Cinematic Vitalism

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2. New Worlds

Uexküll’s *Umwelt* Theory at the Movies

The deadening of the affects, and the ebbing away of the waves of life which are the source of these affects in the body, can increase the distance between the self and the surrounding world [*Umwelt*] to the point of alienation from the body.¹

Walter Benjamin, *The Origin of German Tragic Drama*

Like a chameleon, the human mind disguises itself by camouflaging the globe . . . The cinema has given man an eye more marvelous than the multifaceted eye of the fly.²

Blaise Cendrars, ‘The Modern: A New Art, the Cinema’

Forays

In 1934, the German biologist Jakob von Uexküll published his second book, intended for a general audience. *Streifzüge durch die Umwelten von Tieren und Menschen: Ein Bilderbuch unsichtbarer Welten* (*A Foray into the Worlds of Animals and Humans: Picture Book of Invisible Worlds*) promised its readers ‘worlds (that) are not only unknown; they are also invisible’. At the same time, it invited its readers to transform their very way of seeing and step into a new world:

We begin such a stroll on a sunny day before a flowering meadow in which insects buzz and butterflies flutter, and we make a bubble around each of the animals living in the meadow. The bubble represents each animal’s environment [*Umwelt*] and contains all the features accessible to the subject. As soon as we enter into one such bubble, the previous surroundings of the subject are completely reconfigured. Many qualities of the colorful meadow vanish completely, others lose their coherence with one another, and new connections are created. A new world arises in each bubble.³

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¹ Benjamin, *The Origin of German Tragic Drama*, 319.
Uexküll’s Romantic, pastoral image of a leisurely stroll through a summer meadow might initially suggest a familiar scene to the casual reader—an outdoor enthusiast or occasional birdwatcher, perhaps, convinced of the benefits of fresh air, constitutionals, physical exercise, and a general sense of the beautiful and at times sublime nature surrounding him. The next sentence, though, transforms this image and its corresponding mood into a fantastic scenario by means of the fanciful soap bubbles we ‘blow’ around each creature. Yet even this step—from the pastoral to the fantastic—is only a precondition for an even more radical transformation of perception, one that promises the reader the possibility of stepping into a completely alien and unfamiliar world, much in the way that Lewis Carroll’s Alice entered Wonderland; or, for that matter, the way that the city stroller enters the movie theater.

Imagining stepping into the soap bubbles surrounding other creatures not only enabled a radically different vision, but it also depended on a paradigm of vision other than that of objective perception; a different dispositif. Uexküll playfully introduces the basic assumption of his theory of biology: there is no common ground and there is no common world, for every living being perceives the world differently and as a result lives in a world different from that of other beings, each surrounded by a subjective world that Uexküll terms Umwelt (‘environment’, but more literally ‘surrounding world’). These individual Umwelt bubbles envelop plants, animals and humans like an outer shell or extended body, while simultaneously isolating and separating each entity existentially into quasi-monadic units. The cheerful stroller has himself evoked and painted this picture, and following a familiar trope of the fantastic, is able to step inside; but once there, he becomes captivated and loses control.

This scenario bears more than just a superficial resemblance to the experience in a movie theater. The surface of the bubble that Uexküll invokes surrounds us and shows us a world we hardly recognize. We know that this is ‘our’ world, yet everything looks different; if we were to imagine this scenario as a film scene, the genre would be science fiction rather than Heimatfilm (homeland film). Uexküll’s reference to new and unfamiliar worlds brings to mind Charles Urban’s film series ‘The Unseen World’, which in 1903 marked the beginnings of the popular science film with a program consisting of comical or dramatic animal scenes and microcinematographic films. Microcinematographic films presented everyday objects and creatures that had never been seen before, or at least not seen at such close quarters, and they evoked strong responses of amazement, awe, and disgust in the contemporary press. One of the most popular films, for example, used
microcinematography to transform an image of a man eating cheese into the horrifying scenario of countless giant spider-like cheese mites crawling over his seemingly lifeless piece of food. By employing the technical capacity of film to change the scale of vision, microcinematographic films established a technical analogue of the soap bubble that Uexküll asked his readers to create in their imaginations.

In its focus on the centrifugal organization of the environment by a living being, Uexküll’s *Umwelt* theory constituted not only an interesting example of a vitalist conception of life, but also a cinematic theory of biology. On the one hand, of course, Uexküll’s *Umwelt* theory was simply one of many early twentieth-century transdisciplinary attempts to rethink the relationship between the subject and that which conditioned the subject; that is, the relationship between subject and world. On the other hand, though, *Umwelt* theory was a particularly significant instance of this rethinking, for in linking biological concerns with the question of perception, Uexküll brought to the fore questions of methodology (by means of which concepts and techniques can this rethinking be accomplished?) and technicity (what technical instruments are necessary for this rethinking?). For these reasons, Uexküll—and, as I shall note in this chapter, a number of social critics and film theorists—saw *Umwelt* theory as a significant advance over the Darwinian concept of ‘adaptation’. The concept of adaptation also focused attention on the ways in which the surrounding world conditioned the organism, but this concept renders the surrounding world as a ‘milieu’, rather than an *Umwelt*—that is, as a deterministic, conditioning set of forces, rather than as an environment that was actively constituted by the perceptual capacities of living beings. Many of the key terms that we associate with early twentieth-century philosophy, social theory, and psychology—for example, attention, intention, and consciousness—were worked out on the terrain between milieu and *Umwelt*, in attempts to understand how human subjects were able to react to an environment that was itself rapidly changing; that is, they were attempts to understand how subjects were able to evaluate, make decisions, and successfully interact with what is ‘given’. We might say that the concept of the ‘environment’ formed the backdrop to the most pressing issues and concerns in this period: the environment was that which was

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4 On Urban’s films and for a discussion of *Cheese Mites*, see Oliver Gaycken, *Devices of Curiosity*, 16-37.
‘there’, whether one paid attention to it or not; it defined the horizon for one’s actions and perceptions; and it was shaped by people as they were shaped by it.5

For many early twentieth-century theorists, cinema turned out to be an especially important part of the modern environment, for—as Walter Benjamin noted—cinema not only epitomized the conditions found in the modern world at large, but it also brought these conditions into what he called the optical consciousness. Uexküll’s theory suggested an explanation of why this could be the case, for his account of Umwelt suggested that what cinema presents is simultaneously of this world and a world. Since cinematic images are not the direct result of human perception, they do not show us the world as our Umwelt. This difference is not only a consequence of the fact that we are watching recorded images on a screen. It is, in addition, a consequence of the fact that viewing film images requires a doubling of perception: we perceive film images as embodied spectators, yet these images themselves present a perception of the world that is not dependent upon our body (which perceives the world within physiological limits determined by our intentions and radius of action). We see, instead, the perception of a ‘film body’, to use Vivian Sobchack’s expression, that the screen relays to us.6 We thus perceive another perception, the perception of an apparatus. In doing so, we can integrate, and ‘innervate’, the way the world appears to us in these images.7 These properties of cinema allocate it a central role in reflecting, changing, and reformulating the ‘natural’ environment and our relationship to it—and with that relationship, our sense of our bodies (and, indeed, our bodies’ senses themselves). In contrast to the much more pervasive notion of ‘milieu’, then, Uexküll’s concept of Umwelt is of particular interest for media studies, since it goes beyond the conditioning aspects of the relationship between organism and environment and

5 Theories of environment are thus closely related to the concepts of ‘atmosphere’ or ‘mood’ (Stimmung), which are likewise held to influence and determine foreground actions and perceptions without themselves being the subject of focus or attention (both of which they tend to dissolve when one attempts to focus upon them); see Chapter 3 on Stimmung. On the relevance of the notions of atmosphere and Stimmung, see David Wellbery, ‘Stimmung’, and Leo Spitzer, ‘Milieu and Ambiance’.

6 On the phenomenological notion of the film’s body, see Sobchack, Address of the Eye. Christiane Voss has recently developed further the relationship between body and cinematic illusion for a phenomenology of film in Voss, ‘Film Experience and the Formation of Illusion’.

7 Innervation is a concept important to both Uexküll’s and Benjamin’s understanding of the relationship between mind and body. See Uexküll, Die Lebenslehre, 109-11. For an account of the role of innervation in Benjamin, see Hansen, ‘Benjamin and Cinema’, especially 315-20.
encompasses the effects on perception of specific bodily comportments, as well as the translation of stimuli into signs.

_Umwelt_ theory’s extension of life into what surrounds the finite body (that is, into the _Umwelt_ of the living being) brings to the fore two issues, both of which were central to film theory in the 1910s and 1920s: the role of perception as the sensible link between body and environment, and world-creation as the active shaping of and engagement with our environment. While Chapter 1 considered the implications of theories of the internal organization of a living body for film theory and practice (i.e., duration and rhythm as vitalist conceptions of time), in this chapter I am interested in the implications for film theory when the focus moves to a living being’s perceptual organization of its surroundings. The first half of this chapter introduces the question of _Umwelt_ and the intersection of animals and media by means of a meditation on three differently mediated dogs. It then traces the genesis of the concept of _Umwelt_ in Uexküll’s own writings, documenting how this theory emerged at the intersection of Uexküll’s physiological studies, his reading of Kant, his interest in aesthetic theories of empathy, and his work in chronophotography. The second half of the chapter outlines the reception of Uexküll’s theory by philosophers, social theorists, and theorists of film. I emphasize that this reception was not unified, but instead theorists blazed two quite different trails leading from _Umwelt_ theory to broader cultural, including film-theoretical, concerns. The first trail—what we might call the path of man—was traced out in German philosophical texts of the 1910s and 1920s. The authors who took this path focused on the implications of _Umwelt_ theory for the reconception of the mutual constitution of ‘world’ and ‘subject’, and developed concepts such as Edmund Husserl’s _Lebenswelt_ (‘life-world’), as well as Max Scheler’s, Helmuth Plessner’s, and Martin Heidegger’s distinctions between man and animal, _Umwelt_ and world.

Travelers on the second trail, which we might call the path of alienation (or the path of the animal), were willing to abandon—to varying degrees—the terrain of the human. These travelers were mostly film theorists and artists, rather than philosophers. Some, such as art critic Adolf Behne and artist Franz Marc, were inspired by Uexküll’s colorful theories, images, and imaginings, which provided them with a model for breaking up the habitual perception and conception of both things and living beings, thus opening up the senses to enable a new unity with the cosmos. Film theorists including

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8 In 1918, Adolf Behne wrote the most comprehensive text on the ways in which Uexküll’s work underpinned the interests of contemporary art, including the work of Paul Scheerbart, Bruno
Blaise Cendrars and Jean Epstein went a step further, for they gave in to the temptation—and aesthetic and political potential—to cross-breed human, animal, and technological perceptions. Their texts express the idea of a queered, or cross-species perception that Uexküll’s own references to film inspire, describing the alien, and alienating, worlds and worldviews that film offers, as well as film’s (re)integration of the human being into a leveled playing field (or, in Uexküll’s words, a grand symphony of interweaving melodies) of animals, plants, and inanimate objects. In mapping out this second path, I take Walter Benjamin as my guide, for his work provides a comprehensive framework for understanding *Umwelt* theory in the context of the playful experimentation with a new physis. He is central to this chapter not only because he was familiar with Uexküll and integrated the concept of *Umwelt* into his writings on film and modernity, but also because in doing so, he developed the concept of *Umwelt* in a way that gave it a much more urgent and critical valence.

This second path also allows us to reevaluate the question of Uexküll’s modernity. Uexküll might initially seem an unlikely protagonist for a project concerned with cinema. A biologist from the old, German-speaking Estonian nobility, his sociopolitical texts betray a staunch conservatism, and he was later to apply his notion of *Umwelt* to questions of the German family and state. In addition, Uexküll’s scientific theories were themselves perceived as untimely for most of his career: he was seen as old-fashioned and conservative by leading Darwinist, mechanist, and behaviorist biologists, but at the same time he was seen as too subjectivist—and as suspiciously close to ‘socialist’ milieu theory—by National Socialist ideologues. And, finally, his close friendships with Nazi ideologue Houston Stewart Chamberlain and the conservative philosopher Ludwig Klages emphasize that while Uexküll might not have agreed with Third Reich political practices such as genocide, the ideological gap between his positions and those of National Socialism was marginal when it came to other elements of blood

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Taut, Wassily Kandinsky and Franz Marc. See Adolf Behne, *Die Wiederkehr der Kunst*, esp. 57, 109-11. In his animal paintings, Marc tried to depict a harmonic unity of animal and its *Umwelt*: ‘What does a deer have to do with the worldview we have? . . . Who says that a deer senses the world cubistically; it senses it as “deer”, the landscape therefore has to be “deer”’ (Franz Marc, ‘Aufzeichnungen auf Blättern in Quart (Winter 1911/12)’). For more information on Uexküll’s influence on artists and painters, including Theo van Doesburg, Raoul Haussmann, Gottfried Benn, and Thomas Mann, see Malte Herwig, ‘The Unwitting Muse’, and Botar, ‘Notes Towards a Study of Jakob von Uexküll’s Reception’. Behne and Marc are further discussed in Chapter 3.

and soil ideology. Yet at the same time, Uexküll’s scientific work betrays an astonishing modernity and aesthetic sensibility that was recognized by both artists and film theorists alike. While Uexküll’s own cultural and political views might have been conservative, his biological work produced theories, concepts, and images that could be dislodged from conservative ideology in order to serve other, more progressive purposes.

A Meditation on Mediated Dogs

*Uexküll’s Dog: A Dog’s World*

In 1937, The American Museum of Natural History (AMNH) in New York finalized its plan for a Hall of Animal Behavior, to be curated by Dr Gladwyn Kingsley Noble and sponsored, promoted, and supported amongst others by William Douglas Burden, the writer and creative force behind the 1930 documentary drama *The Silent Enemy* (Burden also had ties to the Hollywood film industry, especially Merian C. Cooper and Ernest Schoedsack, the directors of films such as *Chang: A Drama of Wilderness* (1927) and *King Kong* (1933)). The Hall, as well as an entire lab devoted to behavioral studies, was a tribute to the fact that ethology had become an important zoological discipline that needed representation—and a place for research—at the AMNH. Noble himself had published important ethological papers and had sought to translate them into film with his scientific documentary, *The Social Behavior of the Laughing Gull* (1940). The creation of a department of animal behavior thus spurred forays on the part of the museum in two seemingly opposed directions: on the one hand, toward experimental research on live animals, a direction that also involved including live animals in exhibitions; and on the other hand, toward the use of film and other media for educational and entertainment purposes, a direction that included interest in documentaries that presented animals in their natural habitat, displays of animals with interactive elements such as lights, sound recordings, and images, and even amusement park-like rides.

Though these two approaches might seem to push in opposite directions—one real, one virtual; one grounded in scientific research, the other

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10 See Anne Harrington’s comprehensive, though reductive, description of Uexküll’s social and political views in Harrington, *Reenchanted Science*, 34–71. By focusing primarily on his later sociopolitical texts, Harrington does not always do justice to the complexity of Uexküll’s biological work, which she sees as simply one of several ‘holistic’ approaches that emerged in early twentieth-century Germany.

one in popular entertainment—they are nevertheless closely related. Both moved away from (literally) dead, static, and uncontextualized displays and instead sought to engage animals *in vivo*, which meant observing the behavior of animals as actions and reactions in time and within a certain environment. 'If the interpretation of life is not the proper main objective or goal of our Museum, then what is it?', Burden asked in various letters that he sent in the hopes of gaining support for the new directions of the museum. Film, for Burden and Noble, was not only an important scientific research tool for the scientific study of animal life, but it was also an excellent means of popularizing such study. This belief that film was both a means of conducting research on, and popularizing research about, animals was thus a vision Burden and Noble shared with ethologists such as Konrad Lorenz, Niko Tinbergen, Julian Huxley, and Karl von Frisch, all of whom produced animal behavior films beginning in the late 1920s, continuing the legacy of early popular science filmmakers such as Jean Comandon, J. C. de Mol, and Charles Urban. For all these figures, the mediation by film was able to provide something that displays of live animals lacked: namely, the behavior of animals in their natural environment, rather than in captivity. Noble, in fact, had begun to combine diorama displays of Komodo dragons with a film of the same species: while the diorama allowed visitors to study closely the body and physiognomy of the animal, the film provided a sense of the natural movement of the Komodo dragon and the engagement of these animals with their environment. Inspired by Noble's displays, Julian Huxley tried to implement film displays in the London Zoological Garden that were intended to supplement the fact that the live animal's presence occurred solely within a restricted, artificial environment, by providing filmed representations of the natural behavior of the animal.

