



Metaphysics of the Organic Whole: Ehrenfels, Uexküll, and Merleau-Ponty

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Abstract

The aim of this paper is to compare the theory of Gestalt qualities, introduced by the Austrian philosopher Christian von Ehrenfels (1859–1932), with the concept of Umwelt, proposed by Jakob von Uexküll (1864–1944). The primary basis for the comparison will be the phenomenology of Maurice Merleau-Ponty (1908–1961), who extensively discusses the two concepts in his work. In the Uexküll–Ehrenfelsian context, we focus on analysing the similarities and differences of their argumentation and model approaches to understanding the living and non-living natural entities, their mutual communication, development, and ontological grounding. We also consider the role of individual experience with the environment: in that context, the metaphysical frameworks within which the two thinkers operate in their efforts to explain natural phenomena are central to our comparative reflections.

Keywords Gestalt · Umwelt · Phenomenology · Darwinism · Teleology · Complexity · Experience

Introduction

This paper presents a comparative analysis of Christian von Ehrenfels's (1859–1932) and Jakob von Uexküll's (1864–1944) scientific and philosophical reflections upon natural phenomena, with a focus on Ehrenfels's concept of the theory of Gestalt qualities and Uexküll's concept of Umwelt. Although the two thinkers were contemporaries, we found no instances of mutual referencing in their work, and the same applies to the reception of their scientific work. Nevertheless, the philosophical and scientific reflections of the French phenomenologist Maurice Merleau-Ponty (1908–

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1961), published under the title *Nature. Course Notes from the Collège de France*, do provide a sort of link between the richness of their thought and therefore also an inspiring framework for our comparison. Merleau-Ponty discusses Uexküll's theoretical-biological reflections of organismal perception in detail in the second series of lectures (*Animality, the Human Body, and the Passage to Culture*, 1957–1958, subchapter 'Animality: The Study of Animal Behavior') and repeatedly returns to Uexküll's notion of Umwelt also in the third series of lectures (*Nature and Logos: The Human Body*, 1959–1960). He also repeatedly references the concept of Gestalt in his phenomenological reflections, both directly in relation to Uexküll's Umwelt and within broader phenomenological considerations upon the relation of parts and whole, subject and object, and the visible and invisible. When discussing Gestalt, however, he does not speak directly about Christian von Ehrenfels, the 'father of the theory of Gestalt qualities'. For the most part, he draws on the work of thinkers who further developed Ehrenfels's theory, such as Koffka, Köhler, and Wertheimer (see below). We will, however, work primarily with Ehrenfels's interpretations of the theory of Gestalt qualities, which is rooted in the cosmogonic dualistic dynamic principle of juxtaposition of the shaping force (*gestaltende Kraft*) and chaos. Although Ehrenfels's primary academic background was in philosophy, he also reflected upon the origin and development of living beings, on the relationality of animate and inanimate nature, and on the physical and psychic dimensions of reality, while considering both pro- and anti-Darwinian positions. Although we did not find any analysis related to perception or subjectivity in Ehrenfels's work in comparison to Uexküll, Ehrenfels's broader insights into ways of understanding natural phenomena are no less important. In the following, we focus primarily on the metaphysical background of the analysed approaches to the living: Ehrenfels's metaphysics of the organic world, Uexküll's counterpoint teleology, and Merleau-Ponty's particular metaphysics, which moves on the interface of the finite and infinite.

After a brief biographical introduction of the proponents, we will point out possible analogies between Ehrenfels's theory of Gestalt and Uexküll's Umwelt. In the following section, we discuss the ambiguous conceptions of teleology of both Uexküll and Ehrenfels and, in the fourth section, we highlight their ambiguous relationship to Darwinism. The last section which deals with Merleau-Ponty's phenomenological perception of nature also outlines a synthesis of Ehrenfels's and Uexküll's views. While Merleau-Ponty's direct references to Gestalt and Umwelt run through all preceding sections, they are discussed in detail in the sixth part of the paper. We conclude with a reflection on how the reconstructed conceptual patterns could be applicable to current theoretical biology.

Short Scientific Biographies

The Austrian philosopher Christian von Ehrenfels (1859–1932) was a versatile thinker active in the late 19th and early 20th century. His most influential teachers were Franz Brentano in Vienna and Alexius Meinong in Graz, but his academic

career was strongly linked to the academic environment of Prague.¹ Ehrenfels's academic work focused on value ethics *Über Fühlen und Wollen*, 1888 [On Feeling and Willing], *System der Werttheorie*, 1897–1898 [System of Value Theory] but he also made important contributions to several subjects in psychology, aesthetics, logic, social biology, Darwinism, vitalism, and eugenics. He lectured, among other things, on cosmic morphology and prime numbers. Surprisingly, the topic of the theory of Gestalt qualities was not widely represented in his lectures (except for the years 1918, 1923, and 1926 at the University of Prague; Ověčková, 2022).²

Ehrenfels proposed the concept of Gestalt qualities in a seminal paper from 1890 entitled *Über Gestaltqualitäten* [On Gestalt qualities], whose basic message was that *the whole is not only made up of its part: it is something more* (see further below). Ehrenfels unfortunately did not explicitly return to this subject in writing for another 32 years, when he critically reassessed and further developed his original Gestalt concept in his work on prime numbers (*Das Primzahlengesetz*, 1922 [The law of prime numbers]). At this occasion, he not only republished his paper *Über Gestaltqualitäten* but also added an accompanying text entitled *Weiterführende Bemerkungen* [Explanatory Notes], which built on his book *Kosmogonie*, 1916 [Cosmogony], where the cosmogonic Gestalt principles play an important role.³

Jakob von Uexküll (1864–1944), a German biologist of Estonian origin, exemplifies a vibrant discourse between a mechanistic and a non-mechanistic worldview. Since his student years, Uexküll was influenced by the philosophy of Immanuel Kant, which led him to reflections upon the subjective world: 'He realized that the transcendental analysis that Kant directed to the minds of human beings could be extended to other animal species too' (Brentari 2015: 23). Uexküll rejected the idea that animals are reflective machines adapted to *random* physical and chemical environments. Instead, he argued that animal behaviour can only be explained by taking into consideration processes in their subjective Umwelt (Kriszat, 1956b: 167). Uexküll's modified Kantianism also included a teleological and holistic metaphysics of Nature (Jaroš & Brentari, 2022), where Nature is understood as the goal-directed natural factor arranging the Umwelten of all living beings so that they can interact effectively.

Uexküll studied biology at the University of Dorpat, now Tartu. Initially enthusiastic about Darwinism, he soon became its fierce opponent, as evidenced by his frequent anti-Darwinist statements and a tendency to contrast the absolute and relative worlds (see below). Uexküll then worked for many years at the Institute of Physiology at the University of Heidelberg. While there, he undertook a number of research

¹ In 1896, Ehrenfels became an extraordinary and in 1899 a full professor of philosophy at the German part of the Charles-Ferdinand University (renamed the German University in 1920) in Prague. He retired in 1929 but worked at the university until his death in 1932 (cf. Ověčková, 2022).

² In the overview of lectures, Ehrenfels's courses at the Department of Philosophy in Prague were described as intended for students of natural sciences and Ehrenfels was also instrumental in founding, the Department of Natural Philosophy (*Lehrstuhl für Naturphilosophie*) at the Faculty of Science of the German University in 1929 (cf. Ověčková 2022). After Ehrenfels's death, the department was headed by the philosopher and mathematician Rudolf Carnap until 1936.

