GeoHumanities

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rgeo20

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To cite this article: Ian Klinke (2023) Arguing With Jakob von Uexküll's *Umwelten*, GeoHumanities, 9:2, 462-479, DOI: 10.1080/2373566X.2023.2204138

To link to this article: https://doi.org/10.1080/2373566X.2023.2204138

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Published online: 29 Jun 2023.

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Arguing With Jakob von Uexküll's *Umwelten*

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The past two decades have witnessed the remarkable rediscovery of the Baltic-German bio-philosopher Jakob von Uexküll (1864–1944) and his conception of the animal as a creator of meaning, master of its Umwelt (environment). This paper highlights several blind spots in Uexküll's contemporary revival. Whilst it has not gone unnoticed that his political agitations clash with the spirit of contemporary research agendas, his Staatsbiologie (state biology) and other essays from the 1920s are commonly dismissed as mere mishaps. But as I show in this paper, Uexküll's political ideas pervade his ostensibly biological works. Indeed, what has been lost in the scramble to reclaim Uexküll is precisely the crucial role which human animals and their music play in his bio-philosophy. His attempts to unite his understanding of the swarm and the bubble through his esoteric and anti-democratic Kompositionslehre (theory of composition) should be borne in mind for any further attempts to fashion him into a thinker of the "more-than-human." **Key Words: Germany, intellectual history, more-than-human geography, Umwelt, vitalism.**

Recent years have seen an astonishing outburst of interest in the Baltic-German biologist and philosopher Baron Jakob Johann von Uexküll (1864–1944). Amongst human geographers, the eccentric ethologist was first revived in the mid-2000s by Nigel Thrift, who discovered in Uexküll's writings a relational materialism which could serve as a viable alternative to Darwinism: similarly anti-humanist but devoid of all mechanist reductionism (Harrison, Pile, and Thrift, 2004, 35; Thrift, 2004, 2007). Taking his cue from Deleuze and Guattari (1987, 257), who interpret Uexküll as a Spinozist who teaches us that "[w]e know nothing about a body until we know what it can do," Thrift finds in Uexküll a new way of thinking space in terms of bodily affect, multiple worlds and mutually attuned life forms. What emerges is thus a new understanding of the animal as possessing "properties of potentiality and self-creativity" (Harrison, Pile, and Thrift, 2004, 36).

In 2010, two of Uexküll's most important writings were re-translated into English (Uexküll [1934/1940] 2010). He has since made appearances as an original theorist of sheep rearing (Roe 2010, 269), mosquito breeding (Shaw, Jones, and Butterworth 2013) and food systems (Sarmiento 2015), an interlocutor for reflections on nonhumans in the field (Forsyth 2013), a guide to the Anthropocene (Adams 2016; Ruddick 2017) and an inspiration for research into animals' atmospheres (Lorimer, Hodgetts, and Barua, 2019). His "lasting gift," we are told, is "his curiosity about the diversity of worlds on Earth" (Ginn 2014, 133). And it is not just amongst geographers that the Baltic German has experienced a renaissance. Anthropologists too have been inspired by Uexküll's insistence that meaning is projected by the organism onto its environment (Ingold 2011, 64 see also Ingold 2000; Schroer 2021), as have the philosophers Giorgio Agamben ([2002] 2004) and Elizabeth Grosz (2008), amongst many others (Brentari 2015; Buchanan 2008; Michelini and Köchy 2020; Wambacq and van Tuinen 2017). Uexküll continues to entice us with an "engaging mix of boyish enthusiasm and avuncular bonhomie" (Winthrop-Young 2010, 209). His "charm is still felt in our time" (Michelini 2020, 8).

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Initial submission, January 2022; revised submission, January 2023; final acceptence, April 2023.
Published by Taylor & Francis Group, LLC.

The occasional repetition notwithstanding, Uexküll is indeed a highly engaging writer. Whilst repeatedly invoking the Königsberg philosopher Immanuel Kant, he makes not humans his primary focus but the subjectivity of a wide range of living beings, as they are shaped by sense organs and nervous systems. He illustrates his points with an array of fascinating vignettes, many of which are now famous. Most prominently, there is the deaf and sightless tick which sits patiently on a branch until the butyric acid of a passing mammal prompts it to drop, drink, deposit its eggs and die. This highly specialised parasite's stripped-down self-confinement (it responds to only three sensory cues) and its ability to endure without feeding for up to eighteen years doubtlessly make it a tantalisingly strange life form. There are others: The "duets" of spider and fly, or the hermit crab which treats the sea anemone as food, dwelling or shelter, depending on its mood. Rather than as mere machines or effects of causal environmental influences, nonhumans are read by Uexküll—and especially his followers—as creators of their own worlds (Winthrop-Young 2010, 222), "thinkers in their own right" (Buchanan 2020, xiii). Humanity is given its place amongst these animals, a move which explains the attraction which Uexküll has amongst post-humanists of various stripes.

Uexküll proposes not only a new understanding of the environment as an extension of the organism, but an all-encompassing theory of meaning. For even the simplest life form reads signs in his universe, rather than interacting directly with the material world. On a flowering meadow, every insect is thus surrounded by its very own bubble which "represents each animal's environment and contains all the features accessible to the subject" and in each of which "a new world arises" (Uexküll [1934] 2010, 43).[1] The appeal of Uexküll's solipsist theory draws from the fact that many readers, especially those interested in animal subjectivity, will instinctively agree with him that non-human animals are likely to act and interpret in registers which are particular to their perceptual conditions. Once meaning making is no longer assumed to be an exclusively human prerogative, Uexküll offers himself as a clever "shaman" who crosses over into the animal mind (Sagan 2010, 20). Having revealed that nature is semiotic, Uexküll allows his reader, in a second signature move, to see that life forms leave physiological traces on one another. His theory, in other words, is fundamentally relational: The flower must be bee-like and vice-versa for the two to work as an assemblage. Consequently, "something of the other is part of every organism" (Ginn 2014, 132). The Baltic-German aristocrat thus seems to provide a cosmopolitan interspecies theory of meaning.

