JULIO VELASCO,
KLAUS WEBER (EDS.)

BIO ART

VARIETIES OF THE LIVING IN ARTWORKS FROM THE PRE-MODERN TO THE ANTHROPOCENE

[transcript] Image

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The Living in Artworks in Sociocultural and Historical Contexts

An Introduction

Julio Velasco and Klaus Weber

In the 1980s, Allen Ginsberg (1926–1997) claimed "that the Planet earth has AIDS." The expanding tropical forest clearances resemble the loss of hair associated with Kaposi's sarcoma, growing megacities resemble of its manifestations on the human skin. *Homo sapiens* have been inhabiting the planet since 300,000 years, but have only recently had explosive population growth and developed skills which have become destructive for its host, the earth. *Homo sapiens* is the virus; our way of "consuming the world is a self-depleting disease." (Rosenthal 2022, quoting Ginsberg) By now, we may add that the earth's multiple diseases are weakening its immune system to the extent that experts are apprehending ecological tipping points – e.g. the collapse of the Gulf Stream – which would change the global climate and eco systems irreversibly. Ginsberg's literary metaphor is an early inversion of the anthropocentric perspective which has shaped our worldviews (much of it of "western" origin) at least since the early modern period. And, yet, the American poet had used such metaphors already in 1968, when Paul Carroll interviewed him for Playboy Magazine: the "desensitization […] closing in on human consciousness for centuries now [has led] to complete disregard of the sensitive skin of the earth […]. It's an ecological cancer. We're polluting more and more of the world's freshwater resources […]. Oceans are getting hotter and dirtier on account of all the atomic and DDT waste we're pouring into them; it […] will alter the entire heat balance of ocean and land,

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[…] and generate enough heat to melt the polar icecaps, causing a worldwide flood […]" (Ginsberg 2001: 192–193).[1] In claiming the earth suffered of an ecological cancer, Ginsberg suggested that certain cells of the earth – which he saw as an organism – had mutated out of control, threatening the body as a whole. Even if some of the causalities of ecologic disaster Ginsberg described have been long dismissed[2], his diagnosis remains impressive, and if only for being so early: years before the seminal Club of Rome report "Limits of Growth" (1972), before the nuclear accident at Three Mile Island (1979) and the catastrophe at Chernobyl (1986), before the chemical gas disasters at Seveso (1976) and Bhopal (1984) etc.

With his more recent AIDS metaphor, Ginsberg did not refer to cancerous cells of the earth, but to its inhabitant *Homo sapiens* becoming a pathogen – a far more radical challenge and inversion of the anthropocentric world view, addressing the Anthropocene before the term was coined. Whether or not western anthropocentrism derives from the biblical narrative of incarnate man being created as the image of god and being endowed as a co-creator of this world (Simkins 2014), this inversion puts him at the very bottom of the hierarchy of all the organisms, and compares him with a virus. Most virologists agree that viruses are not even (micro)organisms, but mere intracellular parasites, at best "organisms at the edge of life" (Rybicki 1990). This is quite a plunge, from once having been considered "the summit of the Creator's work […and …] clearly distinguished […from …] the other creatures" to an equal ranking with tiny beings mostly associated with nasty contagious diseases (Catechism 1993: 343).

In the context of this essay collection it is remarkable that this radical critique of an entirely anthropocentric "money-property-power"-driven economy (Ginsberg 2001: 191) was not uttered by someone from the spheres of politics or sciences, but came from the queer "onetime angry

1 Also see https://www.playboy.com/read/the-playboy-interview-with-allen-ginsberg (last accessed 16.03.2024).

2 Oceans are not "getting hotter […] on account of all the atomic and DDT waste we're pouring into them", but on account of CO2 and other greenhouse gas emissions – which does not make atomic and DDT waste less hazardous.

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beat poet who's become the joyous leader, guru and elder statesman of the flower people".[3] It was from Ginsberg's aesthetic approach of poetry and performative arts that he resisted the "desensitization" he saw at work. We dare to claim that more sensitized approaches, merging sciences with arts, have always existed. An example can be provided with the Spanish cleric and enlightenment polymath José Celestino Mutis (1732–1808), not only because of our shared interest in his work, but because he had a long-lasting impact on the visual arts and popular culture in Spanish America (Villegas 2011), and has most recently even inspired work in the field of Bio-Art.

In 1783, the physician, mathematician and botanist Mutis was commissioned by the Spanish crown to direct the famous *Expedición botánica del Nuevo Reino de Granada*, meant to explore the geography and in particular the flora and fauna mainly in what is present-day Colombia. During the expedition, he and his team, many of them of Spanish American, some of African and indigenous American backgrounds (González Bueno 2009), developed new techniques of painting the plants before they ended up as dried specimen in the herbarium. In this novel approach, the disciplines of biology and the arts overlapped. During the expedition, which officially covered a period of 25 years, but in reality lasted half a century, more than 60 illustrators produced 7,000 drawings – a complete and coherent testimony of a large scientific project (Villegas 2011: 12; Mutis 1950–2002).

For Mutis, these drawings were much more than mere illustrations, as for him there seems to be no rupture between the scientific and artistic approaches, to the point where it seems more appropriate to speak of a unity, rather than a complementarity, between fields which, both as a whole and in the isolated elements of his work, completely erased the boundaries separating them (Velasco 2024). When on his own expedition in America, the young Alexander von Humboldt (1769–1859) modified his travel schedule solely in order to meet the Spanish scientist in

3 The quote is from the opening question of the interviewer Lewis Carroll. Also see https://www.playboy.com/read/the-playboy-interview-with-allen-ginsberg (last accessed 16.03.2024).

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Santa Fe de Bogotá in 1801, and expressed his great admiration for the visual work resulting from his research. Mutis offered him a hundred of these vividly colourised drawings, which on his return to Europe, Humboldt presented to the French Academy in order to gain admission as a member of this institution. Most likely inspired by his senior Spanish colleague, Humboldt developed theoretical concepts quite similar to those put into practise by Mutis, associating art and science in new forms of inquiry.

Mutis' work fuelled our interest in finding further examples transcending the boundaries between these two spheres, empathising with the living in general, including non-European cosmologies and transdisciplinary approaches. This gave rise first to an international workshop on the use of the living in art, in 2021, and then to this book. This choice proved particularly rich, opening the way to reflections and debates on fundamental issues – in connection with the question of the Anthropocene, as we have seen above, but more specifically in the field of art. We would now like to consider three of the many questions raised by this approach.

The first relates to the epistemology of art, and concerns its nature and origin. The enlightenment philosopher Immanuel Kant (1724–1804) saw art and nature as opposed (Kant 1987: 170)[4], while the paleoanthropologist André Leroi-Gourhan (1911–1986) attributed the first artistic manifestations, which for him were indissociable from religion, to the *Homo sapiens* (Leroi-Gourhan 1976: 34). In both cases, art is explicitly considered as a characteristic exclusively of humanity. Thus, the debate on the human nature of art is not new, and Concepción Cortés Zulueta's text provides elements for reopening it, based on the Bowerbird case, while Francesco Di Maio offers a theoretical framework based on positions of the German philosopher Friedrich Wilhelm Schelling (1775–1854).

In *Bowerbirds and Their Bowers*, Cortés Zulueta presents the creative work of the males belonging to this group of birds in a process of

4 "Art is distinguished from nature […]. For though we like to call the product that bees make (the regularly constructed honeycombs) a work of art, we do so only by virtue of an analogy with art".

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courtship, in which they elaborate veritable bridal chambers. The author emphasizes the possibility of 'artistic taste' in bowerbirds, and even of aesthetic criticism in the females. This ability would not be innate, but learned or formed through practice (even cultural practice), thus bringing new elements to the discussion of the role of learning in the formation of taste.

For his part, Di Maio's essay on *Animal Architecture in Friedrich Wilhelm Joseph von Schelling's Philosophy of Art* shows how the philosopher dissociated art from the mating rituals of non-humans, understanding it as an activity that goes far beyond this, and in many cases even opposes it. The author returns at length to Schelling's cosmology, where "[a]rt is therefore not what distinguishes humans from other animals, but rather what they have in common." (Di Maio, in this volume) In his view, all beings, including inanimate ones, are, consciously or unconsciously, artists.

These two texts place us directly within the current issues of the Anthropocene, the place of the human in the universe and the boundaries between humans and non-humans. It is even hard to tell whether Schelling's position or the example of the bowerbirds are in contradiction with the theories of Kant or Leroi-Gourhan, because they are based on fundamentally different understandings of being, of beings, and of art. Indeed, it is the very notion of art itself that must be first defined. From the study of the living in the history of art, the hypothesis that emerges and that we endorse is that, far beyond the material or immaterial products of creativity, art is rather a constructed, evolutive concept for which each culture, or even each social group, redefines its sense, limits and meaning.

The question takes on a new meaning today when, in addition to the creations of the non-human living, we are confronted with those made by the non-living: by artificial intelligence of which André Rottmann's text, *On the Ecologies of Contemporary Art*, shows some of the uses of artificial intelligence in interaction with the living made by artists. But, and this is the second question we want to highlight, if art is an evolving and changing concept that each society or group appropriates and redefines, who decides on the evolution, meaning and limits of art within these ensembles?

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The question of the use of the living in art takes a new turn here. The texts by Jérôme Thomas, *Body Ornamentation in Pre-Columbian America*, and by Sébastien Galliot, Sandra Revolon and Anne Di Piazza, *The Snake and the Flying Fox*, present art first and foremost as a manifestation of belonging to a social group and, inscribed on the body itself, as an indication of the individual's position inside that group. Thomas also points to the radically different value of practices such as cranial and dental deformities, etc., which for pre-Hispanic peoples anchored the wearer in a global cosmogony (as in Schelling), while in the eyes of the conquering Spaniards, these practises deprived them of a claim to humanity. The text by Galliot, Revolon and Di Piazza, for its part, places the emphasis on the processes of body ornamentation which, in many cases, count for more than the results, and which involve, even more than the initiate's body, his family and wider social group.

These two examples make explicit the theories of the sociology of art and, in particular, of Pierre Bourdieu (1930–2002), for whom art constitutes a sign of social *Distinction* that taste, formed by implicit learning and not perceived as such (to be related to the text by Cortés Zulueta), makes it possible to internalize, thus transmitting to the individual the codes of the group to which he belongs, without him being aware of it (Bourdieu 1984: 260–281). Nevertheless, such groups and individuals, even when they occupy dominant positions in the society to which they belong, are rarely in a position to modify *Les règles de l'art*. The evolution of art takes place in a more complex way, and is only successful if it is part of an evolution of society as a whole (Bourdieu 1998: 421–424). This means that art is neither completely autonomous, nor entirely dependent, but that it contributes or attempts to provide elements that can accompany and even orient social evolutions.

David Krych's work, *From Beast to Machine*, reveals this process in action. Animal fights, particularly appreciated by certain popular groups and part of the nobility in the 18th century, sought to exalt the "bestiality" of nature. However, these shows evolved over the period studied by Krych and, under pressure from the rising bourgeoisie, tended to become *humanized* by presenting animals not longer as aggressive brutes,

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but capable of performing complicated routines and obeying their masters' injunctions.

