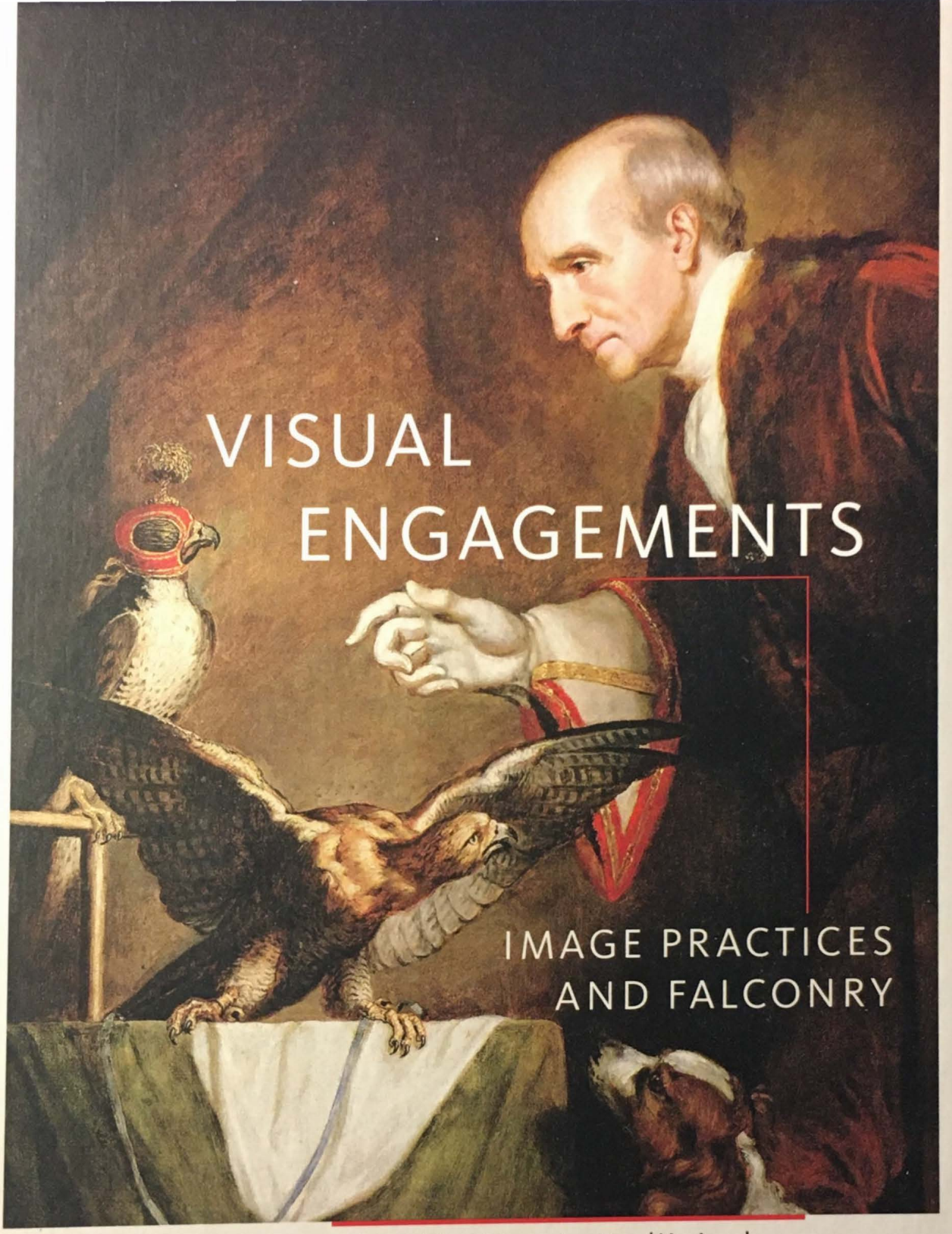

VISUAL ENGAGEMENTS

IMAGE PRACTICES AND FALCONRY

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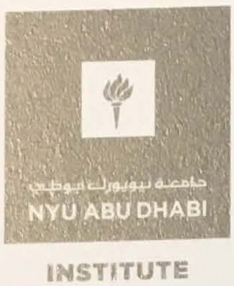

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VIEWS FROM ABOVE

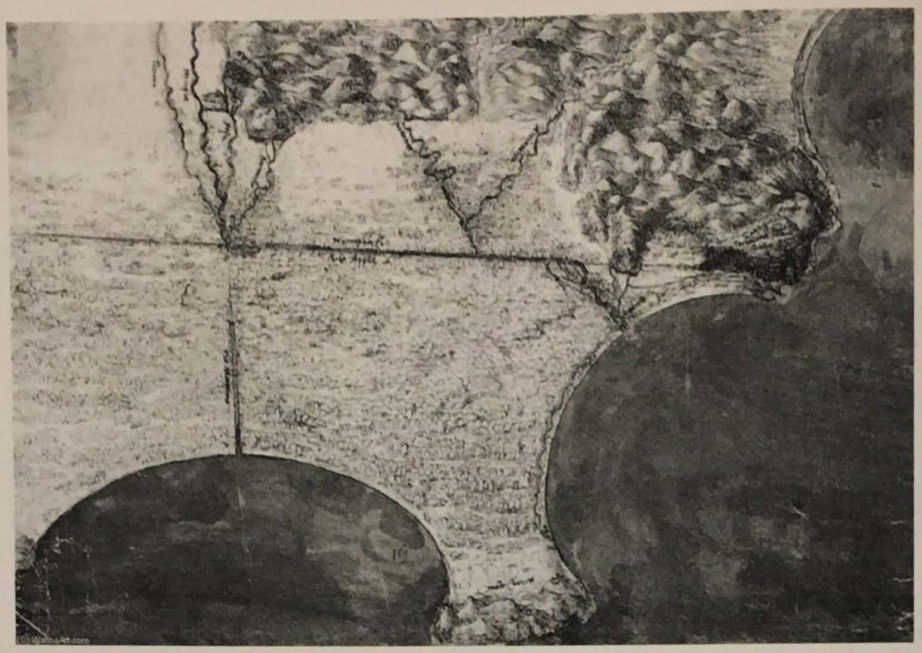
The fascination exerted by the capacity for flight (one of the most ancient anthropological desires, as attested by the myth of Icarus) has encouraged an identification of human beings with animals. Men have desperately tried to put themselves in the shoes (or rather in the wings) of birds. Unsurprisingly, therefore, echoes of such attempts have reverberated through the centuries in the history of visual arts and, more generally, of image production.