Whilst Uexküll's bio-philosophy has found an array of admirers in contemporary human geography, there has been some reservation about his political writings and the way in which his bio-philosophical work has been imported without much concern for its political context (Abrahamsson 2011, 400; Barua 2018, 105; Gandy and Jasper 2017 but, outside geography, see also Schnödl and Sprenger 2021). Uexküll's *Staatsbiologie* (state biology), the idea that the state constitutes a biological organism with an anatomy, physiology and life cycle, requires particular attention. Alongside the writings of the geographer Friedrich Ratzel and the political scientist Rudolf Kjéllen (Kjellén 1920; Ratzel [1901] 2018), *Staatsbiologie* can be located in a multifaceted lineage of thought which seeks to translate biological concepts into political ones (Esposito 2008, 17). Uexküll's proximity in the 1920s to fascist intellectual currents, particularly his exchanges with the proto-Nazi Houston Stewart Chamberlain (1855–1927), have been examined in some detail (Harrington 1996; Schmidt 1975). But often, his political ideas and activities are seen as disconnected from his larger ethological and philosophical oeuvre. His political writings are deemed of a lesser quality than his biological works and should thus be classed as a "mishap"

(Mildenberger 2009, 116). Similarly, his intellectual bond with Chamberlain ought to be regarded as no more than a "curious episode" (Agamben [2002] 2004, 43); his link to national socialism as merely "alleged" (Michelini 2020, 1). In response to such attempts to disassociate the bio-philosopher and the political theorist Jakob von Uexküll, I would like to draw attention to his conception of human subjectivity, which comes into vision once we venture beyond his two most widely cited essays (Uexküll [1934/1940] 2010).

I begin this paper by providing biographical and historical context on Jakob von Uexküll and his most notable ideas. I then examine the way in which Uexküll frames the human condition. We will see not only that Uexküll extends his *Umwelt* concept to humans, but that his humans are either tick-like characters in whose shell-like bubble only Uexküll himself can peer, or a mindless swarm. The final section discusses his alternative to natural selection, the *Kompositionslehre* (theory of composition), which calls upon the state to unite bubble and swarm in harmonic consonance. I conclude from this discussion that there are particular problems not just in Uexküll's politics but in his musical language which have not been fully addressed in the most recent critiques of the Estonian biologist's revival (Schnödl and Sprenger 2021). Contemporary geographers may want to bear these problems in mind as they venture into beastly places with his concepts in their quiver. Ultimately, his animals are not just projections of his own character and the wider socio-political environment which formed him, but they are the creatures of intelligent design. Each *Umwelt* is connected not by a cosmopolitan web of meaning, but rather by a late Romantic vision of symphonic autocracy.

UMWELT'S MILIEU

Jakob Johann von Uexküll is born in September 1864 on a manor in the Estonian village of Mihkli. He is a citizen of the Russian Empire and a member of a Baltic-German dynasty which can trace its roots back to the thirteenth century. After attending the University of Dorpat (now Tartu) as a student of zoology from 1884 to 1888, he works as a self-funded scholar in the field of physiology at Heidelberg and at the *Stazione Zoologica* in Naples, where he experiments on the muscle reflexes of sea urchins and octopi. It is here that he befriends in the early 1890s the neovitalist biologist and philosopher Hans Driesch (1867–1941). At the turn of the century, Uexküll moves to Dar es Salaam in German East Africa for further study of marine organisms. Upon his return, he marries the aristocrat, writer and translator Gudrun von Schwerin (1878–1969), who will in 1964 publish a biographical account of her husband. The Russian revolution of 1905 robs Uexküll of much of his wealth (Uexküll 1964, 88). In 1916, the family estate at Werder is burnt to the ground. But the couple manage financially and professionally with the help of their family network. Although tremendously prolific, Uexküll succeeds only in the mid-1920s in establishing his own research institute, the Hamburg *Institut für Umweltforschung*, initially housed within the city's zoo.[2]

Much of what Uexküll writes in the twentieth century needs to be understood in light of his rejection of natural selection as an explanatory mechanism. Uexküll is introduced to the work of Charles Darwin and Ernst Haeckel as a student at Dorpat, an institution then still under the influence of the naturalist and explorer Karl Ernst von Baer (1792–1876) and the latter's teleological vital materialism. Although initially drawn to evolutionary theory, Uexküll becomes progressively sceptical of Darwinism's use of the fossil record after one of his professors boasts that he

can prove evolutionary relations between any two animal species. "And I told myself," Uexküll will later reflect, "if that is the aim of zoology, then it is no science but a clever trick" (Uexküll [1936] 1957, 76). And yet, in late 1890s he still tries to contribute to the development of causally mechanical theories. He is forced to rethink his position only after one of his co-authors' findings are invalidated and another is exposed as a paedophile (Mildenberger 2007, 65). Only now, he breaks decisively with Darwin: biology is governed not by random mutations but by a plan.

Existing inquiries into Uexküll emphasise the particularities of his Baltic-German milieu, his membership of an elite which lost many of its privileges during his lifetime (Harrington 1996; Mildenberger 2007). Indeed, the first part of his life is shaped by a dual allegiance to the German Kaiser and the Russian tsar, his opposition to the latter's Russification measures, his dissent from the Darwinism of Russian biologists, as well as the particular intellectual climate at the University of Dorpat as a bastion of anti-evolutionary thought. When Gudrun von Schwerin marries Uexküll, the city of Reval (now Tallinn) is not yet on the electric grid (Uexküll 1964, 69–70). Uexküll is convinced that his social class exists in harmony with the Estonian peasantry, a point he tries to illustrate in his memoirs with an anecdote about his mother, Sophie von Hahn, nursing a blacksmith's hungry infant, which "drank until its thirst was quenched and it fell asleep, smiling" (Uexküll [1936] 1957, 26). His aristocratic habitus and belief in an archaic order which allocates privilege according to birth and profession (the *Ständegesellschaft*) are increasingly out of step with his time, a disconnect which may have nurtured in him an intellectual interest in solipsism. And yet, Uexküll is subjected to the same scientific, intellectual and ideological developments that grip European society more generally, particularly the rise of German nationalism, the advent and subsequent crisis of parliamentary democracy as well as the eclipse of Darwinism.

