criticism towards Jakob von Uexküll

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**Abstract.** In the work of Lorenz we find an initial phase of great concordance with Uexküll's theory of animals' surrounding-world (*Umweltlehre*), followed by a progressive distance and by the occurrence of more and more critical statements. The moment of greater cohesion between Lorenz and Uexküll is represented by the work *Der Kumpan*, which is focused on the concept of companion, functional circles, social Umwelt. The great change in Lorenz' evaluation of Uexküll is marked by the conference of 1948 *Referat über Jakob von Uexküll*, where Lorenz highlights the vitalist position of Uexküll. In the works of the years after World War II, the influence of the Estonian Biologist greatly diminishes, even though Lorenz continues to express his admiration for particular studies and concepts of Uexküll. References to Uexküll's work are less and far in between, while the difference is highlighted between the uexküllian theoretical frame (vitalistic) and Lorenz's one (Darwinian and evolutionist). The two main critical lines of argument developed by Lorenz in this process are the biological and the epistemological one: on the biological side Lorenz heavily criticizes Uexküll's vitalism and his faith in harmonizing forces and supernatural factors (which leads to concepts such as the perfect fusion of all biological species in their environment and the absence of rudimentary organs). On the epistemological side, Lorenz, arguing from the point of view of the critical realism, accuses Uexküll of postulating the separateness of all living beings, a separateness which is due to the Kantian idea that every subject of knowledge and action is imprisoned in the transcendental circle of its representations and attitudes.

## Introduction

The aim of this article is to highlight the relationship between the ethology of Konrad Lorenz and the philosophy and work of Jakob von Uexküll. The works of Lorenz with references to Uexküll have been divided into three groups. These three groups will be discussed separately.

- 1) The first group includes the works written before World War II: *Der Kumpan in der Umwelt der Vögel* (Lorenz 1935), partially translated into English as *Companionship in Bird Life* in 1957 (Lorenz 1964[1935])<sup>1</sup>, and *Die angeborenen Formen möglicher Erfahrung* (*The Innate Forms of Potential Experience*; Lorenz 1943).
- 2) The second group is formed by a single yet very relevant work, the unpublished conference paper *Referat über Jakob von Uexküll*, of 1948.
- 3) The third group includes the writings dating to the period after World War II, specifically *Die Rückseite des Spiegel* (published in 1973; translated into English as *Behind the Mirror* in 1977), *Die Naturwissenschaft vom Menschen: eine Einführung in die vergleichende Verhaltensforschung: das "russische Manuskript"* (1944–1948) (published in 1992 and translated into English in 1996 as *Natural Science of the Human Species: An Introduction to Comparative Behavioral Research. The "Russian Manuscript" 1944–1948*) and *Vergleichende Verhaltensforschung: Grundlagen der Ethologie* (published in 1978; revised English translation as *The Foundations of Ethology* in 1981).

Bigger part of this paper will be dealing with the writings of the pre-war period and the 1948 conference, as these are the works where Uexküll's influence is particularly evident.

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<sup>1</sup> When they are available, the author quotes from the English translations of Lorenz' works. As far as *Companionship in Bird Life* is concerned, the author has modified the original translation (Lorenz 1964) in one point (he has rendered "*Funktionskreis*" with "functional circle" instead of "functional cycle").

## The pre-war period

The first group of the works we are going to deal with includes those written during the pre-World War II period, specifically *Companionship in Bird Life* (Lorenz 1964[1935]) and *Die angeborenen Formen möglicher Erfahrung* (Lorenz 1943). Before analysing the writings in detail, it is important to understand the personal relationship between the two scientists. The young Lorenz knew in depth the main works written by Uexküll in the years after World War I, especially *Umwelt und Innenwelt der Tiere* (Uexküll 1909), and began an intense correspondence with the Estonian biologist. In 1935 Lorenz dedicated the dissertation *Companionship in Bird Life* to Uexküll, for his 70<sup>th</sup> birthday. In the same year, when he was already fairly well known in Germany, Lorenz was contacted by Uexküll, who was at the time the director of the Institut für Umweltforschung of the University of Hamburg and wanted to appoint him as his successor.

Lorenz responded positively to the proposal but in the end did not obtain the position because of reasons that were beyond both his and Uexküll's control — among which was the position the two scientists took towards the National-Socialist regime (see Taschwer, Föger 2001). The respect between the two scientists was mutual, as is proved by the wide space Uexküll devoted to Lorenz's experiences with birds in *Streifzüge durch die Umwelten von Tieren und Menschen* (Uexküll 1934)<sup>2</sup>. World War II and the death of Uexküll interrupted this relationship.

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<sup>2</sup> The book was published in 1934 and translated in English in 1957 as *A Stroll Through the Worlds of Animals and Men* (see Uexküll 1964). In the preface to this work, Uexküll writes: "Zu besonderem Dank sind wir Dr. K. Lorenz verpflichtet, der durch Übersendung der Bilder, die seine reiche Erfahrungen an Dohlen und Staren erläutern, unsere Arbeit sehr gefördert hat" ("We are particularly grateful to Dr. K. Lorenz, who sent us the images that illustrate his rich experiences on jackdaws and starlings and in this way stimulated our work"; Uexküll 1956 : 22). The preface was written in December 1933.