It is against this background of the relationship between taxidermied, mediated, and live animals, between different modes of display and spectatorship, that I want to consider a particular diorama that was part of the small 1937 exhibition entitled 'Some Suggestions for a Future Hall of Animal Behavior'. This exhibition sought to give visitors a sense of what to expect, and what they might learn, from the new behavioral department at the AMNH. The centerpiece of this exhibition was inspired by Uexküll's work

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12 See Ibid., 62, 233.
13 On early popular science films, see Gaycken, *Devices of Curiosity*; on the films of Lorenz, Tinbergen, and von Frisch, see Tania Munz, *The Dancing Bees*. On the work of these early ethologists more generally, see the comprehensive book by Richard W. Burkhardt (Burkhardt, *Patterns of Behavior*).
and consisted of several interactive dioramas, all of which depicted animals and their respective Umwelt.\(^\text{15}\) A stuffed animal—in one diorama, a fish; in another, a dog; and in a third, a hen—occupied the foreground of the diorama. The animals were positioned with their backs to the spectator, and each animal focused its attention on a painted background that represented its familiar environment: a riverbed, a living room, and a chicken pen. The exhibit received some attention in the press, since its interactive features and incorporation of visual trickery were novelties against a background of traditionally ‘serious’ educational museum displays. A review of the exhibit in The New York Times exclaimed:

\textit{Museum Visitors Can See As Fish Do—New Gadgets Also Let Them View a Colorless World as It Appears to Dog—Henpecking Is Explained—Psychic Factors Distort Fowl’s Vision So That Objects Seem to Be Thrice Their Size}

\(^{15}\) On the importance of Uexküll for the exhibition, see Mitman, ‘Cinematic Nature’.
... [the exhibit] presented an array of living and dead snakes, fish, rats, lizards and other specimens and a series of gadgets by means of which all sorts of miracles can be performed. By the turning of a switch every day scenes are presented to the human eye in the way that animals are supposed to see them.\textsuperscript{16}

The dog diorama featured a stuffed black bulldog, complete with studded collar, that was directing its attention at a bourgeois living room painted on a canvas (see Fig. 2.2.a). If the visitor pressed a button, however, the backdrop magically changed. The activation of different light sources allowed the screen to fade and make visible a three-dimensional room that corresponded to the animal's vision: in the case of the dog, a lower point of view, an absence of colors and details, decreased depth perception, a loss of distinction of certain lines, and a foregrounding of elements that held a functional character in the dog's life, such as a chair on which the dog could jump and sit or a table under which it could hide (see Fig. 2.2.b). The dog's view has an almost threatening, uncanny quality, since it strips the living room of all its distinguishing markers of class, value, and identity.

The museum display connected spectator and animal in a peculiar way. Fig. 2.1 illustrates that the setup of the diorama resembles that of an over-the-shoulder-shot. The ‘safely stuffed’ dog in the foreground confronted the visitor with its materiality and authenticity, while the interactive spectacle of the \textit{trompe l'oeil} scenery change emphasized the immateriality and instability of the latter.\textsuperscript{17} At the same time, it is the dog that, by withholding from us its face and gaze, remains out of reach, even as we are able to control the view that we project onto the dog with the push of a button. The wistfulness and melancholia we sense when we focus on the dog, with its inherent temporality of pastness (‘I once lived’) and the sense of elusiveness and ultimate unattainability that is the consequence of the dog's denial of the possibility of face-to-face encounter, finds an equivalent in that melancholia that, according to Alice Kuzniar in \textit{Melancholia's Dog}, generally marks encounters between human and dog. As a companion species, dogs are attuned to humans and generally exist as dependent upon humans. As ‘man's best friend’, dogs can not only have their own food, bed, and hairdresser, but their death can also be mourned like that of a human companion. Yet at the

\textsuperscript{16} Anon., ‘Museum Visitors Can See as Fish Do’, 27.

\textsuperscript{17} See Ibid.; Anon., ‘Science: Museum Wants’.
same time, the dog’s being—its feelings, its language, its drives—remain unattainable.\textsuperscript{18}

Formally, then, the diorama introduces us to a number of interrelated questions about subjectivity, environment, and mediality that will reoccur throughout this chapter. First, the diorama emphasizes the problem of access to the animal, both physical and metaphysical. It also brings up the question of materiality and the role of media in the contrast between taxidermy and light show \textit{trompe l’œil} (and the question of whose \textit{œil} we are thinking of). Second, the diorama highlights the relationship between animal and spectator, and between animal and its environment, natural or contrived, fact or fiction. And third, it brings up the role of the medium’s ‘framing’ of the animal, which can direct and limit our approach. The diorama also illustrates that there are always (at least) two aspects to a (re-)presentation of an animal: there is, on the one hand, the animal’s view and, on the other, the view of the animal—or, to put this less anthropomorphically, we have the animal’s world (\textit{Umwelt}) and we have our world, which includes the animal as an element. The diorama confronts us with two modes of relating to an animal: a playful or scientific desire to feel like a dog, and an existential or philosophical desire to feel for, and with, a dog. The dog diorama thus allows us to ask how the desire for communication, mutual understanding, and sympathy, on the one hand, and the sense of absolute, existential difference, incongruity, and isolation, on the other hand—in other words, the simultaneity of difference and sameness we can

\textsuperscript{18} Alice A. Kuzniar, \textit{Melancholia’s Dog}. See also Donna Haraway, \textit{When Species Meet}. On the history and aesthetics of animal dioramas, especially Carl Akeley’s dioramas at the AMNH, see Stephen Christopher Quinn, \textit{Windows on Nature}, 8-24.
feel in a ‘live’ encounter with a dog—changes with technological mediation. Mediation intervenes in the physical presence of two living beings, which might also mean relief from being-human or being locked into being-human (in the face of a dog).

*Nipper—The Dog as Medium*

The iconic image of Nipper the dog attending to the voice of his master as it emerges from the gramophone has become emblematic, and not just for Victor RCA, for the painting visualizes perfectly the complex relationship between animals and technological media. The painting of the dog listening attentively to what the viewer presumes is coming out of the gramophone horn was registered as trademark, along with the inscription ‘His Master’s Voice’. As such, the painting and trademark link sound recording, death, and animality in an iconic image. The story of this painting is well known: Francis Barraud painted a picture of his dead brother’s dog Nipper (whom he had taken in) listening to an Edison gramophone. The painting itself was painted three years after the dog’s own death. While the Edison Company showed no interest in the image, the Gramophone Company (later Victor RCA) did, and Barraud repainted his representation of the gramophone to match the company’s model. The new layer of paint allowed for corporate appropriation, while the new logo for the image—‘His Master’s Voice’—provided a new interpretation of the dog’s attention. The most important transfer enabled by the painting, however, was that of acoustic marvel to visual spell. It is the dog’s attentive gaze directed at the gramophone horn that actually visualizes the sound by standing in for it, transforming the acoustic medium into a visual cipher. As Tom Gunning notes, Nipper’s confusion about the mismatch between a familiar voice and an unfamiliar machine depicts how the dog ‘experiences the sense of disproportion that early audiences did in experiencing sound reproduction without an attempt at visual simulation’.19

However, it is worth exploring the complex relationship between the temporality of the beholder’s reception and the temporality of the two media involved, namely painting and phonograph. While the painted Nipper will forever identify the apparatus with his late owner, the beholder of this image begins by identifying with the ‘Dog looking at and listening to a Phonograph’ (the original title of the painting), but then distinguishes herself from this animal, which must remain a dog listening to ‘His Master’s Voice’ (the corporate inscription of the image). What makes the image amusing is

precisely the beholder’s transition from one attitude to the other, as well as the fact that, once we have performed the transition, we are able to move freely back and forth between these two attitudes. This movement from immediate, empathic identification to reflective analysis and distinction is a temporal transition that the dog cannot perform, since, in this painting, it is forever frozen in the position of immediate reaction; the position of false belief, of being duped. In other words, the beholder’s own sensory confusion when she first encountered a gramophone playing a recording—which, for a moment, creates a bond between the beholder and the listening dog as a visualization of the beholder’s confusion—is sublated by a double mastery: both the mastery of Mark Barraud/Francis Barraud/the gramophone over the animal (i.e., the dog as an owned pet, a commodity, a painted object), and the mastery of the beholder of the image/early gramophone listener over
the animal (‘stupid dog!’). Like the gramophone itself, the listener, in beholding a painting, plays out her mastery over temporality. The momentary bond between spectator/listener and dog thus gives way to a breach between a superior and an inferior being, which in turn reestablishes the mastery of the future record buyer.

This establishment of a hierarchy between animal and human simultaneously allowed the apparatus of the gramophone to appropriate the dog. Upon the incorporation of the painting into the RCA Victor logo, the painted, copyrighted, and endlessly reproduced dog served to reunite the sound apparatus and the human beholder/customer. The dog lent its body to the gramophone, visualizing, and thus signifying, the capacity of the apparatus for faithful sound reproduction—a corporeal transfer so complete that commentators have often referred to this image as the ‘Talking Dog’. This transfer is eased by the symmetry of the painting and the correspondence in ‘posture’ and ‘attitude’ of gramophone and dog. With the boundaries between dog and human, and between dog and human senses and sensibilities, safely redrawn, the dog can lend a body, a face, and an attitude of docile servitude to the technological apparatus, whose unsettling alterity now becomes the safe otherness of a mastered pet. Nipper thus sets into motion what Michael Taussig describes as the ‘imperial balance of mimesis and alterity’.

Yet it is precisely this ‘imperial balance of mimesis and alterity’ that, I will suggest below, is often upset by moving—rather than painted—reproductions of animals. Taussig’s discussion of Nipper and the gramophone does not seem particularly interested in the specificity of the media involved, nor in the particular role animals play in capitalism and modernity. Yet such considerations cannot simply be bracketed here, for in the case of the image of Nipper, the pleasurable, albeit momentary, destabilization produced by an initial identification with Nipper is kept in check by the ability of the spectator to redistribute and separate out the (visually stable) positions of machine, dog, and her human self. The freeze-frame of the painting, in other words, makes it possible for the beholder to surpass the deceived dog by ‘moving on’ to a superior position of knowledge. In this temporal movement, the beholder aligns herself with the temporal flow of the gramophone’s sound. In other words, it is the temporal friction between the two media

21 Taussig seems even less interested in the question of the extent to which mimesis and alterity—as well as empathy, identification, projection, readability, and interpretation—might function differently for animals as opposed to humans.
involved (gramophone and painting) that allows for an exciting destabilization, since one can always safely return to fixed positions. The painting of Nipper shows us, in short, that in the encounter between human, animal, and technological media, the ontological dividing line between human and animal can become blurry, perhaps even breached; but it also shows us that this line can be reinforced, at the expense of a blurring of lines between animal and technology. The painting, or rather, the reception of the painting rehearses the effacement of the capacity to recognize both the dog’s animality and its sameness, as a living, sensing creature, and locates it in the grey zone of human pet. The body and spirit Nipper transfers on to the gramophone have a similarly toned-down grey hue and protect us from recognizing the technological medium’s affinity with both the wildness and otherness of animals as well as with a life, expressivity, and sensuousness that does not differentiate between animals and humans.

Dickson’s and Heise’s Dog—Spectacle and Spectator
A quite different dynamic between medium, animal, and spectator was established by one of the first dogs to ever star in a moving picture. This was a dog that appeared almost incidentally in one of W. K. L. (‘Laurie’)
Dickson and William Heise’s early film experiments at Edison’s Black Maria Studio in 1894. Like their other short films for Edison’s Kinetoscope—a viewing device that allowed one spectator at a time, paying one nickel at a time, to peep through a hole into a box—*Athlete with Wand* shows a human subject on a stage against a flat black background engaging in extreme movements that make the mechanical reproduction of motion especially spectacular and visible. The athlete takes on different poses with his ‘wand’ (a long pole roughly 4 feet in length), each pose separated by a bend of his knees or a repositioning of his legs; he lifts the wand horizontally above his head, holds it in front of his stomach, or twists it vertically to align it with his body. According to Charles Musser, the man was an athlete from the Newark *Turnverein*, and the entire film was probably a test run for the filming of Eugene Sandow, which took place shortly thereafter.\(^\text{22}\) What is unusual about the framing of this short, however, is that it includes a dog lying on the ground next to the athlete, in the bottom right of the frame. The dog is obviously at home in the studio environment and presumably belonged to Dickson, Heise, or the man they were filming. The camera is surprisingly oblivious of the dog (as are, it is worth noting, most descriptions of the film, all of which completely neglect to mention the dog’s presence), and the dog is oblivious of the camera. The dog, resting its head on its front paws, is turned away from the athlete swinging his pole and seems to be disinterested in the spectacle; only when the end of the pole swings particularly close to the dog does it get up on its front legs and lift its head to watch the athlete cautiously.

The dog’s presence in this film is noteworthy for several reasons. First, the fact that the dog appears in the film emphasizes, or reveals, the experimental studio character of Dickson and Heise’s films, in which someone’s dog is able simply to lie on the stage while the filmmakers and technicians take turns before and behind the camera to film and act out short scenes. Second, the fact that we cannot decide whether the dog’s presence in the film was an ‘accident’ or a deliberate aesthetic or experimental decision emphasizes the question of the dog’s relationship to the spectacle.\(^\text{23}\) The dog functions as a stand-in for the film spectator, such that its presence and witnessing of the stage act mirrors the mediated presence of the film spectator, while the dog’s body becomes a medium that transfers the spectator onto the film.

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\(^{22}\) Charles Musser, *Before the Nickelodeon*, 29-56.

\(^{23}\) My guess is that the dog happened to lie on the stage and Dickson and Heise decided on a whim to include it in the film—after all, the athlete is filmed slightly off-center to allow the entire body of the dog to occupy the bottom right.
itself. Yet this dog-spectator is, for the most part, apparently oblivious of the performer who constitutes an attraction for us, as he (the performer) is so spectacularly animated and mediated. In contrast to Nipper, though, this dog is part of the technological mediation. It thus sets in motion a shift back and forth between presence and mediation, subject (in its presence to the spectacle) and object (in its presence as attraction itself). Moreover, the fact that the dog is peripheral to the scene and the framing, and the fact that the dog is decidedly not ‘performing’, add to its spectral quality. In contrast to the many other film dogs that would follow it, this dog presents an anomaly, since it does not constitute an attraction in itself.

The dog’s ability to elicit this subtle, complex response from the spectator is exemplary of the way in which animals on screen are able to punctuate the film experience and enable meditation not only on animals themselves, but on film—and life—as media. Though both Nipper and the dog in Athlete with Wand react (at least briefly) to a spectacle, their reactions do not invite identification in the same way. Nipper’s facial expression and posture were painted by Barraud in a careful balance of dogness as both other (non-human) and the same (the facial expressivity of a complex mammal) in order to invite identification and association. The joke consisted in the momentary conflation of one’s own human attitude with the animal’s, followed by a subsequent dissociation from the animal. In Athlete with Wand, one cannot appropriate the dog’s expressivity through identification and a projection of emotions, since the dog’s existence in time provides resistance to such appropriation—it exists; it ‘behaves like a dog’. As a consequence, though, we also do not need to dissociate ourselves from the dog in the way that we dissociated ourselves from Nipper, and we are thus ‘relieved’ from the reestablishment of rigid boundaries.

We are, however, able to establish a connection to the dog based on its movement and expression of intention, its behavior. When the dog lifts its head to gaze cautiously at the pole that has swung close by its body, we too can become aware of this ‘spectacle’ of the athlete as an event that has a relationship—possibly threatening—to living bodies in its environment. This is not connection via appropriative identification, but rather a connection by means of a corporeal and sensual link. While the painting of Nipper sets up an absolute dynamic of being the same/being different, Dickson’s and Heise’s dog presents us with a life that is both different and the same, that we recognize and are bound to as temporal, living creatures, but that we nevertheless do not conflate with our own being. These three dogs—in a diorama, in a painting, and on film—illustrate that in the mediation of animals, there is always a double transfer that takes place. The
spatiotemporality of the medium, as well as its addressing and configuration of a beholder or listener, intersects with the negotiation of attitude, empathy, and perspective between spectator and dog. Both dog and media do not just present themselves to us; they present a world, or worldview, to us, and thus an invitation to step outside of our spatiotemporal, perceptual coordinates into uncertain territory.