Despite the suppression of explicit cruelty, and despite the showcasing of their pleasant aspects, suitable even for families, these new spectacles nonetheless exerted a much stronger violence on nature, which, moreover, leaves the mechanism of its process – the training of animals – hidden from its primary audience, which is now the new bourgeois class. This way of "subduing" the "bestiality" of non-humans perfectly integrated and responded to the industrial and capitalist mentality of the 19th century, in which nature was to be entirely subordinated to man in order to achieve productivist aims. It is this same evolution, superficially less cruel (and seemingly more respectful of the living world), which is at the origin of the ecological catastrophe we are living through today, in the Anthropocene. And art, taking on a more *human* appearance, has both followed and encouraged it.

Art therefore has its own share of responsibility in the ecological drama we are living today. This is the last aspect that this introduction aims to emphasize. Bio-Art, though a young art form, has already made fundamental changes to its very nature. Born in the 1990s, it deliberately embraced and sparked controversy, e.g. by Eduardo Kac with his famous fluorescent GFP rabbit, allegedly created by gene manipulation to warn us, according to the artists who practised it at this time, against the dangers of the new bio technology.[5] Protagonists of Bio-Art shared such taste for polemics with the whole of art, which at around the turn of the 21st century began to thrive on provocation as a means to attain publicity and also addressing a wider public – and which soon became one of the preferred instruments of populism. It was only later, with the acceleration of climate change, awareness of the imminent mass extinction of species, pandemics, etc., that Bio-Art, or rather bio-artists acquired a new sense and sensitivity and developed expressions more in line with the related concerns of wide portions of contemporary society. In

5 According to INRA, the French Institute for Agronomic and Animal Research, the rabbit was never developed there by or for the artist – which is what Eduardo Kac had claimed (Launet 2011: 103–105).

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response, the discourse of the new bio-artists evolved, and their works assumed, according to them, a predominantly pedagogical objective: to make the public aware of the urgency to change their behavior in order to curb the ecological catastrophe caused, mostly, by productivism and consumerism.

In his essay *Opera Aperta*, Umberto Eco (1932–2016) points out the necessity for art to remain polysemous so as not to become a mere propaganda tool (Eco 1997: 167–177). This principle concurs with Sergio Dalla Bernardina, who points out in his contribution, *The Place of Martyrs*, that the viewer has the right, if not the duty, to be critical. He does so in examining not the living in art, but the dead: hunting trophies and other corpses of animals (including humans) which are increasingly on display in private and public spheres. These recent uses, some for merely decorative purposes, are contrasted with ancient perceptions of the dead body as something sacred – and therefore not dead. The author stresses the importance of questioning both the creations and the discourses that accompany them, which must be verified, first and foremost, in the works themselves. The artwork, including in the context of the Anthropocene and its dramatic consequences, should therefore not be reduced to the artist's educative intentions. Especially since it is almost impossible today not to be aware of the crisis we are living through, and that the effects of changes in our behaviour are often thwarted by the short-term, and often very short-term, interests of dominant groups, adding to the ecological crisis an equally profound democratic crisis which leaves many citizens with a bitter taste of powerlessness.

In her contribution on *Crosscutting Arts, Sciences and Technologies*, Emeline Gougeon introduces the reader to works of bio-artists rendering audible and visible the hidden: the sounds of whales, the effects of marine noise pollution on plankton, the circulation of chemical information between trees and fungal colonies in the soil. It is about (re)sensitizing, and about its impulses for a more circumspect environmental ethics. This is echoed by the text from Regine Rapp and Christian de Lutz, *How Artists Hack Laboratories and Alter the Futures of Science*, indicating some of the directions taken by bio-artists, in particular, by questioning science and its methodology. Many of the artists presented by Gougeon, Rapp and

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de Lutz are employing microorganism (fungi, bacteria etc.) or plankton in their work, others are investigating the prospering of fungi and bacteria on micro-plastic – and, by the way, on latex and silicon sex toys. Quite a few of these organisms are capable of colonizing *Homo sapiens* as their host – which brings us back to Allen Ginsberg's metaphors and inversions. Bio-artists thus render visible a veritable universe beyond human perception, and sensitize to an unsettling aesthetic oscillating between imminence and beauty.

While Regine Rapp and Christian de Lutz emphasize the simultaneous quality of these artists as scientists, André Rottmann's *On the Ecologies of Contemporary Art* shows artists who use technology rather than science to produce hybrid works integrating artificial intelligence, art and the living. These literarily spectacular works deploy considerable amounts of technical, human, economic and energy resources. The western industrial paradigm has always built on replacing human with non-human energy – from draught animals, wind and water to fossil and nuclear power (Vries 2013: 177–183, 199–203). With computer technology, this is now extending to the world of art, taking recourse to data processing centers absorbing increasing portions of electricity.[6] The artworks stand in stark contrast to those presented by Rapp and de Lutz, not – or much less – in terms of the artists' declared intentions or their aims and positioning regarding the living world, ecology and the Anthropocene, but in terms of the artistic paradigms involved and the very notions of art they convey, and even in terms of the audiences they address. These oppositions not only confirm Dalla Bernardina's statements, but also, and above all, demonstrate the relevance of this book's historical approach, which, as mentioned above, provides a comparative framework for our relationship not only with the living world, but also with Art.

6 The total energy consumption of data processing centers worldwide corresponds with the total electric energy consumption of Germany – one of the leading industrial nations. The total energy consumption of such centers in Germany corresponds with the total electric energy consumption of Berlin.

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These points are just a few examples that highlight the richness of the texts here assembled. However, separately or compared, they also reveal other equally fundamental aspects of the use of the living in art. It is therefore necessary to point out that, even more than in other collective publications, each text in this book (including this introduction) reflects the position of its author(s) alone, and in no way commits the contributors or editors as a whole. This explanation is essential, given that the aim of this publication is not to establish truths, but rather to open discussions fueled by writings that may, at times, or in certain respects, conflict with one another.

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Part One: humans – cosmos/culture – nature

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The Place of Martyrs

About the Artistic Recycling of Taxidermied Animals

Sergio Dalla Bernardina

The "cabinet of curiosities" is *en vogue*. Aesthetes, designers and interior magazines are suggesting the use of taxidermized animals for decorative purposes. In the contemporary art world, the use of these "ready-mades" is extremely common. Does this mark a return of paganism? Triumph of animalism? Posthumous homage to the living? This is all very plausible. Yet, the sacrificial hypothesis indicates other directions. From a message from the Drouot auction house concerning two works by the artist Pascal Bernier:

> "He is best known for his hunting accidents: mortally wounded, stuffed animals whose wounds have been carefully bandaged by the artist. By this symbolic and redemptive gesture, he saves them from a second death".[1]

Behind the motives evoked by the artist ("With this work I wanted to signify that …"), are we allowed to imagine motivations that are irreducible to his claims? Can we explain the success of an installation, of an artistic tendency, by factors that do not appear in the official comments? It's an obsolete question, it's true. And the response is clear and well-known: yes, we are allowed – and the massive irruption of stuffed animals in contemporary art, in trendy cafés and even in private homes, from which

1 https://drouot.com/l/15438946-pascal-bernier-ne-en-1960-acci last accessed 30.03.2024.

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they had been banned in the name of ecological morality, provides the opportunity to revisit this old debate.[2]

Curiosity and voyeurism

For a while, having worked extensively on the anthropology of hunting, I sought to compare the display of trophies with the achievements of artists who exhibit the same "cadaver pieces" in other venues. Hunters too, in the past, defined their practice as "art" (and taxidermy, from this point of view, could even be described as bio-art before bio-art). So I wondered: if I question the hunter's explanations, why should I take the artist's literally? To interpret the hunter's occult motivations, I based myself on the descriptions of hunting rituals reported by James Frazer in *The Golden Bough*. Ambivalently, the hunter-gatherer exults at his victim's death (in this case a bear), wreaks havoc on his lifeless body, savors the violence of his deed, and at the same time feels regret. He finally sympathizes with the dead body and devotes a veritable cult to it. At the same time, he lies to it: "Who killed you? It was the Russians. Who cut off your head? It was a Russian axe." These words were spoken by a hunter from a Siberian indigenous tribe, hence why he accused a Russian of the misdeed instead. Likewise, indigenous bear hunters in North America would beg the killed animal not to be angry, and even try to appease him with such words: "Cherish us no grudge because we have killed you. […] Is it not glorious to be eaten by the children of a chief?" (Frazer 1894: 111, 113)

Sigmund Freud was not unaware of this ambivalence and, in *Totem and Taboo*, used these examples to support his largely hypothetical the-

2 I started looking into the rehabilitation of stuffed animals in my study on *Le retour du prédateur.* For the German equivalent of this phenomenon, see, for example, *Le Point*: "Les trophées de chasse, comble du kitsch devenu tendance déco en Allemagne", https://www.lepoint.fr/insolite/les-trophees-de-chasse-comble-du-kitsch-devenu-tendance-deco-en-allemagne (last accessed 29.03.2024).

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ory of the "totemic banquet".[3] Today, in the age of the "ontological turning point" (Keck/Regehr/Walentowitz 2015), there is a tendency to focus on the reconciliatory aspect of these rituals, interpreting them as evidence of the feeling of proximity and interdependency that links humans to non-humans. My attention was drawn to the first part of the sequence, when violence precedes sanctification: the trophy not only repairs things, but it also perpetuates the "delicious" memory of a kill.

The artist as pornographer

So it would reasonable to imagine that the same might be true of contemporary artists who manipulate the bloodless remains of other people's victims (in most cases, they "recycle" already dead and tanned animals) for a good cause. Their function, in this perspective, would be to allow an externalization of humans' empathy for other species as well as our sadistic and destructive tendencies. A painting or a sculpture would certainly suffice. But what makes the experience particularly appealing in this archaically-rooted "body art", is that the dead being put on spectacle is a real dead being. A flesh-and-blood ex-vivor.

When Angela Singer shows her hinds covered in blood or her foxes wearing funeral wreaths on their backs, it's for moral and philosophical reasons: "She is concerned with the ethical and epistemological consequences of humans using nonhuman life and the role that humans play in the exploitation and destruction of animals and our environment".[4] But her work may also offer, by indirect and sophisticated means, the same exciting and macabre experience formerly reserved for hunters.

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3 There was a time, according to Freudian conjecture, when the young males, excluded from relations with the women of the family group, banded together against the father, killed him and, seized by recognition and remorse, began to venerate him. In this scenario, murderous violence and posthumous rehabilitation coexist as a kind of paradigm structuring our unconscious. Freud, *Totem and Taboo*.

4 http://www.thephotophore.com/angela-singer/ (last accessed 29.03.2024).

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When Andres Serrano captures the audience's gaze with his decapitated cow, it implies the edifying commentary of his exegetes: "It's the nerve of an Andres Serrano to impose his bloody cow head in 2008, with its fixed gaze demanding vengeance and forcing us to recognize violence we'd like to do without".[5] But this bovine head, elegantly placed on a marble pedestal, is also reminiscent of other decapitations and that it renders "consumable", through the intermediary of an animal, the violence anonymous members of a voyeuristic public indulge in watching.