A particularly interesting case is offered by the so-called "bird's-eye view": an elevated view of an object or of a landscape from above, as if the observer were a bird. Such views are often employed in the making of blueprints, plans and maps for both natural and urban spaces. Remarkable examples are Leonardo's *Bird's-Eye View of Sea Coast* (ca. 1515) (fig. 1) or Jan Micker's *Bird's-Eye View of Amsterdam* (ca. 1652). Such a view is complementary to the opposite perspective of the so-called "worm's-eye view" (in German "frog's-eye view": *Froschperspektive*; in Italian *sottinsù*), the view of an object from below, as if the observer were a worm.

It is difficult to establish the precise origin of the bird's-eye view genre of representation. Some scholars claim it can even be traced back to archaic times, as in, for instance, the case of a bird's-eye view petroglyphic topographic rendering located north of Prescott (Arizona), attributed to the Hohokam people[2]. Certainly, ever-increasing

1 — This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. [834033 AN-ICON]). I wish to thank here Federica Cavaletti, Pietro Conte, Anna Caterina Dalmasso, Barbara Grespi, Giancarlo Grossi, and Giacomo Mercuriali for their valuable suggestions.

2 — James A. Dockal and Michael S. Smith, "Evidence for a Prehistoric Petroglyph Map in Central Arizona." in: *Kiva: The Journal of Southwestern Archaeology and History*, 4 (2005), pp. 413–420. See also the contribution of Tanja Michalsky in the present volume.



1 ___ Leonardo, *Bird's-Eye View of Sea Coast South of Rome*, ca. 1515, pen, ink and watercolour on paper, 272 × 400 mm, Windsor, Royal Library.

efforts in aerial representation can be recognised from early modern times[3] through recourse to military ballooning in the Napoleonic and Franco-Prussian wars, down to our contemporary aeroplane[4], satellite and drone views.[5] It is no surprise that many aircraft have been named after birds, with a remarkable occurrence of hawks and falcons. Amongst numerous examples from the early days of human flight, one might consider the Nieuport *Nighthawk* fighter (first flight in 1919), the Sikorsky UH-60 *Black Hawk* utility helicopter (first flight in 1974), the Northrop Grumman RQ-4 *Global Hawk* surveillance drone (first flight in 1998), the *HawkEye* micro-satellite (launched in 2018), the Dassault *Falcon* business jet (first flight in 1963), the SpaceX *Falcon 9* rocket (first launched in 2010) and the TwoDots *Falcon* drone (released in 2016). We should not omit the *Millennium Falcon*, the famous spaceship in the *Star Wars* saga.

3 ___ Andrew John Martin, "Das Bild vom Fliegen, dokumentierte Flugversuche und das Aufkommen von Ansichten aus der Vogelschau zu Beginn der frühen Neuzeit.", in: *Fliegen und Schweben. Annäherung an eine menschliche* Sensation, ed. Dieter R. Bauer and Wolfgang Behringer, Munich 1997, pp. 223–240; Daniela Stroffolino, *L'Europa "a volo d'uccello": dal Cinquecento ad Alfred Guesdon*, Naples 2012.

4 ___ Wolfgang Sonne, "Weisungen der Vogelschau: Luftbild und Ästhetik der Gesamtstadt im frühen 20. Jahrhundert." in: *Architektur Fotografie. Darstellung – Verwendung – Gestaltung*, ed. Hubert Locher and Rolf Sachsse, Berlin 2012, pp. 84–96.

5 ___ Andreas F. Beitin, "Imagination, Elevation, Battlefield Automation. From the Elevated View to Battle Drones", in: Exhib. Cat. *Mapping Spaces. Networks of Knowledge in 17th Century Landscape Painting*, ed. Ulrike Gehring and Peter Weibel, Munich 2013, pp. 460–471.

Despite an obvious family resemblance among the various perspectives generally termed "view from above", it is crucial to underline the fact that, prior to the advent of manned flight, the term "bird's-eye view" designates an *imagined* viewpoint, as distinct from a mere high vantage point allowing direct and *actual* observation, as from a mountain, from a tower or from an aircraft. Human beings have attempted to adopt the perspective-taking of flight through an imaginative operation.

The evolutionary link from an imagined bird's view to actual aerial photography or video-recording taken from manned or unmanned aircraft could be identified in experiments like Julius Neubronner's *Bird Photography*, patented in 1907. Neubronner designed a camera that could be fastened to a pigeon's body and would automatically take pictures during the bird's flight.[6] Unsurprisingly, this animal-machine combination was employed in both the First and Second World Wars as a reconnaissance aircraft. The CIA's surveillance experiments with pigeon cameras went on until the Seventies: "Pigeon imagery was taken within hundreds of feet of the target so it was much more detailed than imagery from other collection platforms. (Aircraft took photos from tens of thousands of feet and satellites from hundreds of miles above the target). [...] Details of pigeon missions are still classified".[7] Neubronner's integration of animal flight and a mechanical eye can be considered as a precursor of recent visual practices, such as the Dubai World Record Eagle Flight set in 2015 as the highest recorded bird flight from a man-made structure: Darshan, a male imperial eagle with a camera installed on his back, majestically descended the 830 metres of the Burj Khalifa skyscraper to the arm of his trainer, Jacques-Olivier Travers.[8]

A SEVERE CAVEAT: NAGEL

From the viewpoint of the phenomenology of perception, the human imaginative adoption of the bird's-eye perspective is not without problems. In a famous article published in 1974, American philosopher Thomas Nagel asked: "What is it like to be a bat?" Is it actually possible for human beings to understand the experiential world of these fascinating creatures? His answer was definitely a negative one. In the context of a radical criticism of reductionist approaches to the Mind-Body problem, aiming at explaining mental phenomena as effects of physical causes, Nagel focuses on the notion of the "subjective character of experience" as the mark of consciousness: "Fun-

6 — Franziska Brons, "Bilder im Fluge: Julius Neubronners Brieftaubenfotografie," in: *Fotogeschichte, Beiträge zur Geschichte und Ästhetik der Fotografie*, 100 (2006), pp. 17–36; Julius G. Neubronner, *The Pigeon Photographer*, Bolzano 2017.

7 — From the virtual tour of the official CIA Museum website: https://www.cia.gov/about-cia/cia-museum/experience-the-collection/#!/artifact/24 (accessed June 8 2020).

