

Living nature – perception and science

Empathy and imitation as scientific methodology for recognizing living nature

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(In this text “the living” means the realm of the vital and vitally forming forces)

Understanding the living itself

Buried by so much intellectual activity, it is difficult for us to understand the living, although it actually is constantly present. It is even more difficult to vividly formulate something understandable about the living, whereas the word dies away in the pen, as Goethe says.

Of course, we live! Of course, we perceive that we are living. Of course it is clear to me that my hand does not move from its substance and writes this text. It also seems natural to me that the small wound at my right middle finger, unlike the scratches on my car, will close by some self-healing power. Yesterday our cat scratched me there. This happened very quickly and it's over now. However, in my memory it is vividly present and I can also still recognize the result at my finger. So of course my past is still present in me. It is no longer physically present, it was physically present yesterday, but still it reaches in my presence, it has not dissolved into nothing. Of course I can sit here at my desk right now, just because my parents once lived, and my grandparents and their forefathers. They all have died long ago, but yet they are part of my presence, just like my descendants are part of my presence. This text that I am writing here may also be of importance for someone later on. So my presence has to do with the future. Past, present, future, they form a whole, a continuous flow of change. That's life, in the great flow and also in the normal everyday life.

The own participation in this unique variable life, in this flow of life, can be experienced. The French philosopher Henri Bergson calls this the intuitive experience of duration. This is different from looking at a photo being taken on a holiday trip a decade ago constituting: "Oh yes, I have become older since then." That would be a more mechanical thinking from one to another static point. It would not be experiencing duration or a kind of flow. When you are in the flow you are empty of static, mechanical thoughts. You find yourself in the whole of a situation, of a setting or a social context. You experience a continuous flow, a development of the situation in interdependence with your surroundings. A little bit of this flow can intuitively become conscious: guessing, feeling, perhaps like tasting, very real. Later, if necessary, the mind can turn once again to the memory of the situation, analyse the gained experience, discover habits, and perhaps even find general rules. – So, quite roughly said, also the attitude towards recognizing the living may be described.

The living is not only omnipresent in us, we can also experience it constantly in the outer world, may be in one's living counterpart or in social and ecological cooperation. However, just experiencing is not sufficient for our mind. He wants clear concepts, unique knowledge of causal relationships or best of all logical proofs. As far as logical proofs in empirical science are possible at all, they can also be given for the living.

Evidence of the living

Aristotle has already stated quite clearly that something created always logically presupposes a creator and that of course, this vivid creator cannot be the pure matter itself. Kant remarked: "There is no animated matter, but probably a living body". It is not the matter that is alive!

The fact that the creative power in an organism cannot come from the matter became later particularly clear by the researches on embryology. Here it turned out that cells can develop, according to the needs of the whole organism, depending on the location and surroundings. The development is not necessarily determined by the cells themselves. In the regeneration of a divided hydra, where each part builds a complete hydra again, the organizing power of a whole entity also becomes quite clear.

Genetics have made great progress in recent decades. The base sequence of the DNA was recognized as a code for protein synthesis and the human genome is considered to be decoded. Besides, during the last years, it was found out in the field of epigenetics that the biography of a living being is reflected in the DNA. The former idea of a rigid DNA changed into the idea of a flexible molecule, which follows the habits of a living being. Now it is known, that not only the genes form a living being, but also habits and environmental factors influence the genes. Philosophically you could say that the spirit influences the structure of matter. This really should cause a revolution in biology.

Despite of all this knowledge, it still remains a mystery how the shape of an individual organ or the whole shape of an organism are genetically determined. Especially for the many stages of embryonic development, which is actually an on-going process, a genetic code cannot be found. The purely material realities certainly reflect a lot and deliver valuable information, but, nevertheless, something else is missing.

A living being can creatively respond to different environmental conditions. Everybody can experience this in his everyday life. Even in traffic you cannot drive straight down towards your goal, but creatively, within certain rules, you have to handle the traffic situation and the given disturbances and disabilities on your way. It's the same with plants and animals which creatively pursue their own developing way. This was for example investigated by biologists in the embryonic development of the hydra polyp, which despite of artificial disturbances and disabilities always proceeded towards the formation of an entirety. The biologist and philosopher Hans Driesch gave the example of a dog that achieved a desired goal, despite various disabilities. Such a creative handling of the given circumstances is not fixed in the genes and can impossibly be founded in the matter itself. It requires a certain amount of freedom which can be experienced particularly in our human free will. - All of these phenomena allow no other conclusion than that a living creature, besides matter, needs something else vitalizing and creatively forming.