The catalogue for the *Cabinets de Curiosités* exhibition, organized by the Fonds Hélène et Éduard Leclerc pour la Culture in Landerneau in 2019, may provoke the same suspicion: are the testimonials of those involved authentic? Introducing his collection and announcing a change of perspective, arts patron Antoine de Galbert writes " […] In the end, I only selected works denouncing […] the sad destiny that our world reserves for animals: Rabbit slippers by Wim Delvoye, Snake with legs by Joan Fontcuberta, Dripping octopus by Thomas Feuerstein … All objects of contemporary cabinet". Referring to Mahatma Gandhi, Galbert claimed that the greatness of a nation can be judged by the way animals are treated (Fonds Hélène et Éduard Leclerc 2019: 197). Contemporary art is thus a committed art, and if it dramatizes animal suffering, it is to display our inhumanity. But an unwilling observer might see this argument as a mere pretext and reply: "Wasn't there something morbid about the *curiosities* of the old times? And have we really changed from the past?" He might even compare the ingenuity of the contemporary artist and collector to a recent version of the "Comedy of Innocence" (the concept owes much to the Swiss classical scholar an ethnologist Karl Meuli), the ambivalent staging typical of archaic hunting rituals that caught the attention of the father of psychoanalysis (Dalla Bernardina 2020b, 15–17).

5 https://www.instagram.com/p/CeDdgCMI5Jh/ (last accessed 29.03.2024).

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"Hottentot Venus"

The "curiosities" of yesteryear display a discrepancy between their prosaic background and the nobility of official explanations. Earlier societies infatuation with the bizarre and scabrous was not confined to inanimate remains. Take the case of Sarah Baartman (1789–1815), the so-called "Hottentot Venus" who made headlines when, some twenty years ago, the French state was obliged to return her mortal remains to South Africa. Her story has been researched: in 1810, the unusual morphology (hypertrophy of the hips and buttocks and protruding genitalia) of this Khoikhoi woman was noticed by a naval doctor who, after promising her emancipation from slavery and a brilliant career, took her to London, where she was exhibited in a "human zoo" in Piccadilly Street. After Londoners' interest wore off, Sarah Baartman ended up in Holland, then France, exhibited by an exotic animal showman in cabarets (3 francs to see her, more to touch her).[6] Her physical characteristics caught the attention of scientists: to increase the knowledge of the Muséum d'Histoire Naturelle, the zoologists Étienne Geoffroy Saint-Hilaire (1772–1844) and Georges Cuvier (1769–1832) meticulously studied her physiology, subjecting her to all sorts of measurements. She died in 1815, but her vicissitudes continued: Cuvier had her genitalia and brain preserved in jars of formalin. Her skeleton, along with her body's painted plaster cast, were installed in the Jardin des Plantes. Later, they were moved to the Trocadero, before landing at the Musée de l'Homme. The status of the "Hottentot Venus" changed: from a monster to be laughed at, to a museum object and even a "scientific attraction", a source of study for specialists and information for amateurs. The audience's curiosity is still there, after all, even if its causes are no longer the same.

Today, these causes and reasons are no longer enough. The debate surrounding the repatriation of Sarah Baartman's remains in 2002 has raised new questions. Even the motives of a scientist like Cuvier, who

6 I obtained all this information from Wikipedia: https://fr.wikipedia.org/wiki/Saartjie_Baartman

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worked for the "advancement of human knowledge", have become increasingly dubious: by exploring the intimacy of this African woman, searching for who knows what difference, wasn't he playing doctor, like children who, under the pretext of a medical examination, hide motivations of a different nature? And in any case, how could he have conceived the idea of "taxidermizing" the "Hottentot Venus", when this treatment is reserved for saints, kings and animals? It seems like a practice from another time, incompatible with contemporary sensibilities.

Venus from our home

In Landerneau, however, as part of the Leclerc exhibition mentioned above, I have met the equivalent of the "Hottentot Venus". This "item's" description reads: "Woman with beard. Life-size mummified bust of Germaine D., Delmas-Orfila-Rouvière Collection"[7]. Here is the account of my encounter with this "scientific attraction", whose museal use did not raise the least objection, in contrast with what happened to its South African counterpart:

In this vast assemblage of heteroclite collections, there was no shortage of trophies. Inspired initially by the poetics of simulation, I let myself go into animist fantasies: 'How many souls are in this place? I feel presences everywhere'. There were indeed 'cadavers hanging on the wall', there were plenty of them, but the deadly effect was balanced, I'd even say exorcised, by the comic nature of their presentation. The same enigmatic taste was evident in the next room, which hosted contemporary artists' works. Not far away, visitors with inscrutable expressions silently contemplated a display case. It contained the mummified remains of Madame Germaine D., 'Bearded Woman'. I thought several things at the same time 1) It must be terrible to be here, for the soul of this lady whose pilosity is being perpetuated. 2) This poor woman must have suffered so much. Now it's all over. 3) That beard, though… It happens sometimes.

7 Listed as a historical monument in 1992. Faculté de Médecine de l'Université de Montpellier, page 192 of the catalogue.

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It happened to her, bad luck… Knowing the controversy sparked by the posthumous tribulations of the "Hottentot Venus", I expressed my astonishment to a young security guard who was explaining the contents of the room: "Nobody says a word about this lady?" … "Well yes, there are some who have doubts. But tests are underway to prove that the beard is really hers."

Figure 1: Bearded woman

© Sergio Dalla Bernardina

In the traditional mind, if you have an exuberant beard and you're a woman, you're classed as a prodigy or a freak. And since you're a freak, you can be exhibited. A woman's beard, as a transgression, as a 'mess', is both a fault and a punishment. What is Madame Germaine D. guilty

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of? Of having a beard, of course. In short, we're displaying the stigma of someone who, throughout her life, has been stigmatized. If we can do this with little apprehension (here referring to the imaginary operations, which are not always politically correct), it's because of her theriomorphism, midway between human and animal, between mummy and trophy (Dalla Bernardina 2020, 38–39).

Bio-crafts

We talk about the "art" of taxidermy. Is it art or craft? That's an important question. In any case, aesthetics plays a central role. The same applies to moldings that reproduce flesh-and-blood individuals identically, or simply copy parts of them.

The other star of the Fonds Leclerc exhibition was the "double inversé" of Germaine D.: an "anatomical Venus"[8] in wax dating from the Napoleonic era. The lighting in the room emphasized dark tones, leaving Germaine D. in penumbra and underlining the mortuary charm of the Anatomical Venus with a luminosity that contrasted with the surrounding blackness. The contrast was striking: on one side, a bearded lady dressed up to the neck (she hid it behind a lace); on the other, a naked, perfectly waxed young girl. She lay in the middle of the room, offering visitors much more than her nudity. Her Pygmalion had created her to help medical students understand the location of our various organs. The aestheticism of the project was obvious, as the scientist and waxwork expert Abbé Felice Fontana (1730–1805) had chosen an exemplary creature rather than just any specimen marked by age and life's torments. The feeling of being in the presence of a real person, having truly existed, gave the simultaneous sight of her angelic face and her wide-open belly additional poignancy. The darkness of the place set the imagination free, inviting fanciful comparisons: Snow White in the evil plans of the Queen Witch? Iphigenia sacrificed to Artemis to allow

8 This is how these artifacts are termed.

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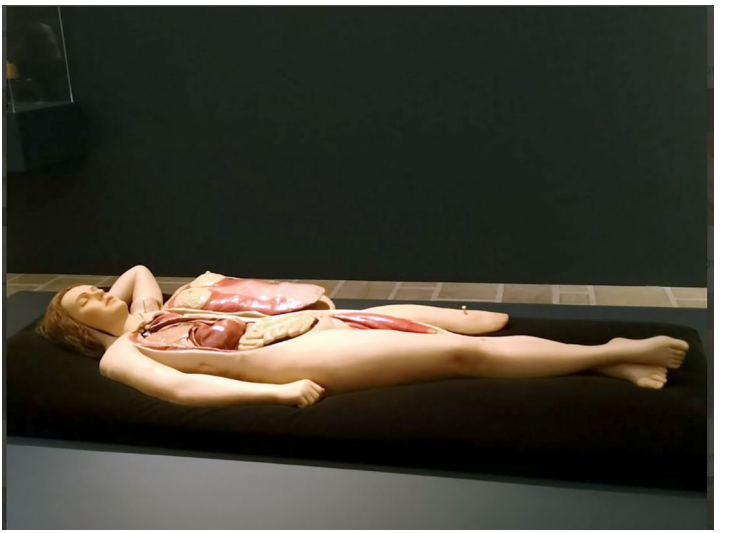
Agamemnon's ships to sail? The protagonist of Boccaccio's story "Nastagio degli Onesti", set to pictures by Botticcelli, pursued like a deer in the pinewoods of Ravenna and gutted by her pursuer? (cf. Didi-Huberman 1999) A victim of Jack the Ripper? The human equivalent of the game animals with gaping wounds that hunting painters – Frans Snyders (1579–1657), Alexandre-François Desportes (1661–1743), Jean-Baptiste Oudry (1686–1755) … – immortalized in sensual poses, or in their icy rigidity? In any case, it was a powerful projective medium, able to arouse a broad spectrum of emotions ranging from pity to concupiscence, from compassion to macabre pleasure.

Figure 2: Anatomical Venus



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Focusing on the strange, the exotic and the baroque, the installation also played on the "sacred" effect, creating an environment halfway between the temple and the morgue. There was no lack of liturgical ob-

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jects, both Christian, like the numerous reliquaries concentrated in the adjacent chapel, and pagan, like the majestic trophies borrowed from the Musée de la Chasse et de la Nature. Can we speak of ritual to define the stereotyped behavior of the public in front of these artefacts charged with death? Anthropologists have little sympathy for "profane" uses of this notion. They point out the distance that separates a recurring collective action, devoid of any transcendent intention, from a practice defined as ritual by the actors themselves. Observation of behavior, however, bears a resemblance to the conduct of a faithful pilgrim. Visitors penetrate the site. As the pilgrims pass through the hall, their gestures become uniform, they speak softly, they decode the legends and make their exegesis. The participant asks about the identity of the person being "shown", the reasons for his or her exceptionality, about his or her eventual tribulations and the circumstances of his or her death. At the exit, visitors buy a souvenir that maintains a metonymic link with the "idol" ("figure, statue, material object that is assumed to be inhabited by the divinity it represents, and which is worshipped as the divinity itself", according to the Centre National de Ressources Textuelles et Lexicales).[9] This purchase captures a little of its charisma and brings it home.

In museums and art galleries, this attitude is the norm: confronted with the spiritual, visitors rediscover the reflexes of a community that, for two millennia, has gone to church every Sunday. Putting collective events (inaugurations, commemorations, etc.) on a religious level is part of its habitus. Once internalized, this disposition doesn't need to be conscious. Nor does anyone feel any need to, since the very essence of ritual, through its recourse to the symbolic, is to authorize psychic adventures that remain inaccessible to consciousness and, to function, must remain so (Dalla Bernardina 2020b, 9–25).

