Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans: With a Theory of Meaning* (1934)

Abstract

Jakob Uexküll (1864-1944), an Estonian-German biologist who rejected Darwinian biology, shaped the term "Umwelt" (environment) and led the Hamburg Institute for Environmental Research from 1925 until 1940. This excerpt, from a publication in a scientific series for the general public, lays out his idea that the perceptual world of a creature should be the starting point for biological understanding. Uexküll was influential beyond biology, notably in the work of Heidegger and later philosophers and semioticians. Yet he also had a close association with the British-born "völkisch" German writer Houston Stewart Chamberlain and signed the German professors' statement of support [*Kundgebung der deutschen Wissenschaft*] for Hitler in 1933.

Source

Foreword

The present booklet does not claim to serve as the introduction to a new science. Rather, it only contains what one might call the description of a walk into unknown worlds. These worlds are not only unknown; they are also invisible. Furthermore, the justification for their existence is denied by many zoologists and physiologists.

While this assertion will sound odd to anyone familiar with those worlds, it can be explained by the fact that not everyone has access to those worlds. Certain convictions are able to bar the entrance to those worlds so securely that not even one ray of all the splendor that spreads over them can penetrate it.

Whoever wants to hold on to the conviction that all living things are only machines should abandon all hope of glimpsing their environments.

Whoever is not yet an adherent of the machine theory of living beings might, however, consider the following. All our utensils and machines are no more than aids for human beings. Of course there are aids to producing effects [*Wirken*], which one calls tools [*Werkzeuge*], a class to which all large machines belong, such as those in our factories that process natural products and furthermore all trains, automobiles, and aircraft. But there are also aids to perception [*Merken*], which one might call perception tools [*Merkzeuge*]: telescopes, eyeglasses, microphones, radio devices, and so on.

From this one can readily assume that an animal is nothing more than a selection of suitable effect-tools and perception-tools, which are bound up into a whole by a control device which, though it remains a machine, is nonetheless suitable for exercising the vital functions of an animal. This is in fact the view of all machine theorists, whether they are thinking of rigid mechanics or flexible dynamics. Animals are made thereby into pure objects. In so doing, one forgets that one has from the outset suppressed the principal factor, namely the *subject* who uses these aids, who affects and perceives with them.

By means of the impossible construction of a combined effect-perception tool, it is not only in the case of animals that one has stitched together the sensory and motor organs like machine parts (without taking into account their

perceptive and effective functions). One has also gone so far as to mechanize human beings. According to the behaviorists, our sensibility and our will are mere appearance. In the best case, they are to be valued only as background noise.

Whoever still holds the view that our sensory organs serve perception and our motor organs serve the production of effects will also not see in animals simply a mechanical assemblage; they will also discover the *machine operator* who is built into the organs just as we are into our body. But then he will address himself to animals not merely as objects but also as subjects, whose essential activities consist in perception and production of effects.

But then, one has discovered the gateway to the environments, for everything a subject perceives belongs to its *perception world* [*Merkwelt*], and everything it produces, to its *effect world* [*Wirkwelt*]. These two worlds, of perception and production of effects, form one closed unit, the *environment*.

The environments, which are as diverse as the animals themselves, offer every nature lover new lands of such richness and beauty that a stroll through them will surely be rewarding, even though they are revealed only to our mind's eye and not to our body's.

[...]

Environment Spaces

Just as a gourmet picks only the raisins out of the cake, the tick only distinguishes butyric acid from among the things in its surroundings. We are not interested in what taste sensations the raisins produce in the gourmet but only in the fact that they become perception marks of his environment because they are of special biological significance for him; we also do not ask how the butyric acid tastes or smells to the tick, but rather, we only register the fact that butyric acid, as biologically significant, becomes a perception mark for the tick.

We content ourselves with the observation that perception cells must be present in the perception organ of the tick that send out their perception signs, just as we assume the same for the perception organs of the gourmet. The only difference is that the tick's perception signs transform the butyric acid stimulus into a perception mark of its environment, whereas the gourmet's perception signs in his environment transform the raisin stimulus into a perception mark.