Although Uexküll is sometimes credited with having coined the concept of *Umwelt*, it is already used by the Leipzig geographer Friedrich Ratzel (1844–1904) in the 1899 second edition of his two-volume *Anthropogeographie* (Human geography) (Ratzel [1882] 1899, 25). Ratzel, who has spent time at the *Stazione Zoologica* too, employs the term to capture the shaping of human societies through environmental factors, an argument laid out in the first edition of the same book (Ratzel [1882] 1899).[3] At this time, the English word "environment" is already in circulation, popularised in the late 1820s by the Scottish writer and polymath Thomas Carlyle as a translation of Wolfgang von Goethe's word *Umgebung* (surrounding) (Conway 2019). "Environment" subsequently undergoes a number of inflections but has by the mid-1880s assumed the connotations of causal natural imposition in the writings of the Oxford jurist and historian James Bryce and the Oxford geographer Halford Mackinder (Bryce 1886; Mackinder 1887, 162). Ratzel's *Umwelt* too invokes such causal processes, but he begins to gravitate towards a different conception around 1900, defining *Lebensraum* (living space) as encompassing both the organism and its environment (Ratzel [1901] 2018, 63, 71). Ratzel has at this stage come under the influence of neovitalism but does not fully embrace it before his death in 1904 (Klinke 2019; Mildenberger 2009).

This, then, is the context in which Jakob von Uexküll begins to speak of *Umwelt* in his 1909 *Umwelt und Innenwelt der Tiere* (Umwelt and inner world of animals) (Uexküll 1909). He does not cite Ratzel, probably because the latter is then still known as a follower of Ernst Haeckel and thus in the camp of mechanists who have been designated by Uexküll as his intellectual opponents (1907; Mildenberger, 2009). But it is unlikely that Uexküll has not read Ratzel, a major intellectual force in Germany at the turn of the century. Interestingly, both Ratzel and Uexküll

are mesmerised by the relationship between the inhabitants of Naples and Mount Vesuvius. It is no coincidence, both authors conclude, that the Neapolitans are so light-hearted, for every day could be their last (Ratzel 1873, 233; Uexküll [1936] 1957, 184). Uexküll's *Umwelt* differs, however, from Ratzel's in that it is constituted physiologically within the organism and projected as *Merkmale* (perceptive marks or cues) and *Wirkmale* (effect marks or, better, responsive actions) onto the environment which it thereby forms. More complex organisms will mark objects with *Färbung* (colour) and *Ton* (tone or note) in order to give them particular meaning (can be used for shelter, food etc.). Between the organism's *Merkwelt* (perception world) and its *Wirkwelt* (effect world), Uexküll locates *Funktionskreise* (functional circles). Beyond each *Umwelt* there lies a larger sphere of *Umgebung* (surrounding), which is imperceptible to the organism. An organism's *Umwelt* can either overlap with that of another or be contained entirely in the *Umgebung*. Although every *Umwelt* is specific to each species, and potentially even to individuals within each species, the basic schema of *Wirkwelt*, *Merkwelt*, *Funktionskreis* and *Umgebung* is universal to all organisms. But absolute space and time, Uexküll insists, "do not exist" ([1909/1921] 2014, 219).

Uexküll schematises his attack on Darwinism, or rather his version thereof, in the 1913 collection of essays *Bausteine zu einer biologischen Weltanschauung* (Building blocks for a biological worldview). The book's preface claims that humanity is entering a new epistemological epoch that replaces the era of "materialism" in which all things are erroneously reduced to chemical and physical processes. This new epoch is that of "the autonomy of life" and Jakob von Uexküll is its pioneer (Groß 1913, 9–10). Unlike what Darwin and his followers have argued, variation is not a creative force, for mutations are no more than temporary reconfigurations from the norm of a species. Although Uexküll concedes to the Haeckelians that there is *Kampf* (struggle) amongst members of each species, such life forms are locked into their very own worlds of meaning and thus rarely struggle for the same objects. All of this enables Uexküll to denounce triumphantly the evolutionary worldview; "the vitalists have proven victorious all around" (Uexküll, 1913, 30; see also 1920a, 8). In the years that follow, he writes admiringly that his friend, the neovitalist Hans Driesch, has dealt the final blow to the machine view of life (Uexküll [1920] 1926, 192–3, [1934] 2010, 194).[4] And although he is hesitant to refer to himself as a vitalist, he declares the following in a 1934 letter to Driesch: "I am always grateful that I consciously conform to you, even if our starting points are in other areas. That is why I use the word plan where you speak of entelechy," the latter a form of vital principle ([1934] 2010).

The outbreak of war in 1914 shatters the coordinates of Uexküll's life. Without abandoning his anti-Darwinism, he turns to political matters, becoming briefly active in the pan-German movement and trying unsuccessfully to receive funding to research pest control for the war effort (Mildenberger 2007, 105–6). A number of shorter wartime writings (Uexküll 1915, [1917] 2013, 1918) become the basis for his 1920 *Staatsbiologie*: *Anatomie-Physiologie-Pathology* (State biology: Anatomy-physiology-pathology), in which he develops an anti-legalist political theory. The state, he posits, is not made up of social contracts but of bodies and materials which come together in complex assemblages (state organs) which, in turn, nourish the *Volk* (population/nation, defined in ethnic terms). The entire productive process, he argues, is not unlike what can be observed inside a paramecium: "with every sip of water, there comes into existence a bubble which transforms itself first into an oesophagus, then a stomach, an intestine and an anus" (Uexküll 1920a, 6).