The Agony of the Starfish: Uexküll’s Chronophotography

For Uexküll, the role of media for comprehending the intersection of organism and environment began in the final decade of the nineteenth century, when he connected his studies in biology with philosophical and art-historical theories of perception and comprehension. In Dorpat, Estonia, Uexküll studied with the anti-Darwinian biologist Karl Ernst von Baer. However, it was while working at Anton Dohrn’s Zoological Station in Naples in the late 1890s and early 1900s—at the same time, as it turned out, that neo-vitalist biologist Hans Driesch was also working there—that Uexküll began to turn away from Darwinism and pure physiology and sought to integrate his earlier studies of Kant with the organicist-vitalist approaches of von Baer. This was not, however, a turn that had purely intellectual origins, and the crucial role of photography, especially chronophotography, in helping Uexküll to redefine the task of biology and his notion of organicity is evident in his early work.

Uexküll began to reconceive the relationship between organism and environment by developing a new theory of ‘organic form’ around a Kantian conception of biology. In a 1902 article entitled ‘In the Battle over the Soul of the Animal [Im Kampf um die Tierseele]’, Uexküll elaborated on Kant’s theory of apperception in order to criticize the premise that psychology was able to make any claims about the ‘psyches’ of non-humans. He reminded his readers of Kant’s claim that apperception is the process by means of which sensations are transformed into intuition (Anschauung), and he stressed that, in addition to this ability to synthesize and recollect sense perception, apperception also included a process of Gestaltung (creation, design, construction, formation). This so-called Gestaltungsprozess for Uexküll emphasized the role of the brain in perception, for the brain is not

24 On Uexküll’s time in Naples and his indebtedness to von Baer, see Mildenberger, Umwelt als Vision, 16–41. Tim Lenoir provides the most thorough discussion of von Baer’s embryology as a form of ‘vital materialism’; see Timothy Lenoir, Strategy of Life, esp. 72–95.
only the organ in which sensory data is collected, but is also the location in which these data are informed by previous perceptions, and in which concepts are formed (and it is only by means of these latter that we can grasp percepts). Uexküll thus claimed that, in this sense, apperception is completely subjective, for it is the individual as subject that provides unity to all percepts. Taking his lead from Helmholtz, Uexküll described the relationship between thought and extensive matter—the fact that movement in the brain seems to stand in a lawful relationship to the external world, even though mediated by manifold sensations that give incoherent input—as one of ‘signs’: the sensuous qualities of consciousness are signs of the movements in the brain and, as mediated by the latter, of the external world.25 The relationship between objects in the world and consciousness of them (qua sensations) can therefore be traced physiologically and is indeed indexical, but nevertheless non-deducible—the objects in the world cannot be determined by looking at the brain.

Uexküll would not develop the concept of Umwelt until a few years later, but we can already discern the first elements of this concept in the implications of the essay. First, since we have no access to the signs that other living beings employ and we are, moreover, unable even to imagine sensations different from our own, we cannot make any claims about the psyche of non-human subjects (i.e., animals). Second, by understanding biological processes as signs—that is, in terms of a biosemiotics—we can substitute for a psychological approach to animals a model that captures the subjectivity and arbitrariness of human and animal perception. And finally, the diversity in the arrangements and functions of animal tissues and organs (and thus, perceptions) is due to the diversity of milieux to which organisms had to adapt. A study of the milieu, the essay concludes, is therefore an integral, yet to date neglected, part of biology.

Though these three elements might initially appear to limit themselves to biological and philosophical issues, Uexküll’s attempt to reformulate the concerns of biology as a science of life were closely related to questions with which contemporary aesthetic theory was also grappling. The importance of aesthetic theory for Uexküll is underscored by his reference to Adolf Hildebrand’s 1893 book The Problem of Form in the Fine Arts (Das Problem der Form in der bildenden Kunst).26 Hildebrand’s Problem of Form was among the most popular theories of art at the time, and Uexküll’s reference to this book in his discussion of Gestaltung emphasized the extent to which he

25 Uexküll, *Im Kampf um die Tierseele*, 17.
26 Adolf Hildebrand, ‘Problem of Form’, 227-79.
was creating a new biological theory by bridging the concerns of multiple disciplines. In part, this convergence of German aesthetic theory and German theoretical biology can be explained by the common Kantian heritage of both disciplines. Like those turn-of-the-century aesthetic theories that have been grouped under the rubric of ‘empathy’ (Einfühlung, literally ‘feeling-into’), Uexküll was working from Kant’s understanding of the relativity of perception. And like these same art theories, Uexküll was interested in the organization of matter, in ‘form’. Kant had defined the form of an appearance as ‘that which so determines the manifold of appearance that it allows of being ordered in certain relations’, and he distinguished between ‘pure forms of intuition’ (space and time) and ‘forms of thought’ (concepts and categorizations that mediate intuition). Rather than being an inherent property of objects, form is a subjective, and necessary, element of apperception—a ‘mode’, as Mallgrave and Ikonomou put it, ‘under which we arrange the objects of perception, a transcendental reality’. According to Kant, the form of an object and the body of the perceiver are correlated, such that pleasure in certain forms, whether natural or artistic, is based on a harmonious relation of the external form with our cognitive faculties. Art theorists such as Robert Vischer (who coined the term Einfühlung), Conrad Fiedler, and Adolf Hildebrand (and, a few years later, philosopher Theodor Lipps) developed further Kant’s suggestions concerning the active, and constitutive, participation of the body in perception. For these theorists of art, the ground for the apperception of form and for aesthetic appreciation was provided by the organic structure of the human body, including its spatial arrangements (e.g., symmetry of body parts or horizontal and vertical axes), its temporalities (e.g., the rhythm of heartbeat, circulation, muscle tension, etc.), and also by kinesthetic perception (such as eye movement) in particular and bodily movement more generally. Additionally, the organic connection of body parts meant that the senses were interrelated and supplemented each other’s input, resulting in synesthetic perception.

In striving to incorporate this interdependence of the perception of form and perceiving body into the new discipline of biology, Uexküll focused on the question of how a subject constitutes an object, and what this allows us

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27 In their comprehensive introduction to Empathy, Form & Space, the editors describe how the publication of The Problem of Form coincided with Hildebrand’s artistic success as a sculptor, and the book quickly went into seven editions. See Harry Francis Mallgrave and Eleftherios Ikonomou, ‘Introduction’, 36.

28 Immanuel Kant, Critique of Pure Reason, 66.

to say about the subject. First, he notes that in the process of Gestaltung, an object is formed on the basis of ‘lawful relations’ to an ‘I’ (that is, an apperceiving beholder). More specifically, the arbitrary and momentary sensations this I receives only gain coherence because the I itself is coherent; because the I gathers the sensations in apperception in order to form a definite object on the grounds of the object’s relationship to the I itself. The structure of the object corresponds to the structure of the I, the subject. Yet what can we know about the perception of form in beings completely different from ourselves, such as animals? Since Uexküll insists that we cannot make any claims about their psyches and processes of apperception, the application of psychological methods to animals is ill-conceived, which means that we have no idea of how animals constitute objects. And this in turn brings up the question of how to proceed when investigating other species.

It was by turning to chronophotography that Uexküll found a way to avoid making recourse to an inaccessible ‘inner life’ of animals. Photography not only restricted its information to the surface, the externally visible, without any interpretive work (from which even drawings were not completely free), but it also depicted its object independently of human perception. In his early work, Uexküll focused on the relationship between nerve stimulation and muscle tension in lower animals such as starfish and sea urchins, and he needed a medium able to record changes over time. Chronophotography had just become more widely known through the publications and traveling lectures of Eadweard Muybridge and Etienne-Jules Marey, with Muybridge focusing on chronophotography’s aesthetic potential and Marey using it as a scientific-analytic tool. Having become frustrated with the limited possibilities for analyzing and representing the movement ‘of the whole animal’, Uexküll traveled to Paris to study chronophotography with Marey for two months. For his second paper on muscle tone, Uexküll prepared a number of chronophotographs that functioned as the backbone for his conclusions about the starfish Ophioglypha’s ability to walk, turn, feed, and perform defensive movements. By focusing closely on his chronophotographs, we can see how Uexküll was able to make the shift from a criticism of animal

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30 Evolutionary biologist Ernst Haeckel was another scientist whose work on form influenced aesthetic theories. His book Art Forms in Nature, with its fantastic illustrations, became an especially important source for Jugendstil artists. Uexküll, however, was the first to bring the perception of form as a concern to biology. See Robert J. Richards, The Tragic Sense of Life, and Stacy Hand, ‘Embodied Abstraction’.

31 Uexküll, Im Kampf um die Tierseele, 9.

psychology and a denial of its methodology to the development of a new approach to animals, one that focused on the relationship of animals to their environment.

At the beginning of his paper, Uexküll distinguished between two different kinds of ‘photographic time-writing’: chronophotography with a static plate and chronophotography with a running film. If an animal moved swiftly past the camera, the result was a recording of separate phases of movement, or what Uexküll calls a ‘record of coordinates’ (*Koordinatenschreibung*), no matter which method of chronophotography was employed. Such a record of coordinates consisted of segments in time and allowed for an analysis of the progression of the coordinated movement. However, if an animal was fixed to a specific position in front of the camera, chronophotography with a static plate allowed for a ‘record of amplitudes’ (*Amplitudenschreibung*) of the animal’s movement. The record of amplitudes is a form of ‘stacked time’ and gives us segments in space. Such a record tells the researcher nothing about the order and temporal dimension of movement, but rather visualizes the intensity and extension of the movement (of, for example, a starfish pinned on a black surface). This recording method allowed Uexküll to represent graphically the distinction between two different kinds of starfish ‘strolls’: on the one hand, a form of walking with the inactive, unpaired fifth leg being dragged behind the four paired, active legs (Fig. 2.5, picture left); on the other hand, a form of walking in which the fifth leg was positioned in front of the other four (Fig. 2.5, picture right).

Though Uexküll had learned chronophotography from Marey, his use of this technique pointed to an entirely different conception of the living body than Marey’s. As I noted in the first chapter, Marey’s chronophotography was based upon a Helmholtzian notion of the body as an energetic machine, and the measurements that his recordings yielded allowed him to analyze the distinct components of different processes of movements, such as walking, running, jumping, flying, crawling, or fighting, whether the subjects of these movements were human or animal. Marey’s chronophotography has for this reason become synonymous with the modern spatialization of time, the analysis and decomposition of perception, and the scientific

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33 There is a sad irony in the fact that such chronophotographs are unable to record the passage of time, for in order to obtain the image, the starfish was pierced and held fast to a piece of cork. Uexküll assures us that ‘the arms’ movements are the same as under normal circumstances, only faster’. While these images may thus give us a correct sense of the movement, they erase the agony of the animal.
rationalization and mechanization of the body and its performance—in a trajectory that leads, both historically and ideologically, to cinema.\textsuperscript{34} Uexküll’s chronophotography provides not only a different use and analysis of the medium, but also points toward an alternative legacy of chronophotography for cinema. He was not simply interested in analyzing the movements of the starfish with respect to their function and efficiency, but rather explored the animal’s ability to organize and reorganize its use of its legs depending upon the circumstances in which it found itself; that is, in the face of the stimulations that the animal received from the environment. Uexküll’s quite different focus is especially evident in his ‘record of coordinates’ (Fig. 2.6) of the starfish. This photographic series consists of filmstrips 2-4 meters in length, which Uexküll claimed to have shot by means of a ‘new apparatus’. What is evident in these strips is that the legs not only change their pairings and mutual coordination in response to stimuli, but, in addition, the starfish, which is prone to ‘shed’ its legs at the slightest resistance, instantly adapts its walk to the new constellation of limbs, proving that there is an intricate collaboration between the different body parts. Any given local change, whether internal or external, thus prompts the entire organism to adapt and change systemically. The graphic serial images of the starfish’s stark silhouette illustrate this quality almost symbolically: the distinct, coordinated, and regular arm movements are

\textsuperscript{34} See, for example, Braun, \textit{Picturing Time}, Rabinbach, \textit{The Human Motor’}, and Doane, \textit{The Emergence of Cinematic Time}. 
the result of impulses travelling from the periphery of the starfish body to its center, where they are organized and travel back into the limbs.

In interpreting the results of his photographs and experiments, Uexküll stressed that there must be a center, a ‘differentiated mechanical apparatus’ of a quality different from that of the regular nerve pathways. In contrast to Marey’s motion studies, which simply analyzed bodily movements, Uexküll’s photographs positioned movement as an organized reaction to stimuli, with the consequence that the bodily surface or external Gestalt of the animal became an integral part of the observation. These differences between Uexküll’s and Marey’s approaches to chronophotography were in large part disciplinary: where physiology (Marey) sought to trace biological processes back to physical or chemical processes, and in this sense ground life in the anorganic world, biology—at least according to Uexküll’s definition—began with living tissues and sought to deduce from the properties of those tissues the functions of the organs and the life of the organism as a whole. What was at stake in Uexküll’s photographs, in short, was a concept of organic form, rather than simply bodily movement.

36 See Uexküll, Im Kampf um die Tierseele, 20.
Uexküll’s work with chronophotography and aesthetic theory was thus on the cusp of a new understanding of biology—or, more precisely, a new conception of the relationship between an organism and its environment, between life and world—without yet being fully able to draw its own conclusions. Uexküll’s initial solution to the problem of animal perception was to investigate an organism’s physical reactions to the environment, as that sole aspect of the interaction of an animal with its world that is available to us. Chronophotography was the medium of this investigation, for it allowed Uexküll to focus solely on the visible body—that is, the response of nervous tissue to outside stimuli and resulting muscular movement—and make observations about the organism’s ‘fight’ against its milieu. But there is a conflict inherent in this answer, a stumbling block, and that is the conventional understanding of environment as milieu from which Uexküll was working. If we focus solely on the way in which the milieu influences the organism, and we understand milieu as ‘that part of the external world [Außenwelt] that is impacting [a particular] animal’, then all we have on the part of the living being is passive reaction. The only formation (Gestaltung) that occurs is that of the organism by the milieu. Yet this view is incommensurable with Uexküll’s aesthetic—empathic—understanding of Formgestaltung in perception as the active, creative, and willing capacity of the body to relate to its surroundings.

This traditional notion of milieu with which Uexküll was working, but against which he was also struggling, had a long lineage in both biological and sociological thought. While Jean-Baptiste Lamarck introduced the term ‘milieu’ into biology, it was Auguste Comte who redefined it more specifically in 1838 as the ‘sum total of outside circumstances necessary to the existence of each organism’. Milieu became a strictly mechanistic term: for example, Jacques Loeb, a mechanist biologist greatly admired by Uexküll, proclaimed that all movement of the organism was forced upon it by the milieu. Hyppolite Taine extended the forces of the milieu to the social sphere; according to Taine, humans are conditioned by race (collective cultural conditions), milieu (specific circumstances of living), and moment or time (accumulated experiences). Milieu was thus firmly established over the course of the nineteenth century as an all-powerful force, ‘mindless of man, who is its finished product, its creature’.

37 Ibid., 21, footnote 1.
39 Spitzer, ‘Milieu and Ambiance’, 177. While my focus here is on film, it is worth stressing that debates about the virtues of using the term ‘milieu’ also emerged in discussions about literature, in part because Émile Zola—drawing on Claude Bernard’s use of the term—proposed that the
Recognizing this tension between the determinism inherent in milieu theory, on the one hand, and his account of the activity essential to an organism's perceptual abilities, on the other, Uexküll introduced the term *Umwelt* into biology and philosophy. Where milieu is an objective set of determining conditions, *Umwelt* is a subjective environment that envelops every living being like a soap bubble. Uexküll's theory thus opposed the 'centripetal' architecture of inorganic things, which are formed by outside forces, to the 'centrifugal' plan of organic life that develops from the inside out in a self-regulating fashion (a model that André Bazin would ascribe to the cinematic image itself some fifty years later; see Chapter 4). Since we are ourselves creatures of the world, we are confined to our individual human soap bubble. Even in our attempts at objective scientific knowledge, we will inevitably project the elements of our *Umwelt*—its phenomenal objects and its temporal and spatial paradigms—onto other creatures. Uexküll's biology is therefore an attempt to create a methodology that aims not at getting behind appearances (the goal, for example, of Uexküll's contemporary Helmholtz), but rather accepts that there is only appearance, yet this appearance in turn reveals something about the living body to which things appear. Since 'all reality [Wirklichkeit] is subjective appearance', investigating different organic interactions with the environment will mark the manifold of subjective worlds which ultimately give us a richer sense of the world itself. Such marking often depends upon technologies, such as chronophotography and film, that mediate between these other *Umwelten* and our human *Umwelt* by enabling our senses to grasp phenomena that they could not have registered in the absence of such technologies. These technologies thus alter and expand our all-too-human gaze, enabling relationships to the world that, even if still necessarily human relationships, were nevertheless not possible prior to a sustained encounter with non-human *Umwelten*.40

naturalist novel should focus its 'experimental' technique on the milieux that determine social action. Georg Lukács’ 1936 attack on Zola and his conception of milieu (in the essay 'Narrate or Describe?') should thus be seen as part of the same dynamic that I outline for the case of film. See Émile Zola, ‘The Experimental Novel’ and Georg Lukács, ‘Narrate or Describe?’

