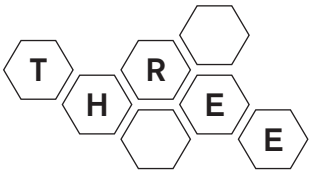

TECHNICS OF NATURE AND TEMPORALITY

Uexküll's Ethology

> Science finds in the insect a world that is closed to us. There is no possibility of divining or even suspecting the impressions produced by the clash of the cymbals upon those who inspire it. All that I can say is that their impassive exterior seems to denote complete indifference. Let us not insist too much: the private feelings of animals are an unfathomable mystery.
>
> –J. Henri Fabre, *The Life of the Grasshopper*

This chapter continues some of the ideas introduced previously but with a special eye on Jakob von Uexküll's ethology—and the conceptual "animal" the tick. Through the tick we are able to discuss more in-depth notions of temporality and affect and realize that Uexküll provided important insights into a dynamic notion of nature relevant to wider theoretical applications of media ecologies.

One of Eugene Thacker's key ideas in his take on swarms, networks, and multitudes was to differentiate between effects and affects.[1] Whereas an effect analysis would stabilize the entities involved and regard them as predefined, an affect approach would focus precisely on the micromovement that is formative of the terms involved. In the context of networks, network effect analysis creates a spatial view of a network, an overarching survey of individual entities acting and reacting on a spatial gridlike structure, and an affect view of networks searches for the temporal becomings of the networks. In my take (already elaborated in *Digital Contagions*) such becomings are always multiscalar, and the affects of network culture involve not only technology but also a whole media ecology of politics, economics, and, for example, artistic creation.

ETHOLOGICAL MAPPING OF MILIEUS OF PERCEPTION

Jakob von Uexküll was already enjoying high prestige during the 1920s and 1930s after having published works such as *Umwelt und Innenwelt der Tiere* (1909, 2nd edition 1921) and *Theoretische Biologie* (1920, 2nd edition 1928). Both introduced his ideas that the Kantian constitutive spheres of space and time, *Raum und Zeit,* were not so much absolutes but rather special conditions of variation found in all animals and entities that sense. As he wrote at the end of the 1930s, "Kant had already shaken the complacent position of the universe by exposing it as being merely a human form of perception. From there on it was a short step to reinstall the Umwelt space of the individual human being in its proper position."[23] Johannes Müller, despite his appreciation of Kant, had inaugurated a certain crumbling of Kantian apperception. In a similar manner, Uexküll wanted to continue the Kantian project into the life-worlds of animals as well but to push it further. In his mix of the physiological psychology of Hermann von Helmholz (where he saw the founding principle for a perception of things in the intensive qualities of sense organs) and Kant, Uexküll wanted to emphasize the role of the body (and alternative organizations of bodies) in perception as well as in the feedback loop between perception and action. As Jonathan Crary notes, this Kantian unity was shown to be exposed to various kinds of manipulations via the physiological system, and in a similar vein Uexküll, who appreciated Müller as well as Kant, can be thought to show the crumbling of the human apperception via the potentially infinite number of perceptual worlds existing in animals—with the world of perceptions too small or too large to comprehend from the human perspective.[24]

For Uexküll, what defined the objective world was not a single reality disclosed similarly to all its inhabitants but the way we perceive and act in the world. Put the other way round, the way we perceive, valorize, and act in a world defines its objectivity to us. From this perspective, there was no objective time or space but a reality consisting of various differing ways of *contracting* time and space.[25] Needless to say, Uexküll was here repeating the same realizations introduced in physics, modern art (e.g., cubism), and philosophy. He was not the only writer rethinking time and space through the nonhuman, and actually these ideas resonated with many of the emerging ideas in philosophy as well. Indeed, through vari-

ous philosophies of process and radical empiricism, the world of experience was opened up much beyond the human being. Kantian transcendental philosophy of experience was extended to the world of animals and things as well.[26]

Hence, ethological mapping of the perception beyond the human being can be connected to a broader philosophical task of understanding the human being as one singular way of contracting the world and as a specific capacity to signify, exchange, and communicate.[27] What can be seen as early phases of animal ethology were, however, according to Georges Canguilhem, much less focused on temporality and dynamics. Jacques Loeb's and John B. Watson's research into animal behavior was still more akin to the mechanistic (and later behavioralist) understanding of the relationship of bodies and milieus. Here the milieu is seen as determining the organism's pose as part of the milieu, a physical continuation (expressed in the centrality of "reflex" responses) of its surroundings.[28] Entomologists such as William M. Wheeler had grown dissatisfied with the morphological view in studies of animal life and proposed to move toward dynamics of bodies. This stance had something more in common with an ecological or ethological analysis, as Wheeler proposed in 1902.[29]