What, then, is the implicit meaning of these museographic adventures centered on encounters with taxidermized ex-living beings? This recalls the initial question of this chapter about the artist's intentions: do anthropologists have the right to imagine motivations behind the artist's and his public's evoked motives that are irreducible to their

9 https://www.cnrtl.fr

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statements? The gap between "the view from afar" of the anthropologist and the perspective of actors involved in his observation can be considerable: leaving the exhibition with a satisfied mind, the visitor would find it hard to recognize any aggressive or funerary disposition in the experience he/she has just undergone. Instead, he/she would likely discuss the cultural and recreational aspects of the visit. I can imagine the visitor's astonishment if I were to share with him/her my conjectures about the analogies between the archaic rituals described by Frazer and the contemporary passion for the taxidermized living: "You emphasize the historical value, the didactic aspects, the artistic gesture, but the spectacle of these patched-up animals, these wide-open bellies, has enabled you to identify with the persecutor and his victim, projecting your sadomasochistic fantasies onto a legitimate object." It's a typical case of the Comedy of Innocence: confronted with the body of the vanquished, the victor gets excited, lashes out, lets off steam, repents and recollects himself. He even ends up sympathizing with the dead and resenting his executioners. The visitor might reply: "You're quite eccentric! Where do you see all these infamous intentions? You have to be perverts to imagine such things… And, what's more, you only focus on one aspect of the exhibition. Read the catalogue, which perfectly sums up the minds of the organizers as well as my own. For example – and the list of motivations is long – the aim was 'to use surprise as a poetic factor, via an aesthetic of shock, contrast and *wow*, with numerous conceptual and material changes of scale' (Fonds Hélène et Edouard Leclerc 2019: 9). The idea was to show that the whole world is now a huge cabinet of curiosities, and that these curiosities are not just the ones you're pointing to. There is no need to look for latent motivations: if I'm here, it is to document myself while having fun, to educate myself through wonder."

Not quite sure I'd be able to convince him, I'd reply: "It's true, I wanted to emphasize the mortuary atmosphere, because it seemed central to me, and the ritual dimension, because its function, although not in the foreground, is decisive.[10] Ritual is both a 'setting in tradition' and

10 "And, I would add, I don't pretend to exhaust all the meanings of your participation in this event, I'm just offering a perspective. Should we refuse it a priori?"

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a 'setting in common'. In this sense, it allows the individual to suspend his or her critical exercise and transfer moral responsibility for his or her views to the collective. From this perspective, the artist is a delegate.[11] His area of expression is an autonomous field whose legitimacy he manages. What is comforting about the objects he presents is that they come with their 'prescription', their 'instructions for use'. This is the function of the catalogue."

Travelling cemeteries

To summarize the above described dynamic: the public is shown a stuffed corpse, they contemplate its condition, empathize with it in the etymological sense (suffering with it). At the same time, the audience profits from his spectacular death. This is not automatic. Sometimes, as with the pieces by Damien Hirst or Gloria Friedmann, it works. Sometimes it doesn't (thus relativizing the generalizations previously proposed). In some cases, in fact, behind the fascination for stuffed remains, the extra-artistic and extra-didactic motivations are so obvious that they make the censor want to act.

From February 12 to April 21, 2009, the exhibition "Our Body – À corps ouvert" in Paris opened its doors. It took place at Espace 12, boulevard de la Madeleine. The public came to admire 17 wonderfully preserved, flayed human bodies.[12] Chess players, runners, archers, rendered in their usual posture, with muscles taut and blood vessels in full view.

Previous versions of the show have attracted over 30 million visitors worldwide.[13] Its origins lie in Gunther von Hagens' discovery of plastination or polymeric impregnation, a sophisticated technique that replaces

11 On the mechanism of delegation, I refer to Sigmund Freud's classic "Mass Psychology and Ego Analysis," in Freud 2001, pp. 129–133.

12 This was not my case, as the pre-logical component of my mentality led me to perceive, in these frivolous contacts with the dead, something contaminating.

13 That's how important the study of anatomy is to us.

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body fluids with silicone. No more stuffing, embalming or formaldehyde. Just polymerize and voilà: the flayed animal retains its translucent freshness for many, many years to come.[14] The German anatomist began exhibiting his specimens in Japan in 1995. He continued in the United States, Europe and Asia. The artistic-didactic enterprise was clearly very appealing. At first, it was a success, even in France: 100,000 visitors in Lyon, 35,000 in Marseille. Show producer Pascal Bernardin, known for organizing Michael Jackson and Madonna concerts in Paris, was asked to take care of the Parisian version. The official motivation for this initiative was not far removed from the Promethean impetus that drives the experts at the Muséum National d'Histoire Naturelle, but the focus was on body care: "to make accessible to the general public what until now has been the exclusive privilege of the medical profession, to enable greater self-knowledge and to raise public awareness of health" (Evin 2009).

Not everyone was convinced. Associations mobilized against a form of barbarism which, in their eyes, had all the air of an irreverent farce questioning the boundaries between the human and the non-human. The Comité Consultatif National d'Ethique (CCNE) saw it as an affront to human dignity, and emphasized the commercial nature of the operation. Questions were also raised about the origin of the corpses, with Asian purveyors suspected of having sold the bodies of dead convicts (of which there is no shortage in China) to the "plastiners".[15] A double fault, then: one of "commodifying" human bodies, and the other of doing so without the consent of the "donors".

The judges intervened. After calling "Our Body" an "illicit attack on the human body" and a show "contrary to decency", it ordered its immediate closure. It is curious that the first country to ban this macabre show

14 In this context, I'd like to recall the research of a pioneer in this field, the Italian Girolamo Segato, who had already achieved remarkable results by other means at the beginning of the 19th century (Dalla Bernardina 2020b).

15 In the background, perhaps, is the pre-modern idea that the body of a criminal has lost its sacredness and can be used for whatever purpose one wishes.

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was France, a country which in the Western imagination is not the most rigorous in terms of censorship.

Intermediaries

In this story, Gunther von Hagens plays multiple roles. He is an educator, a scientist, a taxidermist, a businessman and a showman. He is also an artist, sculptor and choreographer. From the two bodies engaged in eternal coitus that he presented to the Berlin public, to the nonchalant poker players frozen forever in their everyday lives, all his "skinned in context" finally vacillate between different statuses. The inventor of plastination may not be an artist in the true sense of the word, but he contributes effectively to the hybridization of genres.

Equally interesting is the role of the judge seeking to re-establish the boundaries. His decision calls into question not only the motives of the authors, who cease to be "Prometheus" and reveal their nature as merchants, but also those of the public, who thus become their clients. This judge's opinion goes beyond the "Our Body" case, and casts its inquisitorial shadow over all the cases we have examined until now.

At this stage of the thought process, without being limited to the magistrate's opinion, I wondered: is there anything intrinsically immoral in recycling inanimate remains to make transitional objects?[16] That's debatable. In any case, it would be difficult not to consider these posthumous manipulations, even when they claim to be respectful, empathetic and restitutive, as profanations. But then, should Cuvier, whose scientific prestige indirectly authorized the indecent glances from a crowd of curious onlookers be criticized? Should the anonymous craftsman who taxidermized Germaine D. and the Fonds Leclerc who,

16 The "transitional object" (a concept we owe to pediatrician Donald Winnicot) enables children, as well as adults, to project their emotions onto something outside themselves. Such is the case with the animal in contemporary society, which in my blog *L'animal comme prétexte* (https://lanimalcommepretexte.blogspot.com/) is seen as a "teddy bear for adults" (*nounours pour adultes*).

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for historiographical reasons, pilloried her for a few months, be blamed? Should Gunther von Hagens and Pascal Bernardin, who treat human bodies as trophies, artworks, zoological specimens and sources of profit, inviting us to confuse the categories, be blamed? Should Andres Serrano, who puts cow heads under our noses in the name of animal welfare, be blamed? Should Angela Singer who, for the same reasons, inflicts upon us the vision of a bloodied beast and perpetuates, through media circulation, its agony, be met with indignation?

That would be too easy. Ultimately, they are merely intermediaries: the actors in a performance that, by playing on the conventionality of the venue, on the ritualization of behaviors and on the use of persuasive argumentative apparatus, allows the public to externalize their sadistic and necrophile fantasies without paying the moral consequences.

Are we all necrophiliacs?

The reference to sadism and necrophilia is easy and reductive, tells nothing about the quality of the work (the fact that Goya's "The Disasters of War" series may be shot through with necrophile latencies in no way detracts from its artistic value). It can, however, help to better understand the extra-artistic factors involved in the emergence of a fashion, a collective fervor. As Ernest Gombrich so eloquently demonstrated, the work of art is a means of externalizing socially disapproved fantasies (Gombrich 1967). In this age of animalistic awareness, people no longer have the right to rejoice at the bloody spectacle of a hound hunting, to shudder at the sight of a doe riddled with buckshot… An alternative is to shift the source of voyeuristic pleasure into the less dubious field of aesthetic contemplation: "It's horrible, but it's beautiful…"; or moral criticism: "It's awful, I know, but I have to testify, I have to denounce…". The artist, in the unsympathetic perspective as suggested here (hiding behind Gombrich and his Freudian references), becomes a pornographer. And the public his accomplice.

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Illations

There is another, less demeaning hypothesis that could explain the nonchalance with which taxidermized animals are accepted in art galleries, public spaces and the intimacy of the home. This last passage deserves a preamble. The highly hypothetical nature of this approach will have been stressed. To underline this conjectural character, and to avoid repeating the word "conjecture" too much, I have looked up in dictionaries the equivalent of the Italian synonym illazione, which the encyclopaedia Treccani presents as follows:

> "inference art. F. [from lat. illatio-onis, der. d'illatus, past participle of inferre 'to deduce']. – Inferring by arguing, the mental process by which a logical consequence is drawn from a premise: reasoning by successive inferences. More com., the judgment itself which is inferred by deduction; conjecture (and in common usage, it means above all, with a negative connotation, an unwarranted and unjustified conjecture)".[17]

The term "illation" also exists in French, but its meaning is not the same: "L'illation is the term used in Christianity to refer to the transport and return of a saint's relics to their original church".[18] This final illation mixes these two meanings, leading to the identification of relics where one sees only trophies, works of art or anatomical pieces, and to return them to their original place.

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17 Illazióne s. f. [dal lat. illatio -onis, der. di illatus, part. pass. di inferre "inferire"]. – L'inferire argomentando, il processo mentale con cui da una premessa si trae una conseguenza logica: ragionare per i., per successive illazioni. Più com., il giudizio stesso che s'inferisce per deduzione; congettura (e nell'uso com. s'intende per lo più, con connotazione negativa, una congettura indebita, non giustificata) https://www.treccani.it/vocabolario/illazione/ (last accessed 29.03.2024).

18 https://www.linternaute.fr/dictionnaire/fr/definition/illation/ (last accessed 29.03.2024).

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For some time now, in fact, I've been noticing the religious and mystical overtones of the prevailing discourse on animal death. This is true for hunters, who make their practices sacred through ritualized behavior (neo-pagan ceremonies in honor of their victims, the proliferation of Saint Hubert masses, etc.) and who address their trophies in a respectful tone with animistic overtones. The same is true of artists who, at least since the time of Josef Beuys, have readily played on the metaphor of shamanism.

Taxidermists often speak of a veritable "presence", a very special force that emanates from stuffed animals. Their simulacra are only remains, it's true, but charged with mana, as the Polynesians would say. But remains are relics, and to explain their "magnetism" can't simply involve referring to their "realism" or "icasticity". Where does the power of relics come from? It comes from the sanctity of the individual from whom they came, from the "whole" of which they were a part. But it also comes from the way they were made. The value of relics, for the philosopher and historian Krzysztof Pomian, depends, among other things, on their proximity to martyrdom. In other words, the more the saint was persecuted, the more he suffered, the more his body was pawed and torn, the more effective his relics (Pomian 2003).