Of Ticks and Humans

One of the most famous and dramatic examples that Uexküll used to illustrate *Umwelt* theory is his evocation of the world of a tick. This little parasite—which Uexküll describes as like a ‘blind and deaf highway woman’—with its limited *Umwelt* had become an infamous example by this point, since it had been taken up lovingly by a now-long lineage of philosophers and historians of biology, including Georges Canguilhem, Maurice Merleau-Ponty, Gilles Deleuze and Félix Guattari, and Giorgio Agamben. According to Uexküll, the tick’s capability for perception and reaction is limited to three stimuli, which he called ‘effector cues’: the sun on its skin, the smell of butyric acid that issues from the skin of mammals, and the temperature of blood in a mammalian body. The photosensitivity of the tick’s skin compels it to climb up trees or bushes; when it smells butyric acid, it lets itself fall; if it senses warmth, it will move to find a hairless spot on the skin and begin to burrow into the skin and start sucking. (Uexküll focused on the female tick for his example, which after having filled her stomach, drops to the ground, lays her eggs and dies.) Nothing aside from these three elements can be perceived by the tick; nothing else, consequently, exists in its *Umwelt*.

Though Uexküll’s restriction of the female tick’s *Umwelt* to three factors might seem analogous to contemporary biological concepts, such as ‘tropism’, that pointed to the role of specific external influences in triggering automatic biological responses, the concept of *Umwelt* was, by contrast, intended to underscore the autonomy of the living being’s subjective world. Jacques Loeb’s concept of ‘tropism’—for example, the heliotropism of sunflowers or moths—placed its emphasis on external factors that determine plant and animal movement and positioned these movements as simply physico-chemical reactions. Uexküll, by contrast—and much more in line with teleological and vitalist colleagues such as von Baer and Driesch—understood these external factors as an extension of the animal’s *Bauplan*, its blueprint or body plan. The difference between *Umwelt* theory and Loeb’s tropism (as well as similar concepts conceiving of the organism as physico-chemical and the environment as milieu) was

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thus the directionality of the relationship between external and internal factors: it is the organism determining how its Umwelt is constituted, rather than the milieu determining the organism. By means of what he called a ‘functional circle’, Uexküll explained how ‘subject and object are interconnected with one another and form an orderly whole’ (see Fig. 2.7).

The double link of receptor and effector signs, of perceptual and motor activity, by means of which the subject grasps—and thus also constitutes—the object, illustrates how those aspects of external objects that function as bearers of perceptual and functional cues (the striped part of the object in Fig. 2.7) become interwoven with the subject’s capacities. Consequently, in a fly’s world, everything, including the spider’s net, is ‘fly-like’.

This image of subject and object ‘interconnecting’ with one another has an ambivalent emotional valence. On the one hand, the perfect correspondences between subjects and objects seem to point to a miraculous, overarching ‘plan’ of nature (how else to explain the fact, Uexküll asked,

43 Uexküll, A Foray, 49.
that a spider’s web is woven with threads just beyond the threshold of a fly’s vision, in a pattern ideal for capturing flies?). On the other hand, though, the reduction of subjective worlds to perceptual and functional cue bearers produces a feeling of claustrophobia; each animal is enclosed in its own circle. Contemporary philosophers who engaged Uexküll’s texts grappled especially with this latter aspect, and either sought to create more room for agency in the notion of Umwelt or sought to restrict the functional circle to animals, thereby excluding humans from its enclosure.

Phenomenologists and philosophical anthropologists were especially interested in probing the consequences of the relationship between animal and Umwelt, so clearly illustrated by the functional circle, for the relationship of the human being to the world. In Ideas, for example, Edmund Husserl introduced consciousness and intentionality into the notion of Umwelt, thereby adding historical variability and freedom to the subject-object relationship. ‘Umwelt’, for Husserl, is

the world that is perceived by the person in his acts, is remembered, grasped in thought, surmised or revealed as such and such; it is the world of which this personal Ego is conscious, the world which is there for it, to which it relates in this or that way, e.g. by way of thematically experiencing and theorizing as regards the appearing things or by way of feeling, evaluating, acting, shaping technically, etc.

Umwelt, he continues, is the physical reality a person ‘knows’ about; it is that of which the person has consciousness. ‘Speaking quite universally’, Husserl summarizes, ‘the surrounding world [Umwelt] is not a world ‘in itself’ but is rather a world ‘for me,’ precisely the surrounding world of its Ego-subject, a world experienced by the subject or grasped consciously in some other way and posited by the subject in his intentional lived experiences with the sense-content of the moment. As a consequence, Husserl asserts, the Umwelt is ‘always in the process of becoming’, constantly producing itself by

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44 Darwin, of course, had a different answer, namely natural selection.
45 In most of the cases mentioned here, the authors directly, and often extensively, reference Uexküll. However, it is likely that Uexküll was often present virtually even in texts in which he was not mentioned by name, for though the term Umwelt was rarely used before the publication of Umwelt and Innenwelt der Tiere, it became a central category in German philosophy after 1909, suggesting the extent and importance of Uexküll’s work. See G. H. Müller, ‘Umwelt’.
46 Edmund Husserl, Ideas II, 195.
47 Ibid.
means of transformations of sense. Husserl distinguished between a ‘natural’ relationship between body and environment—the physico-chemical reaction of the body to stimuli that can be explained by causal (scientific) laws—and an intentional relationship that constitutes our Umwelt. This intentional relationship is governed by ‘motivation’, and things exist not ‘in themselves’, but rather as experienced (or thought) things. Husserl thus adopts from Uexküll the notion of Umwelt as an individual or personal world, but by introducing intention and experience, our relationship to things, and thus to our Umwelt as a whole, becomes subject to constant change and becomes historical.

For the philosophical anthropologists Max Scheler, Helmuth Plessner, and Arnold Gehlen, as well as for Martin Heidegger, Umwelt theory functioned as a starting point for making an ontological differentiation between human and animal, and the functional circle came to illustrate the closed nature of the animal’s interaction with the world, its boundedness.\(^48\) On the basis of the claim that every animal is bound to, and unable to transcend, its particular Umwelt, each of these authors developed ontologies that fundamentally distinguished between humans and animals. Scheler, for example, introduced the notion of ‘openness to the world’ (Weltoffenheit) as the definition of the human being’s active capacity to engage and shape its world, and contrasted this capacity with the animal’s closedness: as a ‘being having spirit’, the human being is existentially released from the laws governing organic matter and is ‘not tied anymore to its drives and Umwelt, but is ‘free-from-Umwelt’ [umweltfrei] or, as I wish to put it, “world-open” [weltoffen]. Such a being has “world.”\(^49\) In similar fashion, Heidegger turned to Uexküll’s biology in order to make a distinction between beings that simply ‘live’ and those that have what he called ‘existence’ (Dasein). He ascribed to humans the capacity for ‘world-forming’, while animals are ‘poor-in-world’ (weltarm) and non-organic things, such as stones, are ‘worldless’ (weltlos). Heidegger contended that animals are ‘captivated’ by what they can perceive—they cannot relate to objects ‘as such’, but rather relate only in the sense that perceptual cues selectively ‘disinhibit’ the animals’ relationship to the world—and as a consequence they have no access to Dasein.\(^50\)


\(^{49}\) Scheler, *The Human Place in the Cosmos*, 27 (translation modified).

\(^{50}\) See Heidegger, *The Fundamental Concepts of Metaphysics*, 238-70. The somewhat reductive treatment Uexküll received from Heidegger—and, by extension, Agamben—is, of course,
Yet Uexküll’s work was not solely the starting point for a lineage of thought that sought to establish a division between humans and animals—a lineage of which Giorgio Agamben’s *The Open: Man and Animal*, is one of the latest and most prominent examples—and thus arrive at a definition of human being, essence, or existence. This line of reception of Uexküll’s work has received significant attention in the last decade, in large part as a consequence of Agamben’s use of Uexküll’s example of the tick in *The Open: Man and Animal*. What has received far less attention, however—and perhaps even fallen by the wayside—is another path of reception, one that takes up the creative potential of Uexküll’s work, its thrust against anthropocentrism, and its interest in the visual mediation of difference.51 If we take another look at Uexküll’s image of the functional circle, for example, we see that there is a blank center of the object, indicating those aspects of the object that escape the subject (what Uexküll calls counterstructure, ‘*Gegengefüge*’).52 This elusive part of the object differs from subject to subject. In Uexküll’s attempt to reconstruct and depict other *Umwelten*, new views of the object can emerge, since with the change of perception and possible action, the blank center—the invisible, imperceptible, untouchable part of the object—is also transformed, opening up non-human vistas. And opening up these non-human vistas was, as we shall see in the next section, an interest that Uexküll shared with many early film theorists.

**Against Anthropocentrism: *Umwelt* and Cinema**

As I noted above, Uexküll’s descriptions of *Umwelten* evoke feelings of estrangement and encourage an uncanny fascination with creatures we thought we knew; despite occasional lapses into comparisons with our mostly due to the interest of these latter in linking a human/animal difference to a (differently perceived and defined) crisis of humanity.

51 Amongst the recent publications on Uexküll, I found the following useful when thinking about this lineage: Geoffrey Winthrop-Young, ‘Afterword: Bubbles and Webs’; Jussi Parikka, *Insect Media*; and Brett Buchanan, *Onto-Ethologies*.

52 This is a trope we can already find in Henri Bergson’s *Matter and Memory*. The ‘images’—matter’s halfway stage between thing and representation—act and react upon one another in all their elementary parts, yet subjective perception displays images only with respect to ‘the eventual or possible actions of my body’. Uexküll follows Bergson in conceiving of objects as entwined with the perceiving body: since the body’s possible actions are reflected by the external images as in mirror, this realm of possibility is located exactly between body and image, such that it seems to be dependent upon the body’s recognition of itself in the image-as-mirror. See Bergson, *Matter and Memory*, 17-21.
familiar human world (e.g., the tick as a ‘highway woman’), Uexküll’s descriptions and the scientific implications that he drew from these descriptions derive their strength from the attempt to tear off the veil of human perception—not in idealist fashion, as an attempt to show us objects in the world as they really are, but rather as an attempt to reveal the plurality of perceptual worlds (the world as it is to a tick, or a dog, or a fly). By opening up every object to a manifold of creaturely perceptions, we have the impression of a multitude of veils, all of which provide different glimpses of objects, without there ever being an object-in-itself, or one veil that would reveal everything as it is, if only it could be lifted.

In the technical mediation of film, Uexküll found not only a surface-ness that, like chronophotography, revealed the organized interaction of living being and environment, but also a technical method for producing an estranging veil. Uexküll introduced the cinema in his writings as a privileged apparatus that was able to mediate between species perceptions because it was able to alter time and space. Uexküll’s biological inflection of Kantianism encouraged him to treat time and space as dependent upon the body of the respective living being: ‘without a living subject, there can be neither space nor time’.53 He defined the space of a given living subject as a composite of operational, tactile, and visual space. Operational space is produced by the kinesthetic sensations of our own bodily movement, as well as of the three-dimensional bodily coordinate system that issues from the semi-circular ear canals in higher animals and humans. Tactile space is produced by the ability of living beings to localize touch on their bodies, while visual space can be thought of as a ‘place-mosaic’ that the visual elements on the retina spread over the environment.54 The spatial

53 Uexküll, A Foray, 52.
54 This sense of kinesthetic orientation in space as enabled by a moving body, as well as similarities in the conception of tactile and visual space, between ‘roving eye’ and ‘feeling hand’, echo Uexküll’s indebtedness to theories of empathy and recall Adolf Hildebrand’s and August Schmarsow’s theories of perception (see Hildebrand, ‘Problem of Form’; and August Schmarsow, ‘The Essence of Architectural Creation’). In particular, Schmarsow’s interest in bodily comportment in space in the perception of architecture has strong resonances with Uexküll’s notion of bodily space and makes it especially interesting for thinking about film perception. At the same time, Uexküll’s conception of space as produced by, and dependent upon, the body points forward toward theories of orientation in cinematic space, such as the work of perceptual psychologist James Gibson, who coined the term ‘ecological psychology’, as well as to recent applications of theories of empathy and embodied perception by Robin Curtis, Laura Marks, and others. Despite many parallels with Uexküll’s work, though, Gibson’s influence seems to be restricted to the American context (e.g., William James’ pragmatism). See James Jerome Gibson, The Perception of the Visual World; Gibson, The Ecological Approach to Visual
paradigms of a given Umwelt are thus completely dependent upon the body of the subject and its capabilities for sensing.

While Uexküll sometimes employed references to the cinematograph as a metaphor for his understanding of the biological nature of time, this did not exhaust the role that film played in his work. Much more fundamentally, his conception of the relationship between biological time and perception was based on the way in which film functions as a technology for manipulating time. The paradigmatic status of film for Uexküll is especially clear in his description of an experiment on the time perception of a snail:

A snail [Helix pomatia] is placed on a rubber ball which, because it is floating on water, can slide freely past beneath the snail. The snail’s shell is held in place by a clamp. The snail is thereby free to crawl and also stays in the same place. If one places a small stick at the foot of the snail, it will crawl up on it. But if one strikes the snail from one to three times a second with it, the snail will turn away. However, if the blows are repeated four or more times a second, the snail begins to crawl onto the stick. In the snail’s environment, a stick that moves back and forth four or more times a second must be at rest. We can conclude from this that the perception time of the snail takes place at a speed of between three and four movements a second. This has as a result that all processes of motion take place much more quickly in the snail’s environment than they do in our own. Even the snail’s own movements do not seem slower to it than ours do to us.55

The experiment is conceived so as to create the illusion of movement for the snail. Instead of the snail moving itself across space, however, a rubber ball moves underneath the snail (see Fig. 2.8). If a stick is positioned underneath its foot, the snail takes it for a continuation of its path. As the experimenter begins to wiggle the stick, the snail will refuse to climb onto it, presumably because the stick seems unstable and unsafe to the snail. However, as soon as the stick oscillates faster than one third of a second, the snail will continue to climb as though the stick was stable. The conclusion that Uexküll drew from the experiment is based on von Baer’s notion of the ‘moment’ as the basic time-unit of apperception: that is, a moment is the shortest time-span during which a living being can distinctly perceive different qualities. For the duration of its moment-unit, everything in a living being’s perceptual world


55 Uexküll, A Foray, 72.
is immobile, since change has become imperceptible. (In contrast to Henri Bergson’s concept of *durée*, which is an organic-vitalist temporality, von Baer’s moment-time is therefore a psychophysical temporality.) Just as space for Uexküll was a subjective variable dependent upon the body, time was similarly subjectivized by the ‘moment’, and he derided the idea, encouraged by the prevalence of objective time-measuring, that time itself is in any way objective. Apparently, the snail cannot perceive anything shorter than a quarter of a second; a ‘snail moment’, he concluded, is thus somewhere between one-third and one-quarter of a second long, such that ‘all processes of motion take place much more quickly in the snail’s *Umwelt* than they do in our own’.\footnote{56}

\footnote{56} Clearly, there are flaws in this interpretation of the experiment. First, this interpretation assumes that the snail behaves in the lab setting just as it would in nature; in other words, that the snail is duped by the set-up. And second, this interpretation assumes that the snail’s decision to get onto the stick is necessitated by its perception of movement; in making perception and action equivalent, the experimenter does not leave any room for a decision on the part of the snail (‘This is wobbly, but I might still dare to climb onto it’). Finally, for the sake of his argument, Uexküll does not distinguish between different sensory receptor times. This experiment is based

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Fig. 2.8: Experiment on the time perception of a snail.
The snail in the experiment cited above is in many ways reminiscent of an immersed film spectator. The snail is held in place while various objects (rubber ball, rod) move around it. The ‘flicker’ of the rod marks its threshold of perception, just as the discrete images on the filmstrip replace one another at a speed that marks the human receptor-time (which Uexküll determined to be one-eighth of a second). And indeed, in all of his references to time perception, Uexküll mentions the cinema: ‘The cinema alternatingly presents an image and darkness to our eyes. If both occur during the same [human time] moment, the darkness is not perceived. Only when the time-units last longer than one [human] moment does flicker set in, which for so long has been part of imperfect cinemas.’

One could even imagine devising a cinematographic apparatus for snails, hoping their visual capacities would be up for the task: films would only need to be filmed and projected at four frames per second in order for a gastropodian audience to enjoy a spectacle of smooth life-like movement.