8 — See the video at: https://www.youtube.com/watch?v=um8M9azpmb4 (accessed June 8 2020).

damentally an organism has conscious mental states if and only if there is something that it is like to *be* that organism – something it is like *for* the organism".[9] This "for" – the *pour-soi* of the experience, its phenomenological implications – is precisely what his argumentation deals with. "Like" in the expression "what is it like" therefore does not imply any form of analogical resemblance between two different experiences, but rather means: "How it is for the subject himself?"[10]

In order to develop his reflections, Nagel has recourse to the intuitive case of the bat: "Even without the benefit of philosophical reflection, anyone who has spent some time in an enclosed space with an excited bat knows what it is to encounter a fundamentally *alien* form of life".[11] This alien character is clearly illustrated by comparing the operation of "location" as performed by both bats and humans: namely of the procedures of discriminating size, distance, shape, motion and texture of objects in the space. Whereas humans locate objects mainly by vision, bats accomplish this via sonar: they emit high-frequency sound pulses through their shrieks and detect objects by measuring their return when reflected: their kind of location is *echo*location. However, Nagel argues that bat sonar, "though clearly a form of perception, is not similar in its operation to any sense that we possess, and there is no reason to suppose that it is subjectively like anything we can experience or imagine. This appears to create difficulties for the notion of what it is like to be a bat".[12]

From this introductory presentation of the problem, it appears that "subjective" in the above-mentioned expression "subjective character of experience" refers not so much to the individual aspect of experience (as lived by this particular bat or by this particular man), but rather to the *specific* access to experience itself: namely to the experience as lived by bats rather than by humans insofar they are *species* of beings. Nagel employs the term "type" to refer to the possibility of objectively ascribing experiences in the third person, provided this person is sufficiently similar to us so that we can adopt his or her point of view. Of course, individual variations within a type can be significant: within the human species, blind subjects accomplish location tasks by tactile or auditory stimuli, and the understanding of such practices from the viewpoint of non-visually-impaired subjects raises difficulties similar to those related to the human understanding of bat sonar.

Are there practicable ways to solve that problem, provided that we as humans do not possess a sense comparable to the bat's sonar? Scientific explanation of bats' nervous, sensory and motor systems evidently does not offer us the "experience" of a bat. One possible way could be the recourse to *imagination*. We could try to imagine what is it

9 — Thomas Nagel, "What Is It Like to Be a Bat?" in: *The Philosophical Review*, 4 (1974), p. 436.
10 — Nagel (as in note 9), p. 440.
11 — Nagel (as in note 9), p. 438.
12 — Nagel (as in note 9), p. 438.

like to have inter-digital webbing enabling us to fly, to catch insects with our mouth, to hang upside down by one's feet from the ceiling, even to perceive the surroundings through an acoustic reflection. However, objects Nagel, "in so far as I can imagine this (which is not very far), it tells me only what it would be like for *me* to behave as a bat behaves. But that is not the question. I want to know what it is like for a *bat* to be a bat".[13] Since imagination is a faculty which works on materials provided by previous experience via operations of additions, subtractions and modifications, and since my previous experience does not entail anything even close to being a bat, imagining will not help me at all in this attempt to understand what is it like to be a bat.

The species-specific constitution of my human experience prevents me from being able to even imagine what it could be like to be a bat; even if I imagine undergoing a progressive metamorphosis transforming me into a bat, "nothing in my present constitution enables me to imagine what the experiences of such a future stage of myself thus metamorphosed would be like".[14]

Are there further alternatives other than the imaginative strategy to be pursued? Nagel considers a Martian scientist who is not endowed with vision but tries nevertheless to understand what a rainbow is: the rainbow is a phenomenon which is not reducible to its visual appearance as offered to a human viewpoint, and which could be investigated in its objective, physical features. However, if we talk of "experience", such "objective" features must, necessarily, be translated into "subjective" experiencing, both for the Martian and for the human being, who remain, ultimately, alien to each other:

> Members of radically different species may both understand the same physical events in objective terms, and this does not require that they understand the phenomenal forms in which those events appear to the senses of members of other species. Thus, it is a condition of their referring to a common reality that their more particular viewpoints are not part of the common reality that they both apprehend. The reduction can succeed only if the species-specific viewpoint is omitted from what is to be reduced.[15]

"Viewpoint", here, evidently means not simply visual perception, but rather perception through the senses as a whole, as configured by species-specific determinations. In this respect, no species can put itself in other species' shoes. No perspective taking, no empathy is ever possible here. Transcending inter-species barriers is precluded if we insist upon assuming a *subjective* phenomenological stance.

13 — Nagel (as in note 9), p. 439.
14 — Nagel (as in note 9), p. 439.
15 — Nagel (as in note 9), p. 445.

Nevertheless, Nagel eventually leaves an albeit problematic possibility open: concluding his article with what he calls a "speculative proposal", he calls for the elaboration of an "objective phenomenology not dependent on empathy or imagination", whose aim would be to describe, at least partially, "the subjective character of experiences in a form comprehensible to beings incapable of having those experiences".[16] Such a phenomenology should allow, for instance, describe what seeing is like to a blind person without having recourse to the conventional intermodal analogies, such as "red is like the sound of a trumpet". In a further stage, objective phenomenological concepts obtained through this kind of non-first-person analysis of "structural features of perception" might even allow inter-specific understanding, as in the case of experiencing bats' sonar. Unfortunately, such a speculative hypothesis is merely sketched on a negative basis (it should not be subjective, it should not be first-person), and we are given no clues how to even take the first steps.

Despite bats being mammals, not birds, for our present purpose Nagel's argument can be extended to any animal capable of self-powered flight. Since human beings are not capable of such flight, they will never be able to really understand from a phenomenological point of view what it is like to be a flying animal. Consequently, the very expression "bird's-eye view" – which was our starting point – would constitute a fundamental fallacy: human eyes will never be able to understand what it is like to see the world with birds'-eyes.

With respect to Nagel's 1974 severe caveat, I would now like to chronologically take a step backward and a step forward.

A STEP BACKWARD: UEXKÜLL

By the beginning of the twentieth century, the great zoologist Jakob von Uexküll had already started a research program focused on "subjective biology [*subjektive Biologie*]" in the double sense of a science developed by subjects who engage in the study of subjects.[17] In his conception of organisms each species is enclosed within a "bubble" of its own perceptual possibilities: "We must therefore imagine all the animals that animate Nature around us, be they beetles, butterflies, gnats, or dragonflies who populate a meadow, as having a soap bubble around them, closed on all sides, which closes off their visual space and in which everything visible for the subject is also enclosed".[18]

16 — Nagel (as in note 9), p. 449.

