

THE IDEA OF EXTENDED ORGANISM IN 20TH CENTURY THOUGHT

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Over the course of the 20th century, a general pattern of thinking has emerged on several occasions: that the external boundary of an organism – its skin – is not suitable for delineating at least some organismal life-processes; instead, living beings extend beyond themselves into their environments. This general idea has taken on different shapes, beginning with the simple observation that it is frequently difficult to determine where the line between the organism and its environment should be drawn, all the way to the “extended mind” hypothesis in the philosophy of mind, according to which cognitive processes are not all closed within the brain, but rather extend freely into the environment. The paper provides a brief overview of some of the versions of the general conception of „extended organisms“, and of the authors who propounded some of these ideas. For these authors, organisms should not be perceived as self-enclosed units that are closed off from the world by their skin, but rather as extending beyond themselves, or at least as creatures for whom the skin properly speaking lies within life processes, but which in their own turn criss-cross it freely.

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Early in 2009, a book titled *Mapping the Future of Biology* was published, covering those key topics in biology that are bound to come under closer scrutiny in the near future. The authors consider the concept of “organism” to be one of these important topics, which according to them is “a sort of blind spot in today’s biology, since only few explicit definitions of this concept are available” (Barberousse et al 2009: 2). In their introduction to the book, the authors note that the concept of an organism suitable for future biology “should be defined via its activity, namely via biological interactions, and not via its visible borders, like membranes, skin, etc.” (*ibid.*, 8). But a brief glance at history shows that the conception of living beings that does not close them off from the environment but rather perceives them as relational, interactive or even extending to the environment is relatively old, having frequently propped up during the 20th century in various different disciplines, with its roots leading deep into the 19th century. This brief paper mostly surveys earlier examples of the conception of “extended organism” that may be summarised briefly as “organisms are not limited by their skins”.

With respect to the concept of the “extended organism”, something was “in the air” already in the last decades of the 19th century. We may begin with a series of early questions posed about the nature of the self or the ego, presented by the pragmatist philosopher William James. Let us ask, together with him, a series of simple questions, such as: what is our relationship to our clothes – is it to mere

external objects forced upon us by tedious cultural traditions to cover our shameful nakedness? Or do we instead treat them as important parts of ourselves, so that we would rather prefer to have elegant looks in nice clothes, rather than a beautiful body dressed in rags? Or having accomplished something with our own hands and spent a lot of effort on it, pouring all of our skill and energy into it, what would we feel if we were to suddenly lose it? Will we be emotionless and calm, because, after all, nothing part of ourselves was lost? Or will we perhaps feel our very selves shrink and pale, as if a part of ourselves was lost or destroyed? Already these simple questions indicate that the extent of our material body does not coincide with our feelings of what we are as subjects, as selves, as psychic beings. Furthermore: what about our bodies — “are they simply ours, or are they us?” (James 1890: 291). The moment we begin contemplating these exceedingly simple questions, it will be easy to reach the conclusion that “between what a man calls *me* and what he simply calls *mine* the line is difficult to draw” (*ibid.*, 291). In the thought of William James, we have a case where the person, the self or the ego, that psychic subject is not left entirely within the body, so that where the individual body ends the self also ceases; the same „external“ object can, at times, be close to us, and at times more distant; at times, an external thing is part of ourselves, yet at other times merely an object belonging to us, or perhaps we have no relation to it whatsoever.

In its widest possible sense, [...] a man's Self is the sum total of all that he CAN call his, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and his works, his lands and horses, and yacht and bank-account. (ibid., 291, emphasis in the original)

“We see then that we are dealing with a fluctuating material,” James concludes (*ibid.*, 291). Similar thoughts were expressed only a few years earlier by Ernst Mach in his „Analysis of Sensations“:

As soon as we have perceived that the supposed unities „body“ and „ego“ are only makeshifts, designed for provisional orientation and for definite practical ends [...] we find ourselves obliged, in many more advanced scientific investigations, to abandon them as insufficient and inappropriate. [...] The ego is not sharply marked off, its limits are very indefinite and arbitrarily displaceable. (Mach 1897: 13-14)