The animal's environment, which we want to investigate now, is only a piece cut out of its surroundings, which we see stretching out on all sides around the animal – and these surroundings are nothing else but our own, human environment. The first task of research on such environments consists in seeking out the animal's perception signs and, with them, to construct the animal's environment. The perception sign of raisins does nothing for the tick, while the perception mark of butyric acid plays an exceptional role in its environment. In the gourmet's environment, on the other hand, the accent of significance falls not on butyric acid, but on the perception mark of raisins.

Every subject spins out, like the spider's threads, its relations to certain qualities of things and weaves them into a solid web, which carries its existence.

The relations of the subject to the objects of its surroundings, whatever the nature of these relations may be, play themselves out outside the subject, in the very place where we have to look for the perception marks. Perception signs are therefore always spatially bound, and, since they take place in a certain sequence, they are also temporally bound.

We comfort ourselves all too easily with the illusion that the relations of another kind of subject to the things of its environment play out in the same space and time as the relations that link us to the things of our human environment. This illusion is fed by the belief in the existence of one and only one world, in which all living beings are encased. From this arises the widely held conviction that there must be one and only one space and time for all living beings. Only recently have physicists raised doubts as to the existence of one universe with one space valid for all beings. That there can be no such space comes already of the fact that every human being lives in three spaces, which interpenetrate and complete but also partially contradict each other.

Effect Space

When we close our eyes and move our limbs, these movements are known exactly by us in their direction and their extension. Using our hand, we find our way in a space that one can designate the free space of our movements, or, in other words, our effect space [*Wirkraum*].

We measure these paths out in the shortest steps, which we will call directional steps, since the direction of each and every step is known exactly to us through the sensation of direction or *directional sign*. We distinguish six directions, in pairs of opposites: to the left and to the right, upward and downward, forward and backward.

Thorough experiments have shown that the smallest step we can execute, as measured by the index finger of the outstretched arm, is approximately two centimeters in length. As one can see, these steps constitute no precise measurement of the space in which they are executed. Anyone can convince himself of this imprecision if he attempts, with closed eyes, to make his fingertips meet. He would see that this generally fails and that the fingertips miss each other by a distance of up to two centimeters.

It is of the utmost significance for us that we can retain these paths, once executed, very easily in our memory, which makes it possible to write in the dark. This skill is called “kinesthesia,” which adds nothing new.

However, effect space is not just a space of movement constructed of a thousand crisscrossing directional steps. Rather, it possesses a system by which it is controlled, the well-known coordinate system, consisting of levels that are vertically arranged, one on top of the other. This serves as the basis of all spatial determinations.

[…]

Tactile Space

The basic building block of tactile space is not a unit of movement such as the directional step, but a fixed one, place [*der Ort*]. Place also owes its existence to a perception sign belonging to the subject and is not a configuration dependent upon the matter of its surroundings. [Ernst Heinrich] Weber provided the proof of this. If one places the points of a compass more than one centimeter apart on the nape of an experimental subject's neck, the subject can clearly distinguish between the two points (Figure 9). Each point is located at another place. If one moves the points down toward the back without changing the distance between them, they get closer and closer in the tactile space of the experimental subject until they seem to be at the same place.

Abb. 9 Weber's compass experiment.

There results from this that, besides the perception sign for the sense of touch, we also possess a perception sign for the sense of place, which we shall call local signs. Transferred outward, each local sign delivers a place in tactile space. The areas of our skin that produce the same local sign in us when touched change extraordinarily in size according to the meaning that the part of the skin concerned has for touching. After the tip of the tongue, which feels around the inside of the mouth, the tips of our fingers have the smallest areas and are therefore able to differentiate the most places. As we feel out an object, we confer a fine mosaic of place upon its surface with the touch of our finger. The mosaic of place of the objects of the places of an animal is a gift from the subject to the things in its environment in visual as well as in tactile space, one which is not at all available in its surroundings.

In feeling out [an object], places connect themselves with directional steps, and both serve the process of image-formation.

Tactile space plays a very prominent role in some animals. Rats and cats are completely unhindered in their movements even when they have lost the sense of sight – as long as they have their *vibrissae* [whiskers]. All nocturnal animals and all animals living in caves live predominantly in tactile space, which represents a melding of places and directional steps.