Which leads to the sacrificial device. What is the performativity of the scapegoat at the heart of the bloody sacrifice? It is the projection of mimetic violence that cyclically emerges within the community. As René Girard points out, the victim must resemble his lynchers in order to fulfill his cathartic role. They must be both similar and different (Girard 1972). This is precisely the case with the animal: a symbolic substitute which, thanks to the discoveries of ethologists and the reflections of philosophers, is becoming ever closer to the human while remaining something else. In short, the beast on the wall, this three-dimensional summary of persecution and killing, is a scapegoat. A substitute, indeed, little more than a quotation, but it retains its links with martyrological iconography. The place it occupies in the contemporary world is precisely that of the martyr. Sterilized, embalmed and socialized by its introduction into the domestic sphere, it spreads its beneficial effects throughout the community.

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This analytical perspective changes the nature of fascination for artistic representations featuring an embalmed carcass. Instead of being reduced to pretexts for externalizing death pulsion, they become sacrificial acts, immolations. And the wildlife artist ceases to be a pornographer (if he ever was), to become a high priest, an officiant.

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Body Ornamentation in Pre-Columbian America

A Body Language of Aesthetics?

Jérôme Thomas

The first and probably the ultimate work of Art with which man is confronted is without context his own body, either by modifying it or by using it as an artistic medium. It is enough to recall the many hands in red or black discovered in prehistoric caves which define the beginnings of an artistic language, such as in the Cueva de las Manos Pintadas located in Patagonia and dated 9300 CE. All societies have long associated symbols, metaphors, and significations with the body. The human body, with its physical and psychological properties, figures both as a basis and mediator in cultural interactions and, as such, is affected by the social life its supports. The French anthropologist Maurice Leenhardt delivered this reflection in his 1937 study of the society of New Caledonia: "Adornments and body modifications are the most subtle esthetic means by which man expresses, complexes or affirms states that his words cannot express." (Leenhardt 1937: 112) Painted, adorned, shaved, depilated, covered, tattooed, scarified, pierced, incised, deformed, manipulated– the body has been, is and will always be the object of special attention in all societies. No people have ever lived naked. The public is both fascinated and sometimes appalled by the potential for transformation offered by the body. It is possible to manipulate it in countless ways whether through the lengthening of the ears or the lower lip, the piercing of the nasal septum, the binding of the legs or the thighs. One can also proceed to castration of the genitals or breasts, deformation the feet or circumcision. And of course, deform the skull and manipulate the teeth. The list is almost endless.

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The body carries a symbolic burden and occupies a decisive place in identity expression and social communication. Ornament means as much as it adorns, and all these interventions on the body participate in the expression of a humanity. The body is not neutral, as evidenced by the various interventions which arise from an "organisation of appearances" (Barthe-Deloizy 2003: 23). This is all the more true since the body is a material that is easy to work with. The British archaeologist Joanna R. Sofaer notes:

> "The plasticity of the body means that the body is never pre-social and is contextually dependent. There is no gene for plasticity. It is not precoded. Plasticity is a developmental phenomenon that exists from birth to death. For the skeleton, plasticity, as a material quality of the body, rests upon the physical, chemical and mechanical properties of bone which are, in turn, a function of biological processes." (Sofaer 2006: 74–75)

The ornament serves to mark the social condition, profession and general hierarchical categories. All Amerindian peoples used dye or pigmentary substances for various purposes: aesthetic (to attract the eye), hygienic and practical (heat, perspiration, protection of the skin against insects and the sun), prophylactic (bubos, fevers, cavities), magical and religious (war, protect against hostile and evil forces, snake bites). Using the example of the head, Mexican anthropologists Vera Tiesler and Maria Cecilia Lozada specify:

> "The head, in its natural or culturally adapted presentation, is a central locus not only of spirituality but also of appearance and body display. Put on social stage, the head turns into a canvas for social discourse and performance-in reality, all human interaction […]. It is organic hard-ware of what David Le Breton and Marcel Mauss describe as 'corporal sociabilities', body techniques, and embodied interactions." (Tiesler/Lozada 2018: 1; cf. Le Breton 1985)

Beauty, aesthetics, power and domination are all reflected in it. A reflection on idolatry by Franciscan missionary and ethnographer Bernardino

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de Sahagún (c. 1500–1590) further emphasizes the importance of the head for pre-Hispanic societies by its association with celestial space. According to Sahagún's native informants the head is referred to as the *ilhuicatl* which means the sky: "our head, in other words the sky" (Sahagún 1577: III, l. X, c. 27, § 2, f 72v.). The head also channels the flow of energy from the sun into the body at birth.

Before going into detail, it needs to be emphasized that this article is widely based on such ethno-historical and ethnographic sources that provide valuable evidence on these body-related practices. This refers just as much to the subjectivity of the observers and their cultural codes as to the precise data offered by direct witnesses and reporters or who have collected their information from locals. Archeological data can refine, complete or even invalidate historical sources. I propose here a reading grid to try and answer the following questions: How and why societies regulate one's appearance by manipulating the body? Can we go beyond a simple aesthetic reading? Are we not faced with a complex socio-cultural representation? How and why do societies regulate these distinct appearances?

Painting the bodies, wearing feathers, dyeing and manipulating the teeth

What most impressed Europeans when they first arrived in the Americas were the preexisting body modifications observable in most of the indigenous populations. Some had become residual, such as cranial vault modification, while others, such as dental manipulations, were still alive in the 16th century, mainly in Mesoamerica and northern South America. These practices were part of the daily fabric of social relations and also punctuated significant stages in the lives of individuals (initiation rites, mourning, etc.).

Drawing up a panorama of all the body ornaments used by the native American populations is a challenge that is difficult to meet in the space of this contribution as the variety of ornaments is extraordinary and spectacular. The peoples used all the resources of nature to beau-

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tify their bodies, to enhance them and to offer a vision of themselves, mingling aesthetical, religious, social and cultural aspects. In the eyes of the European conquerors, the dazzling diversity of the native population's body embellishments became essential attributes of their identity. Body paintings challenged the first Europeans in the "New World", among them of course Christopher Columbus (1451–1506). As early as in October 1492, he described the body paints of the men who came to meet him:

> "They paint themselves black, and they are the colour of the Canarians, neither black nor white. Some paint themselves white, others red, and others of what colour they find. Some paint their faces, others the whole body, some only round the eyes, others only on the nose" (Columbus 1893: 38).

A few decades later, important chronicler Francisco López de Gómara (c. 1511-c. 1566) also emphasized painted bodies when describing the inhabitants of Hispañola (López de Gómara 1858: I 173) or those of the city of Cumaná in Central America (1858: I 173, 205). Many other chroniclers, missionaries, travelers, also included such observations on painted bodies.

Body paints were among the most sophisticated ancient ornaments all over this world region. The pigment deriving from the *Genipa americana* tree was in use throughout intertropical America. Thanks to the Spanish chroniclers, such as the Jesuit José de Acosta (c. 1540–1600), we learn that the Incas used a compound of mercury, called *llimpi*, a vermilion product reserved for the nobility for the beautification and health of the skin. (Acosta 1954: 103) To paint their face, the indigenous of Collao used a fruit that looks like a cherry, called *ñuñunya* in quechua (Cobo 1956: I, 227). The Taïnos of the West Indies coated their bodies with *roucou*, from a shrub which gave a red color, while the Mayas preferred hematite minerals. Certain populations of the West Indies applied vegetable pigments and mineral dyes while the Peruvians had also discovered the virtues of the mineral vermilion pigment. Some people, e.g.

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the Caribs of the Orinoco, painted their entire body, including head and hair.

Figure 1: Indian woman from Cumana meeting Spanish

Benzoni, Girolamo (1857 [1572]): History of the New World, Shewing His Travels in America from AD 1541 to 1556, p. 4.

The Iquitos on the upper Amazonas were called *puca-umas* or *cabezas-rojas* (red head) because the men wore a tonsure and painted their heads with *roucou*. In 1541, the historian Girolamo Benzoni (1519–1572) witnessed an encounter, at Cumana, of Spaniards with an indigenous woman, practically naked, painted black, her body covered with arabesques:

> "She was quite naked, except where modesty forbids, such being the custom throughout all this country; she was old, and painted black, with long hair down to her waist; and her ear-rings had so weighed her ears down, as to make them reach her shoulders, a thing wonderful to see; she had them split down the middle and filled with rings

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> of a certain carved wood, very light, which wood, in their language, is called Cacoma. Her nails were immoderately long, her teeth were black, her mouth large, and she had a ring in her nostrils, called by them Caricori; so that she appeared like a monster to us, rather than a human being." (Benzoni 1857: 4)

The skin was not the only painted medium. Like this woman, many ethnic groups used to dye their teeth, a practice very widespread in the Americas. Pietro Martire d'Anghiera (1457–1526) described the technique for blackening the teeth (the geographer never crossed the Atlantic and thus relied on the reports of those who had). Between the ages of 10 and 12, the indigenous chewed leaves and then applied the resulting paste to their teeth until they were as black as coal (1912: 368, 369). According to Pedro Sarmiento de Gamboa (c. 1530–1592), who in fact travelled to Spanish America, the name of the Yanaximes people came from *Yana* (mouth) and *Simi* (black) (1907: 205). The Aztecs dyed their teeth black or dark red, a custom widespread also among their neighboring groups Otomis and Huastec (Sahagún 1577: III, 127v, 135r).

The art of the pen strongly irritated Europeans as it was unthinkable for them that such spectacular headdresses, with their shimmering colors and complexity were crafted by an "uncivilized" culture. The numerous feathered objects recovered from archaeological sites are evidence of the importance of feathers in pre-Columbian times. The sophistication and skill with which these objects were made indicate that they were part of a well-developed tradition. On the north coast of Peru, the tradition of feather working extended very far back in time, possibly even to the preceramic period (2000 BCE). Most feathered artifacts come from the Late Intermediate Period, Late Horizon, or Colonial Period. The tradition of feather working also flourished in the Andean highlands. As stated by anthropologist Candler:

> "The iconography of the north and central coast clearly depicts the use of feathers and birds in headdresses. Moche iconography presents an especially varied array of elaborate headdresses, often

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> combining effigies of birds and animal heads with complex feather plume ornaments." (Candler 1991: 8)

During colonial times, the oldest mention dates from the first voyage of Columbus. In December 1492, the Admiral Columbus briefly described men wearing plumes of feathers on their heads: "Some had tufts of feathers on their heads." (Columbus 1893: 96) He renewed this comment in January 1493 about Caribs who embedded their hair in a sort of purse of parrot feathers while others used to wear plumes behind their heads (1893: 159, 160). Pêro Vaz de Caminha (1450–1500), clerk to Pedro Álvares Cabral (c. 1468-c. 1520), the commander of the expedition which landed in Brazil in April 1500, recounts the event in a famous letter to the King of Portugal. Like Columbus, Vaz de Caminha describes this native population by emphasizing their body ornaments and in particular the feather headdresses. Among the first objects exchanged are feather caps: "And one of them [an Indian] gave him [Nicolau Coelho] a hat of long bird feathers with a little tuft of red and grey feathers like those of a parrot." (Greenlee 1937: 9)

The anthropologist Alfred Métraux even affirms that in 16th century Brazil the art of featherwork would have reached its peak (Métraux 1982: 35–36). The Tupi and Guarani populations, settled along the Brazilian coast, particularly used macaw and ibis feathers to adorn their bodies, make capes, coats and tiaras, and these feathers were the subject of an important trade. The Frenchman André Thevet (1516–1592) pointed out that in Brazil "the greatest traffic in this land is that of ostrich feathers, sword trimmings made from beautiful plumes, and the most exquisite feathering of parrots brought from far away" (Thevet 1575: II, 938).