Let us now analyse the 1935's work *Companionship in Bird Life*. In the *Introduction*, Lorenz illustrates the main topic of his work: what does it mean to perceive an object? And, especially, what is the difference in general between the perception of objects in animals and men? These questions draw directly from the premises of Uexküll's work, which can be defined as a *phenomenological-representational perspective*; the definition intentionally refers to Helmuth Plessner, who stated that Uexküll's scientific program was to give a "phenomenology of the living behaviour" of animals (Plessner 1975: 63). In particular, Uexküll's phenomenology of animal behaviour seeks to answer the question: "how do the acting animals feel and perceive the surrounding-world (Umwelt)?"<sup>3</sup> This question can be approached from two different points of view: trying to find the amplitude of the perception of the animal (for example trying to determine the spectrum of light or colours that the animal perceives), or trying to establish the category substratum of the perception, the formal structure in which the data of perception are organized. The first perspective deals with the quantity of environment that the sensory organs open up for the animal, the second (the one Uexküll is more interested in) aims at defining the way in which the mind of the animal interprets the perceived world. This issue raises many more crucial interrogatives in Uexküll's work, about the way the animal unifies the sensory data, the elements it associates, the characters he gives priority to and those it considers as secondary. And again: is the animal's mind capable of creating representations of the action in which the animal is involved? Can the animal understand the aim of its action?

We will not discuss these issues in depth, but it is useful now to remember what forms the background of Uexküll's thought: a careful

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<sup>3</sup> In order to maintain a clear terminological distinction between "environment" in the ordinary sense and Uexküll's concept of *Umwelt*, for the latter (besides the German word) the author uses the term "surrounding-world". The choice is based on the terminology adopted in the English translation of Uexküll's *Theoretische Biologie* (see Uexküll 1926: 127).

and original re-reading of Kant's opus. Uexküll firmly believed that through his work "die Biologie hat endgültig Anschluss an die Lehre Kants gewonnen, die sie in der Umweltlehre durch Betonung der entscheidenden Rolle der Subjekte naturwissenschaftlich ausbeuten will" (Uexküll 1956 : 13)<sup>4</sup>.

The Kantian language (through the mediation of Uexküll) is clearly recognizable even in the introduction to *Companionship in Bird Life*, where Lorenz writes that "what we ordinarily call an object [*Gegenstand*] is created in our environment in somewhat the following way: we gather the stimuli that come to us from one thing, and refer them collectively to that thing [*Ding*] as a common source of stimulation" (Lorenz 1964: 83). At the same time the stimuli perceived and unified in the thing are projected in the outside space in a shape that Lorenz describes as their "inherent spatial coherence", which "gives a 'thing' its objective unity" (Lorenz 1964: 83). As Lorenz notes, this mutual belonging is at the basis of the definition of object in Uexküll: "an object is that which *moves in unison*" (Lorenz 1964: 83). The organization of perception typical to men is therefore the objective-unitary grasp of things, which in this way appear to be characterized by identity and persistence in time.

The behaviour of animals, Lorenz continues, appears instead not to be based on the identity of the perceived object: in different life-situations the object could not be recognized as identical. This is something that is striking to the human observer especially when the thing which is not recognized — the offspring, the brother, the partner, etc. — bears an intrinsic similitude to the perceptive subject (see also Lorenz 1931). In *Companionship in Bird Life*, Lorenz deals specifically with the recognition of single objects in life-situations:

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<sup>4</sup> "Biology has definitively found a connection to Kant's theory, which it wants to apply, in a naturalistic perspective, to the theory of the surrounding-world (Umweltlehre) by stressing the decisive role of subjects".

Judging from their general behaviour, we must credit higher animals with an objective grasp of their world. One might expect that they also had an objective picture of the objects of all their instinctive activities. This should be particularly true where the object of a reaction is a fellow member of the species. Strangely enough, however, this does not seem the case. I venture to offer an explanation of why it is even less a biological necessity for fellow members of the species to retain their subjective identity as releasers in various functional circles than it is for the object of other instincts. (Lorenz 1964: 86)

It is extremely interesting that here Lorenz employs the term functional circles [*Funktionskreis*], which is typical of Uexküll. Uexküll uses this term to describe the set of sensory and behavioural connections that are corresponding to a biologic function: the main functional circles in the life of animals are local movement, the search for food, the flight or defence from an enemy, the search for a sexual partner, reproduction and (in the social species) the interaction with the fellow members. In Uexküll, the functional circles are separate worlds, in which different objects and qualities of the natural environment are highlighted.

The differences between the species are noticeable; in general, the functional circles are richer or poorer of environment elements (which Uexküll divides in *receptor cues* and *effector cues*, *Merkmale* and *Wirkmale*) according to animal's degree of complexity. There are animals which have a simple vital cycle, for example ticks who live the majority of their lives in a very poor sensory world: they can spend in a bush up to several years waiting for a determined sensory element (body warmth, odour of butyric acid) coming from a mammal passing by. From this moment on the tick will experience a series of receptor cues and effector cues, which are never more than two at the same time but are sufficient to complete the action (Uexküll 1956: 136)<sup>5</sup>. In other

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<sup>5</sup> See also Uexküll's *Theoretische Biologie*, in which the author drew a methodological advice for human observers from the species-specificity of perception: "die Sonne, die einen Mückenschwarm tanzen läßt, ist nicht die

animal species instead, especially the social species, the functional circles — feeding, courtship, reproduction, hierarchical interaction with fellow members — happen quickly in sequences, without interruptions, and they are richer in sensory elements and elements for the action.