The soul as the formative entity

Now, if something creative and vitalizing must necessarily be demanded, the question arises of what kind this formative something could be and how one might call it: formative drive, entelechy, field? - The biologist and Nobel Prize winner Hans Spemann was finally convinced that this formative something has to be seen in analogy to our psyche. From our psyche or our soul we have the most intimate knowledge. The soul is an experience to us and only in a very diffuse way a term. After most intense very exact materialistic research on embryology Spemann came at the end of his life to the

deep and experientially saturated belief that every living organism must be animated by a soul. This may be clear to us anyway. However, for a well-respected scientist and Nobel Prize Laureate such a break with purely materialist conceptions is a courageous commitment. Since Spemann awarded a soul not only to sentient beings, but to all beings including plants, it is clear, that he saw, like Aristotle, in the living itself a certain psychic quality.

Aristotle found it absolutely necessary for a natural scientist to have knowledge about the soul. For him the nature of a being and the soul were the same and if a natural philosopher wanted to explore how a living being expresses itself in the physical world, he necessarily had to be familiar with the soul. Aristotle therefore examined the soul very intensively and differentiated the soul into three parts, or rather three organs, namely in the rational, the sensitive and vegetative soul. This corresponds to our own experience: Beside the perception of our body, we also experience our incorporeal, mental or spiritual side. We experience that we get ideas and that we can develop thoughts, that emotions arise in us and we feel happy, sad or angry, that ingested food is transformed in us and wounds can heal. So the differentiation of the soul made by Aristotle is absolutely familiar to our experience.

In this psychologically differentiated manner we can also participate in the outside world: Besides the intellectual recognition and naming of objects we can also feel their qualities with our sensitive soul. For example, according to the design, the colour, the material, the processing etc., we can perceive a garment like a jacket, as sportive and casual, as light and playful or as simple and decent. Such an aesthetic perception is not possible without a sensitive soul. The individual soul feels the qualities of the outside world according to its own abilities in a more or less differentiated way, for example, depending on the aesthetic fashion consciousness and unites in this way with it.

The vegetative soul, which according to Aristotle represents the organ of the soul, which brings the physical processes in movement, also combines our soul with the outside world. This usually is less conscious to us. However, you can experience at a football match, by whom you are deeply moved, how for example you inwardly go along with the striker, who is just scoring the winning goal, and how your own foot joins the kicking movement or at least twitches violently. Mostly such a witnessing does not go till the physical movement. Nevertheless, at the level of nerves the Italian neurologist Giacomo Rizzolatti found out in 1992 with macaque monkeys, that seen movements always cause the same activity pattern in the brain in certain nerve cells as the own appropriate movement. He called this nerve cells mirror neurons. Unlike an optical mirror this mirror is, however, associated with one's own activity, one's own reproducing or imitating. Vivid mirroring is imitating. However, this imitation is not only limited to the mirror neurons, but also related to the whole body, which can be observed particularly with young children. You may observe a small boy, who enthusiastically speaks about an enormously fat man he has just seen. He makes himself thick, bulges his arms outward, blows out his cheeks and involuntarily mimics the fat man. We adults are usually more reserved with our gestures, but if we observe ourselves exactly, we can still notice, how we inwardly, beside movements, also rudimentarily imitate perceived forms in their formative forces. According to Aristotle, an imitation would be in particular an activity of the moving vegetative soul. So we also combine ourselves with the outer world by the vegetative soul.

The forming forces of the vegetative soul and the sensible qualities of the sensitive soul can also be used to get scientifically closer to the living nature. Of course, the rational soul is always involved too. However, it has to, at least initially, withhold terms and concepts.

Holistic Flowing

Too easily the rational mind remains in firm terms and mechanistic conceptions, which he is used to from the physical world. This is what particularly Bergson always warned about. He worked out very clearly, that the need for something which forms living beings originates from our familiar mechanistic thinking. It is the result of our deep habit to think of a whole as build up from parts. Bergson remarks, that our rational understanding is not able to imagine the formation of an organism in another way than as a production, for example, like that of a house or a car. Therefore, we would look out for a skilled foreman, for a principle of life, which carries out the formation of an organism according to its own plan, which seems tremendously complicated to us.

Actually in living nature there is no intelligent foreman or plan as we know it from the outside world and there are also no complex and complicated activities which control or self-regulate each other. These ideas only arise from our everyday experiences in the physical world. In living nature everything happens rather by a holistic undivided flux. This also became clear to the already mentioned embryologist Hans Spemann, when he recognized the dynamics of embryonic development as a holistic flow of cells, in which the movement does not go out from one point or is jammed somewhere. Everything just simply happens, strictly speaking even free of inertia. Bergson supposed that for a developing organism it probably would be just as easy to form an eye as it would be for him to move his hand. He claimed to see the living less with the eye of the intelligence, which can only seize the readymade and sees everything from outside, but with the eyesight, which is immanent to the ability of acting. This eyesight is comparable rather with our vague consciousness of will and movement.