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Figure 2: Tupinamba dance. Theodore de Bry (1592): Les Grands Voyages. India Occidentalis. Pars tertia. Vol. III.

This art is present everywhere, from Mesoamerica to the Andean foothills. The conquest of Mexico allowed the Spaniards to discover an art that had reached its highest level of perfection. Cortés and his companions were in awe of so much beauty and such perfect mastery of these arts, both taxidermy and the use of feathers by the *amantecas*, feather craftsmen highly respected in Aztec society. Of all the presents and war trophies brought back from the Aztec world by the *conquistadores*, featherworks were certainly among the most appreciated and sought after in Europe. Hernando Cortés, conquistador of Mexico, believed that the plumes and other featherwork were so precious that they can only be reserved for the Emperor Charles V. Today, less than fifteen works of Mexican precolonial feather art can be counted in the world. Among these, the most spectacular is undoubtedly the so-called "Moctezuma" plume at Museum für Völkerkunde (Ethnological Museum) in Vienna. It is a headdress made up of more than 450 long quetzal feathers, but also of feathers from the cotinga, spatula and piaye birds, arranged in a fan and decorated with crescents and gold shells. Tradition wants

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that this plume crowned the Emperor Moctezuma and that he himself offered it to Cortés so that he, in turn, could present it to Charles V, but this is rather a legend. More modestly, plumes of this type had a ceremonial function and capped the idols or the priests serving them. We owe Bernardino de Sahagún's *General History of the Things of New Spain* a precise description and detailed vignettes on the artisanship of the Aztec feather craftsmen.

In the Andes region, the Spaniards' admired the *cumbi* the Incas made, finely woven cloths with feathers integrated into the fabric (Candler 1991: 1–15). *Cumbi* featured prominently on any list of precious objects given as tribute or used in ritual sacrifices. The chronicler of Incan origin, Felipe Guaman Poma (c. 1535-c. 1616), refers to "*cumbi* of feathers" (1980: I 146), and Jesuit missionary Bernabe Cobo (1580–1657) described them more in detail:

> "They wove them in the same *cumbi*, but in such a way that the feather comes out over the wool and covers it in the manner of a velvet. The equipment they had for this kind of cloth was very great, because of the innumerable multitude and variety of birds that this land breeds, of such fine colours that it exceeds any price." (Cobo 1956: II, 260)

Native American populations placed great value on these feather adornments. According to Fernando de Alva Ixtlilxochitl (1578–1650), a chronicler born from a Spanish father and a "mestizo" mother near Ciudad de Mexico, when the Spaniards plundered their capital, the Aztecs attempted to save the feathered objects from destruction, while the conquerors greedily seized all the gold and silver that had decorated places of worship (Alva Ixtlilxochitl 1838: 108). Objects of great value and reserved for the elite, feathers were sacred. The hunter who killed a quetzal, whose feathers were among the most sought after, was punished by death. Figuratively, the quetzal feather, *quetzalli*, means "leader, beloved lord". According to the French protestant voyager and colonist Jean de Léry (1536–1613), featherwork was highly valued by the Tupi in Brazil, the

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capes being among the only things that they carefully preserved and carried with them as they moved from site to site (Léry 1990: 92).

Figure 3: : De los officiales de pluma (Amanteca) (detail)

Sahagún, Bernardino de (1577): Historia general de las cosas de Nueva España, vol. II, Book IX, f° 62r.

In pre-Columbian times, from the Mexican plateau to the Isthmus of Panama, many people practiced manipulating their teeth. First evidence of filing is given for the Valley of Mexico, the country's central high plateau, during the Early Classic period (1400–600 BCE). It seems that the practice then spread to the Maya lands, roughly corresponding with Yucatan, Guatemala, Belize and west of Honduras.

Inlays, which appeared in the pre-classic, experienced their golden age during the classic period (100 BCE-300 CE). Archaeologists observed a combination of both for the late classic period (700–900). Finally, in the post-classic, from c. 1000 to the arrival of the Spaniards, the en-

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crustations had disappeared. They had been replaced by tooth filing which, at the time of the conquest, also seemed to be disappearing, especially among men. A 1992–98 study on the remains of 1515 Mayan individuals from 94 archaeological sites in southern Mexico, Honduras and Guatemala showed that up to 65 per cent of women and 58 per cent of men – and even young boys and girls aged around 15 – underwent dental manipulation, which is a considerable percentage. The practice was more widespread in Mesoamerica, but cases can also be detected in the Caribbean and others, less numerous, in South America, especially in what is today Argentina, the Peruvian Amazonas and the Ecuadorian coast.

Dental manipulations can be categorized into three types: filed, pulled out, or encrusted teeth. First, let's look at the teeth filing. We have some testimonies from 16th century chroniclers, the most famous Diego de Landa (1524–1579), bishop of Yucatan, who traveled the province during the 1560s in order to eradicate idolatry.

He described Maya women who "had a custom of filing their teeth leaving them like […] a saw, and this they considered elegant. Old women performed this task, filing them with certain stones and water." (Landa 1941: 125–126). Bernardino de Sahagún specified that the Huastecs "were deliberately sharpening their teeth." (Sahagún 1577: III, 135r) Further south, beyond the Isthmus of Panama, among the indigenous living around Guayaquil, cleric and ethnographer Lope de Atienza (1537-c. 1596) observed that their teeth were filed down almost to the gumline, whereas the Quijos of Ecuador filed their four incisors (1931: 54). Archeology confirms these practices. On the skulls of adolescents discovered in Sayate, in the north of Argentina, there is a double longitudinal section of the forked incisors and the same manipulation, less clear, on skulls discovered near Potosi in Bolivia.

The second type of manipulation concerns the pulling or avulsion of the tooth. The Tarascans of Michoacan removed their canines. On the Ecuadorian coast, the Huancavilcas were toothless, as the chronicler Gonzalo Oviedo y Valdés (1478–1557) described (Oviedo y Valdés 1959: V, 98), while Pedro Cieza de León (1518–1554) noted that three upper and three lower teeth were removed children from the province of Guan-

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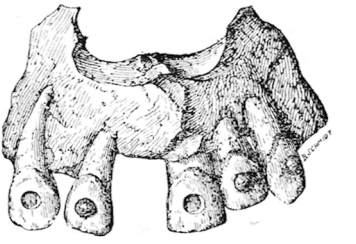
cabilcas in Peru (Cieza de León 1864: 181, 192). This practice was also visible among the Qimbayas of Colombia or the Paenes of the Peruvian altiplano.

Figure 4: Statuette head with four perforated upper incisors

Hamy, Ernest-Théodore (1882): "Les mutilations dentaires au Mexique et dans le Yucatan." In: Bulletins de la Société d'anthropologie de Paris, 5, pp. 879–887, p. 883.

Figure 5: Portion of upper jaw with incisors and canines perforated and inlaid



Ibid.: p. 884.

Finally, the inlay technique was also widespread. A legend from the *Popol-Vuh*, the sacred book of the Maya, presents a mythological character whose "teeth of precious stones, shining in his mouth" were removed (*Popol-Vuh* 1861: 45). The stories of chroniclers Sahagún and Mota Padilla of preparing teeth to encrust stones are confirmed by archaeology. At the end of the 19th century, the anthropologist Théodore Hamy presented two cases: The open mouth of a terracotta statuette from near Medellin in Mexico revealed incisors with regular cylindrical holes, the upper jaw of a statuette from a tomb in Campeche in Yucatan offered incisors and canines with cylindrical holes in which blue stones had been inserted. (Hamy 1882)

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Manipulation of the cranium

It is indeed cranial deformations that appear to be the most accomplished of the bodily manipulations of which man is capable. Although Europeans had little contact with people with deformed skulls because this custom was disappearing when they arrived in America, this practice remains one of the strong markers of pre-Columbian societies. Shaping the cranial vault constitutes one of the most ubiquitous biocultural practices over the world, and a very ancient one. The first, in the Central Highlands of Mexico, has been dated to 8500 to 7000 BCE. Among the Andean communities it is dated back at least to the 6th millennium BCE. Out of a collection of 500 skeletons of Peruvian origin kept in Paris, only 60 show no deformation. In South America, the artificially deformed skull of a person who lived 7000 BCE was found in a cave in Uricocha, in the Peruvian Andes. The Chinchorro culture (7000 to 1100 BCE), from north of Chili to south of Peru was practicing a very pronounced form of deformation. Several ethnic groups adopted these customs, the best known of which are the Paracas cultures (600 BCE to 100 CE), Nazca (200 to 600) or Tiwanaku (700 to 1200) around Lake Titicaca. In many sites excavated in Mesoamerica, individuals with deformed skulls constitute more than 90 per cent of the total. In Mesoamerica, infant head modeling has been practiced from almost ten thousand years. This custom, although in sharp decline, was still visible in the 16th century. In 1557, the Italian philosopher Girolamo Cardano listed the regions where they were still practiced: Cuba, Mexico, Cumana (Venezuela), Porto Velho (Brazil) and Peru.

In his book published in 1552, *Historia general de las indias*, López de Gómara informed that around Cumana (Venezuela), the indigenous population gently squeezed the head of their children: "They squeeze children's heads very gently, but a lot, between two cotton pads to make their faces wider, which they consider beautiful." (López de Gómara 1979: 121) The artificial compression or constriction of the infants' head is easy during the first years of life, when the skull is still malleable. With the skull vault then hardening, the changes become permanent.

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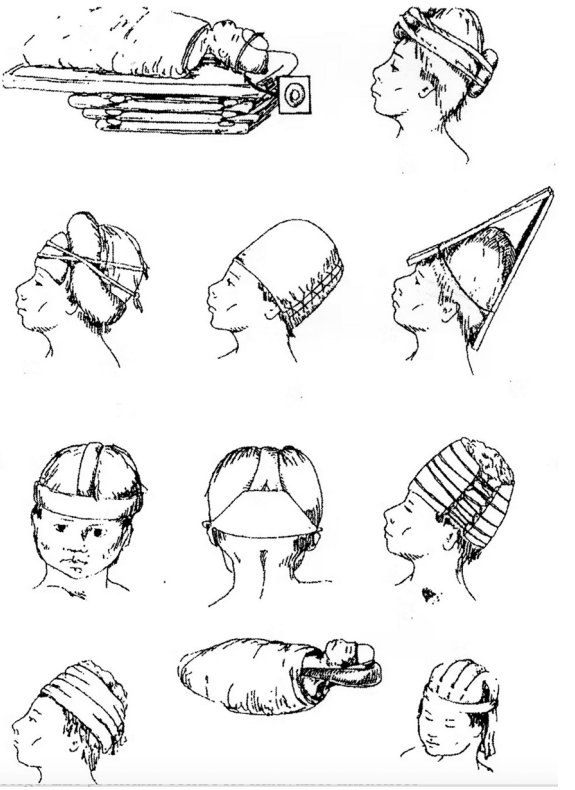
The external distortions may be obtained by massage, hard compression devices, constricting wraps, bandages, and hats.