³ Gestalt qualities, with an overlap to biology, are also the subject of Ehrenfels's scientific reform religion. Besides his book *Cosmogony*, see also his essays *Gedanken über die Religion der Zukunft* (Reflections on the Religion of the Future, 1922) and *Die Religion der Zukunft* (The Religion of the Future, 1929).

stays at the Stazione Zoologica in Naples, where he met, Hans Driesch, among others (Brentari 2015: 26). The highlight of his career in theoretical biology was the founding of the Institute for Umwelt Research at the University of Hamburg. Uexküll introduced the concept of Umwelt in his book *Umwelt und Innenwelt der Tiere*, 1909 [Umwelt and Inner World of Animals] and developed it further in his much later publications from 1934, such as *Streifzüge durch die Umwelten von Tieren und Menschen* [A Foray into the Worlds of Animals and Humans] and *Die Bedeutungslehre* [A Theory of Meaning]. In the following, we also draw on the essays Uexküll published from 1910 to 1913 in the journal *Die neue Rundschau*.

The French phenomenologist Maurice Merleau-Ponty (1908–1961) was strongly inspired by Edmund Husserl and Martin Heidegger but developed their thought further, with a focus on the significance of subjective experience within a broad interdisciplinary framework, e.g., *Nature*, but also *Le Visible et l'Invisible*, 1964 [The Visible and The Invisible] and *Phénoménologie de la perception*, 1945 [Phenomenology of Perception]. He summarised his basic approach as follows: ‘There is nature wherever there is a life that has meaning, but where, however, there is not thought...’ (Merleau-Ponty, 2003: 3). In the introduction to the first course in *Nature*, Merleau-Ponty points to the undercurrent of the relation between Nature and *Physis* (φύσις), that is, the plant world whose ‘primordial and lexical sense’ is related to *phyo*, i.e. the birth and growth of plants. The related reference to ‘autoproduction of meaning’ clearly indicates Merleau-Ponty’s phenomenological position where nature is ‘unconstructed’ and characterised by permanence and eternity. Nature is the nourishing soil that ‘carries us’ (Merleau-Ponty, 2003: 3–4). These ideas anticipate the overall framework of his reflections on nature, closely associated with the concepts of Gestalt and Umwelt.

Ehrenfels’s Gestalt and Uexküll’s Umwelt

A comparison between Uexküll’s concept of Umwelt and Ehrenfels’s Gestalt theory may at first sight seem difficult. Uexküll’s concept of Umwelt is based on signification, that is, it works with the notion of animals finding their bearings in the world by means of their sensory organs and in accordance with their *Bauplan*. Umwelt is thus a concept placed primarily within a framework of physiology. Ehrenfels, on the other hand, in his theory of the Gestalt focuses on morphology, especially metaphysical morphology, within the context of theoretical biology.⁴ Nevertheless, one can also find a number of substantive similarities between these two concepts: they both aim at holistic explanations of phenomena in nature, both react to Darwinism, both reject

⁴ The roots of Ehrenfels’s dualism of entelechy and chaos go explicitly back to the thoughts of Anaximander and Anaxagoras. For both Ehrenfels and Uexküll, the richness of Kant’s and Goethe’s thought is an important source of inspiration.

chance as a primary factor determining the character of living nature⁵, and they both work with a specific teleology.⁶

Ehrenfels's Concept of Gestalt

In line with their holistic approach to the living, both Uexküll and Ehrenfels work with the analogy of melody. Ehrenfels's seminal article *Über Gestaltqualitäten* (1890)⁷ was significantly influenced by his deep appreciation of music. The example of melody and musical harmony allowed him to express his thoughts on Gestalt qualities with emphasis on the relationship between the parts and the whole. The whole, he notes, is not merely the sum of parts or elements or a reference to the relationships between them; the whole becomes a higher reality than its parts with the emergence of a new 'quality':

If the memory images of the successive tones are present as a simultaneous complex of consciousness, then the idea of a new category can emerge in consciousness, namely a unified idea which is connected in a subtle way with the idea of the tone complex in question. The imagination of this whole belongs to a new category for which the name "*fundierte Inhalte*" has become common. Not all fundierte Inhalte are of a descriptive nature and related to the concept of melody. (Ehrenfels, 1932, in Weinhandl, 1960: 61)⁸

In connection with the above, it should be added that every grounded content (*funderter Inhalt*) requires a certain foundation (*Fundament*). This does not mean, however,

⁵ As illustrated below, Ehrenfels dismisses chance as the sole principle of formation. He regards chance (identified with chaos) as one of the dualistic principles that contrasts with the second principle, namely, the shaping force.

⁶ As shown below, Ehrenfels, in contrast to Uexküll, rejects a teleological interpretation of natural development. His concept of the shaping force, nonetheless, embodies a formation principle that enhances complexity, emphasizing not the origin of specific species, but rather the diversity of life itself. Thus, we employ the term 'specific teleology' within this context.

⁷ For Ehrenfels, the key inspiration for this essay was Ernst Mach's *Beiträge zur Analyse der Empfindungen* (1886), where the essence of a melody is identified with the sum of the perceptions of the individual notes. According to Ehrenfels, however, these perceptions were not sufficiently clarified (cf. Ehrenfels, 1890, 1932). Ehrenfels's theory of Gestalt qualities is nowadays relatively little known, and the historical reception of the Gestalt theory is associated mainly with members of the Berlin/Frankfurt school of Gestalt psychology such as the aforementioned Max Wertheimer, Wolfgang Köhler, and Kurt Koffka. Aside from them, Alexius Meinong's school of thought in Graz also played an important role. For a historical overview with a detailed account of the post-Ehrenfels development of the Gestalt theory and attempts to link holistic thinking and the natural sciences, see Ash (1995). According to Merleau-Ponty, elementary functions likewise do not form a whole by their sum and the parts of a thing are not linked merely by external association (Merleau-Ponty, 2002).

⁸ 'Wenn die Erinnerungsbilder der aufeinanderfolgenden Töne als ein gleichzeitiger Bewusstseinskomplex vorliegen, so kann im Bewusstsein die Vorstellung einer neuen Kategorie auftauchen, und zwar eine einheitliche Vorstellung, welche auf eine eigentümliche Weise mit der Vorstellung des betreffenden Tonkomplexes verbunden ist. Die Vorstellung dieses Ganzen gehört einer neuen Kategorie an, für welche der Name „fundierte Inhalte“ üblich wurde. Nicht alle fundierten Inhalte sind anschaulicher Natur und der Melodievorstellung verwandt' (translation of German quotes by Ověčáková).

that every foundation will also acquire a *fundierter Inhalt*.⁹ The connection between Gestalt quality and memory is likewise significant.¹⁰ For Ehrenfels, memory images (*Erinnerungsbilder*) become conscious through the unified idea (*einheitliche Vorstellung*). Individual elements without a Gestalt quality are thus much more difficult to remember than melodies, which are temporal Gestalt qualities that reflect a process, or harmonies, which are non-temporal Gestalt qualities that reflect a momentary state (Ehrenfels, 1932, in Weinhandl, 1960: 62).¹¹

The notion of the ‘height of the Gestalt’ (*Höhe der Gestalt*), which ‘grows with the product of its constituents, its uniformity and the diversity of its parts’ (Ehrenfels, 1922, in Weinhandl, 1960: 50)¹² is intrinsically connected to a gradation of Gestalt. This can extend infinitely – unlike the purity of Gestalt, which reaches a maximum threshold that cannot be surpassed. For instance, pure Gestalten may include flawless mathematical solids that achieve maximum purity at a relatively lower Gestalt level. Ehrenfels explores the prospect of building an entire aesthetics based on the principles of the Gestalt theory, especially in relation to the beauty of natural phenomena. Within this framework, the beauty of a Gestalt would increase proportionally with its complexity. A higher Gestalt is, for example, a rose or a swallow compared to a pile of rocks or a lump of dirt. Low Gestalten are ugly because they are disharmonious. In such Gestalten, there is a competition between the formative elements, that is, between elements where ‘which each represents only that part of a Gestalt which demands completion to a unity, – but in a direction incompatible with that of the other element(s)’, such as a long torso on short legs (Ehrenfels, 1922, in Weinhandl, 1960: 50–51).

