

## ANIMAL AND HUMAN “UMWELT” (MEANINGFUL ENVIRONMENT)— CONTINUITIES AND DISCONTINUITIES

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### **Abstract:**

Cassirer’s philosophy of symbols is applied to Uexküll’s concept of “Umwelt” (meaningful environment). I argue that the vast domain of human symbolism extends the human Umwelt far beyond the Umwelts of animal species. We humans live and act in many intersecting symbolic worlds, one of the most important of which is our ethical Umwelt. I claim that against the background of ecological disaster and the uncontrolled accelerating incursion of our financial institutions and biotechnological industry into planetary ecology, the term “Umwelt” can no longer simply mean the part of our surroundings that is meaningful to us. Given the current severe ecological crisis, Cassirer’s idea of an “ethical Umwelt” must also be expanded, and an ethical imperative must be integrated into our understanding of “environment.” In other words, for us today the meaning of the term “Umwelt” or “meaningful environment” should be synonymous with “the living world to be saved” or “sacred environment.”

**Key words:** Umwelt, environment, meaningful environment, sacred environment, subject, signs, symbols, animal symbolicum, Uexküll, Cassirer, Whitehead.

### **1. Uexküll’s concept of *Umwelt***

In his *Theoretical Biology*, first published in 1920, Jakob von Uexküll provided a highly developed worldview that might be described as “biological Kantianism.” Starting from Immanuel Kant’s intuitions about the subjectivity of space, time, causality, and apperception, he suggested a unique approach to elementary biological concepts such as

“organism,” “perception,” “environment,” “evolution,” and “adaptation” which radically differed from Darwinism and Neo-Darwinism, as well as from the work of all influential theoretical biologists up to the present time. The concept of “Umwelt” was introduced in Uexküll’s famous book *Umwelt und Innenwelt der Tiere* (Umwelt and Inner World of Animals) in 1909. There he makes a clear distinction between “Umgebung,” which I translate as “surroundings,” and Umwelt (1909, 117, 196, 249, 252; 1973, 320). Those relevant features of the physical surroundings that are represented in the organism with respect to its self-preservation and reproduction constitute its Umwelt. An organism implicitly incorporates within its organization information about those aspects of its surroundings that are specifically relevant, i.e. meaningful, to its self-preservation.

Uexküll considers animals as *subjects*, which in virtue of their structure select stimuli of their Umgebung and respond to each in a specific way. These responses have certain effects on the Umgebung, and these again influence the stimuli. In this way “a self contained periodic circle” arises, which Uexküll calls “the function-circle of the animal” (1926, 126). The sum of the stimuli affecting an animal’s sense organs builds “a world in itself” (ibid.). The stimuli build “certain indications, which enable the animal to guide its movements, much as the signs at sea enable the sailor to steer his ship” (ibid.). Uexküll calls “the sum of the indications the *world-as-sensed*” (ibid.). The animal itself is a world for itself—the *inner world* (ibid.). The inner world is built up by the processes in the animal’s nervous system. The third world, the *world of action*, consists of the actions of the animal towards a part of its

Umwelt (ibid. 127). *The Umwelt of the animal consists of its world-as-sensed and its world of action*, which “together make a comprehensive whole” (ibid. 127).

The indications of which the world-as-sensed consists are not mere copies of features of external entities. Rather they are constructed in a non-trivial process as spatially, temporally, and spatiotemporally localized features of the perceived world.

Many indications are combined into a *thing*. A thing is a coherent unit of indications that occupies a moment and a place or a direction in space. Animal and human subjects synthesize things unconsciously (ibid. 93). Things do not occupy extended groups of moments—they do not endure. They are events rather than persistent entities. The unconscious creative process also creates another kind of entities—*objects*. An object is an enduring thing, a thing extended in time. Objects constitute higher unities than things (ibid. 98). Objects can be involved in lawful causal relations. Uexküll calls those objects that possess a *framework* (Gefüge) which merges their parts into an organized whole *implements*. Implements are objects in which “the parts stand in the same relation to the whole as the individual sounds to the melody” (ibid. 103). Implements are organized wholes. They might be artificial or natural entities. The only natural implements that Uexküll knows are organisms, parts of organisms (cells, tissues, organs), and groups of organisms.