In *Companionship in Bird Life*, Lorenz examines five functional circles of the social kind which can be observed among birds: these are centred on the parent companion (*Elternkumpan*), on the brother/sister companions, on the fellow members of the group, on the sex companion, on the offspring. Lorenz highlights how to every relationship situation corresponds on the one side a peculiar constellation of emerging stimuli brought by the fellow members, and on the other side the setting in motion of releasing schemes (*auslösende Schemata*, according to Lorenz's terminology) and innate behaviours (among them the mechanism of imprinting that finds here one of its first extensive expositions). For example, the parenting behaviours are induced in parents by the peculiar colour at the inside of the beak of the offspring or by their specific movements (Lorenz calls them the 'begging' movements); the same happens in the sequences of behaviour linked to courtship and reproduction, in the hierarchical relations between social animals, etc.

Basically, what interests Lorenz in this work is the problem of the recognition of the individual. It is in order to explain this point that Lorenz uses Uexküll's categories: "Jakob von Uexküll coined the term *Kumpan* (companion) for a fellow member of the species who is only treated identically in one functional circle, and I have adopted this term for the present paper" (Lorenz 1964). In fact, Lorenz, too, be-

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unsere, sondern eine Mückensonne, die ihr Dasein dem Mückenauge verdankt. Wir können von der Mückensonne aber nichts aussagen, bevor wir die Planmäßigkeit der Mückenwelt durchschaut haben" ("the sun that makes a swarm of mosquitos dance is not our sun, it is a mosquito-sun whose existence is due to the eye of the mosquitos. We cannot say anything about the mosquito-sun till we have understood the teleology of the mosquito-world" Uexküll 1928: 233).

believes that the functional circles are different according to the different features highlighted in the study of the functional circles in social life, where the emerging features are represented by the characters of the fellow member: colours, acoustic signals, body movements. There can be situations in which a bird, interacting with the same fellow member but in different functional circles (for example first in the functional circle of hierarchical relations, afterwards in courtship), might react in the two situations to a different combination of stimuli and might not be aware that it is interacting with the same individual.

We shall now turn our attention to the 1943's work *Die angeborenen Formen möglicher Erfahrung*. It is necessary to keep in mind the different nature of this work: if *Companionship in Bird Life* was an exposition and an interpretation of data gathered during Lorenz's experimental research on birds, in which the author used concepts from Uexküll, *Die angeborenen Formen der möglichen Erfahrung* is an epistemological naturalistic work, which tries to explain the categories of human thought according to an evolutionary scheme, showing its phylogenesis and its adaptation value.

Lorenz wrote *Die angeborenen Formen der möglichen Erfahrung* in the brief period while he was working at Königsberg University. Lorenz was called to teach at Königsberg in 1940, as the professor of human psychology. That a Darwinian biologist and researcher of animal behaviour would be appointed the professor of human psychology was seen by many as a sign of the times. The main supporters of the prestigious appointment were the philosopher Baumgarten — who appreciated Lorenz for his scientific merits but also, pragmatically, for his agreement with the dominant cultural atmosphere — and Heirich Harmjanz, who was responsible for the SS office of biology, race and heredity. The story behind Lorenz's appointment is complicated. Because of the *Nazifizierung* of Austrian universities two professors had been transferred to Wien, so in the German city there were some positions available, one of which gave an opportunity to the Austrian scientist (for further details see Taschwer, Föger 2001).



To return to the main theme of this paper, it is important to notice that during the Königsberg years Lorenz uses significantly less Uexküll's definitions, while the concepts present in the *Gestaltpsychologie* on the one side, and his own ethological concepts on the other become more and more important for him. In an important passage of *Die angeborenen Formen der möglichen Erfahrung*, Lorenz takes a critical stand towards the ideas of the Estonian biologist:

Was wir nun in geduldiger Einzelforschung zu leisten haben, ist ein genaues Studium und ein Vergleich der Funktion möglichst vieler und möglichst verschiedener Weltbildapparaturen, in ganz ähnlicher Methodik, wie es die von Uexküllsche Umweltforschung in Angriff nahm, aber mit genau umgekehrtem Ziele, denn wir wollen ja eben jener einzigen, allen Subjekten gleicherweise zugeordneten außen-subjektiven Wirklichkeit näherkommen, deren Existenz von der Umweltelehre Uexkülls grundsätzlich geleugnet wird. (Lorenz 1943: 353)

What we have to carry out now, with a patient work of case by case research, is an exact study and a comparison of the functions of as many and as different apparatuses of world-images as possible, with a method that is very similar to Uexküll's research on the surrounding-world, but with the inverse goal. In fact, we want to go closer to that unique reality which is extra-subjective and common to every subject, and the existence of which is basically denied by Uexküll's theory of the surrounding-world.