Visual Space

Eyeless animals that, like the tick, have skin that is sensitive to light will most likely possess the same skin areas for the production of local signs for light stimuli as well as for tactile stimuli. Visual and tactile places coincide in their environments.

Only with animals that have eyes do visual and tactile places clearly separate. In the eye's retina, the very small elementary areas—the visual elements—close together. To each sight element there corresponds a place in the environment, for it so happens that one local sign is assigned to each visual element. Figure 10 represents the visual space of a flying insect. It is easy to see that, as a consequence of the spherical construction of the eye, the region of the outside world that strikes a visual element grows larger as distance increases and ever more

encompassing parts of the outside world are covered by one place. As a result of this, all the objects that move away from the eye grow smaller and smaller until they vanish into one place, for the place represents the smallest spatial vessel inside of which there are no distinctions.

In tactile space, the objects' growing smaller does not take place. And that is the point at which visual and tactile space come into competition. If one reaches out one's arm to grasp a cup and bring it to one's mouth, it will become larger in visual space, but its size in tactile space will not change. In this case, tactile space predominates, for the cup's growing in size will not be noticed by an impartial observer.

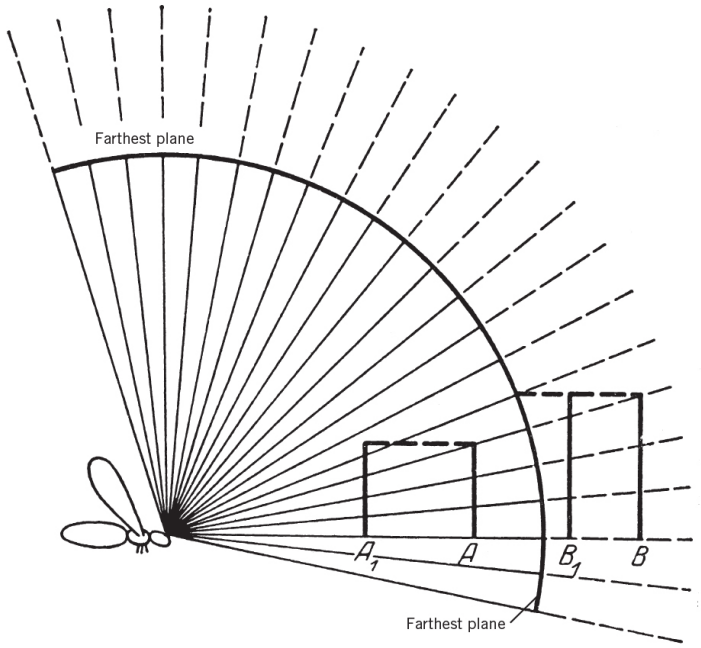

Abb. 10. The visual space of a flying insect.

Like the hand that feels, the eye that glances about spreads a fine mosaic of places over all the things in its environment, the fineness of which depends on the number of visual elements that take in the same segment of the surroundings.

Since the number of visual elements changes extraordinarily in the eyes of different animals, the mosaic of places of their environment must show the same distinctions. The coarser the mosaic, the greater the loss of the details of the things, and the world as seen through a fly's eye must seem significantly coarsened as compared to its being seen through a human eye.

[...]

Source of English translation: Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans: With A Theory of Meaning*, translated by Joseph D. O'Neill. Minneapolis: University of Minnesota Press, 2010, pp, 41-42, 53-55, 60-62. (https://www.upress.umn.edu/book-division/books/a-foray-into-the-worlds-of-animals-and-humans).

Source of original German text: Jakob von Uexküll and Georg Kriszat [illustrator], *Streifzüge durch die Umwelten von Tieren und Menschen. Ein Bilderbuch unsichtbarer Welten*. Verständliche Wissenschaft, vol. 21. Berlin: Verlag von Julius Springer, 1934, pp. VII-VIII, 10-12, 18-21.

Recommended Citation: Jakob von Uexküll, A Foray into the Worlds of Animals and Humans: With a Theory of Meaning (1934), published in: German History Intersections, <https://germanhistory-intersections.org/en/knowledge-and-education/ghis:document-143> [June 30, 2025].