Figure 6: Different methods to deform skulls in America



There are two ways of deforming children's skulls. The first is the tabular or fronto-occipital: the anterior and posterior compression resulted in flattening at the front and back and lateral bulging of the head. Two types of tabular deformations resulted, oblique and erect, according to the angle of board pressure. For the oblique, the head shaping was ob-

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tained with two boards compressing in an oblique way the frontal and occipital regions. The compression at the back was centered at the inion and exerted from the lowest part of the occipital bone to the lambdoid suture. For the erect, the deformation was obtained in two ways. First at all, by a vertical, frontal piece of wood kept in place by a compressive bandage plus the occipital compression, which resulted in keeping the child flat against the cradle-board; on the other hand by two vertical boards exerting pressure on the front and back parts of the child's head. This process is described among many American peoples. In the mid-16th century, the chronicler Perdo Cieza de León (1520–1554) observes that the Caraques of the Ecuadorian coast:

> "When a child was born they put its head between two boards, so that at the age of four or five, the head was long and broad, but flat behind. Not content with the heads that God gives them, they thus make them into the shapes that please them most." (Cieza de León 1864: 185).

In 1566, bishop de Landa – otherwise known for having destroyed most of the Maya scripts in Yucatán (Chuchiak 2005) – offered the most famous description of the mode of deformation practiced by the Mayas:

> "The women brought up their little children with all the roughness and nakedness in the world, since four or five days after the infant was born, they placed it stretched out upon a little bed, made of sticks of osier and reeds; and there with its face upwards, they put its head between two small boards one on the back of the head and the other on the forehead, between which they compressed it tightly, and here they kept it suffering until at the end of several days, the head remained flat and molded, as was the custom of all of them" (1941: 125).

The second way is the annular deformation, result of tightly wrapping the head with a compressive bandage or by constriction bands, single strings, bandaging, or tightly fitted hats resulting in a conical cranial vault. Depending on the type of binding, oblique or erect deformations

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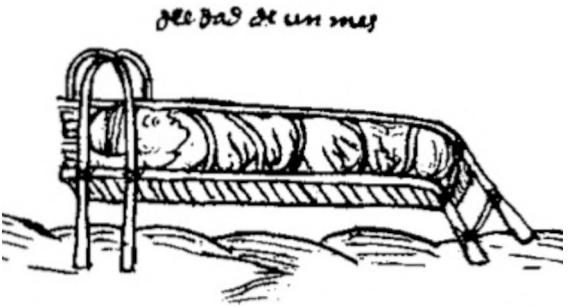
were obtained. Various chroniclers such as catholic missionary Juan de Torquemada (1557–1626) observed this practice: Barely born, the children were provided with a complex apparatus on the head until the age of three or four-five years (Torquemada 1723: 2, 312). According to Cieza de León, the Collas, established around Titicaca, did "wear woollen caps called *chucos* on their heads. Their heads are very long, and flattened behind, because they are pressed and forced into what shape they choose during childhood." (Cieza de León 1864: 363). In the 1610s, the chronicler Guaman Poma de Ayala (c. 1540–1615), of mestizo origin, gave us the only two contemporary drawings of this technique, showing a baby in a cot with its head wrapped in bandages

Figure 7: Inca cradle (k'irawpi kaq), holding a month-old baby Guamán Poma de Ayala, Felipe (1615): Nueva corónica y buen gobierno, f° 212 [214], drawning 79.



Interpretation of the findings

The complex relationships between the body and its socio-cultural role have always questioned anthropologists. Vera Tiesler points out that recent research focuses on the social "construction" of the body and its interactions with the mind, culture, religion, identity, gender and

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age (2014: 13–18). The individual bodily existence(s) founds the group to which it belongs, the community's codes and norms. Thus, the body can be perceived as a "social product". Body art then becomes a physical habitus, constructing the social body through collective constraints. French anthropologist Marcel Mauss is one of the first to have expressed it in the mid-1930s with his seminal article on body techniques (1935: 271–293). Cranial vault modification, dental manipulation, feather ornaments and body paintings can be categorized along three dimensions: manifestations of aesthetics; prestige symbols and signs of belonging to a specific group; elements for religious rituals.

Ornaments and body deformation discerned social groups and showed a social rank. Tiesler suggests that cranial modification was an important indicator of Maya social integration or differentiation according to gender and residence patterns, in particular, during the Classical Period. If children were destined to become rulers, priests, warriors and achieve high status, an oblique deformation was imposed (Sotelo Santos/Valverde Valdés 1992: 210). After the Classical Period, this was much less frequent, probably due to the influence from neighboring cultures (Tiesler 2012, 14; Romano Pacheco/Tiesler: 2008 18–25). In the Andes, head shapes established the person's social identity and separated different groups within society: class, castes and slaves. Torquemada observed hierarchical status distinctions and symbols of group affiliation in this area:

> "We have already mentioned the different nations of Peru, most of whom, and in almost every province, had their own custom, different from the others, of shaping heads with industry, and it was a wonderful thing to see how diligently they deformed heads, especially those of the lords; they ploughed them in such a way (and I don't know if they are used to this custom) that they clamped them with cotton, wool or bandages for two or three years after birth; and when the head had reached more than a quarter of the height of the child

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> and had taken the shape of a *coroça*[1] or a very stiff and very high clay mortar, they then became very diligent, and by great privilege, the people of Peru granted certain lords, whom they wished to favour, to form the heads of their sons in this way like that of their kings and all those of his lineage." (Torquemada 1723: 2, 583)

In the Muisca culture too, in Colombia, cranial deformation was a sign of hierarchy, performed only in the highest classes. It was a sign of social status like clothes, accessories, funeral ceremonies and tombs.

In the same vein, the feather is also a kind of codified language. It served as a form of social recognition, a "mark of rank". In Aztec society, the identity of an individual, for example his rank in the military, was defined by the finery he wore, what part of the bird's body from which the feathers used came from, or their color. The feather allowed for the identification of the social rank, age and economic situation of the person wearing it.

However, this is less clear for teeth. In Mexico, the great character exhumed in the secret chamber of Palenque had very simple dental manipulation, but the guards who accompanied him on his last journey had inlays. At Monte Negro, Oaxaca, the human remains found in large tombs in the center of the necropolis did not show any manipulation, while on the other hand, the skeleton found in one of the simplest tombs of the site showed a pyrite inlay. So, there may not always be a correlation between dental manipulation and high social rank (Romero 1958: 215–220).

Conversely, it may have also been a sign of infamy. Francisco López de Gómara, a priest who accompanied Hernán Cortés, described this custom among the Darien Indians: "The captive's face is scarred and a tooth is knocked out" (López de Gómara 1979: 105). According to the Inca mestizo Garcilaso de la Vega (1539–1616), who wrote a chronicle at the beginning of the 17th century, the Inca Huyna Cápac (c. 1493–1527) punished the Huancavilca chiefs in the following way: He ordered the principal chiefs and their descendants to pull out "two upper teeth and two

1 The *coroça* is a conical headdress made of paper or painted cardboard worn by convicts during the period of the Spanish and Portuguese inquisitions.

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lower teeth, as a reminder and testimony to the lies they had told when pledging loyalty and submission to the great Tupac Inca Yupanqui, their father." (Garcilaso de la Vega 1723: 305) Body painting also showed the position of an individual in society. Among the Indians of the province of Cueba, free men painted their chins, going up to their ears, as well as their arms and chests, whereas slaves were marked on their foreheads and cheeks (Oviedo y Valdés 1840: 136–137).

The reflections of the various observers also crystallize around body adornment as an ethnic marker and a sign of integration into the community. In the early 16th century, the Frenchman Binot Paulmier de Gonneville described the Carijo of Brazil. Their feather crowns are said to have had the function of identifying themselves with a clan through the use of feathers of the same color as those that made up the chief's crown (Gonneville 1946: 36).

However, one of the most important aspects of body adornment refers to religious, ritual and magical motivations. They allow the wearer to emulate aspects of the appearance and/or behavioral characteristics of their animal source, and they provide spiritual strength and protection. First of all, body modifications and adornments have the function of appropriating the qualities and power of an animal by allowing the person to identify with it. In 1615, the capuchin Yves d'Evreux (1570-c. 1630) described the Tupinamba as adorning themselves with "ostrich feathers" for war and explained that this would enable them to flee more quickly if the battle went badly for them (Yves d'Evreux 1864: 24). The behavior of the bird and its appearance merge with the wearer. This is a continuum that can still be observed until recently. When the Waynas of Guyana go to war, they get scarified with motifs representing jaguars and birds of prey, figures that manifest their predatory nature in the face of enemies (Velthem 1995: 254–55).

The size of ornamental teeth also carries this symbolism. The Ticunas of Peru adorned themselves with necklaces of monkey teeth to acquire agility and cunning. For the same purpose, the Carib women of the Orinoco wore sign teeth around their necks and caiman teeth in their ears. These motivations still exist. In the mid-1970s, anthropologist Morales Gómez noted that men of the Cuna ethnic group in Colombia

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wore necklaces of animal teeth in order to incorporate their strength (Thomas 2011b: 202).

Beyond the appropriation of strength and power, identifying with an animal enabled a connection with the divine. In the Andean cosmovision, the art of the feather created links with the world of the gods. The representation of birds, symbolized by their feathers, linked the power of gods with temporal rulers on earth. Textile items decorated with feathers, such as Nazca ceremonial plumes, symbolized this direct link between high political and religious dignitaries with the divine world.

The feather-decorated clothing of pre-Hispanic Peru was mainly found in tombs. The deceased was often wrapped in richly decorated textiles called *unku*, a rectangle of cloth split down the middle to allow it to be put on. Their brightly colored feather decorations (macaws, hummingbirds, toucans) were symbols of identity and marks of power, and these divinized textiles facilitated the journey of the body by helping the deceased access the world of the dead, where he or she is transformed into an ancestor (Ferrer-Joly (eds.) 2016: 22–49).

Finally, and most importantly, body adornments provided spiritual strength and protection. The head, considered as the center of spiritual life, also combined power and strength, authority and vitality. In Inca culture, the head was linked to the upper world, to celestial bodies, to the *animu*. Its circular shape was believed to attract cosmic energies and those from deep within the earth. To close the fontanel meant to ensure that the spirit of the child could not escape, thus causing its death. It is the same in Central America with the *tonalli*, a kind of animate, circulating vital force leaving through the head at the time of death. The *tonalli* of infants was believed to prevent them from falling ill and losing spiritual energy. So, the flattening of the occipital bone was a means to protect a baby's spiritual and physical integrity (Thomas 2017: 91–106). This list further describes the head's qualities for the Nahuatl people from Mexico: ilhuicatl [the celestial part, the sky], tlalnamiquini [the rememberer], tlamatini [the knower], tlancayotl [achievement, destiny], cicpactonal[li] [dexterous, of superior science], mauhcaittoni [venerable].

Heads and faces were believed to be seats of the orifices and organs of the senses as well as openings and possible passages for evil spirits.

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They were therefore to be protected by tattoos, piercings, scarifications, make-up, ornamental jewelry and other conformations and "deformations". Entering and conforming into a social group required going through rituals of deformations. Those regarding the skull of babies are the most impressive examples.