In the 1930s, Uexküll develops only very few new ideas but consolidates his corpus through the 1930 *Die Lebenslehre* (Teachings on life), the popular 1934 *Streifzüge durch die Umwelten von Tieren und Menschen* (A foray into the *Umwelten* of animals and humans) and his 1936 memoir *Nie geschaute Welten: Die Umwelten meiner Freunde, ein Erinnerungsbuch* (Never seen worlds: My friends' *Umwelten*, a memoir).[5] Despite his initial enthusiasm for Adolf Hitler's movement, Uexküll becomes disillusioned with the Nazi regime after his wife Gudrun is unable to produce a certificate of Aryan descent (*Ariernachweis*), introduced in 1933 (Mildenberger 2007, 158). This disillusionment, however, neither prevents him in 1934 from being appointed, alongside Martin Heidegger and Carl Schmitt, to the Committee for Legal Philosophy by the later governor of occupied Poland Hans Frank (Schnödl and Sprenger 2021, 70), nor does it make him question his views. Until at least 1936, he continues to propagate his understanding of the state-as-organism, such as during a keynote delivered at Utrecht University (Uexküll 1964, 192). Uexküll retires from the *Institut für Umweltforschung* in 1940 and moves to the isle of Capri. The German press still celebrate his birthdays and in 1944 publish obituaries for the "great biologist" and "famous founder of *Umwelt* theory" (n.a 1944a, 1944b). Until the very end, he seeks to defend his *Umwelt* theory against what he perceives to be the iron grip of Darwin's machine vision of the world (Uexküll 1943).

HOMUNCULUS THEORY

Although he is mainly known for his speculations on the inner worlds of wild and domesticated animals, it is important to appreciate the degree to which Jakob von Uexküll grapples in the second half of his life with questions of human subjectivity.[6] The same interest in animals' perception organs and spatial awareness now extends to humans. Not only does he write about human *Umwelten* in his memoirs *Nie geschaute Welten* and his 1940 novel *Der Stein von Werder* (The stone of Werder) (Uexküll [1936] 1957; 1940), but even some of his earliest writings on *Umwelt* mention the family and the state (Uexküll 1910, 648). The 1930 *Lebenslehre* features, amongst many other examples, an analphabet navigating a landscape without signposts, peasants who mistake a map for a portrait and an East African man climbing a ladder for the first time (Uexküll 1930, 26, 107). Although *Theoretische Biologie* ostensibly seeks to lay out his view of biology, it often drifts into politics, commenting on the perceptive impoverishment of urban dwellers and reminding its readers of the need for an army. These "lessons" connect neatly with those of *Staatsbiologie*, first published in the same year. Indeed, he will later incorporate a section of state biology in the second edition of *Theoretische Biologie* (Uexküll 1920 [1928], 228).[7]

We will see in what follows that Uexküll approaches humans in two ways, either as highly individualistic subjects who are caught in their soap bubbles or as a formless mass. Though in tension, these two framings are united in Uexküll by the activities of the state, a super-organism which ensures harmony in the world. Seeking to blur the epistemological divide between humans and non-humans, Uexküll notes in *Theoretische Biologie* that he uses human subjectivity as a launching pad into the worlds of non-humans. "The biologist," he writes, "will find much interest in applying to animals what he has learned from [the] study of human beings, and in asking himself the question, "What does the space look like that surrounds animals?"" (Uexküll [1920] 1926, 40). Conversely, he claims in the 1936 *Nie geschaute Welten* to have begun in the 1890s

to apply his knowledge about the environments of animals to his understanding of humans: Individual human subjects do not act out their lives on a grand world stage, but on their very own "special stages" which are designed for each role (Uexküll [1936] 1957, 13; see also [1934] 2010, 69). Every human is surrounded by a round island and above it a dome of sky, the objects in which it perceives through its sense of sight, but also touch, smell and taste. Whilst no animal is ever able to leave this Umwelt in its thoughts, humanity's horizon can expand and to some extent detach itself from its sensory organs. Humans are able to imagine geocentric and heliocentric worlds. But ultimately, each individual remains bounded by the specific spatial qualities which it projects into the world.

It is important to recognise that this solipsist worldview, in essence the belief that there exists nothing relevant beyond each animal's specific *Merkwelt*, *Wirkwelt* and *Funktionskreis*, forms the very core of his theory. As he writes in a 1938 letter to Hans Driesch,

> For me it is solipsism, which fundamentally allows every subject to understand itself as the only form of existence and its world as the only one, which has become a pillar of my *Umwelt* theory. Nature builds itself up out of these closed worlds. The frame which holds each of these worlds consists of space, time and plan. The relationships within these worlds are all subject-bound and therefore designed (*planmäßig*) and non-causal. (Uexküll 1938)

Rather than treating solipsism as something Uexküll desperately needs to refute, he thinks of it as fundamental to his theory. It is, in many ways, his answer to the problem of anthropomorphism, which he detects in his contemporaries' flawed attempts to extent the study of psychology to nonhumans. And although he is using solipsism as a key to all life forms, it may also be, subliminally, an attempt to come to terms with his own particular bubble which we have sketched in the previous section.

Published only 2 years after his acclaimed *Streifzüge*, the largely unknown 1936 *Nie geschaute Welten* sets out to unearth the *Umwelten* of individuals who have shaped Uexküll throughout his life. Although he is clearly the book's protagonist, his own *Umwelt* is only to be inferred from a discussion of his family, friends, teachers, and the like. He begins by clarifying that the study of *Umwelten* is not an "externalised form of psychology" (Uexküll [1936] 1957, 15). "It is not," he continues, "an analysis of the I, […] even where an author seeks to present their own *Umwelt*" (Uexküll [1936] 1957).[8] In fact, Uexküll is always quick to reduce the complexities of the psyche to consciousness, everything beyond consciousness to mere physiology. And it is precisely this lack of interest in the depth of the psyche which ensures that his human characters and their bubbles are often strikingly two-dimensional.

Early in the book, which works through many familiar Uexküllian themes, the reader is introduced to an American stockbroker who has travelled to Naples so that he can finally learn to enjoy life. But when this man, whose favourite drink is a self-invented cocktail of champagne and schnaps, is unable to appreciate the Gulf of Naples and the ruins of Pompei in the way that a European intellectual like Uexküll might, he has a breakdown and has to be sent back across the Atlantic (13). Uexküll's history teacher Bienemann, whose name translates into English as "bee man," is a similarly tragic figure. This arrogant man is unable to understand why others are unaware of his egg intolerance or why they do not necessarily sleep badly whenever he does. "Just as a dragonfly will never conceive of the ideas that there might be other things in the world than dragonfly things, so Bienemann never considered the possibility that there was something else in the world other than Bienemann-things" (31). "Therein," Uexküll concludes, "lies the

tragedy of Bienemann's life, in the fact that the environment in which he lives is not that of his fellow citizens" (34). Bienemann stands here symbolically for all subjects, whether individual or collective. Fully immersed in their *Umwelten*, their interactions result quite naturally in failures of communication. It is thus hardly a coincidence that Uexküll's book features a chapter on "Russian Jews in their *Umwelt*" which describes them as "an entirely foreign people" but which problematizes Jewish assimilation, too (95).