Yet undoubtedly the concept of the “self”, let alone the “ego”, especially in their late 19th century variations, are vague and undefined, so that we cannot, with any sort of confidence, assert that organisms themselves can be thought as “extended”, as reaching beyond their epidermic boundaries, especially if nothing but idle musings about yachts and bank accounts belonging to the ego are provided as proof. For more in-depth arguments, we must proceed to the 20th century. Already in 1910, the now largely forgotten political philosopher and sociologist Arthur Bentley wrote that

[h]owever spatially isolated the individual appears at a crude glance, the more minutely he is examined, the more are his boundary lines found to melt into those of his environment, the more frequently are functions found which work through both individual and environment so that it cannot be told where the one ceases and the other begins. (Bentley 1954: 5)

Similar ideas were expressed by the biologist Francis Sumner some ten years later:

If I should ask you whether the nest of a bird constituted a part of the organism or a part of its environment, I presume that everyone present would resent the question as an insult to his intelligence. [...] The situation becomes somewhat less clear, perhaps, when we consider the calcareous tube of a marine annelid. Here is something which is definitely secreted by the epidermal cells of the organism, and which forms a sort of permanent integument. It does not, however, in this case retain any organic connection with the body of the worm. But when we pass to the shell of the mollusc we find that there is such an organic connection with the body, so that the animal cannot be dislodged without extensive injury to its living tissues. [...] Does such a shell belong to the organism or its environment? (Sumner 1922: 231-232)

Here we see that we can move from phenomena that everybody would presumably treat as part of the *environment*, to what everybody would presumably treat as part of the *organism*, while it is difficult to indicate exactly at what point the transition from one to the other was made.

The problem that makes researchers develop such ideas is the necessity for providing clear definitions, for delineating the units of research, or the elements that one should pay attention to during the research. They are attempting to provide new answers to some of the most basic and primary questions in all research: what precisely is it that we are studying? How to distinguish and define it? What to include and what to exclude? And all of the writers on the topic of the “extended organism” are unsatisfied with the general principle that the organism is separated from its environment by a concrete physical boundary or barrier between the two, so that the organism would be “inside” and the environment “outside” — that one would be precisely what the other is not. In what follows, all the researchers are characterised by their abandonment of the so-called “morphological conception” of organisms (Palmer 2004: 321), that is, the idea that in order to outline an organism as a unit of research, it is sufficient to indicate some particular part of its anatomy — in this case, its skin. They deny that a particular physical structure in space can function as a generally applicable boundary that will precisely structure and oppose to each other the two halves, the organism and the environment. Instead, they seek functionalist solutions, arguing that in studying organismic functioning, the morphological line of demarcation will frequently become irrelevant. And it was precisely when discussing these topics that the psychologist Andras Angyal came to the conclusion that “the consideration of the organism and environment in morphological terms leads to such logical entanglement that the concepts of organism and environment are made useless for scientific purposes” (Angyal 1941: 121), and that “it is, in principle, impossible to draw any line of separation because organism and environment are not static structures separable in space, but are opposing directions in the biological total process” (*ibid.*, 92). Consequently, “the body surface is not the boundary of the organism,” but rather

the organism is entirely permeated by the environment which insinuates itself into every part of it. On the other hand, the organism does not end at the body surface but penetrates into its environment. The realm of events which are influenced by the autonomy of the organism is not limited to the body but extends far beyond it. Every process which is a resultant of the interplay of the organismic autonomy and the environmental heteronomy is part of the life process, irrespective of whether it takes place within the body or outside of it. (*ibid.*, 97)