Uexküll also wanted to distance himself from a physiological and structural understanding of the bodies of animals. Such a mechanistic way of understanding interactions of the bodies and lives of animals did not capture the active, individuating ways of *living* in the world. So instead of seeing animals as mechanistic structures and machines, Uexküll adopted the idea that the simpler animals are, the more potential there is for undifferentiated openness in them. Hence, for Uexküll amoebas were less machines than horses, as the latter are more structurated animals in terms of their development.[30] He understood technology in terms of automation of functions and predetermination, but thought structural openness implied something else. Yet, because Uexküll did not want to succumb to an idealist or vitalist position, he continuously maintained his interest in the idea that the perception and action systems of animals are material and physiologically real.

What an animal perceives *(Merkwelt)* becomes structurally integrated into its action-world *(Wirkwelt).* Hence, the world of an animal is characterized by this functional circle, which integrates an entity into its

environment (or a milieu to other milieus). A tick is in this sense characterized by three modes, three ways of perception/action: it (1) smells a mammal with its olfactory tendency and then drops down from a straw; then it (2) perceives the temperature of the animal and (3) finds a hairless spot where it can stick its nose and draw some blood.[31] According to Uexküll, a physiologist would be content to regard this as a simple machinelike reaction-action pattern that expresses the functional connections between perception organs and the central nervous system. Animal-machines are mechanical entities that interact without the need to add any agencies into the picture. However, Uexküll's account provided a much more dynamic image of nature than that.

What Uexküll implied was that we are dealing not with predetermined objects of nature but with subject-object relations that are defined by the potentiality opened in their encounters. Entities of the world, such as the tick, are only in these relationships of significance and there is no world beyond these relations. As Agamben underlines, adopting Uexküll's example, a laboratory experiment in Rostock where a tick was kept alive for eighteen years in isolation without food demonstrated this. The tick sunk into a dreamlike state of waiting but, without time, a suspended moment. Uexküll's conclusion: no relationships, no world, no time. The world is fundamentally a dynamic one; where relations are temporal and without defining relationships, the world seems to stop.[32] In other words, there is no time "in general," but time is always folded through temporal relations that can be both actual and virtual. The temporality and reality of the world are then enacted through lived relations in a Jamesian manner.

Dynamics afford the structuration. Even though highly structured, a living form is continuously potentially open to its environment, with which it forms a functional circle (what cyberneticians would later call a feedback circle.) Life is a dynamic enterprise that forms through the relations of entities with each other. In a radical posthumanist way, Uexküll never got tired of accentuating that so far we have approached the world through our human, oh-so-human lenses but that there is a panorama of perceptions and ways of approaching the world that are closed to us humans but continuously lived by other life forms:

> Among the animals, with their smaller Umwelt horizons, the celestial bodies are essentially different. When mosquitoes dance in the sunset,

> they do not see our big human sun, setting six kilometres away, but small mosquito suns that set about half a meter away. The moon and stars are absent from the sky of the mosquito.[33]

SPYHOLES INTO THE WORLD

As I explained in chapter 1, animals offered lessons of "nonhuman perception" due to their capabilities to sense, move, and mold the world. The new animal worlds in physiological research and beyond (such as *Alice in Wonderland*–type ideas of Victorian England or the emerging science-fiction genre with its hyperbolic insects from the end of the nineteenth century) presented peepholes or vehicles that transported the human experience to worlds otherwise unperceived. The idea was that we do not know what a potential future mode of life is able to do. This was a very Darwinian idea, expressed in the *Origin of Species,* but was also used by such critics of Darwin as Samuel Butler, who in 1865 speculated on "mechanical creation," writing that "we see no a priori objection to the gradual development of a mechanical life, though that life shall be so different from ours that it is only by a severe discipline that we can think of it as life at all."[34] Exploration was not only part of the geographical travel of the scientists, but a more general mode of tapping into novel worlds of experience and perception.

Hence, in a fitting fashion, the popular and perhaps most celebrated entomologist, Jean Henri Fabre, in 1922 was pronounced the prototypical explorer, "Homer of the Insect World," excavating new environments as had Alice. As one newspaperman wrote of Fabre : "The insect—this 'little animated clay, capable of pleasure and pain'—is to him, as it were, a tiny spyhole through which he looks behind the scenes of the terrible, mysterious universe. His knowledge merely serves to deepen his sense of wonder and awe."[35] Just as the quests of the early entomologists created a new mapping of the superempirical (or subempirical to humans) worlds of insects, the novelists of the imaginary were able to invent worlds not seen, heard, or thought before, as in the case of Alice's plunge into Wonderland.