Things, objects, and implements are the three kinds of entities that constitute the world-as-sensed and the world of action of both humans and most animals. According to Uexküll, things, objects, and implements are differently complex products of one and the same unifying process, the so-called *apperception process* (ibid. 78). The apperception process lies at the root of all perception (ibid. 15):

Whatever the perception, the activity is of the same kind; different qualities are constantly being associated into unities. The power of the subject (Gemüt) that exercises this apperceptive activity is forever creating new structures; in its very nature, it is a formative force (Bildungskraft). (ibid. 16)

Uexküll created a biology of subjects. He claimed that the laws forming our attention and thus creating the Umwelt of our own subjectivity can also be recognized in animal subjects. Uexküll makes clear that the apperception process, although lawful, cannot be mathematically described. Thus biology

cannot be reduced to physics. Following Kant, Uexküll considers the subject to be the non-localizable unity of apperception. The apperception process unfolds lawfully, governed by *a-priori* forms that determine the synthetic process of perception. For that reason the apperception process can be considered the central category of subjectivity. In this sense it is comparable to the striving of actual occasions to complete themselves as subjects in Whitehead’s metaphysics. Both Whiteheadian actual occasions and Uexküllian apperception processes are synthetic activities, or, more aptly, *agents of concretization*.

From a process philosophical point of view, however, an essential question arises: Is there *creativity* in Uexküll’s apperception processes? In his *Theoretical Biology*, the terms “creativity,” “spontaneity,” and “freedom”—so basic in Whitehead’s thought (1979)—do not appear. Of course, one may object that Uexküll’s intellectual closeness to Kant suggests that he implicitly thinks of the apperception process as a spontaneous activity. For Kant spontaneity is a cognitive faculty. It is the autonomous ability of the subject to form concepts, which makes thinking possible. As a self-determined factor of cognition, spontaneity makes human freedom possible. Freedom is a faculty of practical reason, which means that it can be assigned only to subjects, which are able to make moral judgments.

To conclude, from a Kantian perspective it is impossible to assign spontaneity and freedom to subjects that lack the ability to operate with symbols, and thus to create and use concepts. The activity of an Uexküllian subject is entirely predetermined by *a priori* constitutive factors of experience, and is therefore totally restricted. For this reason, Uexküll’s biology cannot account for creativity in the common meaning of the term.

## 2. Cassirer’s understanding of the human as *animal symbolicum*

In his book *An Essay on Man*, published in 1944, Ernst Cassirer considers Uexküll to be “a defender of the principle of the autonomy of life” (1944, 41): “Life is an ultimate and self-dependent reality. It cannot be described or explained in terms of physics or chemistry” (ibid.). Uexküll’s primarily epistemological approach to biology, according to which animals and humans are subjects that build “a world in itself,” emphasizes the *mediatedness of cognition* (1926, 126). This idea, together with the introduction of the apperception process as a syn-

thetic activity governed by *a priori* forms, was bound to attract Cassirer's attention, since he was strongly influenced by the mathematically-scientifically oriented Neo-Kantian "Marburg School."

However, with respect to human cognition, Cassirer expands Uexküll's function-circle by a component, "which appears to be the distinctive mark of human life" (1944, 42). In humans, between the "world-as-sensed" and the "world of action" we find a "third link," which is the world of symbols (ibid. 43). The human lives "in a new *dimension* of reality," in a "symbolic universe," parts of which are language, myth, art, and religion (ibid.). He "cannot see or know anything except by the interposition of this artificial medium" (ibid.). Thus "instead of defining man as *animal rationale* we should define him as an *animal symbolicum*" (ibid. 44).

Non-human animals understand and use signs. Nevertheless, from Cassirer's perspective we must make a distinction between signs and symbols. Animals with highly developed nervous systems are able to express emotions such as rage, terror, desire, playfulness, and pleasure by means of gesture. But *animal communication lacks symbols, which are signs with an objective reference or meaning* (ibid. 48). According to Cassirer, "(t)he difference between *propositional language* and *emotional language* is the real landmark between the human and the animal world" (ibid.).

This difference, which makes humans the only "symbolic species" (Deacon 1997) on earth, also characterizes the specific difference between human and animal intelligence. As Cassirer argues, animals possess "a practical imagination and intelligence, whereas man alone has developed a new form: a symbolic imagination and intelligence" (ibid. 52).