Where does the contrast that Lorenz highlights between the research practice on the Umwelt and the theory of the Umwelt come from? The problem can be summed up in the following way. According to Lorenz the reason why Uexküll emphasises the radical separation between the surrounding-worlds of the various animal species (by surrounding-world here he means the set of functional circles of each species) is that he is, following Kant, convinced that the reality behind the perception of features of the various species is impossible to grasp in itself. The cognitive structures of each species are therefore a barrier limiting the "world" which, as a consequence, does not correspond to

the true reality, nor is the same for animals belonging to different species. Lorenz criticizes them in Uexküll, but those arguments were already arguable in Kant: both accept that a thing can exist in itself and be unknown, and both limit the subject in a circle of transcendental representations (about his view on Kant, see also Lorenz 1941).

The theoretical foundation of Lorenz's critique is Darwin's theory of evolution by natural selection, which Uexküll did not support; Lorenz instead based his ethology on it (and, curiously enough, on Nicolai Hartmann's ontology; see Berlingeri 2009). According to Lorenz, the relation between the cognitive structures of the living beings, no matter how complex they might be, and the extra-subjective reality is the result of a gradual and uninterrupted process of adaptation. This relation, after all, depends on the fact that an eventual loss of touch with the extra-subjective reality would be sanctioned by the danger of extinction for the species in which it happens. To give an example, for Lorenz the category of cause — which according to Kant is "prescribed" to the world by the subject, who shapes the reality — cannot be unrelated to the real relations between objects and events of the extra-subjective world, as the behaviour based on this category runs the risk to lose effect. Lorenz's criticism to the thesis of the "isolation of the *Umwelten*" based on Darwin's evolutionary theory is clear in the 1943's essay where, nevertheless, it is directed more towards Kant than Uexküll (Lorenz 1935: 352).

This is perhaps explained by the circumstances of the essay's redaction (Lorenz taking the University seat which was once Kant's), but also by Lorenz's interest in maintaining a good relationship with Uexküll. To develop this critique in depth would have meant for Lorenz to deal directly with Uexküll's anti-darwinism: if the Estonian biologist believed in the different surrounding-worlds of each species, this was due not only to the influence of Kant, but also to his view of animal species as fixed and unchanging realities. Where Uexküll deals with the origin and differences between animal species, he limits himself to attributing them to the general teleology of nature and its

“active factors”, the *Baupläne* or plans of construction (which also perform the task of keeping the mutual relationship among species in harmony). In case of a direct confrontation on these issues, the distance between the two scientists would have fully surfaced and the gap would have been impossible to fill. It might even be that Lorenz did not want to draw attention to Uexküll's anti-darwinism as Darwin was an important part of the Nazi ideology.

### **The conference of 1948: Referat über J. v. Uexküll**

The unpublished oral paper *Referat über J. v. Uexküll*, of 1948, is the only work Lorenz devoted to a complete evaluation of the biological key concepts of Uexküll.<sup>6</sup> The paper is pervaded by Lorenz' idea that in Uexküll there is a stark contrast between the practice of field research [*Umweltforschung*] and the theory of the surrounding-world [*Umweltlehre*]. It is worth quoting its incipit, which resumes well the complexity of Lorenz's attitude towards Uexküll:

Uexküll — Vitalist der Vitalisten, wütender Idealist, Kantianer — eigentlicher Feind der Naturforschung, denn “die Umwelt jedes Menschen ist getrennt von der jedes anderen”, eine Art Monadologie [...], und wenn man seine philosophisch-weltanschauliche Sachen liest, stellt man als Naturforscher sämtliche Haare auf. Aber mit jenem Doppelleben, das idealistische Naturforscher so oft haben, ist er auf der anderen Seite der exakteste physiologische Experimentator, den Sie sich vorstellen können. — Eigensinnig bis leicht spinnend, genial bis in die Fingerspitzen. (Lorenz 1948: 1)

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<sup>6</sup> The paper, which is dated 19.X.1948, is conserved in the Lorenz-Archiv of the KLI-Institute for Evolution and Cognition Research of Altenberg (Austria). The paper, an unpublished transcription by Hilde Fürnsinn of a seminary by K. Lorenz, has been presented by Klaus Taschwer (see Mildemberger 2005: 431).

Uexküll — vitalist among the vitalists, ferocious idealist, Kantian — a proper enemy of the natural research, because “anyone’s surrounding-world is separated from that of any other”, a kind of monadology [...], and when you read his philosophical works on his world view, you become horrified as a natural scientist. But, with the doublesidedness that idealistic-minded natural scientists frequently have, on the other side he is the most exact researcher in physiology that you can imagine. — Stubborn to the point of being slightly crazy, genial till the fingertips.