Of course, a ‘species cinema’ sounds like a crazy idea, since in the case of cinematic representations of living beings, time manipulation is normally used not to mimic the time perception of the creature being represented, but rather simply to visualize an animal movement for the curious or scientific human eye. In such uses, cinema actually functions as an anthropomorphizing machine, one that translates non-human registers of movement into a human scale, taking into account the human perceptual apparatus and its attention span. Uexküll emphasizes this anthropomorphizing capacity of cinema, noting that in slow-motion photography, ‘more than eighteen pictures are taken per second, and then projected at a normal tempo. Motor processes are thus extended over a longer span of time, and processes too swift for our human time-tempo (of 18 per second), such as the wing-beat of birds and insects, can be made visible.’ Similarly, time-lapse photography speeds up motor processes, so that ‘processes that are too slow for our speed, such as the blossoming of a flower’, can be brought within the range of our perception.

As a translation machine from plant and animal temporality to human temporality, cinema serves both a scientific interest (making visible temporal processes that were previously invisible or obscure) and a popular interest in seeing that which is curious and spectacular.

on skin contact, yet other senses such as vision or hearing might work according to differing intervals.

57 Uexküll, Die Lebenslehre, 141.
58 Uexküll, A Foray, 71.
Yet the implications of Uexküll’s snail experiment are in fact more radical than this anthropomorphizing interpretation suggests. Even in cases in which cinema anthropomorphizes time or space (in the sense of translating into human standards spatiotemporal events that would otherwise be too fast, slow, big, or small for human perception), cinema nevertheless bends the spatiotemporality of the world as we know it and breaks with the conditions of our Umwelt: if we change either the time of recording or of projecting, we are manipulating the duration of the ‘moment’ as the basic time-unit of perception. By watching something in slow motion or fast motion, we either stretch or shorten the ‘moment’ and are thus able to form an image, within our perceptive frame, of the temporality of a living being of a different kind. A time-lapse shot of a snail shows us its movement not as it naturally appears to us in our Umwelt, but as it is mediated by an apparatus with different perceptual-actual capacities than our own, namely those of camera, film and projection. Thus, following Uexküll’s conclusions and calculations above, if we filmed a snail’s movement using a film camera that recorded at a speed of four images a second and the film was then projected at the regular speed of $1/18$ second, we would see a snail that no longer appeared to be ‘crawling’—that is, no longer appeared to move at a slow pace relative to our own bodily sense of ‘normal’ speed—but would instead appear to move at close to our normal walking speed. Such an image is uncanny, because it stretches and deforms our habitual sense of the relationships between slow, normal, and fast movement, in part by reminding us that the snail likely has its own sense of ‘normal’ speed which differs significantly from our own, and in part by making the snail move ‘too fast’—4.5 times too fast, to be precise—in comparison with our habitual understanding of snail speed. This film of speedy snails thus provides us with a template for reorganizing, in the wake of the snail, our sense of what constitutes ‘normal’ temporality.

Researchers such as Henri Fabre, Charles Otis Whitman, and Julian Huxley had already conducted similar experiments to obtain data concerning ‘natural’ animal behavior. Yet for Uexküll, the result of an experiment such as the one described above, despite its use of ‘objective’ instruments and calculations, does not provide us with an objective result, if by ‘objective’ we understand that ‘view from nowhere’ later made famous by Thomas Nagel. Rather, the experiment provides us with an indication—an image—of the subjective perception of a snail by destabilizing our pre-given conceptions of what constitutes ‘normal’ (or ‘fast’ or ‘slow’) movement. The theoretical paradigm of Umwelt research thus puts Uexküll somewhat at odds with

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59 Thomas Nagel, The View from Nowhere; see also Nagel, ‘What Is It Like to Be a Bat?’
the late nineteenth- and early twentieth-century research agenda Lorraine Daston and Peter Galison describe as ‘mechanical objectivity’, according to which images that are mechanically produced—such as photographs or drawings made by an uninformed, non-judgmental individual—reveal the truth, even though they might be more difficult to decipher. While Uexküll employed photography and similar technical instruments to obtain data, he rejected the idea of objectivity per se, including the idea of objective time and space, as a construction or illusion. Precisely for this reason, however, illustrations and colorful descriptions in his work are liberated to take on a new valence, to provide alternate paths for creating images of animal Umwelten—illustrations become ‘intuitions’ (Anschauungen) of Umwelten. Even though Uexküll seldom says so explicitly, he is aware of the fact that the (human) image of the Umwelt of a sea urchin will always project human Umwelt values and percepts into the image, and can for this reason never be more than an image or an intuition. The technological production and alteration of images thus makes possible a view that is not objective, but rather other or alien. Film can alter temporality, as I have discussed with respect to the snail; similarly, photographs shot with specific lenses or otherwise enlarged and reproduced can alter space and make anschaulich animals’ spatial perception. Rather than remaining immanent and transparent, technological media become tools that allow Uexküll to create images of species soap bubbles more effectively than experiments and conceptual tools such as the notion of the moment could.

Cinema presents a particularly valuable technological medium, since it is able, as the earliest film theorists noted, to evoke a world of its own that has the capacity to question or tear at the seams of our ‘natural’ world. By

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60 Lorraine Daston and Peter Galison, Objectivity.
61 Uexküll says of images produced by taking a photograph of a village street and altering it by means of a rougher and rougher grid that they ‘offer a chance to gain an intuition of an animal’s environment if one knows the number of visual elements in its eye’ (Uexküll, A Foray, 63). Similarly, already in ‘In the Fight about the Soul of the Animal’, Uexküll grants literary imagination—he mentions Maurice Maeterlinck’s book on bees—its own epistemological value. Since we are not able to criticize or exclude the colorful possibilities of what life is like from the perspective of various animals, real or not, creative fantasy can provide us with ‘graceful problems’ with respect to animals’ perception. See Uexküll, ‘Im Kampf um die Tierseele’, 18.
62 Another way of putting this would be to say that in Uexküll’s use of images, objectivity is revealed to be an illusion. Mechanically-produced images such as photographs thus do not reveal nature as it really is, unfiltered by an informed, opinionated, and selective human observer, as those committed to what Daston and Galison describe as the paradigm of ‘Truth-to-Nature’ would have it, but rather reveal a space-time alien to our human bodies’ being-in-the-world that might be closer to the space-time of other beings, real or not.
bringing previously imperceptible details and movements into our field of vision, close-up, slow motion, and time-lapse ‘queer’ our anthropocentric perspective by providing us with images that do not coincide with our regular embodied vision of the world. In queering our perceptual relationship to things—in breaking with the functionality of the functional circle, in other words—cinema creates new relationships between bodies and things. This operation, however, requires technology on all levels. It occurs in the filmic construction of time and space, which means: the decision to film at a certain speed (i.e., by employing specific Baerian moments) and with specific lenses positioned at a specific distance. This queering also occurs in the visualization of the cinematic recording, which means: the decision to project at a certain speed, through a particular system of lenses and mirrors, onto a screen of a certain size. Consider, for example, a representation of a flower that grows and blossoms in extreme time-lapse, so that we can translate its striving toward the light, its search for space, its stretching, wriggling and unfolding, into our bodies and connect these movements to those sensations produced by the movements of our own muscular and nervous tissues—such a flower, as Benjamin taught us, is Romantic-blue (whatever its actual color) and has its roots in the ‘land of technology’.

Uexküll’s theory of Umwelt thus pointed to the ways in which cinema provided an apparatus that offered a new vision, and many writers, critics, and artists embraced this potential, indeed finding in the cinema a mechanical eye that confronted them with Umwelten—and with an image of themselves—to which their bodies and minds were unaccustomed. The world in the cinema often seemed threatening, since its vision was not grounded in a coherent subject, in an interiority that provided depth and cohesion. During the ‘Kinoreform’ debates in Germany in the 1910s about the moral and aesthetic value of cinema, a number of progressive voices (among them Hermann Häfker, Georg Lukács, and Herbert Tannenbaum)

63 My notion of ‘queering’ here bears similarities to Sara Ahmed’s use of the term in Queer Phenomenology, where she pays attention to the issue of orientation. A queer phenomenology, Ahmed suggests, is one that redirects attention toward ‘different objects, those that are “less proximate” or even those that deviate or are deviant’. I suggest here that film queers our perception of everyday objects. See Sara Ahmed, Queer Phenomenology.

64 See Benjamin, ‘The Work of Art’, 115: ‘In the film studio the apparatus has penetrated so deeply into reality that a pure view of that reality, free of the foreign body of equipment, is the result of a special procedure—namely, the shooting by the specially adjusted photographic device and the assembly of that shot with others of the same kind. The equipment-free aspect of reality has here become the height of artifice, and the vision of immediate reality the Blue Flower in the land of technology.’
discussed the cinema as purveyor of not just a new aesthetic, but a new experience of body and world that was expressive of modernity. In the late 1910s in France, the members of a progressive film movement spearheaded by Louis Delluc and Jean Epstein began to formulate their thoughts on the specific aesthetic of cinema—what they called photogénie (Epstein) or the Seventh Art (Ricciotto Canudo)—and developed further the ideas that were only implicit in Uexküll’s use of cinema. Authors such as Blaise Cendrars, Epstein, Émile Vuillermoz, and Colette euphorically described the film experience as a new ‘symphony’ that might initially sound strange and unusual, but would ultimately result in a new techno-organic harmony.

In responding to this cinematic challenge, these authors found that they had to adapt or train their perception and innervate the new environment in order to adjust their bodies to this new experience. Authors in this camp took up literally the idea of species-queering, of experiencing a temporary shift of their perception—and along with their perception, their body—into that of another techno-organic creature.

French poet and novelist Cendrars, who assimilated cinematographic elements into his writing style at an early stage, freely assembled human, animal, plant, and machine elements into phantasmatic configurations in his texts on cinema. They present a theory of modernity as techno-organic cosmogony, of which cinema becomes a privileged expression. In The ABCs of Cinema (written between 1917 and 1921), Cendrars exclaimed:

Like a chameleon, the human mind camouflages itself, camouflaging the universe. [...] A hundred worlds, a thousand movements, a million dramas simultaneously enter the range of the eye with which cinema has endowed man. And, though arbitrary, this eye is more marvelous than the multi-faceted eye of a fly. [...] Everything is rhythm, word, life. No longer any need to demonstrate. We are in communion. [...] At high speed the life of flowers is Shakespearean; all of classicism is present

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66 See the essays by these authors in Abel, ed., *French Film Theory and Criticism*.

67 The parallel between Vuillermoz’s theory of film, which describes the medium in musical terms as new symphonic harmony, and Uexküll’s symphony of Umwelten that are linked harmonically, is striking. Both authors attempt to dissolve fragmentation (montage and the static image on the filmstrip, in Vuillermoz’s case, and the individual, closed soap bubble, in Uexküll’s case) into a harmonic unity. See Vuillermoz, ‘Before the Screen: Hermes and Silence (1918)’. 
in the slow-motion flexing of a biceps. On screen the slightest effort becomes painful, musical, and insects and microbes look like our most illustrious contemporaries [...] The least pulsation germinates and bears fruit. Crystallizations come to life. Ecstasy. Animals, plants, and minerals are ideas, emotions, digits. [...] We see our brother the wind, and the ocean is an abyss of men. And this is not some abstract, obscure, and complicated symbolism, it is part of a living organism that we startle, flush out, pursue, and which had never before been seen.68

This text contains a number of tropes that echo throughout the writings of French film theorists like Epstein, Germaine Dulac, or Vuillermoz, such as the idea that cinema has provided the human being with a new prosthetic eye, and that details presented in ‘high speed’, ‘slow-motion’ or close-up lay the groundwork for the new aesthetic of photogénie. Cendrars’ emphasis on camouflage, mimicry, and mimesis also expresses a sense of new bodily potentials of assimilating the environment. Anorganic (crystals, minerals) and organic matter (non-anthropomorphic animals, plants) is combined with the abstract and machinic (ideas, digits, etc.) to create a new organism. Cendrars’ style—the short sentences, enumerations, comparisons, and equations—mimics that of a film with fast-paced editing that joins together disparate shots. This literary strategy translates the power Cendrars ascribes to cinema into his text about cinema: a taking-apart, or blasting apart, of the world, and a defamiliarization of the familiar and habitual that extends into one’s own body.

A Necessary Field of Action: Benjamin, Umwelt, and Play

Partaking in the broader European discourse on film (which, aside from Germany and France, also included Russia), authors such as Walter Benjamin, Siegfried Kracauer, Léon Moussinac, Dziga Vertov, and Sergei Eisenstein emphasized the political importance of the aesthetic of film. However, Benjamin’s media theory is especially important in the context of my inquiry, since he not only made recourse to the notion of Umwelt, but he also converted it into a central aspect of what he deemed to be a necessary revolutionary practice of aesthetic engagement with cinema. Benjamin saw the techniques of cinema that the French critics had highlighted—that is, the techniques of ‘a taking apart, or blasting apart, of the world, and a

defamiliarization of the familiar and habitual that extends into one’s own body”—as the brutal but necessary process of an image space that tears apart ‘the inner man, the psyche, the individual, or whatever else we wish to throw to them’ for the sake of the creation of a body space.69 Even though Benjamin used the term Umwelt not in a strict Uexküllian sense, Uexküll’s theory of Umwelt, as well as his more playful writings, illustrations, and experiments, provide a powerful instrument that highlights what is at stake in Benjamin’s writings on cinema and surrealism: nothing less than the attempt to bridge the gap between body and Umwelt that technology and commodification had introduced.

As was common in sociological and philosophical texts at the time (for example, in Scheler’s writings), Benjamin used both ‘Umwelt’ and ‘Milieu’ (as well as ‘Außenwelt’, external world, and ‘Lebensraum’, living space or home territory) in talking about human surroundings.70 For Benjamin, the German term ‘Milieu’ connoted those environmental forces that influence and shape the human beings (and, presumably, all other living beings) that reside within such surroundings. So, for example, Benjamin used the word ‘Milieu’ when he discussed the visibility of the environment in Russian film.71 Furthermore, as Antonio Somani has detailed, Benjamin—just as some of his contemporaries, such as Ludwig Klages, Béla Balázs, or László Moholy-Nagy—used the term ‘Medium’ not for technical media such as photography or film, but rather to describe the “medium of perception”: the environment, the milieu, the atmosphere, the Umwelt in which perception is configured and organized by a series of steadily evolving technical Apparate [apparatuses, I.P.].72 Benjamin’s use of ‘Medium’ can thus be said to encompass both ‘Umwelt’ and ‘Milieu’; it is a realm of a historically and materially specific and variable quality, in which specific relationships between humans and objects can be established. The slipping, or slippage, from ‘Milieu’ to ‘Umwelt’ in Benjamin’s writings, especially in his essay on ‘The Work of Art in the Age of Its Reproducibility’, as well as in his texts on surrealism and photography, indicates a crucial qualitative change of the ‘medium of perception’.

69 Benjamin, ‘Surrealism’, 217.
70 Benjamin’s use of the Uexküllian neologism ‘Merkwelt’ (perceptual world) in his text ‘On the Mimetic Faculty’ also emphasizes his familiarity with Uexküll’s work. See Benjamin, ‘Über das mimetische Vermögen’, 211.
71 See Benjamin, ‘Kleine Geschichte der Photographie’/’Little History of Photography; ‘Erwiderung an Oscar A. H. Schmitz’/’Reply to Oscar A. H. Schmitz’.
72 Antonio Somani, ‘Walter Benjamin’s Media Theory’, 27.
Benjamin employed this distinction between *Umwelt* and *milieu* in order to address what he understood to be a profound and dangerous historical alienation between body and environment. In his dissertation on the *Origins of German Tragic Drama*, he had described the state of melancholy as one in which ‘[t]he deadening of the affects, and the ebbing away of the waves of life which are the source of these affects in the body, can increase the distance between the self and the surrounding world [*Umwelt*] to the point of alienation from the body.’ In melancholy, the subject’s loss of affect caused in turn a loss of links to his *Umwelt*—that is, this loss of affect produced detachment, since feelings ‘respond like a motorial reaction to a concretely structured world.’ Because the feedback loop between body and environment has been disrupted, the ‘distance’ of the subject from its *Umwelt* can go so far as to alienate the subject even from her own body.