Of course, Uexküll's theory is not solipsist in one important sense: *he* is able to traverse the world of self-enclosure by peeping into other soap bubbles and thus glimpse the work of nature which hides inside and beyond each bubble, a skill he claims to have learned from his mother. By the age of five or six years, the young Uexküll manages to control his musophobic governess's behaviour by leaving a dead rat in front of her doorstep, thus ensuring that she is too scared to leave the house and the young Uexküll free to roam the streets. The moral of the story, he tells his reader triumphantly, is that he is able to manipulate her based on his superior understanding of her *Umwelt*. Uexküll also tells the story of a shopkeeper who lets out a shriek when she finally recognises the 100-mark banknote which Uexküll dangles in front of her. She is initially unable to see it, or so Baron von Uexküll believes, because there are no such notes in her *Umwelt* ([1934] 2010, 114).

It is in such anecdotes that the nature of Uexküll's worldview shines through. It takes his aristocratic mind to burst into the peculiar worlds of commoners, be they shopkeepers, child minders, teachers or American tourists. The aspect of behavioural manipulation is crucial for it serves him too when he experiments with animals. In the same way in which he controls his governess with a dead rat, he fetters chicks and places them under a bell jar, fools jackdaws with a pair of swimming trunks and makes snails move over a rubber ball, prodding them with a stick to determine their perception time. Although they are caught up in their life-worlds, Uexküll's subjects are still manipulable, particularly at the level of the population and swarm, Uexküll's second and more sociological framing.

Sociology is no afterthought for Uexküll. Not only does he speak more favourably of sociologists than of zoologists (Uexküll 1964, 96), but his correspondence and interactions with Houston Stewart Chamberlain reveal the degree to which biological and political questions are intertwined in his thinking (Harrington 1996).[9] In October 1920, Uexküll writes to his friend to lay out his vision of an authoritarian state organism. He ends the letter by promising Chamberlain not a copy of one of his political essays—but of the much denser *Theoretische Biologie*, which includes an early discussion of his composition theory of nature (Uexküll 1920c). In this book, Uexküll asks his reader to mount up in a balloon until humans appear as large insects.

> Now at our leisure let us consider these little creatures which occupy but a tiny action-circle in the vast horizon. We see rivers, as on a map, branching away like blue ribbons; the mountains have become mere mounds, and the cities playthings. Within these the homunculi move to and fro. ([1920] 1926, 332–3)

Uexküll's use of the word homunculus might be accidental here (though probably it is not, given the term's Goethean connotations). Either way, it inadvertently illustrates a flaw in his *Umwelt* concept, the fact that it often assumes some kind of central agency or operator in each organism (and organ) which learns to *master* its space. Uexküll is referring here, moreover, to homunculi as beings which are trying to master space in the *wrong* kind of way, namely via telescopes and

microscopes, misled by the "ever-spreading disease" of Darwinian materialism, the latter denoting for Uexküll both a scientific theory and a modern addiction to consumerism (335). It is important to grasp that he is trying to fight Darwinism on both biological and geopolitical fronts. Indeed, in 1917, he writes that "what Darwin presents as universal human morality is in reality something quite different, namely his own English morality" (Uexküll [1917] 2013, 451). In order to save his readers from joining the mindless masses and their English morality, Uexküll invites them to adopt "the method of geographers" ([1920] 1926, 338), to operate thus at a level in between the microscopic and the astronomic. Only this, he claims, allows society-as-organism to come into view, its roads, railways and towns, all filled with people, gold flowing like blood through these networks, and the government and justice system functioning as its skeleton.

State biology is both an attempt to understand the state and its enemies as well as a blueprint for manipulating swarm-like-populations. If left to its own devices, Uexküll warns, the population is a limbless force which standardises everything and turns it into an "indiscriminate mush," a "slimy creature" which eats away at the nobility's ability to lead and innovate (Uexküll [1936] 1957, 66). Here, Uexküll is under the influence of Gustave Le Bon, whom he cites in *Staatsbiologie* (1920a, 43), but he also sticks quite rigorously to his own conceptual language. The members of the *Volk*, divided by Uexküll into professions (factory worker, engineer, architect and so on), "carry with them like cupped snail-shells their quite different *Umwelten*" (1920a, 28), the consequence of which is a honeycomb of individual but mutually dependent environments. The *Wirkungen* of any one homunculus in a productive chain are the *Merkmale* of another in the same chain.

These organic production lines and family cells into which the homunculi are naturally organised are united in a state organism which protects them and demands of each cell to reproduce, labour and remain healthy. This organism is never entirely completed. It is threatened, moreover, by a whole range of nebulous agencies which seek to grow together and decompose the state tissue. Uexküll is vague about the nature of this threat and uses a whole range of biological metaphors to capture its essence: parasite (*Schmarotzer*), world tumour (*Weltthumor*) and tape worm (*Bandwurm*). In a 1920 letter to his friend Chamberlain, he blames the Jewish people, discussing a potentially self-inflicted "extermination of the Jews" (*Ausrottung der Juden*) and calling their "followers" (socialists, democrats, Catholic centrists and the like) "pus cells which can devour but cannot build up a state organism" (Uexküll 1920b). Surviving letters to Chamberlain, written between 1908 and 1927, reveal not just frequent antisemitic passages but also positive assessments of Adolf Hitler and Benito Mussolini (Uexküll, 1924, 1925a). When Uexküll publishes a revised edition of *Staatsbiologie* in 1933, he expresses his hope that Hitler, that "famous surgeon," will halt the decay of the German state organism (1933, 79).