Ehrenfels was convinced that the doctrine of evolution (see below) is essential for contemplating the multitude of Gestalten. Higher Gestalten emerge during development driven by the shaping principle. The phylogenetic developmental series from the lowest organisms to humans therefore represents an increase in the height of *Gestaltung*¹³, as is the case in ontogenetic development, where, however, this increase may be difficult to observe.

Beyond aesthetics and the natural sciences, the Gestalt theory could, according to Ehrenfels, be effectively applied not only in psychology or epistemology (where it is widely recognised) but also in cosmogony, which is a crucial basis for our article

⁹ Some of his pupils disagreed with Ehrenfels on this point. Some considered the interdependence between the *Fundament* and the *fundierter Inhalt* to be absolutely necessary (e.g. Meinong and Benusi), for others (Wertheimer, Köhler) the conception of melody was not about the production of the *fundierter Inhalt* but about perceiving (*Bemerken*) (Ehrenfels, 1932, in Weinhandl, 1960: 61).

¹⁰ This dimension of the Gestalt approach was further developed by the Berlin/Frankfurt School; cf., e.g., Goldmeier, 1982.

¹¹ According to Ehrenfels, mnemonic devices are also based on Gestalt qualities.

¹² ‘...wächst mit dem Produkt ihrer Konstituenten, ihrer Einheitlichkeit und der Mannigfaltigkeit ihrer Teile.’

¹³ The genealogical tree represents both quantitative and qualitative development: ‘From a few and relatively little differentiated Ur-beginnings, the diversity of shapes grows up towards us in a fan-like manner’ (Ehrenfels, 1916: 11). The target is life itself, the shaping of innumerable diverse forms as the Gestalt series and thus also the complexity increase. Essential for Ehrenfels is the interconnectedness of the ‘Darwinian idea of selection with the assumption of an immaterial, *psychoïd* – but without a sense of purpose – organising principle’ (Ehrenfels, 1916: 84).

and comparison. Ehrenfels considered the cosmogenic framework to be especially significant:

Our generation is realising more and more clearly [...] that we come closest to the constructive creative principle in nature, to the essence of the world, when we try to visualise it as a principle that drives Gestalten in its innermost nature, – as a principle that wants nothing and strives for nothing but Gestalten, and to bring forth ever new and higher Gestalten– no matter what else may emerge or follow thereof, – or even better as a principle which does not “will” this either (in some anthropomorphic interpretation of the expression) - but does it – must do it according to its innermost nature, without being bound to willing or having-willed before or during the doing. (Ehrenfels, 1922, in Weinhandl, 1960: 52–53)¹⁴

Uexküll's Concept of Umwelt

In his early reflections on Umwelt, Uexküll focused on how animals view the world and which parts of the world are accessible to them (Uexküll, 1910: 638–639). Every organism has its own set of sensory perceptions, motor abilities, and subjective experiences that shape its Umwelt. Uexküll emphasises that one cannot consider a single Umwelt in isolation. Rather, one must take into account countless Umwelten that cannot be reduced to each other; our human Umwelt is just one among many – it does not have a privileged significance.

In contrast to the absolute world, which would exist even without any relations to the sensory organs (Uexküll, 1910: 639), Uexküll constructs a relative world of Umwelt that is based on organismal functional circles (Funktionskreis, i.e., the circular relation between sensory and operating organs) and the makeup of the whole body (Bauplan). By perception and transmission of action, sensory organs are connected to the nervous system and the brain. In the brain, there can thus emerge uniform impressions (*einheitliche Eindrücke*) which correspond to objects of the Umwelt. Uexküll then calls the purposeful cohesion of relations, where the makeup of the brain is adapted to the makeup of the sensory organs and vice versa, the *Bauplan* of the animal. This *Bauplan*, which connects the organs in the animal body, becomes a closed whole once objects of the Umwelt are drawn into it. In higher animals, the Umwelt of the sensory organs expands, outgrowing the Umwelt of the ‘working’ organs, i.e., organs typically found also in the lower animals. A close relation is established between the sensory organs and objects. Uexküll thus describes a developmen-

¹⁴ ‘Immer deutlicher kommt es unserer Generation zum Bewusstsein [...] dass wir dem aufbauenden schöpferischen Prinzip in der Natur, dem Wesen der Welt am nächsten kommen, wenn wir es uns als ein in seiner innersten Natur Gestalten treibendes zur Vorstellung zu bringen suchen, – als ein Prinzip, welches nichts will und nichts anstrebt, als Gestalten, und immer neue und höhere Gestalten hervorzubringen – gleichgültig was sonst daraus noch entstehen oder erfolgen mag, – oder besser noch als ein Prinzip, welches auch dieses nicht “will” (in irgendeiner anthropomorphistischen Deutung des Ausdruckes) – sondern es tut – seinem innersten Wesen nach tun muss, ohne daran gebunden zu sein, es vorher oder während des Tuns auch zu wollen oder gewollt zu haben.’

tal series from simple animals with simple Umwelten to differentiated animal bodies with rich and varied Umwelten (Uexküll, 1910: 640–641).

Melody and counterpoint play a central role in efforts to understand Uexküll's concept. The analogy from music theory emphasises the importance of sensory organs and their relation to individual cells, which form like a living carillon whose individual cellular bells chime in different self-tones:

In order to understand this, one must recall that the body of each living being is built from living cells that together form a living carillon. The living cell possesses a specific energy that makes it possible for it to respond to any effect which approaches it from outside with a 'self-tone'. Self-tones can be combined with one another into melodies and do not require the mechanical interrelation of their cell bodies in order to have an effect on each other. (Uexküll, 2010: 201)

The doctrine of counterpoint enables Uexküll to interpret relationships among living beings analogously to the rules governing the interplay of various tones expressed by different musical instruments in a composition: 'Like every instrument, every animal harbors a certain number of tones, which enter into contrapuntal relationships to the tones of other animals' (Uexküll, 2010: 187). Uexküll develops this analogy from simple examples (the flower and the bee being composed in counterpoint to each other) to a general view of the relationships and development of living beings within a broader ontological framework:

Only the knowledge that everything in Nature is created according to its meaning and that all environments [Umwelten] are composed into the world-score opens up a path leading out of the confines of one's own environment [Umwelt]. (Uexküll, 2010: 200)

The Ambiguous Presence of Teleology

Possible Bridging between Gestalt and Umwelt

In relation to the concept of Gestalt quality, let us now look at Uexküll's explanation of a meaning carrier (*Bedeutungsträger*) within his theory of Umwelt. Both in the context of cosmogony and when considering the development of nature, natural entities, or culture, Ehrenfels remarks that it is important to note that a Gestalt quality does not emerge necessarily, because its emergence depends on our shaping ability or the *gestaltende Kraft* itself (though, importantly, this power is without purpose). For Ehrenfels, Gestalt theory is the only possible conceptual instrument that can grasp the non-teleological shaping principles in nature. The long-term development of these new, potentially continuously linked Gestalt qualities cannot be guaranteed: it can lead to a dead end. The emergence of a new Gestalt quality, which – like Uexküll's Umwelt – is not a boundless but restricted phenomenon, is accompanied by resistance that may be difficult to overcome; examples include the emergence of new qualities

of social systems, ethical ideals, but also new biological species (cf. Ovčáčková, 2022). In this context, Uexküll's concept of *Bedeutungsträger* in an Umwelt shares some aspects with Ehrenfels's concept:

Anything and everything that comes under the spell of an environment [Umwelt] is either redirected and re-formed until it becomes a useful carrier of meaning or it is completely neglected. Thereby, the original components are often crudely torn apart without the slightest consideration for the structural plan which controlled them to that point. (Uexküll, 2010: 144)

A comparison between the broader context of Gestalt and Umwelt indicates that Ehrenfels's and Uexküll's argumentation takes place within different conceptual frameworks, i.e. different core approaches to explaining living nature. Ehrenfels imagines the formation of nature as a synthesis of random chaotic diversity and shaping unity, while Uexküll is fully grounded in a purposive understanding of the development of living beings. Nevertheless, a comparison between the 'height of the Gestalt' and the 'height of the Umwelt' reveals their shared emphasis on the significance of development, specifically the increase in complexity, which encompasses both diversity and unity. The concepts of melody and counterpoint also suggest a similar understanding of development. Interestingly, Uexküll speaks of higher Gestalten in the context of the symphony, giving the example of a young man intently following the score during a concert:

Each voice of a person or instrument is a being for itself, but one which melts into a higher form [Gestalt]¹⁵ through point and counterpoint with other voices, which form then grows further, gaining richness and beauty in order to bring forward to us the composer's soul. (Uexküll, 2010: 185–186)

Ehrenfels's Dynamic relationship of Chaos and *Gestaltende Kraft*

To understand Ehrenfels's argumentation regarding the formation and development of the Gestalt, we need to take a closer look at his cosmogonic framework, which is anchored in a dynamic dualistic metaphysics of contrasting but indispensable principles of chaos and the shaping order. Everything arises through the *gestaltende Kraft* (or entelechy): it is the primal source of all lawfulness, order, and Gestalt. But this unified divine principle does not create out of chaos but through the resistance offered

¹⁵ Interestingly enough, Uexküll at this point uses in the original German edition the term 'Gestalt' and not the term 'Form'. He does the same also in the following paragraph when writing about 'a glance into the many-membered form [Gestalt] of the performed artwork' (Uexküll 1956: 142). In this context, a comparison with Ehrenfels's reflections on the Gestalt convergence of human artefacts is clearly at hand (cf. Ehrenfels, 1916: 193). However, the notions of 'Gestalt' and 'Gestaltung' are also found in other passages of Uexküll's *Theory of Meaning*, for instance in connection with 'Gestaltbildung' (form development) or in the following case, where he states: 'Thanks to its taking on foreign motifs, the body of any and every subject is formed [gestaltet sich] into a recipient of meaning from those carriers of meaning whose formative melodies have taken shape [Gestalt] in its body as motifs' (Uexküll, 2010: 198).

by chaos. The first Gestalt arose by accidental miracle out of the bottomless chaos that existed in eternity before the world came into being. This event became the basis of further development driven by mutual cooperation or destruction of one of the principles, that is, by never-ending emergence and extinction (Ehrenfels, 1916: 198–199).¹⁶ The development of the organic world is of the same nature.

Ehrenfels criticises the mechanistic approach and exclusive reliance on chance, but a teleological approach is equally unacceptable to him. Although an organism seems to be the means (*Mittel*) and as such purposefully ordered, it is not clear what purpose the organism, as the means, is supposed to serve. According to Ehrenfels, its purpose can be stated only with reference to the organism itself: ‘Self-preservation and the preservation of the species – the preservation of that shape of *Gestaltung*, which is definitely and in every respect a “means”, is also its only plausible “purpose”’. Means and purpose seem to coincide in the organic’ (Ehrenfels, 1916: 81).¹⁷ Ehrenfels’s contemplations here unmistakably display Kantian influences (Ehrenfels, 1916: 150–153).

Ehrenfels’s *gestaltende Kraft* enables the shaping of the whole in the course of life processes and increases the likelihood of viable variations in the evolutionary development compared to mere chance. For Ehrenfels, Gestalt development in the organic world (which is not in conflict with his dualistic approach) moreover forms a genealogical tree:

... the vast majority of formative streams always succumb to the gnawing influences of random resistance, end ‘blindly’, that is, without offspring, – get lost in chaotic sand. – But shaping impetus pushes inexhaustibly along all paths. And if a hundred branching streams dry up, – the hundred and hundredth one struggles through, divides itself into a hundred and more than a hundred arms, finds new paths, drives forth new shapes, so that – always defeated in by far the greatest number of its battles – the stream of life as a whole nevertheless always swells, gives birth to something new, splits up into manifold forms, expands into the immeasurable. (Ehrenfels, 1922, in Fabian 1990: 249)¹⁸

¹⁶ See also Arnheim, 1971 for this context.

¹⁷ ‘Die Selbst- und Arterhaltung, – die Erhaltung jener Gestaltungsform, welche durchaus und in jeder Beziehung „Mittel“ ist, ist auch ihr einzig plausibler „Zweck“. Mittel und Zweck scheinen im Organischen zusammenfallen.’

¹⁸ ‘... Gestaltungsströmen immer die weitaus größte Überzahl den nagenden Einflüssen der zufälligen Widerstände erliegen, ‚blind‘, das heißt ohne Nachkommenschaft endigen, – sich im chaotischen Sande verlaufen. – Aber unerschöpflich drängt gestaltlicher Auftrieb nach auf allen Bahnen. Und wenn hundert Zweigströme versiegen, – der hundertunterste ringt sich durch, zerteilt sich in hundert und mehr als hundert Arme, findet neue Wege, treibt neue Gestaltungen hervor, so dass – in der weitaus größten Zahl seiner Kämpfe immer besiegt – der Strom des Lebens als Ganzes doch immer anschwillt, Neues gebiert, sich in Vielfältiges zerspellt, ins Unermessliche erweitert.’

Uexküll's Planfulness

Ehrenfels's dynamic account of the origin and development of formation in nature stands in a opposition to Uexküll's purposive understanding of similar phenomena. In adult animals, Uexküll even speaks of a double purposiveness: 'firstly, the organism is purpose-built and secondly, the organism is purpose-fitted into its environment' (Uexküll, 1912: 100).¹⁹ Uexküll often uses the term 'purposiveness' (*Zweckmäßigkeit*) but also suggests using the term 'planfulness' (*Planmäßigkeit*) instead. By 'planfulness', he means 'that the parts are arranged according to a ground plan or a plan in such a way that together they form a uniformly functioning whole' (Uexküll, 1912: 100).²⁰ This approach to teleology hints at the specific causality of living beings, a notion that can be traced back to Kant (2000 [1790]). Also for Uexküll, the Darwinian term adaptation or *Anpassung* falls short of fully capturing the relationship between organism and the environment, because organisms do not merely adjust to the physically existing world – they respond to the world of signs. Uexküll prefers the term *Einpassung* (Uexküll, 1927) and this term encompasses both the matching of organs and their parts and the matching of organisms and the environment as noted above, but also the matching of Umwelten to each other (Uexküll, 1927: 696, Kull, 2004)