In the 1920s context, these new perceptual worlds, "spyholes," curiously resonate with the discourses of film and media technological deterritorialization of human perception.[36] New technological apparatuses,

as noted in the first chapter, were able to capture even wavelengths of sensation that would otherwise elude the human senses.[37] As Agamben explains, Uexküll's work is closely related to quantum physics and the artistic avant-garde movement in its valuation of the primacy of variation, an "unreserved abandonment of every anthropocentric perspective in the life sciences and the radical dehumanisation of the image of nature,"[38] and thus a continuous interest in an infinite possibility of parallel worlds.

But Uexküll was not keen on parallels between animals and machines. The animal was at best an imperfect machine.[39] For Uexküll, (media) technologies were still very much mechanistic machines. In a Fordist manner, he thought that machines meant clocks, factories, and blindly repeated processes whose physiological equivalents were the reaction-time experiments from the nineteenth century on.[40] Against this spatializing understanding of technology and physiology (something that, for example, Bergson also criticized), Uexküll proposed a more temporal take, a so-called musical approach to natural technics: animals were not mechanical machines, but they seemed to express technics understood as an art of perception and orientation, as do the bees who are able to coordinate on a field toward certain key forms of openness and closedness found in flowers.[41] In other words, instead of imposing external meters and measurements on the intensive capacities of animals, we should approach them as creating the measurements by their unfolding with the world. Animals create worlds as an unfolding not unlike the temporality of music, whereas physiological understanding of technology seems to be a mere tracing of this creation. This resonated strongly with Bergson's view in *Creative Evolution,* where he noted that even though matter was seen to express an order that was "approximately mathematical," the intensive forces of nature were not reducible to such a tracking. Instead, nature was a creative evolution without finality, a radically non-human-centered becoming.[42]

Curiously, Martin Heidegger picked up on Uexküll's points in his meditations on instruments, animals, and humans. To a certain extent, Heidegger was following ideas similar to those of Uexküll and even Bergson. The animal is different from machines in its dynamic nature, its temporal unfolding. The organs of an animal are not instruments in the sense of a machine because the latter are "ready-made pieces of

equipment" and always subject to preregulated forms of action. In addition, as Heidegger said in his 1929 lectures on metaphysics, the machine always needs a creator and an operator.[43] Organisms are radically contrasted to such an inert technology, which shows that Heidegger's idea of technology was very much stuck with the rationalized Taylor-Fordist paradigm of his age. Only organisms are seen as self-reproductive, self-regulating, and self-renewing. Even though there was a radical difference between his view and the Deleuzian and Bergsonian "machinics of nature," when Heidegger wanted to differentiate the animal from the human (the animal is poor in the world, it lacks history and self-consciousness and is not able to exist beyond its factual environment in the way *Da-sein* is able to be in the world), his view of the temporality and processuality of nature stayed in touch with Uexküll. The world is filled with events such as seeing, hearing, grasping, digesting, and so forth, all of which are "processes of nature."[44] Where animals differ from inert matter (such as stones) is in their nature as unfolding events, a behavioral relationship they have with their environment. Insect perception is localized not in the structure of the eye, for example, but in the continuous tension between the capacities of the insect that have formed the physiological eye and the environment as its needed partner in unraveling the perception event. The organs of an animal are not just instruments that follow the prescriptive paths but are bound to the animal's lifespan (to use Heidegger's words) and also to the temporal span of its environment: "Rather the organs are bound into and are bound up with the temporal span which the animal is capable of sustaining as a living being."[45]

Uexküll for his part used the idea of "emergence" to differentiate between the mechanical understanding of structures and the inert forces of physical nature. The Estonia-born ethologist thought an animal is to be considered a dynamic and living entity; it is always more than its bodily mechanism, which is built from the constitutive parts of cells and "formation building orders" *(Formbildungsbefehl)*.[46] Instead, life is music and melody, a curious kind of understanding of material forces that we should now turn to. This resonates with a broader ethological project as well, defined as an analysis of "patterns in time," some of which might elude the human senses and demonstrate alternative perceptions of time and bodily patterns.[47]

MACHINIC ASSEMBLAGES OF NATURE

A key part of Uexküll's "technics of nature" consists of the idea that compositions or aggregates of nature are centrifugal. Although such mechanical machines as watches are always turning only toward their inner principles, which are predetermined and rely on those components (i.e., are centripetal), the "building" of an animal works as a project that always orients away from a center to the world.[48] In *Bedeutungslehre,* a short and lucid explanation of his key ideas from 1940, Uexküll referred to this kind of understanding of technics as a melodic one; in other words, musical ideas of composition act here as the needed "lesson," showing that harmonies are always produced of at least two notes. Notes, punctuation, and patterns form, only together, a contrapuntal relationship both in music and in matter (nature).[49]