COMPOSING NATURE

Although Uexküll never quite developed the influence under Hitler that he had hoped for, his friendship to the late Chamberlain is noted in Nazi circles and ensures continued access to the politically influential family of the composer Richard Wagner (Harrington 1996, 68).[10] His link to the Wagner dynasty is not the only way, nor indeed the most crucial, in which music matters to his *Umwelt* theorising. Indeed, many readers have detected the prominence of musical metaphors in Uexküll's work (Amrine 2015; Buchanan 2008; Martinelli 2004). Operating with a conception of

the organism as both a biological entity and as an *organon*, Greek for instrument, he often frames nature as a "celestial music show of which we hear only strains" (Sagan 2010, 7). And whilst this musical holism has certainly been classed as eccentric, it has thus far been deemed politically benign (e.g. Feiten 2020, 8). But it is worth pondering what kind of music Uexküll has in mind when he writes that it is "musical and not mechanical laws that we need to study if we want to find out about the laws of life" (Uexküll [1937] 2001, 117).

Although it is developed most comprehensively only at the end of his life ([1940] 1982), Uexküll's *Kompositionslehre* (theory of composition) is already present at a much earlier stage (1919a, 320; [1920] 1926, 2–8). Indeed, it is in *Theoretische Biologie* that he speaks about the affective experience of being "so much under the influence of music that […] we give ourselves up to the rhythm" (49). Within, between and beyond each *Umwelt* there exists only a vast musical composition. At the lowest level, nerve cells communicate via rhythms and melodies. These cells then come together to form larger melodies at the level of the organs, which form the organism as a kind of symphonic production. Such organisms then unite in harmony with other organisms at the fourth level. At the fifth scale, nature makes itself felt as a gigantic composition, only fragments of which are audible (Buchanan, 2008, 26–27).

Crucially, Uexküll expands the meaning of "tone" to incorporate webs of meaning amongst non-humans. "The tone that attracts bats in the bat-*Umwelt,*" he explains, "is at the same time a warning-tone in the *Umwelt* of the night moth" (Uexküll [1940] 1982, 64). He plays with terms like *Stimmung* with its dual meaning of tuning and atmosphere. More crudely, Uexküll seeks out the tonality of ontogeny itself.

> Inserting frog cells, that normally evolve into frog brain, into the mouth area of a triton larva, the insert obeys the mouth building tune of the triton larva. However, it does not become a triton mouth but the mouth of a tadpole, true to its origin. One could do a similar experiment with a string orchestra. When replacing the violins with horns in a certain movement, the orchestra can go on playing the same tune but with a very different tonal quality (*Tonfärbung*). (Uexküll [1937] 2001, 121)

Uexküll, moreover, frequently uses the language of polyphony and counterpoint (*Kontrapunkt*), the latter a technique of forging rhythmically and melodically independent voices into a harmonically interdependent formation, to illustrate how individual *Umwelten* conspire to form grander compositions. As he writes in his 1940 essay *Bedeutungslehre* (The theory of meaning),

> We must also look for two factors that form a unit in the examples taken from nature. Therefore we always begin with a subject that finds itself in its *Umwelt* (subjective universe) and we examine its harmonious relationships with individual objects that have appeared as meaning-carriers to the subject. The organized body (*Organismus*) of the subject represents the meaning-utilizer or, at least, the meaning-receiver. If these two factors are joined by the same meaning, then they have been jointly composed by nature. The content of the theory of the composition of nature consists of the rules that govern such pairings. ([1940] 1982, 52)

We can see here that Uexküll's search for polyphony and harmony is built into his approach. The occasional recognition of struggle aside (Ginn 2014, 133), this results in a flattening out of biological processes and an ultimately conservative framing of nature in which all relationships appear as curiously symbiotic, leaving little or no room for ecological conflicts and crises (Teherani-Krönner 1992, 169). Although Uexküll seems hesitant to inform his reader of the

musical genre he models this vision of nature on, his examples are often taken from the realm of symphonic music and he mentions the Austrian composer Gustav Mahler specifically (Uexküll [1940] 1982, 62). Interestingly, Gudrun von Uexküll notes that her husband "found symphony concerts and chamber music less captivating than the *Lieder* of Schumann and Wolff" (Uexküll 1964, 92). However this may be, she also writes the following:

> As much as Uexküll's thinking was dominated by [] struggles over worldview, his sense of mental balance often prompted him to offer his mind relief in the form of light entertainment. He enjoyed attending light operas and operettas. Offenbach and Mozart were his favorite composers. Of Wagner, he valued Tannhäuser the most. […] For him, art was primarily a matter of conception. He liked to use expressions such as "melody", "score", "counterpoint" to illustrate the unfolding of life plans [*Lebenspläne*] in time, but he was not musical in a general sense of the term. He never learned an instrument. (Uexküll 1964)

Uexküll is thoroughly immersed within the eighteenth and nineteenth century European tradition. He does not have in mind a genre of music which is defined by improvisation, nor is he interested in music which might challenge the boundaries of his era's bourgeois aesthetics. Quite the opposite. He enjoys light entertainment, consonance not dissonance. Contra Buchanan (2008, 27), Uexküll's composition of nature thus resembles neither the twelve-tone music of Arnold Schönberg nor the free jazz of John Coltrane. Unsurprisingly, his correspondence with Chamberlain shows that he thought very little of jazz (Uexküll 1925b). In fact, even Mahler's harmonic complexity might seem avantgarde in Uexküll's musical universe.

Much has been written about the way in which an Uexküllian bio-philosophy allows us to appreciate the animal as the creator of its own world. "Nobody is the product of their milieu – each is the master of its Umwelt," Winthrop-Young (2010, 216) cites Uexküll (1923, 266). But Uexküll is referring in this sentence, quite unremarkably, to humans' ability to take ownership of their life. Only very rarely, such as when Uexküll describes the variation in the movement of a squirrel from branch to branch, do we get the impression that he might be speaking of improvisation. Even here, he stresses, the number of subjects (*Themen*) which such an organism is capable of playing is limited (Uexküll 1930, 116). As Grosz observes,

> For Uexküll, the music of nature is not composed by living organisms, a kind of anthropomorphic projection onto animals of a uniquely human form of creativity; rather, it is the Umwelten, highly specifically divided up milieu fragments that play the organism. […] Each organism is a musician completely taken over by its tune, an instrument, ironically, only of a larger performance in which it is only one role, one voice or melody. (Grosz 2008, 43)

Whilst at times Uexküll does allow the organism-*Umwelt* unit to play its tune, elsewhere he retains an operator and conductor, a homunculus subject which steers the rhythms and melodies that pulsate through the organ or organism. The problem with Haeckel's machine view of life, he argues, is precisely the abandonment of such a "machine operator" which perceives, uses aids and affects (Uexküll [1934] 2010, 42). Yes, we occasionally find moments in which Uexküll seems to conceive of conductorless orchestration, such as when he examines the starfish whose legs move the animal. But hierarchy generally prevails. Indeed, he uses the very same musical metaphors in his 1920 *Staatsbiologie* when he likens the monarchy to a musical ensemble whose tempo is controlled by the rhythmic gestures of a single authoritative figure, the conductor. "It arises from this," he claims in the last of a number of argumentative leaps, "that the monarchy is necessarily the only form of organisation which every state must take" (Uexküll 1920a, 18).