The whole paper is built on the alternation of criticisms and favorable statements. On the one hand Uexküll is described as a vitalist and an enemy of the descendance theory — “Anpassung gibt es bei ihm nicht, weil es keine Entwicklung, keine Stammesgeschichte gibt für ihn, alle Tiere sind Gegebenheiten für ihn — daher der Bauplan ein Schöpfungswunder, an der er nicht näher rührt und herankommt”<sup>7</sup> (Lorenz 1948: 1) — on the other we find the precise exposition of Uexküll’s main biological concepts, from that of the functional circle to the notion of Umwelt. Lorenz is an enthusiastic admirer of the latter part of Uexküll’s work. In this paper he even claims that if Uexküll had only elaborated that part, it would be possible to consider him a sort of “good behaviourist”. Its vitalistic approach, writes Lorenz,

hindert aber Uexküll nicht, jetzt fabelhaft genaue Beschreibungen von Tieren zu geben, kausalanalytisch. Wenn man das Vorherige nicht gelesen hat, glaubt man, das ist ein vollständig objektivierender Behaviorist, nur dass er nicht ganzheitsblind ist, sondern das Tier in seiner Anpassung in die Umwelt sieht. (Lorenz 1948: 3)

does not prevent Uexküll from giving incredibly exact descriptions of animals in a causal-analytic way. If you hadn’t read the previous part, you could believe that he is a wholly objective-minded behaviourist,

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<sup>7</sup> “According to him there is no adaptation, because there is neither development nor phylogenesi s for him; all animals are fixed entities for him — for this reason the construction-plan is a miracle of creation to which he won’t get closer with his enquiry”.

with the only difference that he is not blind to the entirety, but can see the animal in his adaptation to the surrounding-world.

This statement is extremely meaningful. We know that Lorenz criticizes harshly American behaviourism, accusing it of studying animals only in a lab, forcing them to behave outside their natural environment and, as a consequence, to develop only mechanical reactions to artificial stimuli and no true behavioural sequences (see Lorenz 1996: 199–201). Acknowledging Uexküll's research as a development of modern science means, in other words, to consider it a step further, beyond the limitations of behaviourism; and this is due to the fact that Uexküll was able to understand the animal in its entirety as a living organism in relation to their surrounding-world.

But let us come to the main critical issue of Lorenz's paper. Here we find what was missing in the work of 1943: a direct and explicit connection between the Uexküll's Kantianism and the consequences that this philosophical position has on his scientific work. Besides defining Uexküll's idea of the separation of the *Umwelten* as a kind of "monadology", in the *Referat über J. v. Uexküll* of 1948 Lorenz says that Uexküll's image of the world is "multi-mundane":

Uexküll glaubt nicht an die Außenwelt, glaubt, dass die Sonne nicht wirklich am Himmel steht, sondern jeder seine eigene Sonne hat, er leugnet die Existenz einer absoluten Welt. "Multimundanes Weltbild". Welt eines Tieres: das, was in seinem Zentralnervensystem repräsentiert ist von den Außendingen. (Lorenz 1948: 4)

Uexküll doesn't believe in the external world, he believes that the sun isn't really in the middle of the sky, so that everyone has his own sun, he denies the existence of an absolute world. "Multimundane world view". World of an animal: the part of the external things which is represented in its central nervous system.

But the most indicative statement is perhaps the following:

Uexküll behauptet, die höheren Gehirne kennen die Welt nicht nur durch eine Zeichensprache, sondern spiegeln sie im Räumlichen ihres Gehirns wider — das ist die “Gegenwelt”. — Wenn ein Tier räumlich einen feindlichen Gegenstand sieht, flieht er nicht mehr von einem Reiz, sondern von einem Bild des Dinges. Der motorische Teil des Nervensystem hat seine Beziehung zum Umwelt verloren. Erregungen nur mehr aus zweiter Hand, aus einer neuen Erregungswelt zwischen Umwelt und Zentralnervensystem. Er reagiert auf das Bild. (Lorenz 1948: 5)

Uexküll claims that the superior brains know the world not only through a language of signs, but they reflect it again in the spatial dimension of their brain — this is the “opposite world”. — When an animal sees a hostile object in a spatial way, it does no more run away from a stimulus, but from the image of a thing. The motoric part of the nervous system has lost every connection to the surrounding-world. Now there are only stimulations of second hand, they come from a new stimulatory-world between surrounding-world and central nervous system. It [the motoric part of the nervous system] reacts to the image.

It is clear here that what Lorenz disagrees on is not the idea of the semiotic relation between animal and Umwelt (for the term *Zeichensprache* see Uexküll 1909: 192), but the hypothesis that the use of a language of signs leads to the formation of a second world which is separated from the natural environment. Again we find the idea that the neural and cognitive structures of each species, and the stimuli they mediate, are a kind of a subjective prison from which living beings cannot break away. At the end of the paper, Lorenz is very critical towards Uexküll’s idea that “die Reize der Umwelt umschließen das Tier wie eine Mauer gegen die ganze fremde Welt”<sup>8</sup> (Lorenz 1948: 6):

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<sup>8</sup> “The stimuli of the surrounding world enclose the animal like a wall against the whole alien world”.