Uexküll thought that such melodics can conjoin various kinds of phenomena across scales, as his examples show. The leaves of an oak form a coupling of melodics with raindrops, the leaves themselves acting as a channeling and a distribution machine while the raindrops engage in a compositional becoming with the "living machine" of the oak and its cells. In the animal kingdom, an apt example is the living machine formed by an octopus and seawater, with the water becoming a "carrier of significance" *(Bedeutungsträger)* for the animal, which uses it for its movements.[50] Furthermore, in the world of insects, such couplings, or foldings with the world, are constantly taking place.

The perfect example is the coupling of the spider and its web with the fly. The spider is here referred to as a tailor but one that does not measure the fly with a measuring stick but somehow contains an image *(Abbild)* of the fly of an a priori nature *(Urbild).* A certain perfectness that parallels the previous chapter's focus on insect geometrics is evident here as well. The threads are in optimized composition regarding the size and perceptive capacities of the fly. Weaving the radial threads stronger than the circular threads allows the spider to capture the fly in the web, and the fly with its rough eyesight is not able to perceive the finely constructed threads.[51] As Agamben notes, the "two perceptual worlds of the fly and the spider are absolutely non-communicating, and yet so perfectly in tune that we might say that the original score of the fly, which we also call its original image or archetype, acts on that of the spider in such a

way that the web the spider weaves can be described as 'fly-like.'"[52] In the melodics of nature, entities possess a certain score that defines their affect-worlds, the potential affordances, potentials, or affects they have with the world, and in which the score of the spider and the fly are interlocked at least on a virtual level. One can find the same rhythmics and contrapuntal levels on various scales, from primitive levels of life such as that of amoebas and insects to social life, as Uexküll seemed to hint in his collection of biographical texts originally from 1936, *Niegeschaute Welten* (Unseen worlds): like ants and mosquitoes, counts, barons, and, for example, Neapolitans have their own closed worlds, a pattern that is multiscalar and defining.[53]

Such an idea of technics characterizing the whole of creation can be understood well with the emphasis Deleuze and Guattari placed on Uexküll's ideas. This is what Deleuze and Guattari refer to as a concept of machinic assemblages, the machinics of the world. There is a primary artificiality and technics that characterizes not merely the human historical world but creation in general, a sphere that precedes the division to nature and culture. What Uexküll constantly underlined was the need to see nature and its actors not as structures and predefined categories (species or genus) but as becomings that are dynamically intertwined with their surroundings (not static). In other words, "machines, devices, and technologies of animal and human life, such as spectacles, telescopes, lathes and so on, are to be viewed as 'perceptual tools' and 'effector tools' that are a constitutive feature of the 'worlds' of living things,"[54] as Ansell-Pearson clarifies. In this context Deleuze and Guattari use the idea of associated milieu as a structuration going on across various scales of living entities. Associated milieu works through the dynamics of capturing energy sources, sensing and perceiving relevant materials nearby, and fabrication of compounds based on the perceptions and captures—a responsive gesture toward environment, that is.[55] Drawing directly from Uexküll, the structuration of an animal milieu is seen as a morphogenetic feature that parallels the importance of the form of the animal. That is, even though Uexküll noted the importance of the physiology of an animal in a materialist vein, the structures are active only in their associated milieus:

> Since the form depends on an autonomous code, it can only be constituted in an associated milieu that interlaces active, perceptive and

> energetic characteristics in a complex fashion, in conformity with the code's requirements; and the form can develop only through intermediary milieus that regulate the speeds and rates of its substances.[56]

IMMANENCE AND THE ARTIFICE

The technics of nature relate to the idea of positing a plane of immanence on which the issue of categorical differences between animals and humans, nature and technology is bracketed and the view of affects, movements, and relations among parts is posited as primary. Deleuze (and Guattari) think Uexküll is best read here together with Spinoza in order to create a synthesis of ethological ethics: there is only one nature as a plane of immanence on which variations and interactions take place. In this framework of assemblages, bodies are primarily relations of speeds and slowness, motion and rest and defined by their capabilities to affect and be affected by other bodies. There is a plane of nature on which bodies are articulated as affects (passages between bodies) and change. Living things are singularities composed of relations and intensities, an approach that tries to think of life beyond structure, substance, or constitutive subject-object relationships.[57] Here the primary temporality and metastability of living entities is what characterizes individuals across scales, from the coupling of the tick with mammals to the emerging swarm or the spider and the fly conjoining in a common rhythm. This kind of ontological technics seems to have been, then, already in its emerging context in the early twentieth century, grounded in a new understanding of the primacy of temporality as a structuring force.