To replace the morphological conception, Angyal proposes a distinction between two aspects of the total life process, which he called *autonomy* and *heteronomy* respectively. The former Angyal imagined as the organism's independent or self-governed processes, examples of which would be the healing of a wound, reflexes — such as when a cat turns itself around when falling down, thus landing on its feet — and the regulation of body temperature, accomplished by all warm-blooded creatures. On the other hand, within this total life process there are things that reach the organism from its surroundings, and as examples we can provide a list corresponding to the one just presented: something sharp cutting the skin, gravity pulling the cat downwards, and air or water temperature. Thus retaining the body temperature is autonomous, the sharp external object heteronomous, and so on. Yet despite what might at first appear, this is not a reiteration of the original separation between the organism and its environment, since the organism cannot be completely equated with the autonomous, and the environment entirely with the heteronomous aspect of life processes; furthermore, Angyal's is not a morphological distinction. Instead, in different parts and at different times within the life process, the ratio of autonomy and heteronomy is different; Angyal did not consider these two aspects as opposed, but rather claimed that the transition from one to the other is gradual. Whereas during body heat regulation the heteronomous aspect seems predominant (if there were no changes in air temperature, regulating body temperature would be unnecessary), putting together a syllogism seems mostly an autonomous process, but in neither case is the organism turned entirely inward or entirely outward. In addition, the autonomous processes seem, at certain points, to expand and extend outside, continuously absorbing more and different things, thus turning things that were formerly independent of the organism into its own autonomous parts. For example, when one starts to learn how to ride a bicycle, the bike will initially be a foreign external object and keeping it upright while riding needs constant effort and attention — that is, initially the bike will be almost entirely heteronomous. But once one has learned how to ride, the bicycle will feel almost like a part of one's own body, and riding it will require very little attention. In this way, riding the bicycle will be completely integrated into one's total life process, becoming part of the organism's autonomy, despite the fact that a bike is, of course, completely separable from the human body. Or we could also imagine a squirrel who keeps its nutrients as fats within its own body and as acorns in its den. Although these two sources of food reside one at the other side of the skin, and fats as living tissues probably have more autonomy than a heap of acorns, they both fulfil the same biological function and thus both remain *within* the squirrel's life process.

In the first part of the 20th century, the philosophers who most systematically criticised the morphological conception of organisms and moved towards a more expansive view were probably John Dewey and Arthur Bentley. In his wonderfully titled paper *The Human Skin: Philosophy's Last Line of Defense*, Bentley declares that

[h]uman skin is the one authentic criterion of the universe which philosophers recognize when they appraise knowledge under their professional rubric, epistemology. [...] If there is a „knower“ and if there is a „known,“ if one of these lies apart from the other and if there is a process of „knowing“ which involves both, then skin lies somewhere along the line of march, and must be taken into account. (Bentley 1941: 1-2)

Such a statement may seem strange at first sight, perhaps far-fetched or merely provocative. But it should be pointed out that in both the professional jargon of philosophers and in everyday language there is an abundance of pairs of concepts that accept and follow the rigid, mutually excluding distinction between organism and environment. Natural languages, replete with binary oppositions, include among them plenty of those that all seem to follow the skin-based line of demarcation: in these pairs of concepts, one always points to the “inside”, the other to the “outside”, and there is no third term that could come between them. Examples of such pairs of concepts would be subject(ive) – object(ive); mental – physical; personal – public; knowledge – reality; mind – matter; stimulus – reaction; individual – social; rational – empirical; cognitive – behavioural; epistemology – ontology, etc. In each case, the first word in the pair indicates the “inside” of the organism, the other the “outside”. And as one can see, such pairs of concepts are plentiful and they are widely used, and in all cases the same logic is in operation: these binary oppositions divide the world into two separate parts, one of which remains within the organism, and the other outside of it. Moreover, the experience that lies at the base of these pairs of concepts and from which such a distinction is derived will usually remain unnoticed. As Bentley notes with his characteristically hostile tone:

The philosopher, having no open truck with skin, leaps from essence to essence – from the essential knower to the essentially known. He leaps with never so much as the twitch of an eye-lash to mark that he glimpses anything of significance lying in between. Yet it is simple to show that skin – and indeed skin in its primitive anatomical character – dominates every position the philosopher occupies and every decision he makes. (Bentley 1941: 2)