Cassirer highlights three crucial differences between human language and animal usage of signs. *Firstly*, symbolization is "a principle of *universal applicability*," since everything can be denoted (ibid. 54). Other than signs used or interpreted by animals, which represent specific entities, situations, or emotions, symbols are not restricted to particular cases. *Secondly*, a symbol is "extremely variable, ..." (whereas) a sign or signal is related to the thing to which it refers in a fixed and unique way" (Cassirer 1944, 56). Whereas any one individual sign or signal refers to a certain individual entity or process, a specific idea or thought may be expressed by using quite different symbols or combinations of symbols. *Thirdly*, human language is able "to isolate rela-

tions—to consider them in their abstract meaning" (ibid. 59). By using an adequate symbolism, humans are able to abstract from particular entities and to study their spatial and other relations to a degree, which is far beyond animal intelligence. Geometry and algebra are the classical examples of humans' ability to study universal relations in abstraction from related entities. Without the preliminary step of human language, mathematics would not be possible.

A direct result of the ability of humans to focus on abstract spatial relations is the abstract perception of space. Unlike animals, which live in their individual concrete "perceptual space," humans are able to conceive the idea of "abstract space" or "symbolic space" by a very complex process of thought (ibid. 64f.). Since Newton, physics has been based on the idea of abstract or mathematical space, which should not be confused with the space of our sensual experience. Abstract space is an entirely homogeneous extension that is a fiction of the human mind: it does not represent any physical or psychological reality. Cassirer considers the "points and lines of the geometer ... (to be) nothing but symbols for abstract relation" (ibid. 66).

Besides the experience of space, human symbolisms radically influence our experience of time as well. "When dealing with the problem of organic life," says Cassirer, "we have, first and foremost, to free ourselves from what Whitehead has called the prejudice of 'simple location.' The organism is never located in a single instant" (ibid. 72). The momentary state of an organism cannot be described without taking that organism's history into consideration and without referring to its future. Cassirer understands memory to be a general function of all living beings, meaning that the organism preserves in its body material traces of past events, and that these traces influence its future reactions. He makes clear, however, that human memory is something quite different. Unlike memory in animals, human recollection cannot be described as an ideational return of past events as a faint copy of former experiences. It is rather "a rebirth of the past; it implies a creative and constructive process" (ibid. 74). Human memory is a *symbolic memory*, which is "the process by which man not only repeats his past experience but also reconstructs this experience. Imagination becomes a necessary element of true recollection" (ibid. 75).

For an appropriate understanding of human relation to time, the dimension of the future is even

more crucial than the dimension of the past. Anticipation of future events and even preparation for future actions is an important factor in the life of animals with highly developed nervous systems. In humans, however, “(t)he future is not only an image; it becomes an ‘ideal’” (ibid. 78). Only humans are able to conceive of a *theoretical* idea of the future. Our symbolic forms enable us not only to expect the future, but to upgrade it to an “*imperative* of human life” (ibid.). Cassirer calls our *symbolic future* a “prophetic future” because it is best expressed in the life of the great religious prophets (ibid.). These religious teachers did not simply foresee future events or warn of future evils. *Their prophecies were the exact opposite of auguries:*

“The future of which they spoke was not an empirical fact but an ethical and religious task. ... Prophecy does not simply mean foretelling; it means a promise. ... Here too man’s symbolic power ventures beyond all the limits of his finite existence. But this negation implies a new and great act of integration; it marks a decisive phase in man’s ethical and religious life” (ibid. 78f.).

### 3. Human Umwelt—an ethical imperative

The human Umwelt does not merely have a threefold structure—“world-as-sensed,” “world of symbols,” and “world of action”—but rather these three dimensions indissolubly interpenetrate one another. Kant’s famous slogan “intuitions without concepts are blind” anticipates Cassirer’s insight that we cannot even see anything except by the interposition of symbols. Our conceptual denotation of objects essentially influences our perceptual experience of them. To be an animal symbolicum means to perceive the world through abstract “organs” formed by millennia-old cultures. This symbolic mediateness necessarily increases the distance of human intellect from what Uexküll calls the “world-as-sensed” and the “world of action.” Our highly entangled symbolic forms not only allow for understanding our world, *they also restrict our comprehension of what we perceive and how we affect our Umwelt.* Paradoxically, this distance from our Umwelt has made possible for us the extreme extension of both our world-as-sensed and our world of action through the aid of artificial devices, such as telescopes, microscopes, and particle accelerators. The development of these material devices is based on

our most powerful, because most universal, instruments—our concepts<sup>1</sup>—which can be invented only within advanced symbolic structures.