It is also worth noting the difference to phenomenological accounts of experience, something that Uexküll's research could also easily be seen to address. Whereas in phenomenology the experience of something is always conceptualized as a relationship between a subject and an object, the Deleuzian idea of a plane of immanence sidesteps this Kantian-Husserlian understanding and looks for the events of experience as constitutive of its participants. This is a field of experience designed for no one in particular, even though actualizing and resulting in actual bodies. This also implies that experience is not limited to one transcendental form of experiencing, such as the human being. This radical variation, or

radical empiricism, was already proposed by William James and can be seen as well illustrating how to move beyond the epistemological problem of how we can know or experience anything beyond our own human form.[58] A multiplicity of real relations are neglected by our perceptions, raising the question of on what level or scale those superempirical relations are experienced.

This was naturally the inspiration and the problem of research into unknown worlds in entomology, the arts, and philosophy, as well as the new technologies: how to grasp (or "prehend") fields of experience that would reach beyond our particular worlds. As one entomologist of the Indian tropic wrote in 1909, the problem was one of translation and transposition:

> The senses, the instincts, the modes of expression of insects are so totally diverse from our own that there is scarcely any point of contact. In the case of mammals, of birds and to some extent of reptiles, we have in the eyes, in the feathers and in the movements, a clue to their feelings, to the emotions that sway them, to the motives that guide their actions; in insects we have none, and the great index of insect feeling, the antenna, has no counterpart in higher animals, and conveys nothing to our uninformed brains.[59]

Heidegger tackled a similar issue as the primarily human faculty of being always beyond oneself (although not denying that animals could not transpose themselves).[60] On a broader diagrammatic level, biology and sciences of physiology tried to construct such planes of inspection on which they could try to track down the intensive qualities of animals and map them as media technologically determined functions. Such experimentation can be seen as in a way trying to construct subjectless spaces of experience, but still remained under a very functional logic of slowing down the uncanny experiences of alien nature.[61] As an alternative to such processes of slowing down, or phenomenological enterprises, one should also keep an eye on the radical difference at the heart of the world. Instead of a relativity of perceptions (phenomenology), we have a continuous reality of relations, as Deleuze underlines, backed up by James. The question is, How can one tune oneself so that a part of that radical difference, the experiences that overwhelm us, would be able to enter our registers of experience? How can one enter a plane of

immanence and open oneself up to durations of animals, insects, stones, matter, technology, etc.?[62] Or, in other words, how can one move toward the horizon of the unliveable and the inhuman forces and nonhuman material intensities and rhythms in contrast to the phenomenological enterprise of what can be experienced as human beings? This means, as Elizabeth Grosz notes, that we must replace Husserl with Nietzsche[63]—and humans with insects, we can add.

In resonance with Uexküll's ideas, Deleuze extends this plane of immanence to a technics of nature, in which "artifice is fully a part of Nature, since each thing, on the immanent plane of nature, is defined by the arrangements of motions and affects into which it enters, whether these arrangements are artificial or natural."[64] This means that we must focus on the affective potentials of animals, human beings, or any other interactional entities, a defining factor of existence as becoming: what affects is one capable of, what can they do, with whom, when, and with what results?

The answers to all of these questions, as Deleuze ceaselessly underlines, are not known a priori but only through experimentation. Hence, he also mentions Uexküll as a great experimenter, one who looked for the potential melodics in nature, from the scale of local interactions to harmonies of nature. The animal (or, if we want to talk on a more general level of becoming, the living entity) is continuously coupled with its environment, stretched through counterpoints such as the plant and the rain, the spider and the fly. It is not a question of a body representing drives, forces, or even ideologies but of intermingling with the world.[65] There is a material connection (beyond consciousness or representations) that the body folds with itself. Bodies always exist via their limits and membranes, points of connection with other bodies across scales. For Deleuze and Guattari as readers of Uexküll, the interior and exterior are intermingled and selected as well as projected through each other, which already echoes the theme of folding as constituent of subjectivity, something that Deleuze elaborates in his book on Foucault written a couple of years later (1986). An individuality is always constituted as a tension or a machination between elements. So even if, as Bergson notes, the technics of animals and insects are immanent to their bodily formations in contrast to the intelligent externalization we find in humans, these technics are in constant tension with an outside, a folding, instead of a self-enclosed system.[66]