17 — Jakob von Uexküll, "Die Umrisse einer kommenden Weltanschauung", in: *Bausteine zu einer biologischen Weltanschauung. Gesammelte Aufsätze*, Munich 1913, p. 143 (1907).

18 — Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans*, translated by Joseph D. O'Neil, Minneapolis 2010, p. 69 (German 1934).

The field for this subjective biology was to be the "inner world [*Innenwelt*]" of animals meaning, primarily, the domain of their nervous system.[19] Moving from Kant's fundamental acquisition of the transcendental role of subjectivity in the constitution of experience, and at the same time sensing the need to expand his transcendental aesthetics essentially centred on *Mensch*, on humans in general, Uexküll initiates a process of multiplication of the *a priori* forms of space and time, whose variety ends up coinciding with the number of animal species. Depending on the constraints imposed by its structural plan (*Bauplan*), each organism is equipped with receptors that select innumerable environmental stimuli but accept only those which are significant for the organism itself; these stimuli are then analysed according to the nature of the receptors (the same light stimulus can produce chromatic effects in some animals, merely *chiaroscuro* nuances in others) and finally transformed into nervous excitation.[20]

Even though the different animal species cohabit in the same world, each of them will live it as its "environment" (*Umwelt*: literally "surrounding world") in a specific way inaccessible to all the others, because conditioned by its own organisation. However, the receptive moment is only one side of the *Umwelt* coin: namely the side that corresponds to the *Merkwelt* (the perceptual world, offered to the *Merken*, to the noticing of something, of *Merkmale* as "perceptual marks" in the phenomenal field, operated by the receptor organs). The other side is the *Wirkwelt* (the operational world, modified by the *Wirken*, from the action of the living being on its environment, thanks to its effector organs).

The relationship between subject and *Umwelt* thus comes to take shape in the sense of reciprocal action, in the form of a unitary "functional cycle [*Funktionskreis*]";[21] it is a correlation in which, so to speak, we take as much as we give: after having undergone an effect from a perceptive mark, each animal exerts a counter-effect against its environment. The subject-environment interaction is configured as an incessant interpretation of salient and meaningful signs, which are received and sent: the sign theory of sensation (already set by Lotze and Helmholtz) expands in the direction of a real ecological zoosemiotics,[22] and foreruns the enactivist approach introduced by Humberto R. Maturana and Francisco J. Varela and subsequently developed by theorists such as Alva Noë, Evan Thompson, Shaun Gallagher.[23] In each animal it is its

19 — Jakob von Uexküll, *Umwelt und Innenwelt der Tiere*, Berlin 1909, p. 6.

20 — Von Uexküll (as in note 19), p. 251.

21 — Von Uexküll (as in note 18), p. 49.

22 — Thomas A. Sebeok, "Biosemiotics. Its Roots, Proliferation, and Prospects", in: *Semiotica*, 1–4 (2001), pp. 61–78.

23 — Humberto R. Maturana and Francisco Varela, *The Tree of Knowledge: The Biological Roots of Human Understanding*, Boston and London 1988; Alva Noë, *Action in Perception*, Cambridge MA 2004; Evan Thompson, *Mind in Life*, Harvard 2007; Shaun Gallagher, *Enactivist Interventions. Rethinking the Mind*, Oxford 2017.

specific *Bauplan* which ensures the possibility of a perfect "adequacy [*Einpassung*]" between receptor organs and perceptual marks on the one side, and effector organs and operational brands on the other: in its environment, the wasp meets wasp-things, the dog dog-things: a dog does not sit on a chair because the chair is a "human opportunity", and not a canine one, of sitting – an *affordance*, as Gibson would have said.[24] Therefore, arguing against a certain Darwinist reductionism, Uexküll claims that it is precisely adequacy that must be considered, and not adaptation (*Anpassung*): if we accept the idea that the organisms must progressively adapt to their environment, we would conceive them as fundamentally inadequate to it, at least at an early stage, failing to respect them in their own right and ending up measuring them by extraneous, perhaps human, standards.

Throughout the development of his zoological reflection Uexküll fought against the anthropocentric prejudices that hinder a proper understanding of the animal worlds, starting from biological terminology: in his youth, together with his colleagues Beer and Bethe, he had proposed an "objective biological nomenclature",[25] which substituted, for example, "sight" and "smell" with the more neutral "photoreception" and "stiboreception". Returning later to the matter,[26] he then opted, by contrast, for a nomenclature "referred to the subject" considered case-by-case and with regard to its specific organisation: objectivity is not (however unattainable) neutrality, but recognition of the plurality of subjectivities and their respective organizations.

In the early 1870s, Nietzsche enunciated his perspectivist programme in perceptology:

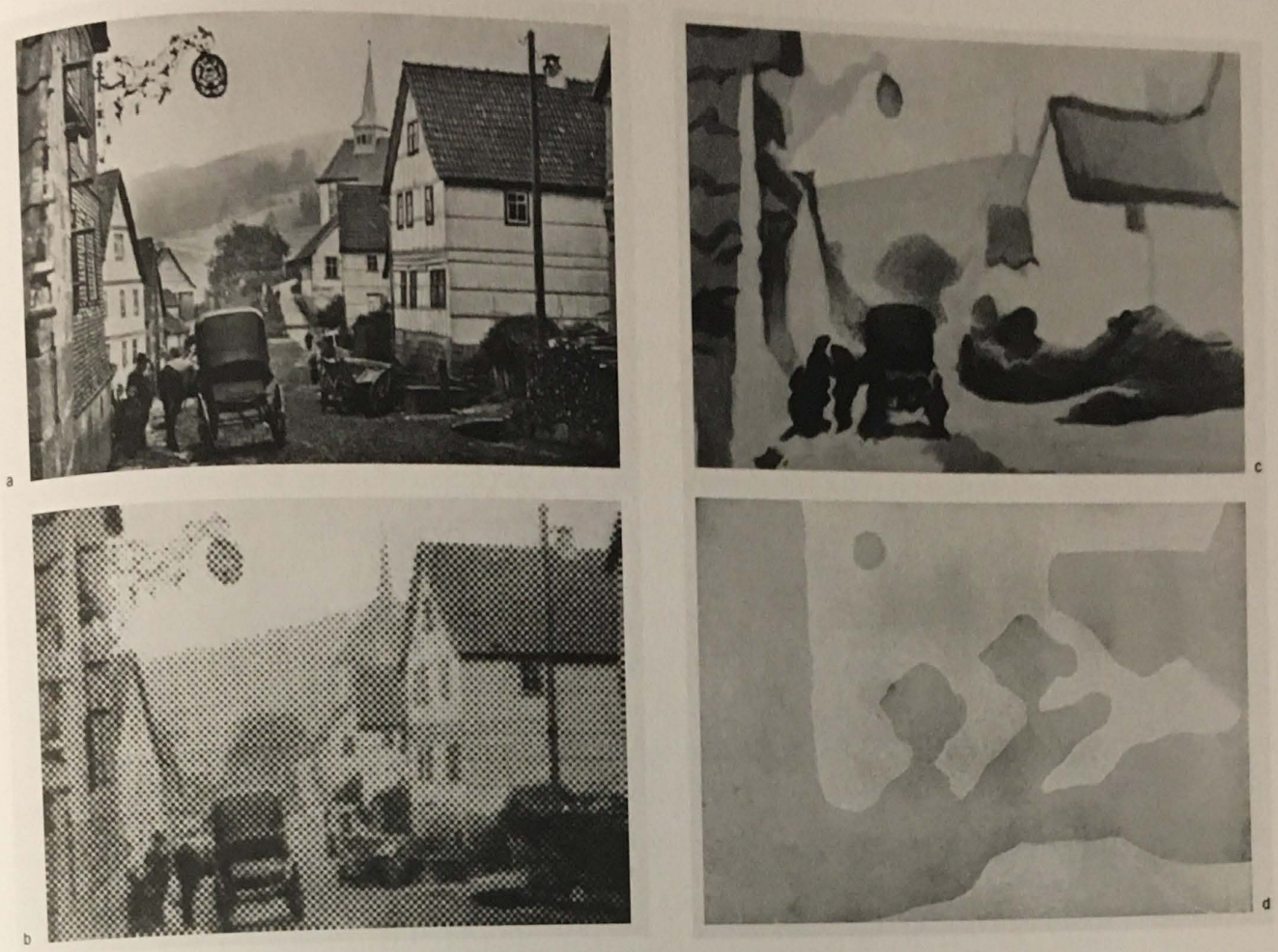
> It is even a difficult thing for him [viz. for the human being] to admit to himself that the insect or the bird perceives an entirely different world from the one that man does, and that the question of which of these perceptions of the world is the more correct one is quite meaningless. for this would have to have been decided previously in accordance with the criterion of the *correct perception*, which means, in accordance with a criterion which is *not available*. But in any case, it seems to me that "the correct perception" – which would mean "the adequate expression of an object in the subject" – is a contradictory impossibility.[27]

24 James J. Gibson, *The Ecological Approach to Visual Perception*, New York 2015 (1979).

25 Jakob von Uexküll, Theodor Beer and Albrecht Bethe, "Vorschläge zu einer objectivierenden Nomenklatur in der Physiologie des Nervensystems," in: id., *Kompositionslehre der Natur. Biologie als undogmatische Naturwissenschaft. Ausgewählte Schriften*. Frankfurt am Main 1980, pp. 92–100 (1899).

26 Jakob von Uexküll and Friedrich Brock, "Vorschläge zu einer subjektbezogenen Nomenklatur in der Biologie," in: id. (as in note 25), pp. 129–142 (1935).

27 Friedrich Nietzsche, "On Truth and Lies in a Nonmoral Sense", in: *Philosophy and Truth. Selections from Nietzsche's Notebooks of the early 1870's*, ed. and transl. Daniel Breazeale, New Jersey and London 1992, p. 86 (1873).



2 ___ Photograph of a *village street* (a); *village street* photographed through a screen (b); the same *village street* for a fly's eye (c); *village street* for a mollusc's eye (d): from Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans*, Minneapolis 2010 (1934).

Uexküll endowed such transcendental perspectivism with a biological basis. Yet the anthropocentrism kicked out of the door by Uexküll seems to subtly come back in through the window. If every animal, including man, is locked in its own soap bubble and there is no way that different animals access it, or that it accesses other bubbles, how can it interact, for example in the fatal relationship between predator and prey? It is nature itself that harmoniously embraces the perceptive brand and operative brand of different worlds:[28] Nature with a capital "N" becomes thus a sort of meta-animal or immanent and omniscient deity that sees all and knows all, where every species is bound to the boundaries dictated by the corresponding *Bauplan*.

It is, however, difficult to avoid the impression that sometimes Uexküll inclines to make this synoptic point of view coincide with that of the zoologist and, ultimately, of his own person. Uexküll seems to admit that the human as a supreme animal has

28 ___ Jakob von Uexküll, "Wie sehen wir die Natur und wie sieht sie sich selber?", in: id. (as in note 25), pp. 179–213 (1922).

somehow access to the environments of a fly, a snail or a mussel, whose specific "visions of the world" are obtained thanks to the progressive impoverishment of a photographic image – considered equivalent to human visual data – through the superposition of a series of rasters (fig. 2).[29]

A peculiar tension is therefore established between a strictly monadological and anti-anthropocentric approach, by virtue of which every animal species – including humans – lives its own space, its time, its movement (in a way that remains inaccessible to any other species) and an anthropocentric temptation, which (thanks to technological prostheses such as the microscope or the camera) allows humans in some way to pierce their own soap bubble to explore those of other organisms, identifying themselves in their visions of the world. Such technical instruments, as human artefacts, are inevitably bound to our perceptive capacity as humans, as Uexküll (1922) himself acknowledges.[30]

In any case, Uexküll's merit remains undisputed, having placed the interactive relationship between organism and environment (to which already Lamarck had attracted attention at the beginning of the nineteenth century) at the heart of biological research. His ideas have stimulated the reflections of philosophers such as Max Scheler, Martin Heidegger, Ernst Cassirer, Gilles Deleuze, Giorgio Agamben and Peter Sloterdijk. His notion of *Umwelt* has found full development in contemporary biology with the notion of "niche".[31]

A STEP FORWARD: BIRD FLIGHT SIMULATORS

The paradoxical and yet highly stimulating approach developed by Uexküll – theorising a biological monadology of "soap bubbles" on one hand, whilst admitting the possibility of humans acting as "peeping Toms" in other species' bubbles on the other – seems to have been picked up by contemporary immersive virtual environments.