The vast variance of our world of symbols extends the human Umwelt far beyond the Umwelts of animal species, which are limited by their sensual perceptions. All theoretical and technical disciplines, all forms of art, and all political discourses constitute a meaningful world, and hence an Umwelt. Thus we all live and act in many intersecting symbolic Umwelts, each of which is inhabited by a huge number of abstract concepts. One of the most important symbolic worlds is our *ethical Umwelt.*

Our symbolic Umwelts of physics, chemistry, and biology have made the infinity of space and time objects of our scientific research. They have made it possible for us to think systematically about the vastness of space, the past and origin of the universe, and the evolution and origins of life. However, our abstract, purely symbolic access to these areas of physical actuality does not guarantee that we *understand* the symbolized entities and processes. It was not by chance that German Neo-Kantian philosopher Heinrich Rickert introduced a distinction between *understanding* (Verstehen) and *explaining* (Erklären). Experience of value and meaning is the *conditio sine qua non* for understanding. Hence, entities and processes that do not have any value or significance for us cannot be understood, but merely described or explained (Rickert 1929). From the perspective of Edmund Husserl’s phenomenology, we may say that we understand only beings and processes which are part of our *life-world* (Lebenswelt), or the realm of our experiences and intuitions (1970, 123-135). From Rickert’s and Husserl’s point of view, we *cannot* say that we understand physical and biological entities and processes, which we can explain by applying our abstract symbolisms if they do not belong to our life-world. Understanding the explanations of scientists is not the same as understanding the beings that the explanations are about.

Uexküll divides our visual area into the “visual space” and the “remotest plane” (1973, 21). Within the visual space we are able to see objects stereoscopically, and thus to have depth perception of them. In other words, we only perceive our spatial distance from objects if they are within our visual space. The outer limit of our visual space is the remotest plane. If objects are beyond our remotest plane, we are not able to estimate which of them is

<sup>1</sup> I owe this idea to my student René Pikarski.

closer to us and which is further. We perceive such objects as though they were placed on the inner side of the same spherical surface, the so-called “celestial sphere.” All celestial bodies appear to move on that sphere. In direct analogy to Uexküll’s distinction between visual space and space beyond our remotest plane, we may also separate our symbolic processes into those inhabiting our “space of understanding” and those operating beyond our “remotest plane of understanding,” that which marks the beginning of a vast area of knowledge that may be called the “area of mere explaining.” Only in the former case can we be confident that we understand the beings and processes upon which we base our symbolisms, whereas in the latter case we should say that we can only explain them. Viewed in this light, we should not think that we understand the essence of entities which we denote by scientific symbols such as “electrons,” “quarks,” “quantum processes,” “gravitational waves,” “dark energy,” “black holes,” “genes,” and “proteins” without them being a part of our embodied, experiential world, as is the case with trees, humans, rocks, mountains, oceans, storms, feelings, thoughts, and many of our own organic processes.

The entirely abstract concepts of contemporary physics, life sciences, technology, and especially biotechnology are clearly outside of what I have called our “space of understanding.” The fact that we successfully operate with abstract symbols in our scientific languages proves only that we have learned the abstract rules of their application; it by no means shows that we understand the nature of the represented entities, let alone the complex relations between them. The symbolic systems of contemporary nano- and biotechnology, to most inventors of which the concept of life-world doesn’t mean anything, allow for the manipulation of natural beings without having even the faintest idea of the tremendous distance between their nature and our explanations of them, since those entirely abstract concepts are clearly outside of what I have called the “remotest plane of understanding.”

Unfortunately, this negative aspect of symbolization—which haunts not only science and technology, but also politics, mainstream Anglo-American philosophy, and neoliberal economics—seems to escape Cassirer’s attention. Of course, in 1944 it was not nearly so obvious as it is today that our ignorance of the distance between our abstract symbolisms and the nature of the symbolized entities and processes—the basis of what Whitehead so accurately

described as the “fallacy of misplaced concreteness” (1979, 7)—can be so destructive. Today we have to understand that explaining should not be confused with understanding, and that the horizon of our life-world grows incomparably more slowly than our ability to act outside of our “space of understanding.”