Significantly, compared to Ehrenfels's 'mysterious force' (*geheimnisvolle Kraft*), Uexküll speaks of a 'mysterious plan' (*geheimnisvoller Plan*) in his reflections upon the evolution of humans and other organic beings: 'The development of the human individual takes place in the same way as that of animals. The same protoplasm forms the basis of our body and in the same way the genes mould our structure according to a mysterious plan' (Uexküll, 1913: 1080).²¹

This 'mysterious plan' seems to be identical to Uexküll's *Bauplan*, which raises the question of how flexible and open to change this *Bauplan* is. Ehrenfels's unified *gestaltende Kraft* could, after all, represent a kind of flexible *Bauplan*, although one that lacks intentionality because it is in constant contact with chance and therefore chaos. According to Ehrenfels, God's objective is not the life 'of certain forms of Gestaltung – but life in general', which means 'to shape as much and as many and as rich as possible'. Life shapes itself, 'as the unpurposed success of this shaping, in that the ongoing shaping always offers the next starting conditions for new shaping' (Ehrenfels, 1916: 82). In most cases, Uexküll speaks of a fixed *Bauplan* to whose command the cells of organs and entire organs are subjected. They do, nevertheless, have their own meaning tone (*Bedeutungston*), which is important. The 'life tone' of an entire animal thus consists of its 'organ tones'. A living animal is thus not merely a physical mechanism made up of cells and organs in accordance with the order of development (Uexküll, 2010: 157). On the other hand, Uexküll's understanding of

¹⁹ '...einmal ist der Organismus zweckmäßig gebaut und zweitens ist der Organismus zweckmäßig in seine Umgebung eingepasst.'

²⁰ '...dass die Teile entsprechend einem Grundrisse oder einem Plane derart angeordnet sind, dass sie gemeinsam ein einheitlich funktionierendes Ganzes bilden.'

²¹ 'Die Entwicklung des menschlichen Individuums läuft in gleicher Weise ab, wie die der Tiere. Das gleiche Protoplasma bildet die Grundlage unseres Körpers und in gleicher Weise formen die Gene unsere Struktur nach einem geheimnisvollen Plan.'

melody is rather narrow, although, like Ehrenfels's, it has the tendency to leave the realm of mere elements:

The meaning tone starts up abruptly and activates the form development order in the self-tones of the previously homogeneous cell elements, which then sort themselves out in different tones attuned to each other and allow the form development to proceed according to a previously established melody. (Uexküll, 2010: 156)

But what gives the semantic tone the impulse to give the order to shape the form in self- or other tones? Uexküll believes that behind all development in living nature, there is a teleological principle, a plan; this is then also reflected in his terminology (cf. *Bauplan, Entstehungsplan, Planmäßigkeit*, God–nature, or the ‘mysterious plan’). Relevant in this context are Merleau-Ponty's reflections on what may be ‘the Umwelt of Umwelten’; this refers to Uexküll's statement that all Umwelten are carried by one (perhaps God–nature), which nevertheless remains inaccessible to all Umwelten (Merleau-Ponty, 2003: 177). In Uexküll's works, we find no hints to interpreting the interconnectedness of Umwelten by reference to some higher anchoring of content, as is the case with Ehrenfels's *fundierter Inhalt*. Ehrenfels's Gestalt shaping and the Gestalt itself are difficult to grasp, as is – due to its processual nature – the determination of boundaries between Gestalten.

Communication between Gestalten and Umwelten

Both Ehrenfels's and Uexküll's approach have a connection to the distinctive Kantian teleology of the living. In *Critique of the Power of Judgment* (2000 [1790]) Kant emphasised the complexity of ‘natural purposes’ and argued that our minds cannot fully comprehend them. For Kant, a natural purpose is anchored in the interrelationships between parts that make up the whole and in the interaction between the whole and its parts, where all parts are, reciprocally, both the end and the means, because organisms are both organised and self-organising (*sich selbst organisirendes Wesen*, Kant 2000: 245; AA 5 374, also Kanócz forthcoming). The problem with grasping natural teleology is not due to its claim that the parts cause the whole, as mechanistic explanations of nature tend to assume, nor is it linked to the relations between the parts themselves. Rather, the difficulty with grasping natural teleology is in how the parts are caused by the whole. Still, the telos is internal, not external, to the whole.

This distinction characterises the divide between the realms of the animate and inanimate and captures the internal process of self-creation that is inherently self-directed. Living organisms emerge from within themselves, emerge from their wholeness, thereby becoming the cause of their own existence. This *wholeness* is irreducible. Brier gives an apt example: If we talk about experience, we cannot say that my brain has experience. We can only say that I, as a feeling and thinking subject, have experience (Brier, 2015). Likewise, if we accept that even cells have some rudimentary experience (albeit not conscious), then the cell as a whole cannot be reduced to its parts (ribosomes, etc.). Even Uexküll attributed the functional circles and subjectivity to the cells (Uexküll, 1931). Also, the Uexküllian *Plan* represents the

spatial and temporal whole (Kull, 2004). This teleological causality where the *whole* both constrains and generates the parts (whose purpose is to realise the whole) makes organisms both self-generating and self-causing (Švorcová [forthcoming](#)).²² Such a whole can be understood as a Gestalt, and only with such a Gestalt there emerges an irreducible quality of the whole, represented either by a cell or a more complex organism, which enables them, i.e., the cells or organisms, to attribute meaning, a relation of self-reference, and thus Umwelt. This, we believe, is another point that links the thinking of Uexküll and Ehrenfels. Although Umwelt and Gestalt are not quite the same, Umwelt cannot exist without Gestalt.

Teleological thinking, especially as based on the Uexküllian external plan for the whole nature, may appear irrelevant to contemporary biology. But some trends in the philosophy of biology, such as biosemiotics or agency theory, recognize living beings themselves as end-directed, having a certain internal teleology (Švorcová [forthcoming](#) in 2024). According to the classical theory of Darwinism, organisms only appear to be purposeful systems because of natural selection made it seem purposeful, but they are not purposeful systems per se. This is where Uexküll clearly departs from Darwin's views.

Searching for Similarities through the Relationship to Darwinism

Ehrenfels's dualistic metaphysical concept is strongly rooted in Darwinism, but that does not mean that Ehrenfels accepts it fully. In his view, Darwinism is in explaining organic evolution subject to 'an almost grotesque overestimation of the actual chances of probability that are given for the chance occurrence of an internally logically constructed whole' (Ehrenfels, 1922, in Fabian 1990: 240).²³ Ehrenfels's rejection of chance as the principle exclusively responsible for the emergence and development of natural entities is closely related to his identification of chance and chaos. In a world of blind chance, nothing graspable or continuous can emerge. Ehrenfels seeks to find the *missing link* that would allow us to consider the emergence and development both on the basis of chance and based on a unified shaping principle. Ehrenfels's contribution to Darwinian considerations thus consists of extending the notion

²² The notion of the whole outlined in this paper expands upon Humberto Maturana and Francisco Varela (1980) and is related to their theory of autopoiesis. Their perspective underscores the independence of living systems that is evident in their ability to self-organise and sustain themselves by regulating their composition and maintaining their boundaries. It also draws upon the organicist tradition, which originated with thinkers such as Kant and Bernard but its roots can be traced back to Schelling and even Aristotle (Švorcová [forthcoming](#) in 2024). But Maturana and Varela's contribution goes beyond this by emphasising the concept of embodied information. Embodied information transcends mere representation of the external environment; rather, it embodies its collaborative aspect, suggesting an ongoing and reciprocal causal relationship between organisms and their surroundings. According to Maturana and Varela, the physical world lacks meaning in itself. It acquires significance through the organisms' active engagement in converting environmental stimuli into functional information. Maturana and Varela endorse a semantic theory of information where information is viewed not as an inherent property of objects but as emerging from interactions between them, akin to the principles found in semiotics.