Recent years have been characterised by an ever-increasing diffusion of Virtual Reality (VR) helmets and Head Mounted Displays (HMD) as interfaces for personal computers (Oculus Rift and HTC Vive) and video game consoles (Sony PlayStation VR). These devices are also mimicked by low-budget smartphone wearables (Google Cardboard and Samsung Gear VR). Virtual Retinal Displays (VRD, like Magic Leap One) and increasingly cheaper and standalone devices (Oculus Go) have already been released in 2018.

29 — Von Uexküll (as in note 18), pp. 64–65.
30 — Von Uexküll (as in note 28).
31 — F. John Odling-Smee, Kevin N. Laland and Marcus W. Feldman, *Niche Construction. The Neglected Process in Evolution*, Princeton 2003.

In the kind of image experience offered by such devices, a fundamental freedom which characterised the pre-immersive image reception appears definitely negated: namely the possibility of switching one's gaze beyond the image itself, focusing on non-iconic parts of the visual field: once I have put on the helmet, I cannot physically see anything real but experience only images in a 360° field. This elementary and, at the same time, crucial feature implies a series of experiential consequences, which can be summarised under three main categories:

Unframedness: by contrast to pre-immersive image experience (which was characterised by framing devices such as picture frames, statue pedestals and screen borders), the VR immersive image appears in a spatio-temporal continuum with the real spatio-temporal environment of the user, producing a veritable environmentalisation of the iconic field. *Immediateness*: differentiating itself from pre-immersive pictures (which allowed for a twofold possibility of focusing either on the represented image or on the material medium that supported it), the VR immersive image tends to blur (and ideally to suppress) its mediateness, aiming at effects of illusion and transparency that are paradoxically obtained by highly mediated technological solutions. *Presentness*: whereas pictures have been traditionally – although highly problematically – interpreted in mainstream Western image theories as referring to an extra-iconic dimension (as being representational "images-of"), environmental VR pictures elicit a powerful presence effect, as paradigmatically exemplified by hyper-realistic and multisensory environments, consisting of simulating reality in the flesh. Because of this tripartite challenge to the conventional iconic experience, VR immersive images might be characterised as "an-icons": namely as images which tend to negate their own status as images.[32]

Within this contemporary virtual iconic landscape, a particularly interesting case for our bird's-eye view subject is the development of bird flight simulators. Let us consider three recent examples.

Aquila Bird Flight Simulator (developer and publisher Graeme Scott) is a VR App released in 2017. Originally designed for the Oculus Rift and subsequently made available for OpenVR, *Aquila* offers the user the possibility of switching between third person and first person: in the former case, a flying eagle's body can be seen in its entirety, as perceived from the viewpoint of another bird flying beside it; in the latter, the user assumes the eagle's own subjective vantage point, in which only the wingtips are visible in the visual field.[33] The text introducing this simulation software reads as follows: "Have you dreamed of what it would be [...] to soar like an eagle? *Aquila Bird Flight Simulator* lets you experience soaring bird flight using the Oculus Rift headset.

32 Andrea Pinotti, "Self-Negating Images: Towards An-Iconology." *Proceedings* 856 (2017), pp. 1–9. http://www.mdpi.com/2504-3900/1/9/856 (accessed June 8 2020).

33 https://www.youtube.com/watch?v=1U1NV4NhsWU (accessed June 8 2020).

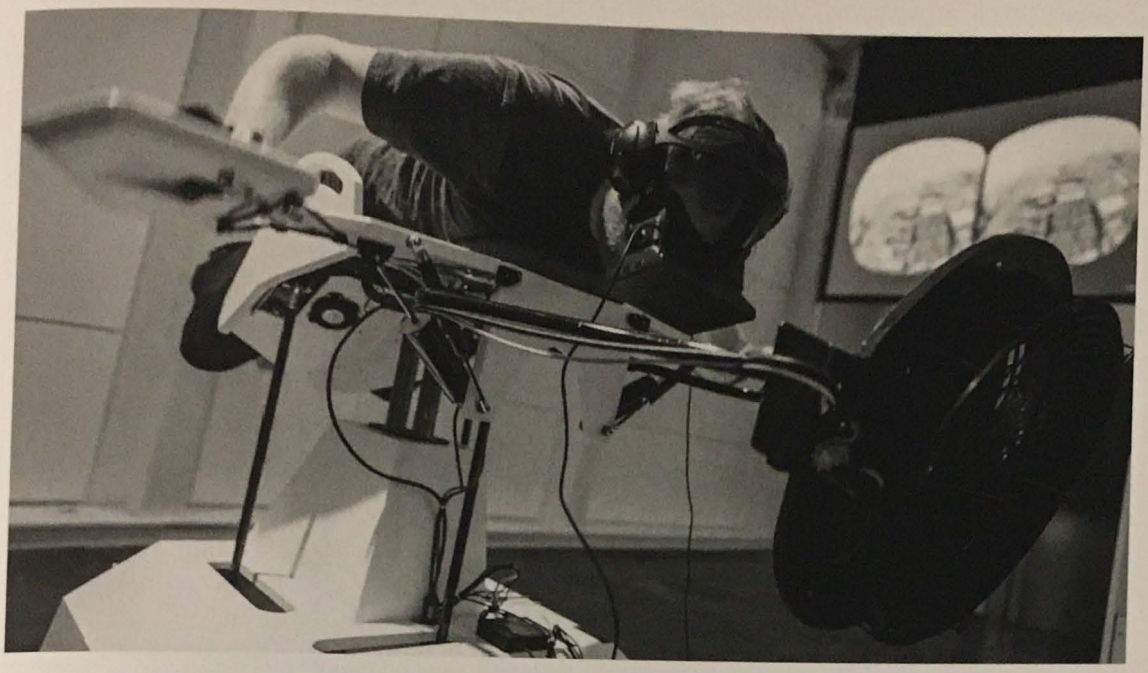
This is a soaring simulation, so you can make use of ridge lift and thermals like any other soarer in the skies [...]."[34]

Eagle Flight is a VR simulation video game developed and published by Ubisoft and released for Microsoft Windows and PlayStation 4 in late 2016. Contrary to *Aquila*, the only perspective possible here is the first-person view, but in exchange it can be both single-player and multiplayer. Flight direction is chosen by using the tilt of the user's head. According to the first introduction to this simulator:

> Humans can't fly on their own in real life, but we can at least experience the sensation thanks to Eagle Flight. The first VR game to come out of Ubisoft's Fun House studio, Eagle Fight lets you soar as an eagle above the streets of an abandoned Paris. Vegetation has overtaken its most popular monuments. Its human population has been replaced with all manner of creatures. But as it turns out, there's still plenty for an eagle to do.[35]

VR immersive apparatus often triggers so-called "cybersickness" (a pathological syndrome including nausea, vertigo, imbalance, dizziness and blurred vision),[36] because of the conflicting information provided to the brain by three different systems: the vestibular, the visual and the proprioceptive. The subject is affected by a mismatch between two conditions: when you feel motion, but do not see it (like when you are reading in a car), and when you see motion, but do not feel it (like in space, because there is no gravity). In the specific case of simulated flight, the discordancy occurs between the information sent to the brain by the ear (the body is sitting on an armchair) and the one sent by the eyes (the body is flying over a landscape). In order to reduce such unpleasant effects, Ubisoft has adopted two strategies: the introduction of "dynamic blinders" narrowing the view during intense movement, and (most important for my discourse here) of the eagle's beak in the lower area of the visual field.[37] Operating as a partial avatar of the user's own body incorporated in the eagle's body, the beak functions as a surrogate for the human nose tip, which is constantly included in our visual field even if not explicitly thematised in standard perceptual life (and which is, by contrast, excluded by the head-mounted display while experiencing a VR immersive environment).

34 — https://www.metacritic.com/game/pc/aquila-bird-flight-simulator/details (accessed June 8 2020).
35 — https://news.ubisoft.com/en-us/article/313278/eagle-flight-everything-need-know (accessed June 8 2020).
36 — Alireza Mazloumi Gavgani, "A comparative study of cybersickness during exposure to virtual reality and 'classic' motion sickness: are they different?", in: *Journal of Applied Physiology*, 6 (2018), pp. 1670–1680.
37 — Ashley Whitlatch, "Tunnel Vision: How Ubisoft Created 'Eagle Flight', A VR Flying Game With No Nausea", 2016, https://uploadvr.com/how-ubisoft-created-eagle-flight-sickness/ (accessed June 8 2020).



3 ___ Flight simulator *Birdly*, designed in 2013 by Max Rheiner, Fabian Troxler and Thomas Tobler at the Zurich University of the Arts (ZHdK) and subsequently developed by Somniacs.

A further step in flight simulation has been taken with *Birdly*, originally designed by Max Rheiner, Fabian Troxler and Thomas Tobler at the Zurich University of the Arts (ZHdK) in 2013 and subsequently developed by Somniacs.[38] (fig. 3, plate V) The official presentation refers to it as to the possibility of finally fulfilling nothing less than "The Ultimate Dream of flight":

> For millennia, humans have longed to fly like a bird, to take to the sky, arms outstretched, with the power and innate grace of the avian masters. While human biomechanics will never allow for the facility of unfettered flight, today's virtual reality (VR), coupled with robotics and simulation technology, can deliver an experience like never before [...] fulfilling our ultimate dream of flying like a bird.[39]

Unlike other flight simulators, *Birdly* does not require either joystick or mouse but is directly commanded via a full-body series of operations which include instinctive movements of both arms and hands, controlling speed, altitude and navigation. Inputs given by the user's body, laying horizontally with arms stretched as if they were wings, are translated by a virtual flight processor and returned as physical feedback to the body. A fan in front of the user's face, producing whirling winds, and the surround

38 ___ https://birdly.com/language/en/ (accessed June 8 2020).
39 ___ http://birdlyvr.com/ (accessed June 8 2020).

audio diffused from the earphones integrated into the headset add to the reality effect of the whole experience. You can choose between a *New York Experience*, where you can fly through the Manhattan skyscrapers and meet King Kong on the top of the Empire State Building,[40] or rather take the prehistoric path and become a pterosaur, immersing yourself in the *Jurassic Flight*.[41]