Gestures and qualities

Actually life itself is never something finished. It is not only always in change and movement, it is the change and the movement itself. The nature of the living can therefore only be perceived by empathizing with the quality of its dynamics and imitating it. This inner imitating of the shape of a process can vaguely become conscious. Bergson speaks of a vague cloud of feelings, through which the living can be guessed intuitively. This is completely different from the though lifeless, but crystal clear knowledge, which can result from logical analysis in the area of the material.

Movement, change and life cannot be seized by quantitative values. Rather, you can assign them something like a gesture or a quality. Here you are not in the area of the quantitative, where you can measure with a technical apparatus. Gestures or qualities affect the emotional level and therefore can only be experienced by sentient beings.

Gestures and qualities have to do with an aesthetic perception of the world. Just as you can internally witness the curving and forming forces of a sculpture like gestures and the colours of a painting like qualities, while looking and empathizing with a piece of art, you can also do this with a living being, yes, in certain manner with all perceivable things. Therefore you have to place yourself by an effort of imagination and empathy in what is perceived. Qualities are thereby internally recreated as a kind of aesthetic feeling. According to Aristotle, this would be an activity of the own sensitive soul. Movements and shaping forces are imitated as gestures by our own inner formative forces. This is, as already described, according to Aristotle, an activity of our own vegetative soul, which touches the sensitive soul in a certain manner. Just as with an abstract sculpture, where swelling, bulging, contracting, condensing, flowing, dissolving forces can be felt, also the formative forces of a living

being such as clenching, expanding, dissolving, airing, withdrawing forces can be perceived. These, however, have to be felt not only concerning the current form of the organism, but also with the help of memory, in regard to the figure which is changing in time. After extensive research, the overall gesture of a sculpture or an organically created being, which penetrates every detail, can be guessed intuitively. So the perception of vivid characteristics and vivid forms, which correspond to the nature of a living being and its whole life expression, are comparable to the perception of aesthetic qualities and artistic forms.

This was particularly clear to Goethe. Goethe described how his artistic work and his way of looking at art helped him to perceive and understand plants, animals and people. For him this was the only way to bring together their nature and their appearance. He highly appreciated Immanuel Kant, because Kant had searched for a connection between art and natural sciences. Goethe transferred Kants aesthetic judgment to his way of scientific research and called this "observational judgment". This was his secret key to understand the living. Goethe's contemporary Heinroth, who had a deep understanding of Goethe, pointed out, that such a way of scientific research could only be achieved by artistic practice, intensive training and habituation.

Bergson as well believed that art gives us the possibility to come to an expansion of perception and to an unbroken connection of the outer world with ourselves. He saw the reason for the fact that ordinary people like us hardly use this means in comparison to true artists on the one hand in the dominance of the practical intelligence of our mind and on the other in the appropriation by our practical everyday life. Our mind is always focused on fixed terms, usefulness and effective action. An artistic view is regarded rather as ineffective and unnecessary. Our intellectual mind alone, however, cannot understand the expressiveness of art as little as the expressive power of the living. This has to do with the fact that the mind always searches for the universal behind the concrete, for example for terms. Terms do not arise from the concretely perceived individual case, but are always formed by abstraction from a huge number of perceptions. In contrast, art always goes, just like the living, to the individual, as Bergson says. Every artistic creation is an individual creation and every artistic view is an individual view. General terms only counteract an artistic creating or an artistic viewing. Naming the perception with terms ends an artistic process. The nature of art does not work with terms. Every living being is also an individual being, a subject. Again, the individual cannot be grasped by concepts and terms, but only by an artistic view. Only in this way you can get closer to the individual being in its individual environment. By turning to their individual being objects of observation become subjects with individual characteristics. In a way, they become peculiar beings. Such a subjectification of the world leads thus to an inspiring of the world. Everything around us gets inspired and everything in us gets revived, as Bergson says.

Subjective universal validity

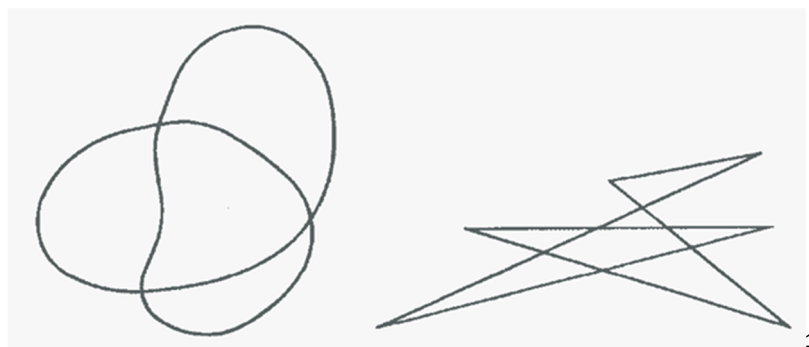
Now, if the living as well as a work of art cannot be seized by terms, how can scientific knowledge of the living nature then be formulated and communicated? Driesch and Bergson clearly recognized this problem. Driesch solved it for himself by inventing many new, little clear-cut terms to describe the living. Bergson thought it to be possible to approach the living by a pictorial language with metaphors and comparisons. The knowledge of the living would be given immediately by intuition. Through images it could be suggested. A vivid image could give us a direct vision and build a connection between thing and idea. From various aspects images to a perceptual object could be gathered which reach a certain liveliness and could stimulate an interlocutor to an own intuition.