Benjamin’s use of the term *Umwelt* thus significantly modified Uexküll’s original concept. Though Uexküll’s concept of *Umwelt* was intended to counter the external determinism implicit in concepts such as *milieu*, he nevertheless tended to describe the elements of subjective *Umwelten*—for example, the ‘effector cues’—in terms that seem quasi-automatic, and thus make it difficult to understand whether any ‘distance’ could open up between a self and its *Umwelt*. Would Uexküll, for example, have allowed for the possibility of a melancholy tick—a tick, that is, that smells butyric acid, but cannot quite bring itself to drop from the tree onto the body of the animal whence the smell originates? For authors such as Scheler and Heidegger, animals lacked such capacities of non-response, or varied responses, to effector cues, and hence these two philosophers appropriated the term *Welt* solely for humans. (For Heidegger, for example, the purported automaticity of animal response is precisely what denies animals the openness of the world, and instead makes them simply ‘poor-in-world’.) Benjamin, by contrast, was less interested in parsing out the limitations of animal being than in thinking about what had in essence remained an unexplored dimension of Uexküll’s account: namely, how is it that a living being’s *Umwelt* can change, and how does this change relate to possible changes of the living being? Uexküll’s descriptions of

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73 Benjamin, *Origin of German Tragic Drama*, 140. There is a remarkable similarity between Benjamin’s description of melancholy and Heidegger’s description of boredom as a method of detaching us from our *Umwelt* in order to gain more ‘authentic’ access to our *Dasein*. See Heidegger, *Fundamental Concepts of Metaphysics*.

74 Benjamin, *Origin of German Tragic Drama*, 139.
the variety of human *Umwelten*—for example, the *Umwelt* of the child vs. that of the adult, or the *Umwelt* of the hunter vs. that of the non-hunter—made it clear that there was not one, but many, human *Umwelten*, and that through changes in their physical capacities and their knowledge, *Umwelten* also changed.

Rather than understanding moods like melancholy solely as experiences that afflicted isolated individuals, however, Benjamin was interested in the ways in which such moods were widespread consequences of social, political, and economic changes. In his later texts, Benjamin warned that if we are not able in some way to re-insert ourselves into the *Umwelt*, we will become playthings of the forces of nature and technology. The goal that Benjamin suggested ought to guide our attempt to reconnect ourselves with the modern capitalist *Umwelt* is not that of mastery, but rather a functioning interaction between body and environment, an ‘equilibrium’—a functional circle, as it were, in which the body has become as naturally unnatural as the technologized environment.

Film, Benjamin proposed, can take on a mediating role in our efforts to produce this equilibrium, for when we watch a film, it is not simply part of our *Umwelt*—that is, it is not like the theater seat on which we sit. Instead, the film screen relays the *Umwelt* of the camera and of film as an industry to us, a technologized and capitalized *Umwelt*. This *Umwelt* can take on human or animal qualities, but it remains fundamentally alien. Benjamin’s notion of *Umwelt*, like his notion of perception, thus took on a political and historical dimension, and photography and cinema for him were means ‘for a salutary estrangement between man and his *Umwelt’.*75 This capacity of cinema is summarized in his notion of the ‘optical unconscious’. Everyday objects (as well as humans themselves) become unfamiliar and escape those efforts to ‘grasp’ them that are grounded in the circuit of perception-actualization; the habitual links between subject and object break down. By stepping into the soap bubble that is the cinema, we can see our own *Umwelt* in a different light; and by allowing us to become estranged from our surroundings, film also allows us to become aware of the force that these surroundings, as milieux, are exerting upon us.

Cinema is able to perform this function because it does not simply ‘reveal’, but can function as a tool, or toy—both *Werkzeug* and *Spielzeug*—by means of which humans can claim this estranged *Umwelt* back as their *Umwelt*.76 By

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76 This is why Benjamin calls the cinema a ‘second technology’ in the artwork essay. See Benjamin, ‘The Work of Art’, 106-08, 117-18.
training their perception collectively through film reception, by adapting their bodies through an innervation of cinematic shocks and by putting their bodies in front of the camera lens, film spectators can realize new potentials for action. With these connotations of Umwelt in mind, a familiar quote from Benjamin's artwork essay takes on new meaning, since the terms ‘Milieu’ and ‘Umwelt’ he used now signal the dialectical operation of the cinematic apparatus:

The most important social function of film is to establish equilibrium between human beings and the apparatus. Film achieves this goal not only in terms of man's presentation of himself to the camera but also in terms of his representation of his environment [Umwelt] by means of this apparatus. On the one hand, film furthers insight into the necessities governing our lives by its use of close-ups, by its accentuation of hidden details in familiar objects, and by its exploration of commonplace milieux [Milieus] through the ingenious guidance of the camera; on the other hand, it manages to assure us of a vast and unsuspected field of action [Spielraum, literally ‘room-for-play’].

For Benjamin, there can be a lag, or a gap, between creature, Umwelt, and milieu. If the milieu changes, due to economic, social, and technological forces, we are not able immediately to adapt our bodies, senses, and actions to the new conditions, which also means that our Umwelt does not adapt immediately. There is a temporal lag between milieu, on the one hand, and body and Umwelt, on the other. A medium such as cinema can help us bridge this lag, not only, but particularly, because it itself is one of modernity's capitalist, technological, mass-oriented enterprises. It literally reflects back to us the ‘new’ environment with which our bodies, and Umwelt, are out of sync. Since this reflection includes us, as actors, and our Umwelt, we gain creative space in the gap between our immediate sensorial Umwelt and our Umwelt reflected and refracted through the cinematic apparatus. The reclaiming of the Umwelt as field of action in the cinema, the coincidence of body-space and image-space (as Benjamin put it in his essay on ‘Surrealism’), opens up room-for-play, a space within which a new body, penetrated by technology, can be playfully tested out. This creative space not only allows us to adjust our outdated sensorium to the present, but it also makes possible new provisional constellations geared toward possible futures.

Ibid., 117.
In his writings on play—which are influenced by contemporary child psychology and Uexküll’s *Umwelt* research, as I will outline below—Benjamin provided an implicit methodology that clarifies how we could actually make use of this room-for-play which becomes visible in the alienated image cinema provides of human being and of human *Umwelten*. The child’s engagement with its *Umwelt* in the mode of play is for Benjamin exemplary of film’s creative and restorative potential for enabling new engagement with our surroundings, and thus allowing us to appropriate the modern *Umwelt*. As a number of his essays testify, throughout his life, Benjamin maintained a keen interest in children’s play and in toys. *Berlin Childhood around 1900*, for example, documents Benjamin’s serious engagement with the phenomenal world of the child. In short vignettes, Benjamin recounts and retrospectively analyzes in this text the sensations, experiences, games, and fantasies that occupied him as a bourgeois child in Berlin: his relationship to the disembodied voice that issued forth from the telephone in the hallway; butterfly hunting, in which the relationship of hunter to prey was characterized by a magical metamorphosis and a becoming-prey; the intense and intimate relationship of a sickly child to his bed as a sort of territory that contained a comforting landscape of valley-folds, wrinkle-mountains, and pillow-buildings that could be rearranged at will; his secret bond to the numerous statues in the *Tiergarten* park. All of these short vignettes emphasize the instability of the child as a subject and of the objects in its environment, as well as the magical power of these objects to change, to become-other, and sweep up the child in their transformation. Though the child might initially have summoned up the transformation, stable identities were soon lost in the vortex of a mutual metamorphosis of subject and object.

In establishing the connection between *Umwelt* and play, Benjamin is likely to have drawn on the work of child psychologists who had explicitly connected Uexküll’s work to children’s engagement with the world.  

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78 My work on Benjamin and play is indebted to Miriam Hansen’s essays on Benjamin, especially Miriam Hansen, ‘Room-For-Play’.

79 Benjamin may also have known Uexküll personally, for Agamben has claimed that Benjamin stayed in Uexküll’s villa on Capri during his first visit to the island in 1924. See Agamben, *The Open: Man and Animal*, 39. While I have not been able to verify this claim, it seems likely that Benjamin and Uexküll at least met in the tightly-knit German community on Capri. In 1924, Benjamin rented a room in a separate little cottage at ‘Villa Dana’, but never mentioned any details about the location. See Benjamin, ‘Letter to Gershom Sholem, Capri 7.7.1924’. Since Dana is the name of Uexküll’s and Baroness Gudrun of Schwerin’s daughter, this might have been their villa, though they seem to have moved several times, from the villa of Gudrun von Schwerin’s aunt, to one of Axel Munthe’s villas, and ultimately to an old villa in Anacapri (which is now
Martha Muchow’s 1935 *Der Lebensraum des Großstadtkindes* (The Living Space of the Metropolitan Child), a wonderful, albeit now largely forgotten text, may have pointed out to Benjamin the productive potential of Uexküll’s concept of *Umwelt*, especially when it came to describing (and seeing) the world differently on the basis of children’s playful action and perception. Muchow had applied Uexküll’s *Umwelt* theory to modern urban life and contrasted ‘adult perceptions’ of city spaces with the perceptions of children. She analyzed how children in Hamburg-Barmbeck interacted with typical urban spaces, such as an unused industrial area, a playground, streets with just a little traffic in comparison with streets with significant traffic, and a *Karstadt* department store. While Muchow’s study testifies to the climate of lively interdisciplinary exchange in Hamburg in the late 1920s and early 1930s, it simultaneously and tragically exemplifies the brutal end of this atmosphere with the rise to power of the National Socialists. In April 1933, Stern and Cassirer, who, like most of the other employees of the Psychological Institute, were Jewish, were prevented from entering university property and subsequently fled to the Netherlands and England, respectively. Muchow was denounced as a collaborator with Jews and on the basis of that claim, it was further claimed that she was an ‘active member of the Marxist Weltbund für Erneuerung der Erziehung’ (World Association for the Reformation of Education). In September, shortly after she was fired and the Psychological Institute was closed, Martha Muchow attempted suicide and died two days later. Her brother published Muchow’s *Lebensraum* posthumously. See Jürgen Zinnecker, ‘Recherchen zum Lebensraum des Großstadtkindes’.

Uexküll’s *Umwelt* Institute was founded in 1926. Until its closure in 1946, one of its most important employees was Emilie Altenloh, who had published one of the first sociological studies of cinema in 1914: Altenloh, *Zur Soziologie des Kino*. On the collaboration between the institutes, see Mildenberger, *Umwelt als Vision*, 145-65. The integration of Uexküll’s *Umwelt* theory into Stern’s personalist psychology and Cassirer’s philosophy also illustrates the far-reaching interdisciplinary proliferation of Uexküll’s thinking. Cassirer based what he proposed as the distinction between man and animal—namely, man’s symbolic capacity—in an Uexküllian foundation. See, for example, Ernst Cassirer, *An Essay on Man*, 27.
Berlin’.\textsuperscript{82} Benjamin in turn made references to Stern's work in his letters and described Heinz Werner’s work as ‘the most advanced treatment’ of a ‘physiognomics of language’ that locates ‘linguistic and choreographic expression in one and the same mimetic faculty’.\textsuperscript{83}

Muchow’s analysis of the role that a former cargo-unloading area at Hamburg’s Osterbek Canal played for children, in contrast to its role for adults, provides a striking example of children’s appropriation of a functional, purposive space and their playful, tactile, and mimetic transformation of it. Muchow begins by describing the site objectively, as a ‘thing in itself’, and goes on to describe how the unloading area relates to different subjective worlds: the ‘purpose-space’ (\textit{Zweckraum}) as it was intended by the construction agency; the ‘space of action’ (\textit{Handlungsraum}) in the worlds of workers or of anglers, who used the space to fish in the canal; and finally, the ‘room-for-play’ (\textit{Spielraum}) in the world of the child. In the children's \textit{Umwelt}, there is no ‘functional tone’ to the site; that is, they do not regard its features with respect to their intended purpose. Instead, their activities are centered around a gate and the banks of the canal. To adults, the gate is only in the periphery of their perception as something that marks the border between street and workspace and that protects passers-by from falling down onto the lower ground of the unloading area. It is primarily an optical perceptual cue (\textit{Merkzeichen}) that ‘structures space, blocks movement and provides protection’. The kids, by contrast, whether they are passing by or looking for a place to play, try to ‘establish a direct relation’ to the gate:

The gate literally has a calling-character. Hardly any child between three and thirteen years of age on the sidewalk along Osterbeckstraße passes by the gate without touching it. They may choose to let their hand glide over the upper or middle bar of the gate, or touch it with a stick, a ball or even a schoolbag or shopping bag; or they may mark their path past the gate rhythmically by just beating, touching or tapping the gate’s posts: in any case, and in fact invariably, a touch, a tactile sensation is sought. Other children—and not only those who want to enter the unloading area—seem to feel like a passionate mountain climber (or does the latter feel like them?): they cannot leave the towering height unconquered. Even though two broad, convenient sets of stairs and a slowly inclining runway offer comfortable possibilities for getting up and down, the

\textsuperscript{82} William Stern and Clara Stern, \textit{Die Kindersprache}. On the references to Benjamin in their work, see Heinz Brüggemann, \textit{Walter Benjamin über Spiel, Farbe und Phantasie}, esp. 86-88.
\textsuperscript{83} See Benjamin, ‘Problems in the Sociology of Language’.
children almost exclusively use the gate and the slope behind it. They either climb across the gate or go through the bars, if they are among the smaller children—sometimes for no other reason than to return the same way, sometimes in order to enter the unloading area via the slope, and sometimes to clamber about the gate. . . . In the world of the child, [the gate] presents a tactile perception- and action-image \([\text{Merk- und Wirkbild}]\). By means of the strongest, irresistible power, it seems to exert a force that compels the children to touch it \([\text{Berührungszwang}]\). 

Muchow's careful observations highlight that whatever we (grown-ups) think of the gate, however we perceive it (even when we see kids playing on it), the gate has completely different qualities in the Umwelt of a child. For children, is a ‘grasp-, jump-, climb-, sit- and squat-thing’ that almost magically summons the child and demands to be touched.

In Muchow’s evocation of the world through a child's eyes and senses, the urban landscape is transformed and restructured as we enter the child's 'soap bubble'. As in watching a film, where we shift back and forth between awareness of, and attention to, the world the film presents (thus making it our immediate Umwelt) and the Umwelt of the movie theater, in reading Muchow’s descriptions we drift between immersion in the children’s Umwelt’s new order, sensations, and attractions (which resonate in us by triggering memories), and a comparison with our preconceived understandings of the importance, meaning, and function of these same urban sites. The quiet residential street becomes a playground and protected ‘home zone’, while the busier streets have little importance and are often only a space for passing through, whose features hardly enter the children's Umwelt—with the exception of shop windows, which compel only one-sixth of the children. The youngest ones make contact by touching the glass or tracing the outlines of exhibited goods; the attention of somewhat older kids is caught by attractions such as moving puppets, colorful pictures, toys, candy, and so forth. Only older kids are interested in shop windows as the presentation of purchasable commodities. The department store, finally, figures as a fantastical 'adventure world' for children. Their energy focuses on bypassing the doormen (who keep out unaccompanied minors) by sneaking past them, showing forged notes from their mothers, or pretending to be ‘with someone’, that is, a customer whom they either asked beforehand or who unknowingly takes on the role of parent or older sibling in the children’s acting scheme. Once inside, they try to become invisible in the

shopping crowd, make use of the store’s labyrinthine structure to play, compare, touch, or slip into their pockets objects of their desire, or mimic adult consumers by discussing expertly the qualities of clothes, tools, pens, and so forth, and inventing reasons for their use.

I have stressed the importance of Uexküll and his theory of Umwelt for an understanding of early film theory not simply for the sake of historical completeness, but also in order to establish the concept of Umwelt as an important intervention in theories of cinema and, by extension, an addition to the conceptual tools by means of which we think about the conditions of modernity. From this latter perspective, we might summarize the importance of Uexküll and Umwelt theory for our understanding of early cinema, as well as cinema more generally, under three headings. First, in contrast to more simplistic concepts of milieu which focus only on the influences of the environment on the individual, Umwelt research stressed that mental and physical engagement with the environment opens up new leeway, or room-for-play, in the relationship between the individual and what surrounds it. Second, the concept of Umwelt emphasizes that cinema—like Muchow’s study and like Uexküll’s imaginings in a text such as Forays into the Worlds of Animals and Humans—makes use of our capacity to imagine other worlds. Third, and finally, cinema’s world, at least as perceived by a number of critics in the 1910s and 1920s, bears significant similarities to the child’s world.

The central elements of children’s play in both Muchow’s study and Benjamin’s childhood memories—mimicry and mimesis, the testing of spatial boundaries, a blurring of subject-object distinctions, the animation of objects or their investment with magical powers, a dominance of the sense of touch over other senses—outlined, in a sense, a blueprint for those aesthetic operations that film critics performed in their perception of cinema itself. Jean Epstein, for example, described the animistic quality of cinema. For Epstein, cinema not only bestowed life on objects such as ‘a revolver in a drawer, a broken bottle on the ground, an eye isolated by an iris’, but these objects were also ‘elevated to the status of characters’; they gained a mysterious personality. And in his essay on the close-up, he emphasized the intimacy and pressing proximity of touch of the image. Blaise Cendrars’ account of film perception is also modeled on a playful engagement with the world: ‘the human mind disguises itself by camouflaging the globe’.