Ich würde sagen: Durch diese Umwelt erfährt [das Tier] eben von der Welt, wenn auch ein ziemlich grobes Modell. Tiere und Menschen haben ein verschiedenes, aber doch übereinstimmendes Modell. Wie Uexküll trotzdem auf den absurden Gedanken kommen kann, an der Realität und relativen Merkbarkeit der Außenwelt zu zweifeln, ist mir unverständlich und ärgert mich so wahnsinnig. (Lorenz 1948: 6)

I would say: it is exactly through this surrounding-world that [the animal] experiences the world, even if it is quite an approximative model. Animals and men have a different yet overlapping model. How, despite of this, Uexküll could conceive his absurd doubt about the reality and the relative perceivability of the external world, this is not understandable for me and irritates me so much.

In synthesis, in the *Referat* of 1948 Uexküll is appreciated for his work as a researcher on the field, and heavily criticized for both the epistemological consequences of his theory of Umwelt, and his teleological approach. The criticism we are more interested in, and that has to be examined more closely in the conclusion of this paper, was specifically directed to that part of the theory of Umwelt which enclosed all subjects into the walled confinement of their own representations and categories.

## The post-war period

In *Behind the Mirror*, Lorenz (1977) gathers a large part of the materials previously published in *Die angeborenen Formen der möglichen Erfahrung* (1943). The choice to rework the essay of 1943 was due to two reasons: on the one hand, the aim was to add the data of the more recent scientific experiments and, on the other, there was a need to “clean” the terminology that was too near to the Nazi language. We cannot discuss here Lorenz’s participation in the Nazi ideology but it appears pretty clear that in 1973 Lorenz could not publish chapters entitled *Die Selektion der Unerwünschte* [*The selection of the un-*

desired] or *Der Wert der Reinrassigkeit* [*The value of the purity of the race*].

In the general reorganization of the work, the references to Uexküll are maintained (for example the definition of the subject as “what moves in unison” in the environment) but they are only used to strengthen other argumentations. Lorenz also avoids exposing his main criticism of Uexküll: the accusation of “solipsism” (which is, instead, directed again towards Kant). The general impression is that Uexküll is less important in this work, both as a positive model for field research and as a negative referent.

Starting with *Natural Science of the Human Species: An Introduction to Comparative Behavioral Research (The Russian Manuscript 1944–1948)* and in the following essays, Lorenz criticizes Uexküll more directly, as a vitalist and supporter of finalistic harmonical causes, in the name of a contingent view of evolution. Lorenz bases his critique on two main arguments.

Firstly, as he never explains the origin of species, Uexküll never gives reasons for their extinction. Lorenz agrees with Uexküll on one important issue: those who believe that the natural selection lead to an increasing perfection in adapting, indicating that superior organism and men would be more adaptable than inferior species, make a fundamental mistake. Against this mistake, which is not due to Darwin, but to those who tried to interpret his work, Lorenz writes:

The *species-preserving* purposivity of higher organism is no greater than that of the lowest forms of life, and Jakob von Uexküll was entirely justified in stating that all living organisms are *equally well* adapted to their environments. In fact, one could more justifiably reverse the widespread view and state that the survival of higher forms of life is generally *more* threatened than that of lower organism. (Lorenz 1996: 93)

Once the faith in nature’s teleology is lost, Uexküll’s thesis on the reciprocal relation of adaptation (*Einpassung*) between organism and environment is still true but it is limited by the possibility of extinction



(caused by a sudden change in the climate or because of the arrival of a new species).

Secondly, a similar critique is directed by Lorenz to the “doubtlessly exaggerated claim” of Uexküll according to which

there are in fact no rudimentary organs. When faced with such tenets, which are always guided by the vitalistic belief that all living organisms are occupied by a directing “factor”, one must always remember the principle stated above, that even *nonfunctional features* may be preserved as long as they present no threat for the survival of the species. (Lorenz 1996: 129)

In both arguments we find an attempt at arguing those harmonizing teleological factors with Darwin's thesis of accident and contingency of evolution, testified both by the possibility of extinction and by the presence of “attempts” at evolving (the rudimentary organs) which have not yet a value as adaptation.

In the same work there is also a very relevant remark about what can be referred to as the ambiguity of Uexküll. According to Lorenz, the Estonian biologist was a typical vitalist in his theoretical thought, and a crypto-mechanist in his empirical work as a researcher:

It is a question of belief whether one feels in one's heart that there is something supernatural that is immune to research. As a researcher, however, one must be a mechanist. Even the great vitalistic natural scientists, ranging from Müller and Bernard to Uexküll and Driesch, arrived at their greatest and most enduring achievements in cases where they approached life processes with purely mechanistic working hypotheses. As researchers, they too were mechanists! (Lorenz 1996: 195–6)

In order to reach a correct understanding of this quotation, it is necessary to point out that here mechanicism does not coincide with reductionism: Lorenz thought that biology cannot be reduced to a branch of physics or chemistry, but what he wants to underline here, is the importance of explaining biological phenomena with scientifically observed prior causes (excluding every teleological factor).