²³ '...einer geradezu grotesken Überschätzung der tatsächlichen Wahrscheinlichkeitschancen, welche für das zufällige Zustandekommen eines innerlich folgerichtig aufgebauten Ganzen gegeben wird.'

of chance-based creation to the idea of the emergence of unified Gestalten that not only stand in opposition to chaos but also originate from it.²⁴ Random stimuli give rise to uniform Gestalten. If new Gestalten or Gestalt series have a more permanent character, they attract more intensely other shaping forces of the unified principle. These again give rise to new formations, but always with the aforementioned lack of focus.²⁵ That mysterious force, ‘which begets life and brings forth Gestalten, shows [...] an inexhaustible imagination, but no trace, neither of deliberation and foresight, nor of pity and compassion for its creatures’ (Ehrenfels, 1922, in Fabian 1990: 244).²⁶

Uexküll was, in comparison with Ehrenfels, a fierce opponent of Darwinism. His attitude to the evolutionary theory is clearly summed up by Merleau-Ponty: ‘For Darwin, life is endlessly menaced by death; for Uexküll, there is a solidity of superstructures, a shuffling of life’ (2003: 171). Uexküll sharply criticised both the materialistic and mechanical character of Darwinism and the scientific monistic worldview represented by the German zoologist and physician Ernst Haeckel.²⁷

In opposition to Darwinism, Uexküll calls for biology to be governed by meaning and not by a causal order that remains hidden from the ‘great connections’ (Uexküll, 2010: 160). For him, a meaningful form (*bedeutungsvolle Form*) is always the work of the subject and not of an object that acts unplanned; even plants and animals owe their bodily form to the fact that they are evaluators of meaning factors that come to them from outside (Uexküll, 2010: 151).

Uexküll is aware that while we cannot know how animals observe the world (that would be a matter of psychological speculation), we can investigate and find out which parts of the world are accessible to animals through their sensory organs (Uexküll, 1910: 638). The lower organisms form a closed unity with their world in which they do not struggle for their existence. They live in an Umwelt in which they are adapted to dangerous situations. Yet, the Umwelten of humans and animals are irreducible to each other: ‘We can therefore only speak of countless “Umwelten”, among which the world around us is only an individual case but must by no means be

²⁴ Ehrenfels finds even in inorganic nature a number of remarkable analogies with the world of living organisms (e.g. the Gestalt individuality of crystals). Inorganic and organic nature share the asymmetry of emergence and extinction and, in both cases, it is possible that there will be a rapid ‘Gestalt fall’ into formlessness. Nevertheless, according to Ehrenfels, the inorganic world lacks the constantly overflowing and compulsive power to shape (cf. Ovčáčková, 2022).

²⁵ The dynamic delineation of opposing forces leads to humans who, through their own creativity, have become part of the inner life of God and thus his collaborators. Only at this point does Ehrenfels contemplate divine purpose and purposive consciousness (Ehrenfels, 1916: 207). According to Ehrenfels, the cosmogonic development thus consists of three important events: the beginning of the world, the emergence of life and its psychic dimension, and finally the emergence of the purposive will in humans.

²⁶ ‘...welche Leben zeugt und Gestalten hervortreibt, zeigt [...] eine unerschöpfliche Phantasie, aber keine Spur, weder von Überlegung und Voraussicht, noch auch von Mitleid und Erbarmen für ihre Geschöpfe.’

²⁷ Haeckel formulated his naturphilosophical and Darwinism-anchored worldview in his *Generelle Morphologie der Organismen* (1866). It culminated with the founding of the German Monistic League (*Deutscher Monistenbund*) in 1906 (Ovčáčková, 2018). Ehrenfels also turned against Haeckel’s monism. Unlike Uexküll, however, he primarily criticises Haeckel’s monistic cosmogenesis, which is in opposition to his dualistic understanding of the origin and development of the world (cf. Ehrenfels, 1916: 36–46).

regarded as standardising' (Uexküll, 1910: 639).²⁸ This also implies that animals do not passively adapt to a shared world (see Sect. 3.3. on *Einpassung*).

Uexküll identifies in the excessive influence of materialism a great danger of his time, noting that the world has become 'desolate'. Interestingly, Uexküll encourages – quasi in line with Merleau-Ponty – to look from the invisible to the visible: 'It really is time to shift our gaze from the invisible to the assessable if we want to experience something of the essence of the visible' (Uexküll, 1910: 646)²⁹.

Merleau-Ponty's Reflection upon Natural Phenomena within *Umwelt* and *Gestalt*

Our main link between Uexküll and Ehrenfels in this context is the thought of Merleau-Ponty. Similar to Uexküll's approach to animals, Merleau-Ponty challenges the longstanding Cartesian subject–object tradition, where subjects supposedly use their mind or consciousness to perceive external objects in the objective world. According to Merleau-Ponty, our existence in the world is fundamentally perceptual, whereby perception is more a lived experience rather than a purely cognitive one. Uexküll attributes a central role to perception also in animals: it is species-specific and thus grounds the existence of the various *Umwelten*, the subjective, experiential realms of signs. Consequently, organisms undergo transformation through semiotic causation (Hoffmeyer, 2008) guided by interpretation of environmental signs. Merleau-Ponty also interprets (at least) animals as subjects (Tønnessen, 2009) and his philosophical interpretation of *Umwelt* through the concept of *Gestalt* can help us take the connection between these two thinkers further:

The notion of *Umwelt* is destined to join what we usually separate: the activity that creates the organs and the activity of behavior, lower as well as higher. From animal-machines to animal-consciousness, there is everywhere an unfurling of an *Umwelt*. What is unfurled, and from what? (Merleau-Ponty, 2003: 173)

Ehrenfels's metaphysics of the organic world might offer one answer to the question posed above, but Uexküll's teleological framework would have to be shifted. This possible direction is supported by Merleau-Ponty's further statement about 'the unfurling of an *Umwelt* as a melody that is singing itself' (Merleau-Ponty, 2003: 173). It is a fundamental departure from Uexküll's concept of counterpoint, because the melody is not based on an external but an internal impulse. Thus our arguments are in line with Merleau-Ponty's (see Sect. 3.4.). The respective quotation, as well as the one just below, allude rather to Ehrenfels's *Gestalt*. Merleau-Ponty understands melody as a Platonic idea that cannot be viewed in isolation:

²⁸ 'Wir dürfen daher nur von zahllosen "Umwelten" reden, unter denen die uns umgebende Welt nur einen Einzelfall bildet, aber keineswegs als normgebend angesehen werden darf.'

²⁹ 'Da ist es wahrhaftig an der Zeit den Blick vom Unsichtbaren auf das Übersichtbare zu lenken, wenn man etwas vom Wesen des Sichtbaren erfahren will.'

It is impossible to distinguish the means and the end, the essence and the existence in it. From a center of physical matter surges an ensemble of principles of discernment at a given moment, which means that in this region of the world, there will be a vital event. (Merleau-Ponty, 2003: 173)

Ehrenfels's and Uexküll's reflections upon the formation of the natural world, the processes involved in the development of living beings, the dynamic metaphysical framework, and interpretation of meaning in orientation in the world from both immediate and distant perspectives can now be appreciated within Merleau-Ponty's broader phenomenological framework. This is presented by Merleau-Ponty in his two books *The Visible and The Invisible* and *Phenomenology of Perception*. Although Merleau-Ponty's understanding of Gestalt was shaped mainly by the Gestalt theory as presented by Ehrenfels's followers (Koffka, Köhler and Wertheimer), it may still help us understand more deeply the Uexküllian perspective.