Uexküll seems to be saying that the symphony orchestra, the kind big enough to play a Mahler symphony, has grown together organically. Although each instrument is able to perform a solo piece, it has also become, over time, part of a larger assemblage which is contrapuntally aligned. This alignment is not just one of melodies, harmonies and rhythmic patterns, but also one of the sounds which particular materials (brass, wood, horse-tail hair and so on) are able to produce together. The composer, the only figure that stands above the conductor, could have picked any instrument, but the choice is constrained by how well these material objects work alongside one another (Uexküll [1940] 1982, 64). Uexküll is obviously struggling to think about music as a culturally specific form of production here. For in universalising the European philharmonic orchestra as the pinnacle of natural harmonisation he can only contrast it to a clown orchestra. And "[a]nyone who has listened to clowns play music with instruments that otherwise are only used for making noise—such as combs, cowbells, and the like—will be convinced that they can indeed produce a cacophony but not a symphony" (Uexküll [1940] 1982, 145).

Just as an orchestra and an organism's nervous system must be centralised and hierarchical, so must society. Equal suffrage, Uexküll writes in 1918, dismayed by the prospect of a democratic Germany, would be the musical equivalent of giving the vote to all individual notes in a composition. The consequence would be the disappearance of the rarer notes and thus, again, a "wonderful cacophony" (Uexküll 1918, 202). Parliamentary democracy, in other words, is unviable on a political, musical and biological level. It is in his political writings that the meaning of Uexküll's musical metaphors is thus revealed. If life is a symphony, then there is little room in this composition for creativity, other than in the godlike figure of the composer, who stands outside of the authoritarian orchestration.

HUMAN, ALL TOO HUMAN

When Jakob von Uexküll dies in 1944 shortly after the Allied capture of Capri and the eruption of nearby Mount Vesuvius, his intellectual project is already in crisis. The synthesis of Mendelian genetics and Darwinian evolution ensures that there is little appetite for neovitalist explanatory models. His Hamburg institute quite literally in ruins, he also lacks an heir who might carry his research agenda into the post-war era. In many ways, he has already outlived himself (Mildenberger 2007, 204–7). And yet, with the acceptance of the semiotic relation between animal and *Umwelt* in the ethology of Konrad Lorenz, the continued popularity of Uexküllian tropes in late twentieth century European literature and a more recent revival in popular debates around animal intelligence, something of him does survive (Brentari 2009; Herwig 2001; de Waal 2016).

Amongst continental philosophers, Uexküll's influence remains pervasive. He is not only Martin Heidegger's most cited scientist (Sagan 2010, 4)—but makes appearances too in the work of Maurice Merleau-Ponty, Georges Canguilhem and Gilles Deleuze, amongst others. It is his endurance in philosophical debates which has driven his recent revival in human geography, as the field grapples anew with the relationship between nature and society, organism and environment, human and non-human life. Although there are different routes to Uexküll, including several English language translations, many anglophone geographers will have arrived at Uexküll via Deleuze's use of the tick vignette as a way into an ethological study of affect. To be clear, Deleuze's is a very particular reading, one which rejects *design*, the homunculus subject

and the static framing of *Umwelten*, and which sees the organism as a political problem rather than as a solution. And yet, his interpretation does build on Uexküll's ontology, his functional circle, musical metaphors and his logic of counterpoint (Buchanan 2008; Cimatti 2020, 177). The reason why Deleuze and his collaborator Guattari speak of "world" or "milieu" and not *Umwelt* is purely due to the French translation they are using (Brentari, 2019, 82). To grapple with Deleuze's geography is, to some extent at least, to struggle with Uexküll. But what geographers should bear in mind is that Deleuze's reading refers only to two of Uexküll's works. What is lost is precisely the theorist of human *Umwelten*.

Throughout his life, Jakob von Uexküll seeks to make sense of his own *Umwelt* as well as those of other humans and nonhumans in his vicinity. Despite his frequent rejection of anthropomorphism, he uncritically projects the language of European symphonic composition onto these *Umwelten*, blissfully unaware of his own positionality. This suggests that it may be difficult to fashion Uexküll into a thinker of critical anthropomorphism. His prescriptive vision for society pervades many of his major writings, including those which are ostensibly biological. When he loses his Estonian homeland, his anti-Darwinism is increasingly driven by personal and political frustration rather than just by scientific curiosity. A firm separation between Uexküll as a biologist and sociologist, a theorist of non-human and of human *Umwelten*, is thus impossible. His conception of the state-as-organism remains with him until his final years. We should consequently be careful not to mould Uexküll into a cosmopolitan theorist of meaning. An "all encompassing world-space" is to him no more than a "fiction" and "fable," albeit a convenient one (Uexküll, [1934] 2010, 69).