Even in *The Foundation of Ethology*, which is a seminal work defining the scientific autonomy of ethology, we find a clear example of the distinction Lorenz makes between a good *practice of field research* and a bad *theory of the surrounding-world*. Here the praising references to Uexküll's work (Lorenz defines classic the research on tick, on sea urchin and on jellyfish) and the criticism to vitalism coexist. In order to discuss this second aspect, following quotations are very helpful:

Every "learned behavior" does contain phylogenetically acquired information [...]. Whoever denies this must assume a prestabilized harmony between the environment and the organism to explain the fact that learning — apart from some instructive failures — always reinforces teleonomic behavior and extinguishes unsuitable behavior. Whoever makes himself blind to the facts of evolution arrives inevitably at the assumption of a prestabilized harmony, as have the cited behaviorists and that great vitalist, Jakob von Uexküll. (Lorenz 1981: 10)

The assumption made by Kuo (1932) and other behaviorists, that the mechanisms of learning "know" without any previous experience what is and what is not useful for the organism, contains the covert postulation of a prestabilized harmony to which the great vitalist, Jakob von Uexküll, overtly testifies. If one does not believe in miracles — and a prestabilized harmony would be one such — it remains simply incomprehensible where, for example, within the aquarium in which the young stickleback was reared — among the diversity of its animal and plant world — the information should be contained that the rival to be attacked is red on the ventral side. (Lorenz 1981: 58)

As we have seen in order to define the vitalistic faith in final causes which "tuned" organism and environment, Lorenz uses strong expressions like "miracles" and "prestabilized harmony". For Lorenz, the gap between him and Uexküll is now impossible to bridge.

## Conclusion

In the work of Lorenz we find a moment of great concordance with Uexküll, which can be traced back to the first half of the 1930s, followed by a progressive distance and by the occurrence of more and more critical statements. The moment of greater cohesion between Lorenz's and Uexküll's research approach is the pre-war period, and especially the work *Der Kumpan*, which is focused on the concept of companion, functional circles, *Merkmale* and *Wirkmale*. This essay was written at the time when Lorenz was hoping to become a member of the Institut für Umweltforschung directed by Uexküll; perhaps this was the reason why the differences between the two scientists (which were already evident as Lorenz proclaimed his Darwinism since the beginning of the 1920s) were not exposed by Lorenz. The conference paper of 1948, *Referat über Jakob von Uexküll*, marks a great change in Lorenz's evaluation of Uexküll, and in the years after World War II the influence of the Estonian biologist is greatly diminished, even though Lorenz persists in stressing his admiration for particular studies of his. References to Uexküll's work are less and far in between, while the difference is highlighted between the Uexküllian theoretical frame (vitalistic) and Lorenz's one (evolutionist, Darwinian but not reductionist).

As far as the critical attitude of Lorenz towards Uexküll is concerned, we can identify two tendencies which have to be kept distinct. The first is a biologic one: Lorenz heavily criticizes Uexküll's vitalism and his faith in harmonizing forces and supernatural factors. The second is an epistemological one: Lorenz, arguing from the point of view of critical realism, accuses Uexküll of postulating the separateness of all living beings, a separateness which is due to the Kantian idea that every subject of knowledge and action is imprisoned in the circle of its transcendental representations. The literature of the last years has mainly stressed the first aspect of the critical attitude of Lorenz

towards Uexküll (see Mildenerger 2005), while I have chosen to focus on the second one.

Let us go deeper into this point, in order to develop some final remarks. The epistemological critique based on the separateness of the species-specific sets of cognitive structures is an integral part of the process by which Lorenz's ethology acquires an autonomous conceptual foundation of its own. Uexküll's idea of the Umwelt as a harmonious set of perception features (*Merkmale*) and features for action (*Wirkmale*), for example, is substituted by the ethologic concept of instinctual behaviour in animals, caused by the interaction of specific stimuli on the one hand, and genetically transmitted uses on the other.

As a general trend, after the war Lorenz shows a diminished interest towards the study of the representative-phenomenological aspect of animal behaviour. The attention to the ways in which the sensory stimuli are organized (for example the recognition of the identity in objects on the part of the subject) leaves space to the objective study of the provoking stimuli and of the physiological states. The aims of research are unrelated to the discussion of how the animal *categorizes the perceived objects*; Lorenz concentrates on establishing the "values-limits" of stimuli and the greater or smaller reaction of animals in various natural and artificial situations. This might lead us to think that he began to consider the problem of categorization as unessential or unsolvable. It is quite important, at this stage, to take into account the brief essay of 1963, *Haben Tiere ein subjektives Erleben?* [*Do Animals have a Subjective Experience?*], in which Lorenz excludes the possibility of understanding the subjective experience of animals from the observation of their behaviour.<sup>9</sup>

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<sup>9</sup> If this animal behaviour research perspective becomes more and more secondary in Lorenz's writings, his concern with a similar problem (the phenomenological approach to complex animal behaviour) will still be a major part of his work. In order to explain the ability to recognize and differentiate the behaviour schemes of various species, Lorenz uses in all his works the *Gestaltpsychologie*; see for instance Lorenz 1981, in particular the second chapter of the work.