Even Kant regarded an intuitive looking as necessary for a research of living nature. However, he awarded to this way of researching only a reflective and not a decisive character. For scientific research, he considered it unsuitable, because in his opinion it would throw the doors wide open for arbitrariness. In fact, he recognized in this arbitrariness the most serious problem of an intuitive cognition. The ability of an aesthetic or intuitive judgment will certainly depend on the differentiation of the mental empathy of a researcher. A skilled, practicing artist will normally be able to perceive a work of art more differentiated than an untrained layman. A scientific observational judgment, which turns towards the living, must be trained and practiced as well as an artistic judgment. Goethe practiced it by artistic working and viewing. An artist thus would have the best skills for a vivid scientific researcher's activity.

Furthermore, there is a great danger that the scientist researching in this way does not look at his research objects as research subjects but projects his own feelings and ideas into them. To study living beings you first have to become emotionally tranquil. Then you can unintentionally turn to the research object in an empathic way. Intuitive insights cannot be forced.

The question arises, whether in regard to these possibilities of error a certainty of cognition is ever possible? Probably not in the sense as it is known of the crystal-clear mathematical laws of mechanistic science, but rather in the sense of an experienced long practicing doctor. The certainty of cognition can be improved by exchanging one's own guessing perceptions with other researchers.

The fact that subjectively perceived qualities or aesthetic feelings can be experienced in a quite similar way by different people and can be communicated, was found out in 1920 by the founder of the Gestalt Psychology Wolfgang Köhler. He presented the following two figures to a greater number of participants:



The participants should describe their feelings towards these figures and associate the fantasy names Maluma and Takete with the two objects. Almost all participants named the figure on the left side Maluma and that on the right side Takete. The own feelings towards the figure on the left coincided with the feeling of the soft, rounded sound of the word Maluma and towards that on the right with the feeling of the hard, angular sound of the word Takete. Such aesthetic qualities were called "Anmutungsqualitäten" (affective qualities, apparent qualities, impressions of quality) by the German Gestalt psychologists. Affective qualities show a subjective universal validity, as Kant expressed it.

If you draw or model the qualities Maluma and Takete in quite your own manner you will be able to recognize, how your own inner formative forces combine with these qualities and thereby a corresponding shape is formed.

Of course Maluma and Takete are two very archetypal qualities, what facilitates an aesthetic judgment. Nevertheless this attempt of Köhler showed that Descartes' statement that only the measurable, countable, ponderable can scientifically be researched and communicated is a false scientific limitation. Also qualities show an extensive general validity. In the same way intuitions, images and vague inklings to the living can be exchanged and communicated. So a scientific approach to the nature and the qualities of living beings is absolutely possible.

Spirit and Matter

When science is expanded in this way, spirit and matter can approach again. Bergson points out that gestures or qualities perceived in the outer world are not only subjectively generated inside of us, as the constructivists believe, but really represent a property of the external world. They belong to the spiritual being of the outer world. Now external world and internal feeling can approach by a double process: The own individual memory images are brought to the internally perceived imitating or empathizing of the external processes. These images manifest themselves as Bergson says from our own spirituality in the physical brain; they become, so to speak, material. The own spirituality thus moves towards a materialization. On the other hand the externally perceived physical world reveals a spiritual aspect of itself in its gesture or in its quality. So the external physical world moves towards spirituality while the inner spiritual world moves towards materialization. In this way matter, perception and spirit form a solidary whole, as Bergson calls it. The separation of spirit and matter introduced by Plato into philosophy and by Descartes into science can therefore be overcome.

Such kind of emotional perception can lead to recognition of the living. This can be deepened by practice and can be extended to a scientific methodology. In all areas that have to do with the living, such as biology, medicine pharmacy, agriculture, and also in social, educational and therapeutic areas a necessary complement and enlargement of materialist research would be possible in this way.

Our acting in everyday life could also be changed. Goethe has already pointed out that the way of thinking and looking at the world affects ourselves and influences our acting in the world. Certainly an artistic worldview which links us to the perceived qualities leads to a different attitude towards life and a different acting in the world than a causally determined analytical worldview. These two ways of looking at the world are complementary. Only together they lead in science as well as in everyday life to a deeper understanding of the world.

Footnote:

1 Source: Köhler, Wolfgang: Psychological problems, Berlin 1933, p 153rd