In emphasising Uexküll's aristocratic milieu, my point was not to raise the question of whether he is class conscious (clearly, he is not), but whether he has a noticeable tendency for over-generalisation and dramatic over-interpretation which is rooted in his membership of the nobility. Indeed, the same man who uses his mother's breast as a symbol of the aristocracy's supposed care for the peasantry also claims that there is no need to explain his *Umwelt* theory to women, for "[e]very woman knows that her neighbours live in a different world" (Uexküll [1936] 1957, 119). Of course, Uexküll is trying to be funny here, but statements such as these are indicative of his argumentative and literary style. Even where arguments are pursued with more seriousness, the evidence is often thin and the tone over-confident, such as when he proclaims that monkeys cannot open doors ([1920] 1926, 143). And whilst it is perhaps all too obvious to point out that ethologists are driven in their pursuits of nonhumans by an interest in humans, the more important point is that we may struggle to understand why Uexküll arrives at his particular noncausal theory of overlapping *Umwelten* with its connotations of hierarchy, solipsism and self-mastery without an understanding of Uexküll's humans and Uexküll-the-human. It is perhaps unsurprising that he tries to frame himself as a jovial genius and creator of his own world. But in order to achieve this self-image, he must first ignore the way in which his own environment has moulded him. Just as he struggles to demonstrate self-mastery in his own life, he is never quite able to reveal it in the animal kingdom.

Uexküll is not the only thinker to attribute animal-like qualities to humans, although it is noteworthy that he does so as a theorist of nonhuman difference. Why would a theory that works seemingly so well for animals struggle to produce convincing results for humans? Is it just the complexity of social life which makes the duet of bubble and swarm seem inadequate and necessitate intervention at a higher level, that of the state-as-musical-ensemble? In fact, Uexküll invokes such a level even when he writes about animals. Harmony awkwardly operates in his

writings both as *explanandum* and *explanans*. And although polyphonic metaphors continue to inform some new materialist research agendas (Tsing 2015, 23–24), it is precisely his theory of composition, with its overtones of intelligent design, which has proven the least satisfactory to geographers (Shaw, Jones, and Butterworth 2013, 263). Unfortunately, however, to theorise with Uexküll whilst neglecting his *Kompositionslehre* is a little like invoking Darwin without natural selection.

None of this should imply that it is fruitless to argue with Uexküll. His ontological provocations are ones which reverberate through the early twenty-first century as humans reconsider their place on earth. The way in which Uexküll collapses the subject-object distinction through the functional circle without ever losing sight of physiological questions will continue to find support. His contemporary admirers may, however, want to note that some of his animals are perhaps a little less colourful than he assumes. We now know, for instance, that Uexküll was operating with a simplified understanding of the tick's ecology (Mildenberger 2007, 175). There exists a huge variety of tick species, including ones which do not feed on mammals. Ticks are neither as likely to live as long as Uexküll claims, nor is their quest for hosts as unidirectional as he states. Ticks do not tend to drop from branches and some are considerably mobile hunters (Randolph 2014). And whilst this added complexity may not cast doubt upon the basic formula of *Merkmal*, *Wirkmal* and *Funktionskreis*, it does question the stripped-down peculiarity of the tick's environment. For if the tick behaves like many other arachnids, the argument for a solipsist theory of *Umwelt* loses its force.

Whilst Uexküll's followers have long neglected the ways in which his politics drives some of his most important lines of reasoning, his critics have struggled to see that there might slumber a politically more interesting project in his bio-philosophy. Whereas the former have downplayed his flirtation with national socialism, the latter have displayed a tendency to inflate his role as a reference point for contemporary fascist ecological currents. It remains an open question as to whether Uexküll's posthumanist project can be chiselled off from his oeuvre's more problematic facets. Even if one were to dispose of these most dubious dimensions, to cleanse him thus from both state biology and plan, one would still need to rinse off all mentioning of music because those too stand, as I have shown, for state biology and plan.

Geographers have rendered the charge of solipsism against Uexküll a "partial reading" and found instead a "reciprocal ethic" in his figure of the "duet" which supposedly leaves plenty of room for discord and antagonism (Ginn 2014, 132). As we have seen, however, Uexküll explicitly set out to construct a solipsist theory which is free from any antagonism in an evolutionary sense. His followers would presumably respond that an author's self-interpretations are of little relevance to their reception. Or they might argue that he *did* allow for some degree of intersection between the *Umwelten*. The latter is true of course. But what connects these different worlds is only to be found in music, in composition and thus ultimately in intelligent design. His very symphonic metaphors presuppose a composer and creator who hovers above the world-monarchy. It is only Uexküll who can occasionally peer into the *Umwelten* of others. Any attempt by geographers to mould a cosmopolitan theory of interspecies meaning/matter out of Uexküll would thus be faced with a task more considerable than previously assumed: to dispose of music.

ACKNOWLEDGMENTS

I would like to thank Maan Barua, Thomas Jellis and Jamie Lorimer for feedback on earlier drafts of this essay. I am also very grateful to Tim Cresswell and three anonymous referees for further input. I enjoyed writing this piece during and after a period of parental leave in 2021.

NOTES

1. I have used English language translations of Uexküll's texts, where available. All other translations are mine. I have left the term *Umwelt* in the German to highlight the specific meaning which Uexküll gives it.
2. The most authoritative biography on Uexküll is by Mildenberger (2007). The earlier account by Gudrun von Uexküll (1964) often portrays her husband with a surprising degree of critical distance. For a periodisation of Uexküll's major works and a detailed discussion of his most important concepts and reception, see Brentari (2015), but also Buchanan (2008).
3. On the conceptual history of *Umwelt* before Ratzel, see Sutrop (2001, 454–6).
4. Hans Driesch has in recent years experienced his own revival, most prominently in Bennett (2010).
5. Although writing in seemingly different genres, including auto-biography and fiction, Uexküll worked through similar questions in all of them. He also cultivated a distinctive style of narration which featured anecdotes, aphorisms, and jokes, even in his more theoretical works.
6. There is a cursory discussion of Uexküll's human *Umwelten* in Sarmiento (2015).
7. The state also appears as an object of analysis in one of twelve "Biological letters to a lady" (written to Gudrun von Uexküll) which he publishes in 1919 (Uexküll 1919b).
8. An excerpt from *Niegeschaute Welten* is available in English (Uexküll 1936 [2001]).
9. Whilst Uexküll dedicates his 1913 *Bausteine zu einer biologischen Weltanschauung* to Chamberlain, the latter acknowledges Uexküll's influence on his thinking (Chamberlain 1919, 65). When Chamberlain dies in 1927, Uexküll completes his *Natur und Leben* (Nature and life), published posthumously the following year (Chamberlain 1928).
10. Houston Stewart Chamberlain was married to Eva (née von Bülow), the daughter of the composer Richard Wagner.

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