In this essay, the ethologist appears to be open only to two “indirect approaches” to the interior life of animals. The first one is the empathic approach, according to which man can be empathic to superior animals and “feel [*fühlen*]” the meaning of their expression movements. In a similar way to that of the Austrian psychologist Karl Bühler, Lorenz defines this proximity mode of knowledge as “evidence of the other” and stresses how this becomes weaker as the evolution level of the animal becomes lower (Lorenz 1963: 369–388 and 371; Bühler 1922). The second indirect approach is “the empiric analysis of the neuronal processes in our own mind in connection to [specific] subjective experiences” (Lorenz 1963: 361) and in looking for similar results with animals. According to Lorenz this research is the field of study of neurobiology. He considered highly promising the research of Von Holst about the neuronal substratum of the single instincts and of the sequences of instinctive actions (Lorenz 1942: 380–388 and 346–349, 390–393, 395). Both approaches are radically different from Uexküll’s theory about the inner world of animals and also from his concept of empirical practice (*Umweltforschung*).

As we have seen, one of the crucial moments in the building of the critical attitude of Lorenz towards Uexküll is the conference paper *Referat über Jakob von Uexküll*, where what we have called the epistemological criticism found its first precise formulation. Yet in this paper Uexküll’s idea of a sign-based relation between animal and environment was still accepted; what Lorenz refused was the solipsistic result of the use of the signs by the living beings (depending on the Kantian basis of Uexküll’s perspective). After the paper of 1948, the behavioral relationship between animal and environment appears less to be based on a *Zeichensprache* than on the reaction to stimuli. At least as far as the instinctive behavior and the lower animals are concerned, the problem of the sense of a behavioral situation is gradually replaced by that of the genetic programming of the behavioral mode itself.

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### **Эпистемологический критицизм Конрада Лоренца по отношению к Якобу фон Юкскюллу**

В работах Конрада Лоренца можно выделить начальный период, где он вполне соглашается с теорией умвельта Юкскюлла. Затем следует постепенный отход и все более критические заявления. Момент наибольшего согласия между Лоренцом и Юкскюллом представляет работа Лоренца *Der Kumpen*, которая сосредоточивается на понятиях партнера, функционального цикла и социального умвельта. Большую перемену в отношении Лоренца к Юкскюллу знаменует доклад 1948 года *Referat über Jakob von Uexküll*, где Лоренц указывает на виталистские убеждения Юкскюлла. В работах после Второй мировой войны влияние эстонского биолога на Лоренца заметно уменьшается, хотя Лоренц и восхищается отдельными работами и концептами Юкскюлла. Ссылки на работы Юкскюлла редки, ярко освещена граница между теоретическими взглядами Юкскюлла (витализм) и Лоренца (дарвинизм и эволюционизм). Критика Лоренца развивается в основном по двум направлениям: биологическое и эпистемологическое. В плане биологии Лоренц гневно критикует

витализм Юкскюлла и его веру в гармонизирующие и сверхъестественные силы (что приводит к идеям о полной адаптации организмов к своей среде и отсутствия рудиментарных органов). В эпистемологии Лоренц (с точки зрения критического реализма) обвиняет Юкскюлла в том, что тот утверждает, будто все живые существа неизбежно различены друг с другом. Эта точка зрения опирается на идею Канта о том, что каждый субъект знания и действия неизбежно является пленником трансцендентального цикла своих репрезентаций и отношений.

### **Konrad Lorentzi epistemoloogiline kriitika Jakob von Uexkülli adressil**

Konrad Lorentzi töödes näeme esmalt algusperioodi, kus ta on väga päri Uexkülli omailmateooriaga (*Umwelthehre*), millele järgneb aga järk-järguline kaugenemine ja üha kriitilisemad avaldused. Lorentzi ja Uexkülli vahelise suurima üksmeelsuse hetke esindab Lorentzi *Der Kumpan*, mis keskendub kaaslaste, funktsionaalsete tsüklite ja sotsiaalse maailma mõistetele. Suurt muutust Lorentzi hinnangus Uexküllile tähistab 1948. aasta ettekanne *Referat über Jakob von Uexküll*, kus Lorenz juhib tähelepanu Uexkülli vitalistlikele seisukohtadele. Teise Maailmäsõja järgsetes töödes väheneb eesti bioloogi mõju Lorenzile olulisel määral, ehkki Lorenz väljendab jätkuvalt oma imetlust Uexkülli teatud uurimustööde ja mõistete suhtes. Viited Uexkülli töödele on harvad ning rõhutatakse erinevust Uexkülli (vitalistliku) ja Lorentzi (darwinistliku ja evolutsionistliku) teoreetilise raamistiku vahel. Lorentzi kriitika käib peamiselt kahes liinis: bioloogilises ja epistemoloogilises. Bioloogilisel poolel kritiseerib Lorenz vihaselt Uexkülli vitalismi ja tema usku harmoniseerivatesse jõududes ning üleloomulikesse faktoritesse (mis toob endaga kaasa sellised ideed nagu kõikide bioloogiliste liikide täiuslik sulandumine oma keskkonda ning rudimentaarse organite puudumine). Epistemoloogilise poole pealt süüdistab Lorenz, lähtudes kriitilise realismi vaatepunktist, Uexkülli selles, et ta väidab, et kõik elusolendid on üksteisest päästmatult lahus seisvad — seisukoht, mille aluseks on Kanti idee, et iga teadmise ja teo subjekt on päästmatult oma esituste ja suhtumiste transsendentaalses tsüklis vangis.