Attempting to overcome this perceived hegemony of the skin, Dewey and Bentley reach conclusions rather similar to those of Angyal. In their book *Knowing and the Known*, published in 1949, they write: “Organisms do not live without air and water, nor without food ingestion and radiation. They live, that is, as much in processes across and “through” skins as in processes “within” skins” (Dewey and Bentley 1949: 128). Instead of depicting the environment as everything that merely happens to surround the organism, it should be imagined rather as a channel or riverbed along which the organisms move and that carries them forward. Organisms do not live in environments; they live *with* or *through* their environments. From this perspective, it would be more accurate for the order of things to place that entire medium of life, the entire environment through which life processes proceed, be it oxygen, nutrients, vehicles or state institutions, directly *within* the life processes themselves. To think of these things as merely parts of the physical surroundings of an organism is misleading, as life goes on criss-crossing through them. For Dewey, the sentence “organism is in an environment” is equal to the statement “the fire is in the wood or in the oxygen” – in a sense, it may visually appear to be so, but it will entirely

disregard the fact that combustion is a process that takes place in the interplay of the fuel and the oxidant; that is, with phenomena like these, noting the mere spatial location will almost entirely miss their nature. From all this, Dewey and Bentley conclude that

life-activity is not anything going on between one thing, the organism, and another thing, the environment, but as life-activity, it is simple event over and across that distinction (not to say separation). Anything that can be entitled to either of these names has first to be located and identified as it is incorporated, engrossed, in life-activity. (*ibid.*, 323)

We can find movements in similar directions from anthropology. In the early 1950s, the anthropologist Alfred Irving Hallowell became engaged with the issue of the self and its behavioural environment. He begins first by making note of a simple observation pertaining to the long tradition of cultural anthropology, namely that there is a general tendency of collecting data and constructing explanations about the different generalised, abstracted and supra-individual “ways of life” that are perceived as aspects of one particular culture; as a result, anthropologists have paid very little attention to the experience of particular individuals. In other words, anthropology has tended to be culture-centred rather than behaviour- or practice-centred. The anthropologist, taking up a position as an external observer, picks out from the observed behaviours precisely these elements that, for him or her, comprise a culture as such as a whole, and thus pays little attention to how the members of that culture act and relate in the course of their daily activities. From this perspective however, Hallowell claims, it is very difficult, or perhaps even impossible to comprehend the most significant and relevant aspects of people’s lives as they themselves experience them, what they think about and what motivates them to act. Thus, for example, language described in formal categories is not language as it exists for particular individuals, as they experience and use it. It is an elementary fact that most of us are entirely unaware of the total structure of the language that we speak; language as formally described by a bystander is not the language of first-hand experience. For a particular individual, they themselves and their world is permeated by language, for which reason language cannot be literally neither objective nor subjective — it cannot be simply placed at one or the other side of a morphological line of demarcation; rather, it resides in between the person and the environment and intertwines the two aspects together. The same pertains to all the other cultural phenomena when observed from the perspective of particular individuals. Hallowell notes that

Since culture can be objectively described and for certain purposes treated as if it were a sui generis phenomenon, it is sometimes implied, or even argued, that it is in fact phenomenologically autonomous. To do so is to misunderstand totally the basic conditions of human psychological adjustment. Any inner-outer dichotomy, with the human skin as a boundary, is psychologically irrelevant. [...] For these reasons, the organism and its milieu must be considered together, a single creature-environment interaction being a convenient short unit for psychology. (Hallowell 1955: 88)

The final brief example of the idea of “extended organism” is derived from the “extended mind” hypothesis in contemporary philosophy of mind (Clark and Chalmers 1998). Here the emphasis is on processes of perception and cognition, and on the impossibility of reducing either of them to a merely spatial entity. The

argument is that for an organism that is thoroughly enmeshed in its surroundings, cognitive processes freely cross, at least on occasion, over the boundaries of the organism, taking hold of and using for its own purposes parts of the environment that normally reside outside. Moving about in their environments, the perceivers make use of the aspects of the surrounding world that operate in a stable, predictable manner — they employ for their own purposes those things in the environment that can reliably support and assist in the activity currently at hand.