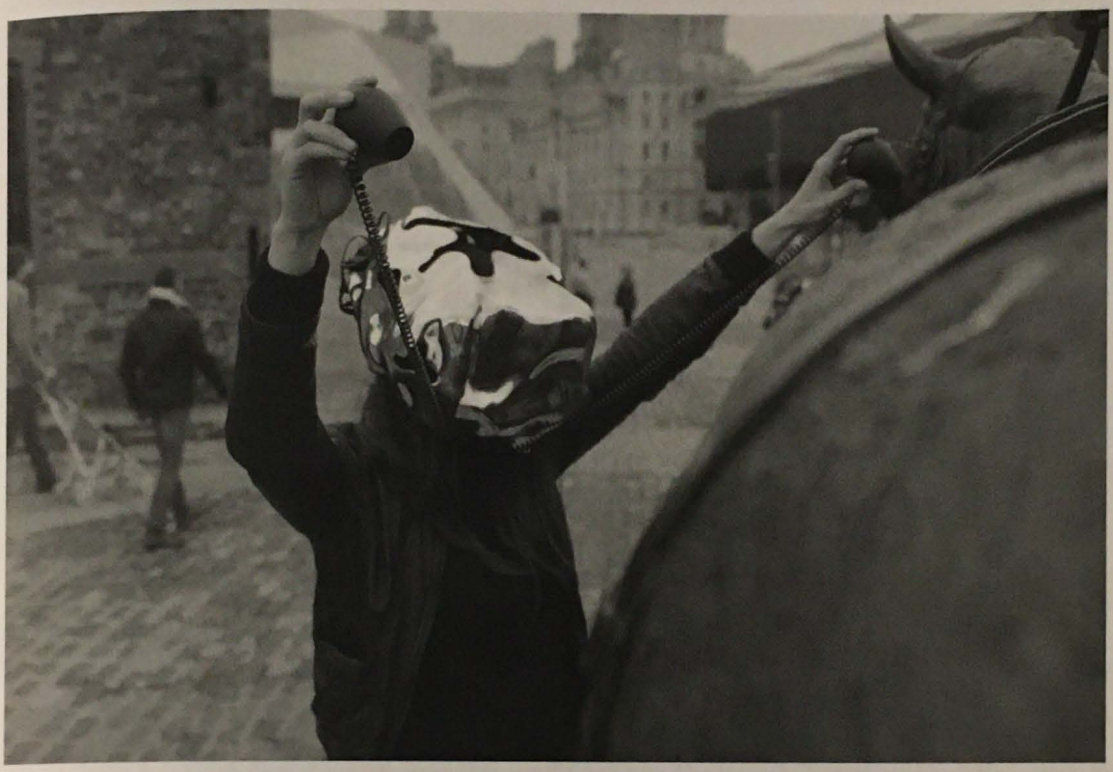
A PARADOXICAL DRIVE

Such virtual immersive simulative attempts should be considered in the wider context of an anti-anthropocentric drive, which currently characterises not only the VR world but contemporary visual culture, in various mediums, more generally. Such a drive has been named "the nonhuman turn", namely "a turn toward and concern for the nonhuman, understood variously in terms of animals, affectivity, bodies, organic and geophysical systems, materiality, or technologies".[42] Within this context, particularly interesting for our discourse is the specific attention paid to "nonhuman vision", intended not merely as a machinic and prosthetic vision (such as the one offered by CCTV cameras, telescopic, microscopic, and endoscopic devices, Google Earth views, satellites, and drones), but as an enlarged notion of vision which considers "the human as part of a complex assemblage of perception in which various organic and machinic agents come together—and apart—for functional, political, or aesthetic reasons".[43]

In this scenario, animal perception evidently plays a major role: as the nearest Other to the human, the animal offers multifarious possibilities of exploration that are being investigated in manifold ways, both in fiction and non-fiction genres. Among the non-fictional approaches, a paradigmatic case is the 2012 ethnographic documentary *Leviathan*, directed by Lucien Castaing-Taylor and Verena Paravel, who have recourse to GoPro cameras installed on different bodies – of fishers, fish, and boat – on board a commercial fishing vessel operating in the North Atlantic.[44] YouTube already hosts compilations of GoPro videos recorded via an animal POV (Point of View) shooting.[45] Amongst fictional works, a rich tradition is represented by animal horror movies,[46] in which animal POVs are used to render the subjective theriomor-

40 — https://vimeo.com/270146072 (accessed June 8 2020).
41 — https://vimeo.com/268133291 (accessed June 8 2020).
42 — Richard Grusin (ed.), *The Nonhuman Turn*, Minneapolis 2015, p. vii.
43 — Joanna Zylinska, *Nonhuman Photography*, Cambridge MA 2017, p. 14.
44 — Michael A. Unger, "Castaing-Taylor and Paravel's GoPro Sensorium: Leviathan (2012), Experimental Documentary, and Subjective Sounds," in: *Journal of Film and Video*, 3 (2017), pp. 3–18.
45 — See for instance: https://www.youtube.com/watch?v=bjtxmwZTkIE (accessed June 8 2020).
46 — Lee Gambin, *Massacred by Mother Nature: Exploring the Natural Horror Film*. Baltimore MD 2012; Katarina Gregersdotter, Johan Höglund and Nicklas Hållén (eds.), *Animal Horror Cinema. Genre, History and Criticism*, Basingstoke 2015.

4 __ Film still from *Empire of the Ants*.



5 __ The modified Oculus Rift helmet for the *EYEsect* project, developed in 2013 by the Berlin art collective The Constitute.

6 __ Film still from *Alien vs. Predator*.

phic perception. *Empire of the Ants*, a 1977 science fiction horror film co-scripted and directed by Bert I. Gordon and loosely inspired by H. G. Wells' homonymous short story, is particularly interesting because it aims to reproduce via a multiplication of the same percept the iterated vision characteristic of the compound eye constituted of many tiny lenses (fig. 4, plate VI). A similar approach has inspired more recently the *EYEsect* project developed in 2013 by Berlin-based art collective The Constitute.[47] Two detachable cameras installed on an Oculus Rift helmet provide different visual information to the right and left eyes (fig. 5), going radically beyond the conventional stereoscopic human field of vision: "It allows users to take the perspective of a horse, chameleon or a totally out of body point of view", as Christian Zöllner, one of the members of the collective, claims.[48]

An analogous effort is that of science-fiction, striving to render the perception of alien life forms and to make this perceptible by human sensory organs: a particularly thought-provoking case is offered by the successful *Predator* horror saga, which commenced in 1987 with the homonymous movie directed by John McTiernan, continued with *Predator 2* (1990), *Predators* (2010), *The Predator* (2018) and crossed with the *Alien* saga in the films *Alien vs. Predator* (2004) and *Alien vs. Predator: Requiem* (2007). The lethal extraterrestrial Yautja hunter is equipped with a helmet (the "bio-mask") providing not only the ability to see a spectrum ranging from the high ultraviolet to the low infrared thermal vision (fig. 6, plate VII) (modelled on the heat vision in snakes),[49] but also electro-magnetic field detection, used to visualise Xenomorphs (the aliens).

Such attempts intensify, on the one hand, the effort to imaginatively exceed anthropocentric limitations; on the other hand, they cannot patently hope to escape Nagel's caveat. Since they are visually rendered on a screen, a compound-eye vision, a left-right-eye independent vision or an infrared vision will always be visions processed by a human eye-brain system. Human species-specific organisation operates as a physiological and phenomenological *a priori* that cannot simply be bypassed. This is, of course, true also for any sort of VR simulation of non-human ways of experiencing the world: they all ultimately have to be processed by such human *a priori*.

Despite the above, the paradox that we have seen embodied in Uexküll's oxymoronic stance – theorising the impenetrability of the soap bubbles and doing nothing but trying to overcome it – calls for the recognition of a species-specific feature of us humans: namely the insuppressible drive to go beyond the constraints imposed by our physiological constitution through the joined action of imagination and technology. As Nietzsche put it in the above-mentioned text on the impossibility of adequate per-

47 — http://theconstitute.org/eyesect/ (accessed June 8 2020).

48 — https://vimeo.com/83762484 (accessed June 8 2020).

49 — For a compilation of the Predator's heat vision see: https://www.youtube.com/watch?v=DKF7kSL2myg (accessed June 8 2020).

ception, it is a matter of *aisthesis* and invention: "Between two absolutely different spheres, as between subject and object, there is no causality, no correctness, and no expression; there is, at most, an *aesthetic* relation: I mean, a suggestive transference, a stammering translation into a completely foreign tongue – for which there is required, in any case, a freely inventive intermediate sphere and mediating force".[50]

50 Nietzsche (as in note 27), p. 86.