#### 4. Conclusion: Sacred environment—a Whiteheadian perspective

Against the background of ecological disaster and the uncontrolled accelerating interpenetration between financial institutes and biotechnological industry, the term “Umwelt” cannot have the same meaning that Uexküll gave to it over a hundred years ago. Today “Umwelt” can no longer simply mean the part of our surroundings that is meaningful to us. In today’s German language, “Umwelt” means “environment.” However, in different discourses “environment” has different meanings. From the scientific point of view of theoretical ecology, both the rainforests of Earth and the dunes of Mars are environments. But *what is at stake today is the rescue and preservation of the living Umwelt of the earth* and not the “terraforming” of Mars that is propagated by technocratic transhumanists. Given the current severe ecological crisis and against the background of Cassirer’s idea of an “ethical Umwelt,” an ethical imperative must be integrated into the term “environment.” In other words, for us today the meaning of the term “Umwelt” or “environment” *should* be equal to “the living world to be saved.” This world has spatiotemporal extension. Its spatial extension coincides with the terrestrial biosphere. Its temporal extension entails the past and, most notably, the future of the biosphere, which includes the future of humanity. The emphasis, however, must lie on the next decades, because in that short period of time it will be decided whether our biosphere survives. The term “the living world to be saved” is an intrinsically political concept laden with strong ethical intentions. *What this term refers to is symbolized only in order to be saved and preserved because it is indispensable and at the same time is in severe danger.* From this point of view, the concept of Umwelt/environment should not be applied to other planets or space colonies. In our extremely critical present age it is important to outline the concept of “Umwelt” as an *earth-centered* or *geocentric concept*, because what is at stake is the rescue of *this* world, in which we live *now*. We have to get rid of the technocratic temptation to think of possible ter-

raformed “biospheres” on other planets as if this would be just a matter of scientific knowledge, power, and time.

The concept of Umwelt/environment, as I understand it, has to be reinterpreted in the light of Cassirer’s pioneering concept of the “prophetic future.” As said above, prophecies are not about future events, but are about *promises, the fulfilling of which is an ethical task*. This, however, I quote again, “implies a new and great act of integration.” What else should this integration be today than the integration of science, technology, economy, and ethics? Cassirer’s concept of *prophetic future* implies the reconciliation of the symbolic Umwelts of science, industry, and the financial sector with what I have called above an “ethical Umwelt.”

This integration requires a view of nature formed by a *new mental closeness or intimacy of understanding* as a counterbalance to the emotional distance of scientific explanations. *Understanding*, as Rickert said, *evolves out of the experience of value*. In order to understand living nature and not just explain it, we have to ascribe to living beings intrinsic value; that is, they should not be valued for the sake of their contribution to some desired end, but for their own sake. The term “ethical Umwelt” refers also (but not only) to future living beings, including humans, as having intrinsic value. Whitehead’s metaphysics provides the best philosophical foundation for this unprovable but nevertheless healing presupposition (Whitehead 1979). In stark contrast to process thought, the current mainstream scientific worldview supports the implicit reduction of natural beings and processes to passive worthless elementary entities devoid of any kind of striving and feeling. This is the ideal foundation of neoclassical economics, which considers the economy to be an isolated *perpetuum mobile* (Muraca 2010, 42) and operates based on the abstraction that different forms of capital—for example natural resources, financial capital, human capital, and know-how—are quantifiable, and therefore convertible, and thus interchangeable (ibid. 37-39, 46). The “moral community” of current mainstream western science, politics, and economics—this means the community for which interests should be protected, values are important, knowledge is taken seriously—is restricted to a continuously shrinking “elite” of western individuals living in the present. In diametrical opposition to this ideology, Whiteheadian, Bergsonian, and other process philosophical worldviews provide the

intellectual foundation for a new economics that is based on the principles of non-convertability of different forms of capital (Daly 1996, 51; Muraca 2010, 45-52), and the extension of moral community in order to include future generations, indigenous people with local knowledge, animals, plants, and landscapes of the present and the future (Muraca 2010, 173-181, 243-247).

Process-philosophical economic and scientific theories embed economy and science in the biosphere. They consider the extended moral community to be a part of an ethical Umwelt. The inclusion of morality in the idea of Umwelt transforms the latter to a *sacred Umwelt* or *sacred environment*. Whiteheadian metaphysics makes obvious that the value of future living beings is not a future value, but a present value: the future has its value now.

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