86 Epstein, ‘Magnification (1921)’, 237.
When the children in Colette’s description of an educational film screening watch ‘the intentional and intelligent movement’ of flowers in the cinematic land of slow-motion technology, they ‘get up, imitate the extraordinary ascent of a plant climbing in a spiral, avoiding an obstacle, groping over its trellis: “It’s looking for something! It’s looking!”’ The magic bond that the children formed with the plant in this experience of cinema reflects that of little ‘Walter B. from Berlin’ as he is hunting butterflies: ‘the more butterfly-like I became in my heart and soul—the more this butterfly itself, in everything it did, took on the color of human volition.’ The spell cast by both the ‘old law of the hunt’ and cinema (both encompassing the activities of shooting and capturing), reveals how the latter, as technology, activates the same perceptual-actual—even ontological—mobility in the child as the magical and ritual aspects of the hunt.

However, it was only in Benjamin’s appropriation of Umwelt and play for his texts on art, technology and politics that play became a politically viable, even necessary methodology of engaging one’s environment, at least if we are to avoid false subjugation and to effect real, mutual transformation of subject and environment. Benjamin’s approach emphasizes that film has the capacity to create its own world, even as the film world’s ‘stuff’ is taken from the world, in the sense that film is ‘of’ this world. When we watch a film, it becomes part of our Umwelt, our subjective world. However, it does not just show us things—a stone, a tree, a smile—as they appear to us in our normal Umwelt. Rather, everything is transformed by the apparatus. In cinematographic mediation, things—whether a dog, a smile, or a magnified cheese mite—become visible and audible to us. They are no longer immediate objects of our Umwelt, yet they remain recognizably objects in the world. The cinema, to use Benjamin’s terms, is a technical apparatus that reorganizes ‘the medium of perception’, that is, our perceptual world, yet it also produces a medium of reflection between spectator and screen. This experience is exhilarating and unsettling—and, as Benjamin warned, necessary in order to take on a world full of apparatuses. What is given to us in the film experience is thus simultaneously familiar and unfamiliar, old and new, heimlich (in the sense of familiar, intimate) and unheimlich (unfamiliar, uncanny)—uncanniness is a fundamental part of the film experience. We might say, in fact, that Epstein’s concept of photogénie seeks to describe precisely this surplus value that is produced by means of cinematic reproduction, a surplus value that, as Epstein wrote, ‘acts on

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88 Colette, ‘Cinema (from Aventures Quotidienne)’, 61.
89 Benjamin, ‘Berlin Childhood around 1900’, 351.
one’s feelings more to transform than to confirm them, and personally, it makes me uneasy’.90

Uexküll’s Umwelt theory thus not only introduced a concept with which to understand one’s environment as a subjective creation, but it also provided film critics of the early 1920s—and can continue to provide us—with the example of a playful engagement that breached the Umwelt boundaries of ‘proper’ perception. Engaging this latter potential, of course, requires that we move beyond Uexküll’s own interpretation of Umwelt theory as describing an ahistorical system of functional circles, and toward the approach outlined in Benjamin’s texts on film, which emphasize the critical issue of historical environments and conditions of perception. As Benjamin stressed, things that change as a consequence of the processes of commodification and technologization—and these include goods, but also patterns of work and daily life—can slip out of our radius of perception and action because our body does not automatically adapt to these changes. That is why, as Benjamin stressed, we need film as a second technology, a technology that in the name of play and experiment distances the human being from nature—which means, as well, from natural perception.

Painlevé’s Cinema of Bewilderment

I began this chapter by discussing animals in non-cinematic media, considering first, a taxidermied dog that appeared in a diorama inspired by Uexküll’s work, then the painted dog Nipper in RCA Victor’s iconic ‘His Master’s Voice’, and finally the appearance of a dog in one of W. K. L. Dickson’s early film experiments for Edison. These three examples of mediated ‘companion animals’ allowed me to identify three quite different relationships between technological medium and animal life. The relationship between medium and animal can emphasize the gap that separates animal life and technological mediation, pointing toward a loss in modernity of animal life as radical otherness; it can also, conversely, conflate technological medium and animal in an operation that drains both of their potential to upset traditional understandings of what constitutes a human being. Yet media, and especially cinema, can also allow animal vitality to play a more destabilizing role by eschewing strategies of identification and narrative control, instead enabling a more corporeal mode of relation that sets into motion a feedback loop between animal and

90 Epstein, ‘Magnification (1921)’, 239.
technology as two media that allow a renegotiation of, and reflection on, life in general and human life in particular. This feedback loop destabilizes rigid boundaries between animals and humans and thus enables an exhilarating state of bewilderment.

In his films between 1927 and 1954, Painlevé combined scientific documentary with avant-garde techniques as a way of finding the strange and unfamiliar in the seemingly familiar waters of France. Painlevé’s films, whether they take sea urchins, water spiders, octopuses, or seahorses as their subject, are interested in life forms that do not correspond to our mammalian sense of the body and anthropocentric perspective on behavior and interaction, and his films thus destabilize our understanding of movement, physicality, bodily comportment, and sexuality, as well as our relationship to our environment. Stylistically, these films combine the scientific with the fantastic and even the political (as, for example, in a film on the ‘fascist’ vampire bat), using techniques such as microcinematography, coloration, slow-motion, and the first underwater cameras.

The engagement with animals in early cinema is due to the affinities of animals with technical reproduction, an affinity based on both physical and metaphysical correspondences. These affinities include the visual appeal of animal bodies, movements, and behavior, their strong presence on the screen due to their un-self-conscious being, and their kinship with the cinematic apparatus due to the way that both seem to transmit life (a transmission that, in the case of animals, is often positioned as a function of unquestioning situatedness in life). In various ways, early films and animals each harnessed the resonant power of the other, or gave themselves over to the other, serving the other, often in the form of play. This was a play that already implied, like the playful fights of young animals, a struggle over life and death—but at the same time we need to distinguish this from that Hegelian death-struggle that has so marked twentieth-century philosophical engagement with the relationships between animals and humans.91

The popular science film combines many of the strands of film-animal interaction I have discussed above. These films have their origin in the attraction and spectacularity of animals, which is often heightened by means of special effects ranging from manipulations of the animal or its environment—for example, a terrarium the size of the film frame containing

91 See Hegel’s account of the struggle between master and slave in Georg Wilhelm Friedrich Hegel, *Phenomenology of the Spirit*, 11-19. For the importance of this for a variety of figures, including Kojève, Bataille, and Sartre, see Descombes, *Modern French Philosophy*.
two antagonistic species—to suggestive montage to microcinematography and timelapse photography. These films then combine such images with explanations and with scientific facts and educational information about the animals. In the case of *Flies: A Scientific Film* (Charles Urban, 1913), for example, intertitles explain; ‘The fly larvae dig into the soil to undergo a metamorphosis’; ‘The pupa’; or ‘After one hour.’ The visualization of ‘How a fly transmits tuberculosis’, invisible to the naked eye, is achieved by means of a Kuleshovian montage effect, namely the image of flies crawling around in a spittoon, followed by a close-up of flies on a pacifier, followed by a child sucking on a pacifier.

Jean Painlevé not only continued the legacy of the early popular science film, but also thematized in his films questions of animal presentation, *Umwelt*, and technology. Painlevé’s work on scientific cinema follows in the footsteps of Marey, in a genealogy that Painlevé himself laid out, and which includes Dr Eugène Doyen and Jean Comandon as important intermediaries. I will focus on Painlevé’s early popular films, most of which were spin-offs of research projects and research films. Especially in their employment of microcinematography, the films combine scientific interest and facts with an aesthetic impulse to reveal bizarre, unusual life forms, reproductive cycles, organs, and behaviors. On the most basic level, Painlevé’s films make visible life as movement where the naked eye was not able to see anything, or at most a tiny, undifferentiated creature. Consistently, the films take up a creature and provide closer and closer views of parts of its body, creating the impression of a vortex that draws one deeper and deeper into life, where everything is revealed to be organic movement (one could call this first level the level of interest in the ubiquity of life as movement, or movement as life). On a second level, the films are interested in the moving animal or animal part depicted (an interest in the spectacular visuality of animals). The pumping air hole of an octopus, the grasp of the unhinged jaw of a stenorhynchus, the labor contractions of a male seahorse: all of these scenes pivot on the border between factual representation and scientific interest, on the one hand, and the presentation of a fantastic world—some sort of alternate universe—that leaves the spectator astounded, confused, disgusted, and amused, on the other hand.

Painlevé’s real skill, however, lies in a combination of images, music, playful comments, and scientific fact (via intertitles and voice-over) that probes the spectator’s relationship to the image and the animal depicted; this constitutes the third level of the films’ engagement with animal life.

92 See Hamery, *Jean Painlevé*, 27–33; James Leo Cahill, *Cinema’s Copernican Vocation*. 
Intertitles and image track—or, in the later films, soundtrack, voiceover, title cards and image—pull the spectator in various directions at once. Animals, often mundane, but of such a small size or so familiar that they had never been given a second look before, are elevated into beautiful and horrifying creatures. The spectator is constantly called upon to compare physical or behavioral traits of animals to human physiognomy and demeanor. As soon as the spectator is lured into appreciating the animal scientifically or ‘objectively’, an image or a verbal comment highlights the relationship of the animal to the human being and destabilizes any objective, simply factual stance.

Painlevé’s films thus mobilize cinematic means to break open notions of human self and animal other. Not only does life become a cinematic matter in his films, but cinematic life no longer remains bound by man-animal distinctions. Painlevé’s films do not simply focus on the aesthetic dimension of science films, but rather jolt the spectator out of a distanced mode of aesthetic reception, bringing her body and her sense of human self into the game. The reception is thus not only involved and physical, but takes apart the spectator’s self-movement, behavior, feelings, and cultural customs and sets these, as elements, alongside or against the movement, behavior, and feelings of the animals onscreen. This cinema works by continually confronting scientific fact with unfounded, interpretive fiction, rationality with fantasy, documentary style with manipulation pre- and post-production, and neutral observation with anthropomorphization. The screen itself becomes the space where the animality—of animals and of the spectator—is negotiated as something physical, instinctual, and intellectual.

Painlevé’s indebtedness to Marey as both a scientist and father of chronophotography highlights again that the commitment of a scientist to non-vitalist positions by no means implies that his work in or on film could not be important for the formulation of a cinematic vitalism. What makes Painlevé such an important filmmaker for this project is the way in which his film style allows film and animal to engage in an open exchange of vital expression, each profiting from the other and engaging, or rather incorporating, the spectator. The camera makes visible life and movement on microscopic levels, where the naked eye, or previous, less magnifying shots, had only seen stillness. His popular science films emphasize that our senses have only an incomplete grasp of the life that surrounds us and the films inevitably turn into a journey into the abundance and ubiquity of everyday life, since they always remain with everyday environments and everyday creatures in and around freshwater and seaside in France.
Painlevé’s cinematic operations depend on the mobilization of different genres and styles, of different regimes of knowledge, such that they mutually question one another. Most importantly, these are the genre of scientific film and the reliance on facts derived from external observation and analysis, on the one hand, and the genre of the avant-garde and experimental film and artistic operations of making-strange, making-familiar, and of highlighting irrationality and the unconscious. The origins of this unique combination lie in Painlevé’s association with various camps. He studied zoology and biology at the Sorbonne, where he became the research assistant of Paul Wintrebert, an important embryologist associated with the Marine Biology Station at Roscoff, who employed Jean Comandon in the 1910s to collaborate on a film together (Wintrebert had relied on films as research tools and for presentation early on). Yet simultaneously, Painlevé became part of artistic circles, especially the surrealists, in his early twenties, mostly mediated by his cousin Pierre Naville, in whose apartment André Bréton’s ‘Bureau of Surrealist Research’ found a home in 1924. Around the same time, Painlevé befriended Yvan Goll and contributed to the first and only issue of Goll’s journal *Surréalisme*. In 1926 and 1927, he participated in films with Antonin Artaud, contributed footage of a starfish to Man Ray’s *L’Étoile de Mer* in 1928 and, the following year, one of his photographs (of a lobster claw) to George Bataille’s *Documents*. Film critics including Elie Faure, Germaine Dulac, and Fernand Léger praised Painlevé’s first films in 1928-29, and some of Painlevé’s closest friends were filmmakers, including Jean Vigo and Sergei Eisenstein.93

In an essay entitled ‘Neo-Zoological Drama’, his first artistic publication in Goll’s *Surréalisme*, Painlevé provides an early literary example of his cinematic strategy of interlacing science and art, as Roxane Hamery, in her comprehensive monograph on Painlevé, and more recently, James Cahill, have argued. In this text, Painlevé amasses scientific names and references, combining and embellishing them with word plays, poetic turns of phrase, and anthropomorphizing, eroticizing descriptions:

The plasmodium of the Myxomycetes is so sweet; the eyeless *Prorhynchus* has the dull color of the born-blind, and its proboscis stuffed with zoochlorellae solicits the oxygen of the *Frontiniella antipyretica*; he carries

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93 See Brigitte Berg, ‘Contradictory Forces’, 19. Léger, along with Marc Chagall, was quoted in a review of Painlevé’s film in *L’Intransigéant* (23 December 1930). Elie Faure mentions Painlevé in *De la Cinéplastique*; and Germaine Dulac and Jean Renoir were invited to the premiere of Painlevé’s first film, *La Pieuivre*. See Roxane Hamery, *Jean Painlevé: le cinéma au cœur de la vie*, 65. Dulac frequently rented a copy of *La Pieuvre* for the film screenings and lectures she organized.
his pharynx in a rosette, a locomotive requirement, horned, stupid, and not at all calcareous. But *Dendrocoelum lacteum* and *Planaria torva*, gonocephalous and olive-greenish, sharpen the pleasure of the hoops; the little turbellarian knows the embrace of their mouth; good for *Chironomus plumosus* to outline their intestinal arborizations in red lace; what spherical astonishment: he flees and ruptures the phlegmy threads reserved for the *Bythotrephes longimanus*, that sacred little crustacean with close-cropped hair; he would rather be born by parthenogenesis than touch these threads of the ovoviviparous *Mesostoma*...94

To be sure, all scientific names and facts that Painlevé mentions are correct; a biologist could decipher the references and would find the text to be a poeticization of the life cycle, diet, enemies, and companion species of a flatworm (*turbellarian*) called *Prorhynchus*. However, to the lay reader with a sensitivity to literary aspects—that is, the majority of the intended readership—the Latin genus and species names only reference the treasure chest of unknown life forms without classifying particular identities. Rather than ascribing identities within the Linnaean taxonomic system, the scientific names have here the opposite effect. The result is not dissimilar from the effect produced by Dada sound poems, for which the evocative power lies in the sound and rhythm of non-sensical words; yet in the case of Painlevé’s text, these words do have a real denotation. Painlevé’s employs the device of defamiliarization in two directions: the language of science is defamiliarized by an injection of non-scientific language and semantic procedures at the same time as poetic language is defamiliarized by the injection of scientific classification and description of facts. Hamery notes that this text coincided with ‘the Gollian conception of surrealism, in which brute, living matter provides the basic support for poetic images, subversive misappropriations and incongruous association’.95 In contrast to André Bréton’s definition of surrealism, which soon—a few months after Goll’s publication—became the predominant and canonical definition of the movement, Goll insisted on deriving surrealist elements from brute reality, rather than the unconscious: ‘Every artistic creation has its point of origin in nature...the most beautiful images connect elements of reality far removed from one another as directly and as rapidly as possible.’96

94 Jean Painlevé, ‘Neo-Zoological Drama’, 117.
95 Hamery, Jean Painlevé, 32.
96 Yvan Goll, ‘Manifest des Surrealismus’, 186 (translation mine). On Goll’s definition of surrealism in contrast to Bréton’s, see Jeremy Stubbs, ‘Goll versus Bréton’. See also Andreas Kramer,
For Yvan Goll, film was the surrealist medium par excellence, since it could connect disparate bits of reality directly, as images, without any detour through language or other symbols. Film was based on ‘movement’, which he identifies as the single most important element of modern art. Film relayed reality as brute matter on the basis of its technical reproduction, yet transformed it into surreality due to the newly-won visibility provided by the camera-eye, and it was able to connect disparate parts of reality through ‘synthesis and the play of opposites’ on the basis of montage.97 Painlevé's interest in filmmaking thus had a double foundation that is reflected in the double defamiliarization of his ‘Neo-Zoological Drama’. There were scientific filmmakers such as Jean Comandon, who made educational films for the broader public and were very aware of the aesthetic quality of the films they were producing. And then there were avant-garde artists such as Yvan Goll, who regarded film as the most powerful medium of expression of the current time, since it could take bits of (also scientific, factual) reality and translate them ‘onto a higher artistic plane’.98 In his best popular science films, Painlevé mobilized both our understanding of the natural scientific world to yield an aesthetic value and our understanding of aesthetics to yield an epistemological value. As a consequence—and this is often overlooked—Painlevé’s films develop not only a kind of scientific aesthetic, but also a methodology for a different understanding of science that includes a sense of wonder, or, as Hamery describes Comandon’s work, ‘a poetic approach to life where the exploration of physical phenomena retains a profound mystery’.99

Painlevé’s first popular science films, or ‘zoological dramas’, from 1928-29, while lacking the modern musical accompaniment and ironic voiceover that characterizes his later films, already contain the aspects I have highlighted in the beginning of this section. First, they are interested in life as a movement that determines pace and structure of the film. Second, they are focused on animal bodies, developments and behaviors that we can

98 Goll, ‘Manifest des Surrealismus’, 186. Indeed, Goll’s conception of film art and Comandon’s notion of cinematic mediation are not that far apart. Comandon writes, for example: ‘Soul speaks to soul without conventional intermediary: these here are the universal languages, the spiritual diapasons the vibrations of which are passed on with intensity to the minds [esprits].’ Jean Comandon, ‘Le cinéma et les sciences de la nature’, quoted in Hamery, Jean Painlevé, 50-51.
99 ‘For [Comandon],’ she continues, ‘the discovery of a strange microcosm, populated with unknown elements, exceeds the limits of pure science and elevates the mind [pensée].’ Hamery, Jean Painlevé, 50 (translation mine).
grasp and comprehend with our mammalian understanding of life, but that nevertheless stretch and bend this understanding. And finally, they open up a space for reflection on our limited perspective on life, which focuses on intelligent behavior, the mammalian body, and easily perceptible body size, and our relationship to the bizarre animal world we are witnessing in the films, a world to which the film brings us too close to remain comfortable in our seat.