For Merleau-Ponty, the world and life stand in a relation of the visible and the invisible, whereby the invisible is '*Verborgenheit* by principle, i.e. invisible of the visible, *Offenheit* of the Umwelt and not *Unendlichkeit*' (Merleau-Ponty, 1968: 251). In this connection, he also defines his understanding of metaphysics: 'I am against finitude in the empirical sense, a factual existence that *has limits*, and that is why I am for metaphysics. But it lies no more in infinity than in the factual finitude' (Merleau-Ponty, 1968: 251). A similar type of metaphysics can also be found in the works of Uexküll and Ehrenfels. In the fifth chapter of *Die Bedeutungslehre*, which deals with the regularity of formation of shapes of bodies and the regularity of meaning, Uexküll realizes that his metaphysical ideas will not be easily acceptable to biologists (Uexküll 1956: 123). Ehrenfels, on the other hand, explicitly speaks of a metaphysics of the organic world (Ehrenfels, 1922, in Fabian 1990: 237–246) and, as we have already shown, the metaphysical dimension is crucial to his understanding of Darwinism and to an elaboration of his neo-vitalist position. Therefore Merleau-Ponty's discussion of Driesch's concept of entelechy (a notion to which Uexküll and in part Ehrenfels³⁰ also reacted) cannot be omitted. Merleau-Ponty's phenomenological reflections on the ontology of subject and object and the visible and invisible within scientific knowledge seem to circle around a problematic understanding of wholeness that goes hand in hand with not only the concept of entelechy but also, in parallel, with the concept of Gestalt:

But we must follow Driesch in this "philosophical" effort because he remains aware of the difficulties that had led him to totality. And moreover, totality is not a key: we must think it itself as a gestalt. And Driesch's attempt, of course, teaches the difficulties of transcendental totality, sketches the totality of emergence. (Merleau-Ponty, 2003: 235)

Merleau-Ponty's quotation from the final reflections in the fourth sketch of the third series of lectures from 1959 to 1960, *Nature and Logos: The Human Body*, is also

³⁰ Ehrenfels defines himself against Driesch by contrasting entelechy with the second metaphysical principle of chaos (Ehrenfels, 1922, in Fabian 1990: 258).

significant. Following Uexküll and his concept of melody, he returns to a rehabilitation of the sensory world: ‘This being-there by difference and not by identity we think only by the rehabilitation of the sensible world, not as a “psychological fact” to reconstruct in positive terms, but as the visibility of the invisible’ (Merleau-Ponty, 2003: 238–239). In doing so, Merleau-Ponty emphasises a departure from the anthropological view:

In nature there is no preestablished field [...] In any case a new field is realized. Thus, the perceived form is not an anthropomorphic illusion in relation to the nature in-itself behind it, but to nature englobed in living nature, that we must strip of human clothing (= science): we find then a center [foyer] of phenomena, a lateral encroachment of microphenomena on each other, a cohesion around invisible being even *der jure*, that they envelop, around which they fold up, crystallize the Gestalthafte. (Merleau-Ponty, 2003: 239)

This quote clearly reveals a direct connection to Ehrenfels’s cosmogonic Gestalt thinking characterised by a dualistic dynamic framework that contemplates Gestalt while rejecting the idea of a preestablished world.

From the above, becomes obvious that Ehrenfels’s and Uexküll’s perspectives on relating to the natural world have different starting points. Although both thinkers viewed their approach as metaphysical, Uexküll’s interpretation of natural phenomena remains primarily in the realm of the sensory world of meaning, i.e., within the world of the visible, whereas Ehrenfels’s position based on his grounding in the cosmogonic perception of the world tends to move towards the world of the invisible. We have shown that these perspectives can not only intermingle, but also complement each other. Meaningful reflection on this interface is central to Merleau-Ponty’s phenomenological emphasis on understanding the nature of both Gestalt and Umwelt also in relation to the body and corporeality. Merleau-Ponty’s reflections on Gestalt are most clearly present in his working notes (named *Gestalt*) from September 1959. This text clearly spells out Merleau-Ponty’s intention to understand Gestalt not as an idea or meaning but as a body:

My body is a Gestalt and it is co-present in every Gestalt. It is a Gestalt; it also, and eminently, is a heavy signification, it is flesh; the system it constitutes is ordered about a central hinge or a pivot which is openness to... (Merleau-Ponty, 1968: 205).

Such ‘openness’, free of focus, is also characteristic of Ehrenfels’s conception of Gestalt. Gestalt itself, i.e. the Gestalt quality, is also carried on the physical level by *gestaltende Kraft* that does not have a predetermined goal. Its aim is to shape not only with respect to the whole, but also in reaction to new situations. Such situations may call for an interpretation determined not by an external framework but rather by an inner ability to grasp and perceive the meaning of the inorganic and organic game being played.

Conclusion

The concept of Gestalt has held a distinct position in the historical trajectory of biology and numerous thinkers have engaged with it, be it in its original sense put forth by Ehrenfels or in a later, slightly modified interpretation represented by Wertheimer, Köhler and Koffka.³¹ For example, Portmann also introduced the idea of the whole being more than its parts and in doing so, he explicitly referred to Gestalt. This is discussed by Jaroš and Brentari (2022), who emphasise that Portmann understands the whole not as a structure binding parts together but as a distinct quality that empowers the organism to harness lower-order natural processes. Therefore, Gestalt is not just the physical form of an animal but also the totality of appearances. As such, it transcends the Darwinian focus on a functional interpretation of organismal structures. The influence of the Ehrenfelsian concept is evident.

This line of thought could be extended so as to encompass even simpler organisms, including unicellular ones. It can be argued that closure, topologically represented on the basic level by a cellular membrane since the origin of life, is a necessary precondition for agency, organisation, and semiosis (Švorcová & Markoš, 2023). Beyond these first-order closures, there also exist second-order closures characterised by dynamic and often ad hoc formations, such as cell communities or holobionts (higher Gestalten). We posit that first-order cellular closures *structurally enable the whole* and yet the additional quality emphasised by Ehrenfels and Portmann is *irreducible* to any structure of the whole or any of its parts. Only the whole can relate to the world through experience and semiosis (i.e., via Umwelt).

However, these ideas are not entirely new. The Czech philosopher Zdeněk Neubauer, who was inspired among others also by the work of Portmann, emphasised the difference between the bodily forms of the living (or better Appearance, *eidōs*, Gestalt), which are the shape of the *Self* (being itself and emerging from itself), and the qualitatively quite different objects, which are scientifically studied. When observing the elusive flowering of the hibiscus, Neubauer defined the foundations of his *eidetic biology* (Neubauer, 2017, cf. Merleau-Ponty's idea of *Physis*). The dynamic nature of the living does not emerge from temporal slices, like when a film captures a chain of objective, immobile states; rather, it represents a continuous emergence and occurrence. The living gives itself to the world as a Gestalt/Appearance and only as such it can be perceived and enter into a relationship of counterpoint with other living beings.