One interesting way that this works has been called *cognitive offloading* (Clark 1997: 94), referring to the tendency of human beings to make use of their environments in order to facilitate cognitive operations. A simple example would be the use of pen and paper for performing mathematical calculations. Another would be the computer game Tetris, in which the player has to rotate differently shaped blocks so that they would fit closely together at the bottom of the playing field. By observing people playing Tetris, or by trying it yourself, it becomes immediately clear that in order to find a suitable place for the blocks, the players start rotating them the moment they appear. If one tries playing Tetris so that one has to find the place for the block only in one's own mind before the block can be rotated, this turns out to be much more difficult than rotating them in real-time, and as the pace of the game goes up, it finally becomes entirely impossible. Turning the blocks in real time, that is, making active use of the environment offloads into the world some of the cognitive resources required for finding a suitable place for the block — these are “actions whose purpose [is] to reduce inner computational effort” (Clark 1997: 66). Thus cognition is not something that only takes place “in the head”, nor something that goes on within the whole body, but is rather a relational field of activity that freely crosses the external boundaries of both brain and body: “cognition as forever leaking out into its local surroundings” (*ibid.*, 82). Clark and Chalmers summarise the functionalist “extended mind” thesis as follows:

If, as we confront some task, a part of the world functions as a process which, *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world *is* (so we claim) part of the cognitive process. Cognitive processes ain't (all) in the head! (Clark and Chalmers 1998: 8)

The above were just a few brief examples of the different ways that the morphological conception of organisms have been criticised over the course of the previous century. To reiterate, according to the morphological conception, organisms can be defined as separate, spatial, skin-bounded entities. The thinkers described here instead moved towards more functionalist definitions, proceeding from the inevitable and closely knit relationships between organisms and their surroundings. The first example was about the flexibility of the boundaries of the self or the ego, its capacity to take hold of the things in the external world; second, rather than treat organisms and their environments as spatial entities, it was proposed that they should instead be analysed as different parts of a total life processes comprised of more and less autonomous aspects; third, life process is a medium *through* which the organism and its environment move *together*; fourth, cultural anthropology tends to reify cultures into supra-individual entities and to leave individual experiences aside, for which reason the subjective-objective distinction is considered universal and inevitable, whereas in individual experience this distinction never falls precisely on the line of the skin and is

in fact completely irrelevant for studying practices; and fifth, cognitive processes make active use of the surrounding world, they “leak” into the environment.

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Laiendatud organismi idee 20. sajandi mõtteloos

Kahekümnenda sajandi vältel on korduvalt esile kerkinud üldine mõttelõng, et organismi väline piir — tema nahk — ei ole vähemalt mõnede organismi eluprotsesside piiritlemisel kohane, vaid et teatud mõttes ulatuvad elusolendid justkui iseendast väljapoole, otse oma keskkondadesse. See üldine tõdemus on endale võtnud mitmeid varjundeid, alates lihtsast avastusest, et sageli on raske kindlaks määrata, kuhu täpselt peaks organismi ja tema keskkonna vahelise piiri tõmbama, kuni vaimufilosoofia „laiendatud vaimu“ hüpoteesini välja, kus tunnetusprotsesse ei vaadelda mitte aju suletutena, vaid vabalt keskkonda laienevatena.

Artikkel annab põgusa ülevaate mõnedest „laiendatud organismi“ ideed arendanud mõtlejatest, kelle väitel organisme ei tuleks vaadelda endassesuletud üksustena, mis on maailmast nahapinna abil välja suletud, vaid pigem iseenda piiridest kaugemale, keskkonda ulatuvatena, või siis vähemasti olenditena, kelle jaoks nahapind jääb otse eluprotsesside sisse, mis aga ise seda vabalt risti-rästi ületavad.

Märksõnad: laiendatud organism, morfoloogiline kontseptsioon, nahk