*The Octopus* (*La pieuvre*, 1928), *The Daphnia* (*La Daphnie*, 1928), and *Sea Urchins* (*L’Oursin*, 1928) were shown as short features preceding a main feature (and, in some cases, accompanied by another short film) at the most important avant-garde theaters in Paris between December 1928 and October 1930; these theaters included the Studio Diamant, the Studio des Ursulines, and the Parisiana. Painlevé conceived of these films following his first scientific films in 1927, most notably *The Stickleback’s Egg: From Fertilization to Hatching* (*L’Œuf de l’épinoche, de la fécondation à l’éclosion*) and his participation in a couple of avant-garde ventures, first as an actor alongside Michel Simon in René Sti’s never completed *The Unknown Woman of the Six-Day Race* (*L’Inconnue des Six-Jours*, 1926), and subsequently as director of Yvan Goll’s play *Methuselah* (*Mathusalem ou l’éternel bourgeois*, 1927), with Antonin Artaud as protagonist.

*The Octopus* stands out among the early films, since it seems to have the least consolidated form. The film is still very much suspended between a

100 A few months after these three films, Painlevé completed his first sound films that had a similar circulation and include *The Hermit Crab* (*Le Bernard-l’ermite*, 1929), *Hyas and Stenorchynchus* (*Hyas et Sténorinques*, 1929) and *Crabs and Shrimp* (*Crabes et Crevettes*, 1929). The premiere of *The Octopus* took place at the Studio Diamant. It was shown together with Georg Wilhelm Pabst’s *Abwege or Begierde* (*The Devious Path / Desire / Crisis*, 1928—the film was released under various titles)—a brilliant pairing, I think. Not only do the images of the octopus and Brigitte Helm’s characteristic body movement (stretched-out head, angular, exaggerated movement of the limbs, pliable, almost boneless torso) complement (and compliment) one another, but the latter film’s first half, which shows Helm trapped in her *haute-bourgeois* life in a modern glass villa, more than resembles an animal trapped in an aquarium, while the second half, which shows her ecstatic experience at a nightclub, mirrors the drama of octopuses fighting a crab, a lobster, and one another in the second half of *The Octopus*.

101 See Berg, ‘Contradictory Forces’, 12-19; and Hamery, Jean Painlevé, 276. Berg, who directs Painlevé’s archive ‘Les Documents Cinématographiques’ in Paris, also recounts that it was Painlevé who introduced actor Michel Simon to Painlevé’s best friend Jean Vigo for the role of the old sailor in *L’Atalante* (Jean Vigo, 1931). However, there are also further personal entwinements between Painlevé’s artistic and scientific endeavors in film: the cameraman for *The Unknown Woman*, André Raymond, employed time manipulation techniques that inspired Painlevé to pursue a scientific film on the basis of the same techniques. Raymond became his cameraman for many subsequent popular science films.
surrealist film experiment and an aestheticized documentary, and it lacks the more complex engagement with scientific discourse that characterizes Painlevé’s later films. The film nevertheless has a discernible structure. It begins with a kind of surrealist overture of various shots of an octopus in absurd settings: following two introductory shots that acquaint us with the body and movement of the octopus, we see a living octopus slithering from a window sill (Fig. 2.9), an octopus crawling over a doll lying on its back, an octopus sliding down from a tree and a few shots of an octopus in water, moving around a human skull. The overture thus functions like the introductory scene in Luis Buñuel’s *Un chien andalou*, in which an eye is cut open in close-up: an opening scene that provides not only a symbolic image of the destruction of conventional (artistic) vision, but also a violent physical reminder that the spectator ought to remain on the edge of her seat, distrustful, suspicious, and alert, paying heightened attention to every image and subsequent cut.

In *The Octopus*, the opening shots deliver this lesson more gently: Painlevé uses the capacities of film to present photographed movement and to combine seemingly disparate things in order to confront us with images of a real, living, moving octopus, in and of itself already an uncanny creature
of monstrous appearance, such that we open up our vision and imagination to the many unscientific associations the animal’s body, features, and movements evoke. The introductory images, in other words, fulfill a sort of educational task, namely that of ensuring that over the course of more sober images, we remain open to the mythical, monstrous, and irrational dimensions of the creature, in order to leave space for the mystery that science cannot explain away and to ensure that our perceptual frame remains open to ideas, stories, facts, and associations of all kinds. While it might seem as though these images are just a joke that does not do justice to the real animal, I argue instead that it is not only a joke, but also a trick to ensure that the film, spectator, and animal represented are not limited to scientific logic and reasoning, but maintain a right to make illogical, unreasonable connections. In this interplay of discourses and visual strategies, not only is the spectator enabled to combine reactions such as amazement, disgust, arousal, and insecurity with a scientific interest in knowing and seeing, but the film itself also insists on a freedom to rip at the seams of genre ascription, and the filmed animal regains a freedom of expression in the spaces thus opened that it did not have in films that tried to stitch narrative trajectories predetermining the animal’s attraction. The film then transitions into a more educational style by means of a dissolve to a landscape shot of the Atlantic, with long waves slowly rolling in against a rocky shore (long-distance shots of the ocean occur twice more, segmenting the main body of the film into three parts). Subsequently, two long shots allow the spectator to ‘discover’ octopuses in shallow tidal pools. An intertitle helps us to see and understand further indices of the presence of octopuses, such as ripples in the water around a rock that betray the otherwise hidden creature. Rather than lecturing at us in a top-down fashion, these shots turn the spectators into independent students and accomplices. Though the subsequent, more ‘scientific’ shots lack the obviously transgressive qualities of the opening sequence, they nevertheless instantiate a similar aesthetic by subordinating the film’s pace to the animal’s vital movement. This remains one of the most important aspects of all of Painlevé’s subsequent films, in fact: the exploration of animal movement, from the plainly visible (as in the octopus) to the microscopically small, and the willing subjugation, or loving yielding, of the film’s temporality to the vital rhythm of animal movement. The first segment of the film’s main part contains a series of shots that focus first on the octopus’ eye, which with its eyelids and iris resembles a human eye, and then on the octopus’ breathing mechanism. The otherwise motionless animal inhales through two breathing holes on its sides, and uses one of its two breathing tubes
to exhale. As it takes water in, the breathing tube closes like a mouth, and the entire animal body extends; as it exhales, the body compresses and water flutters out of the tube. Painlevé slows down considerably the cutting rate for this scene and fills the images with the rhythmic movement of the octopus’ breath. At the same time as one takes note of the strange breathing apparatus and makes uncomfortable or exciting physiological connections (both pulsating hole and tube resemble other malleable orifices and boneless extremities), one cannot help but be affected by the rhythmic breathing and a need to willfully disengage oneself from an alignment with the pace of the octopus’ breath (which has a faster rate than the average human’s breath).
Painlevé achieves the most effective integration of film and animal movement when he employs microcinematography to make visible otherwise unseen life forms, organs, body parts, and movements. Both *Sea Urchins* and *The Daphnia*, as well as the majority of Painlevé’s later popular science films, contain moments of increased excitement built around increasing magnification. A sea urchin, for example, is a less immediately spectacular subject for a film than an octopus. In Painlevé’s *Sea Urchins*, it is thus the magnification (and, to a lesser degree, timelapse) that slowly undoes our conception of the sea urchin as a distant, boring, fairly motionless animal and allows us to discover in the urchin an entire republic of fantastic creatures in wild animation. After briefly presenting the sand urchin, the film turns to the rock urchin. We see Painlevé himself standing in the ocean water in a bathing suit, fetching an urchin from underneath the water (Fig. 2.10.a). A series of shots show us the urchin in extreme close-up, revealing far more detail than an unmediated look at a sea urchin would have provided, and functioning as an incentive to take a closer look. After the film explains, with intertitles, microcinematographic shots, and an animation, how the sea urchin moves by means of sinuous spines ending in suckers, underwater shots present to us ‘The sea urchin’s walk’ (Fig. 2.10.b). The attraction of this shot is not only the close-up of the animal, but the witnessing, and understanding, of how a rock urchin moves up a rock, one contracting sucker after another—the attraction of seeing the animal’s natural behavior in its environment. This shot constitutes the transition from perceiving the sea urchin as an object to realizing that even an animal as bizarre and non-human as the sea urchin engages in activities and movements to which we can relate. The following shots magnify more and more details of the sea urchin’s body. We move into ‘the forest of spines’ that now appear as enormous Doric columns stretching to the sky (Fig. 2.10.c). Between the spines, numerous pedicellariae (swiftly moving snake-like extensions ending in three jaws) become visible. The jaws open and close, turning in every direction, in a wild search for food (Fig. 2.10.d). Moving ever closer, we discern various teeth in these threatening jaws, teeth that range in appearance from a shark’s serrated teeth to a snake’s fangs, ready to inject poisonous venom into their victim (Fig. 2.10.e). The maximum magnification—200,000x—reveals that the surface of these pedicellariae is actually covered by swiftly moving cilia, slender protuberances 0.001 mm long, the rotation of which generates whirlpools that bring food into the reach of the jaws. Having undone our conception of the sea urchin as a unified, somewhat boring animal/object, Painlevé ends with a panoramic sunset over the water (Fig. 2.10.f), returning us to our familiar vision with
a canonical image that, as we now know, belies the incredible life forms contained in it.

By the time we are watching the cilia, and thus movement on a cellular level, the film has several times revealed an excess of life forms where we had previously been unable to see movement, nor had we been expecting it. The sea urchin has been transformed before our eyes into a foreign planet with a plurality of different life forms and movements. Uexküll had described the sea urchin as an animal with a large number of independent functional cycles or reflex arcs that are not centralized—‘when a dog runs, the animal moves its legs. When a sea urchin runs, its legs move the animal.’ In Uexküll’s vocabulary, the sea urchin constitutes a ‘reflex republic’ in which spines, pedicellariae, and so forth, each constitute ‘reflex persons’ that react separately to different receptor cues that are not centralized into a concerted response or the perception of a distinct form or motion. While Uexküll’s description highlights the difference between the sea urchin’s organism and Umwelt and ours in order to make clear that we cannot project our conception of the body and perception onto this and other animals, Painlevé’s film instead seeks to create a confusion of boundaries, or what I would like to call a strategy of bewilderment.

Etymologically, the term ‘to bewilder’ first came into use in the late seventeenth century and is a compound of be- ‘thoroughly’ + archaic wilder ‘lead astray, lure into the wilds’, which latter is derived from the Old English word wildern (adj.) ‘wild, savage’ (from wilde ‘wild’ + deor ‘animal’). According to the Oxford English Dictionary, bewilderment, that is, the state or condition of bewildering or being bewildered, can mean a), confusion arising from losing one’s way; mental confusion from an inability to grasp or see one’s way through a maze or tangle of impressions or ideas; or b), a tangled or labyrinthine condition of objects, an inextricable confusion or medley. Painlevé’s films take the word literally: they confuse us, they create an entanglement of the ideas of man and animal, by leading us astray, into the wilderness, that is, to where the wild animals live. According to the change in meaning from wilderness to bewilder, modern wilderness consists precisely in mental and physical confusion and disorientation. Painlevé’s films provide an example of a film form that uses the confrontation of styles, genres, and the audience’s expectations such that in the resulting confusion and disorientation, a sense of wilderness, a wild sense of life,

102 Uexküll, A Foray, 76.
is set free. This sense of life comes close to what Maurice Merleau-Ponty termed ‘wild being’, namely a mode of being in which self, perception, and world are all part of a dense weave of flesh.104 ‘Wilderness’ understood in this sense does not refer to a separate realm that is opposed to civilization, but rather constitutes a mode of existence in which human and animal are connected on the basis of a ‘lateral kinship’.105 This kinship expresses itself in an act of perception that is based on a corporeal continuum and connects human spectator, film, and screen animal.

Painlevé brings this wild kinship into our awareness by creating a cinematic texture of life that envelops animal body, film form, and embodied spectator, but combines it with maneuvers that jolt us out of wild being and into a state of objective reflection by means of scientific or educational discourse and an objectification of the animal. An example of this shift from affective, corporeal engagement to detachment would be when, in Sea Urchins, he evokes the image of the sand urchin getting sand into its mouth as it is digging, creating a corporeal bond between the spectator and the urchin. In the following shot, however, he simply cuts open a sand urchin with a knife, allowing its bodily fluids to run over his hand, in order to reveal the urchin’s sand-filled intestines. It is the contrast between modes, the jolt that marks our switch from corporeal, sensual bond to reflective, intellectual engagement, that creates an awareness of film and animal as vital participants in our own being, both corporeal and spiritual or intellectual.

Painlevé’s films, even though they did not strive to present the Umwelten of animals, thus illustrate the aesthetic implications of Uexküll’s attempts at imagining other worlds. While Umwelt at first glance might seem to be a concept that reduces world and world-perception to a limited subjective sphere, it in fact opened up biological research, philosophy, imagination, and images to a multiplicity of worlds imaginable by, but inaccessible to, humans—a conception of world and perception that was reflected in early film theory. At the basis of the concept of Umwelt, however, is the impression (and scientific validation) of the fact that each kind of animal does not simply have an organic structure that differs from ours, but in addition its world, and its access to the world, is also a different from ours. Our engagement with animals—and, by extension, with other human beings, as well as with plants—thus not only opens up our eyes and minds to new visions, but it also sensitizes us to a different mode of being, of

104 On wild being, see Merleau-Ponty, The Visible and the Invisible.
being-in-the-world, and of life. Early twentieth-century films that depicted animals were, deliberately or not, doing two things. They were, first, making use of the medium’s ‘affinity with life’ to gain an understanding of animals that is impossible, or difficult, to achieve otherwise. Second, these films were using the cinematic mediation of animals to transmit a different sense of being, corporeality, and life to the audience.

Uexküll’s theories thus opened up the question of the extent to which media, and especially technological media, can mediate between different forms of life, including different Umwelten. The aspects of a man-animal encounter—seeing, being seen, and (man) seeing (animal) seeing (man)—when brought into cinema, extend into an existential, all-encompassing confrontation with one’s participation in animality. Cinema makes this possible, because the cinematic image is continuous with our world, is part of our world, while, at the same time, cinema brings into our world a new visibility. Cinema can thus make visible animality, as that which we share with animals, where before we only saw categorical distinctions. This capacity of cinema is not least based on the spectator’s attitude toward the cinematic image, namely the fact that the spectator is half situated in her own body, and half situated in the screen image as she is making sense of the image. This position of both being a body and lending one’s body to the image is one of heightened passivity (the capability of being affected) and vulnerability. Cinematic images of animals thus reveal a mode of being of passivity and vulnerability that links being animal, relating to the animal, and being in cinema.