³¹ Wertheimer, Köhler, and Koffka sought – in line with an empirical philosophical worldview – a ‘radical reconstruction of psychological thinking’ (Ash, 1995: 103). The differences between their and Ehrenfels's Gestalt approach mainly had to do with the idea of the whole, i.e., the ‘fundierter Inhalt’ (grounded content), which for Ehrenfels is necessarily linked to the ‘Fundament’ (foundation). According to Ehrenfels, however, the ‘fundierter Inhalt’ can be missing. For Wertheimer and Köhler, foundation is always linked to founded content. It is thus not its ‘Produktion’ (product) but only its ‘Bemerken’ (notion) (Ehrenfels, 1932, in Weinhandl, 1960: 62). These approaches are also reflected in the conception of the whole as something other (though not necessarily more) than the sum of its parts (cf. Rausch, 1960). Ehrenfels's approach is thus clearly incompatible with an atomistic and mechanistic understanding of Gestalt shaping (cf. Weinhandl, 1960: 5).

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References

- Arnheim, R. (1971). *Entropy and Art. An essay of disorder and order*. University of California Press.
- Ash, M. G. (1995). *Gestalt psychology in German Culture 1890–1967. Holism and the quest for objectivity*. Cambridge University Press.
- Brentari, C. (2011). *Jakob Von Uexküll. The Discovery of the Umwelt between Biosemiotics and Theoretical Biology*. Springer.
- Brier, S. (2015). Can biosemiotics be a science if its purpose is to be a bridge between the natural, social and human sciences? *Progress in Biophysics and Molecular Biology*, 119(3), 576–587.
- Ehrenfels, C. (1890). Über „Gestaltqualitäten“. *Vierteljahrsschrift für Wissenschaftliche Philosophie*, 14, 249–292.
- Ehrenfels, C. (1916). *Kosmogonie*. Eugen Diederichs.
- Ehrenfels, C. (1922). Weiterführende Bemerkungen. In F. Weinhandl, (Ed.) (1960). *Gestalthaftes Sehen. Ergebnisse und Aufgaben der Morphologie* (pp. 47–60). Wissenschaftliche Buchgesellschaft.
- Ehrenfels, C. (1922). Gedanken über die Religion der Zukunft. In: R. Fabian (Ed.) (1990), *Christian von Ehrenfels, Philosophische Schriften 4: Metaphysik* (pp. 231–280). Philosophia Verlag.
- Ehrenfels, C. (1929). Die Religion der Zukunft. In: R. Fabian (Ed.) (1990), *Christian von Ehrenfels, Philosophische Schriften 4: Metaphysik* (pp. 281–288). Philosophia Verlag.
- Ehrenfels, C. (1932). Über Gestaltqualitäten. In F. Weinhandl, (Ed.) (1960). *Gestalthaftes Sehen. Ergebnisse und Aufgaben der Morphologie* (pp. 61–63). Wissenschaftliche Buchgesellschaft.
- Goldmeier, E. (1982). *The memory Trace. Its formation and its Fate*. L. Erlbaum Associates.

- Hoffmeyer, J. (2008). *Biosemiotics: An examination into the Signs of Life and the life of signs*. University of Scranton.
- Jaroš, F., & Brentari, C. (2022). C. Organisms as subjects: Jakob Von Uexküll and Adolf Portmann on the autonomy of living beings and anthropological difference. *HPLS*, 44, 36.
- Kanócz, R. (forthcoming) Kant: Mechanism, Teleology, Organism, and the Powers of Our Mind. In, & Švorcová, J. (Eds.). *Organismal Agency: Biological Concepts and Their Philosophical Foundations*.
- Kant, I. (2000 [1790]). *Critique of the Power of Judgment*. Cambridge University Press.
- Kriszat, G. (1956). Enzyklopädisches Stichwort. Biologie Und Umweltlehre. In J. Uexküll, & G. Kriszat (Eds.), *Streifzüge Durch die Umwelten Von Tieren Und Menschen. Bedeutungslehre* (pp. 163–169). Rowohlt Taschenbuch.
- Kull, K. (2004). Uexküll and the post-modern evolutionism. *Sign Systems Studies*, 32, 99–114.
- Maturana, H., & Varela, F. (1980). *Autopoiesis and cognition. The realization of the living*. Springer.
- Merleau-Ponty, M. (1968). *The visible and the invisible*. Northwestern University.
- Merleau-Ponty, M. (2002). *Phenomenology of Perception*. Routledge.
- Merleau-Ponty, M. (2003). *Nature. Course notes from the Collège De France*. Northwestern University.
- Neubauer, Z. (2017). *Das Aufblühen Des Hibiskus*. Thanhäuser.
- Ordnung Der Vorlesungen an Der Deutschen Universität in Prag*. Prag: Deutsche Universität Prag (1920–1932).
- Ordnung Der Vorlesungen an Der k. k. Deutschen Karl-Ferdinands-Universität zu Prag*. Prag: Karl-Ferdinands-Universität (1896–1920).
- Ovčáčková, L. (2018). Die Rezeption Des Naturwissenschaftlichen Monismus Von Haeckel Im Tschechischen Kulturraum. In H. Matis, & W. L. Reiter (Eds.), *Darwin in Zentraleuropa* (pp. 311–341). LIT.
- Ovčáčková, L. (2022). Přírodní Filozofie Christiana Von Ehrenfelse. O gestaltové teorii a darwinismu. *Živa*, 4, XCIII–XCVI.
- Rausch, E. (1960). Zur Entwicklung Des Gestaltbegriffs. In F. Weinhandl (Ed.), *Gestalthaftes Sehen. Ergebnisse Und Aufgaben Der Morphologie* (pp. 334–338). Wissenschaftliche Buchgesellschaft.
- Švorcová, J. (forthcoming). *Organismal Agency: Biological Concepts and Their Philosophical Foundations*.
- Švorcová, J., & Markoš, A. (2023). Closures as a precondition of life, Agency, and Semiosis. *Biosemiotics*, 16, 45–59.
- Tønnessen, M. (2009). Umwelt transitions: Uexküll and Environmental Change. *Biosemiotics*, 2, 47–64.
- Uexküll, J. (1910). Die Umwelt. *Die neue Rundschau*, 5, 638–648.
- Uexküll, J. (1912). Das Subjekt als Träger Des Lebens. *Die neue Rundschau*, 1, 99–107.
- Uexküll, J. (1913). Die Aufgaben Der Biologischen Anschauung. *Die neue Rundschau*, 8, 1080–1091.
- Uexküll, J. (1927). Die Einpassung. In A. Bethe, v., G. Bergmann, G. Embden, & A. Ellinger (Eds.), *Handbuch Der Normalen Und Pathologischen Physiologie* (pp. 693–701). Springer.
- Uexküll, J. (1931). Die Rolle Des Subjekts in Der Biologie. *Die Naturwissenschaften*, 19, 385–391.
- Uexküll, J. (1956). Die Bedeutungslehre. In J. Uexküll, & G. Kriszat (Eds.), *Streifzüge Durch die Umwelten Von Tieren Und Menschen. Bedeutungslehre*. Rowohlt Taschenbuch.
- Uexküll, J. (1956). Streifzüge Durch die Umwelten Von Tieren Und Menschen. In J. Uexküll, & G. Kriszat (Eds.), *Streifzüge Durch die Umwelten Von Tieren Und Menschen. Bedeutungslehre*. Rowohlt Taschenbuch.
- Uexküll, J. (2010). The theory of meaning. In J. Uexküll (Ed.), *A foray into the worlds of animals and humans; with a theory of meaning*. The University of Minnesota.
- Weinhandl, F. (Ed.). (1960). *Gestalthaftes Sehen. Ergebnisse Und Aufgaben Der Morphologie*. Wissenschaftliche Buchgesellschaft.

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