Body paints also played a protective role. They were linked to bloodshed, whether in the context of war or hunting, hence the highly valued red color, which had additionally strong magical and ceremonial meaning according to chroniclers such as López de Gómara (1858: I 173–174). And even though the smell of the paints put them at a disadvantage in battle with the Spaniards, they did not give them up. In the early 17th century, the Spanish Franciscan friar Pedro Simón (1574-c. 1628) referred to the Pijaos of the New Kingdom of Granada who were easily spotted by the soldiers' dogs because of the smell of the paints. Although they knew it, they did not fail to apply it, so powerful was its symbolism (Simón 1892: IV 379). In a more general way, colors had a close relationship with blood. In Aztec society, yellow was the color of sacrifice and prisoners who were to be killed were smeared with this color. Aztec warriors covered themselves in black before going into battle because it symbolized war and the night.

On the other hand, the color protected against death. It was attributed protective qualities against hostile and evil forces. In the 17th century, according to the Flemish priest Adrián de Ufeldre, the Darien of Panama organized ceremonies for children aged between six and nine. During an initiation session they would paint them to ward off demons and evil spirits. Similarly, the Darien and Cunas painted young girls as they entered puberty (1682: 1–56).

Finally, in a more prosaic way, body paint protected the skin. In 17th century Peru, the chronicler Ruiz Blanco noted that men and women painted their bodies to protect themselves from the sun (Ruiz Blanco 1690: f° 32). Columbus and Cortés had already noted this. These dyes were also a means of defending oneself against insects, especially mosquitoes, and to fight certain diseases (Thomas 2011a: 77–78).

In a similar vein, cutting or inlaying teeth was a practice of mystical essence as in the Mayan culture. Some gods were sculpted or painted

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with the oblique cut of a tooth, such as Tlatoc, the deity of rain and storms. He was depicted with large eye circles and long teeth on his upper jaw. The most represented god in pre-Hispanic times was Huehue-Teotl (Old Gods), worshipped by the Olmecs, Zapotecs and Aztecs. His canines are oversized and this characterized old people considered important and knowledgeable. Chac-Xib Cha, god of fertility, offered himself to his worshippers with protruding nostrils, an enlarged tongue and showing his canines, a sign of ferocity (González Ortiz/Montero Becerril/Toriz Maldonado 2008: 47–48). The funeral rituals are also very interesting. Often the face of the deceased was covered with a jade or ceramic mask with the mouth open, without teeth or central incisors, to enable a fleeing spirit.

In Amerindian thought, birds occupy an essential place in mythology. One need only recall the founding myth of Tenochtitlan, the Aztec capital. It was an eagle on a prickly pear tree that indicated to the migrating people where to finally settle, after their tutelary god had been guiding them in the form of a hummingbird since the beginning of their long journey.

In the indigenous cultures, the relationship between the society of birds and that of men was believed to be very close, to the extent that the former became a metaphor for the society of men in Central and South America. Within the animal kingdom, the bird society was the one believed to have the most similarities with human civilizations. Paradox? Since they differ profoundly from humans, birds can afford to resemble them. Claude Lévi-Strauss makes this clear. Feathered, oviparous, winged, they seem to form a society distinct from ours. Yet, however far removed it may be, this bird society is homologous to the one we live in. Birds love freedom, build a home, live in a family and feed their young. They socialize with their fellow kind and, above all, they communicate by acoustic means that are reminiscent of an articulated language (Lévi-Strauss 2004: 245–246). And while different birds have an extraordinary difference in appearance that makes them immediately recognizable, there are hardly ethnic distinguishing marks in humans. The art of plumage was created in order to distinguish them and allow them to display an identity. The bird became the reference to imitate.

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The feather also became a material that singled out, ordered, arranged, and displayed the hierarchy of societies. In imitating birds, it became a metaphor for human identity (Schoepf 2001: 28–30).

Summary

Body adornments of the indigenous Americans reflect a certain way of being in the world with a unity of soul and body. They reveal complex symbolic codifications – signs of belonging, rites of passage, aesthetic, prophylactic, therapeutic, social and cosmogonic functions. The embellishment of the body, its remodeling, modification and improvement are acts that represent a form of bodily memory that express an identity, reveal a status or indicate belonging to a society. It is a language of signs, an aesthetic expression as much as a marker of identity and cosmology.

Thus, the body becomes a medium and a subject of representations and thoughts. Through a drawing, a color, a pen, a body modification, meaning is inscribed on and in the body, and a whole culture and a relationship to the divine are expressed. The complexity of these adornments reflects a collective and individual expression. The body is the site of collective manifestations of what is personal. Body adornments embellish, dress as well as protect and give meaning to life and daily acts. For example, there were social, political or spiritual meanings for the cranial and dental manipulations as well as references to health, beauty, ferocity, social distinction and the godly.

The cosmological and religious dimension of these ornaments are elements primordial for their understanding. The wearing of feathers, the manipulation of the occiput, paintings or dental modifications also protect against diseases and bad influences, defend against spells and establish a privileged relationship with the deities. The head in particular – plucked, painted, deformed, with teeth filed or inlaid, not to mention pierced lips, ears or cheeks, hair cut in a thousand ways, tattooed or scarified skin – linked individuals with the cosmos via the human body.

This body is polysemous. For Amerindian people, it was an indispensable medium between the material and the spiritual, and much

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more than an envelope of flesh, bone and blood. It was the conduit for magical and religious rituals and spirituality, and it undoubtedly played a part in balancing the world.

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The Snake and the Flying Fox

Parthenogenesis, Endosymbiosis, Interspecies Breeding, and Ritual Processes in the Pacific

Sébastien Galliot, Sandra Revolon and Anne Di Piazza

> "Bioart's program is to work on the living and the logic of life, by doing things differently than nature itself does, by doing what nature cannot do or has not done"[1]
> *(Kac 2016: 5)*

Summarizing the general orientation of contemporary Western bioart, the above quote from artist Edouardo Kac not only brings art closer to science by virtue of its experimental nature, but at the same time distinguishes its program from the forms of manipulation of the living that are generally reserved for experimental science and molecular biology (in a perspective of knowledge production, control of resources and profit).

Bioart is also highly heterogeneous in terms of its techniques and aims. This is why we have chosen to focus here on two specific aspects: the processual dimension of bioart which is geared towards working with and highlighting vital processes rather than producing objects (Abergel 2011: 101), and its projective dimension. The latter places it

1 Translated from the French by Sébastien Galliot.

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in a form of continuity between mythopraxis[2] and science fiction by experimenting with the living, organic matter and biological material to provoke unprecedented reactions and bring to life some of the ideas buried in the collective imagination, just like many rituals do.

Compared to the more conventional methods of contemporary art, bioart is also exemplary in the diversity of techniques used and the unintentional results it manifests, since the visual characteristics of the work depend primarily on the possibilities offered by advances in natural science and vital processes over which artists have only limited control. In other words, by relying on the agency of the living, and by mediating a *nature naturante*, bioart formulates a dual critique of Western science and anthropocentrism, and thereby contributes to questioning man's place within nature, as the examples below demonstrate.

Produced in 2003, artist Aurelia Jaubert's *Albumines* series highlights the metamorphic capacity of organic matter, and the random shapes into which albumen or egg whites bursting in boiling water congeals (Fig. 1). Coloured and then photographed, these albumins become "natural sculptures" reminiscent of cave concretions, certain fungi or rhizomes, seed germinations, biological cell cultures and organs…".[3] This series may not require any expertise in molecular biology to be put into practice but, insofar as it freezes the changing nature of organic matter by hand (first in water, then through photography), it can be considered at an entry point on the one end of the bio-artistic spectrum.

At the other end of the spectrum are the experiments of the academic and artist couple, Marion Laval-Jeantet and Benoit Mangin. In their series *Cultures de peau d'artistes*, they produced, in the mid-1990s, a work of interspecies hybridization by having samples of their own epidermis grown on pig dermis in the laboratory. These skins were then tattooed with various motifs taken from the "best selling animal imagery in vogue in tattoo parlours in the United States" (Laval-Jeantet/Mangin 2003: 102). Although this bestiary, preserved in jars of formaldehyde,

2 In Sahlins' terms (1981: 67), i.e. in the sense that the past, mythology and collective memory contain patterns of actions that can be actualized in the present.

3 https://aureliajaubert.com/albumines/ (last accessed 29.03.2024).

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went unnoticed at the time, it was a pioneering gesture of inter-species metamorphosis experiments in art based on biotechnological laboratory techniques.

Figure 1

These two examples illustrate the paradoxical position that bioart occupies in relation to both conventional art and biotechnology. They also show how bioart relates to other forms of human production, by depicting phenomena of hybridization, exchange, transformation and metamorphosis between humans and non-humans, both visible and invisible, which are at the heart of social relations in many of the societies studied by anthropologists. In these societies, while ritual processes involve the production of objects or images whose effectiveness relies on the intervention of non-human, supernatural or counter-intuitive entities, highly technical interventions of humans play a key role in the ritual achievement (Galliot 2022). And the work of bio-artists, even when based on cutting-edge techniques, comes close to ritual work in its ability to make the unexpected happen and chimeras visible. In both cases,

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whether constituted in a microbiology laboratory or based on vernacular knowledge in a Pacific society, the sciences of life and matter play a central role in visual devices designed to transform the self and accompany the person throughout its social journey.

Numerous anthropological studies highlight the literal meaning of the term "construction" as applied to the person, given that indigenous conceptions of subjectivity are based on a constant transformation of the body and its skills (Revolon/Di Piazza 2022) and through the use of artefacts and the incorporation of various substances such as bodily fluids, food or certain plants (Godelier 1982; Warnier 2007; Erikson 2009; Santos Granero 2012; Revolon 2018; Galliot 2019).

This is how we intend to take part in a discussion on contemporary bioart and its non-Western, prefigurative occurrences, since they actually fall within universal patterns of thought according to which the introduction of a substance or foreign body into a living organism, or mere contact with it, results in a transformation, whether internal, visible, external or invisible.

In order to highlight some of the cultural forms that the exploitation of properties recognized or inferred from non-humans can take in the (re)production of people and human social relations, we will briefly draw on two quite different cases from Pacific societies in Samoa and the Solomon Islands. They seem relevant to us insofar as in these two situations:

1) the mode of figuration intervenes in a primarily non-representational framework;
2) the societies in question exploit the properties of the living and organic matter by mobilizing local knowledge relating to metabolism, begetting and the constitution of persons. In doing so, they combine epistemic domains that Western sciences tend to consider as autonomous, namely the laws of matter and biology on the one hand, and on the other hand, the domain of ideas and representations.

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Body permeability, metabolization and ordeal in the Samoan Islands (Western Polynesia)

The first case stems from research carried out by Sebastien Galliot within island and diasporic Samoan societies between 2001 and 2016. Except where indicated in the text, the data summarized below are drawn from the book *Le tatouage Samoan. Un rite polynésien dans l'histoire* (Galliot 2019).

In this case, it is a ritual of collective initiation during which a specialist (*tufuga ta tātau*) and his assistants create a gendered and standardized image on the initiates' bodies (*malu* for women Fig.2, *pe'a* for men Fig. 3), using a hand-tapping technique on a tool fitted with needles. Traditionally, they were made out of tusks from undomesticated pigs but have been replaced by disposable steel needles since the mid-2000s. This tattooing technique is only found among Austronesian societies in the Pacific and Southeast Asia (Robitaille 2018: 25).

Figure 2

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Figure 3

More complex and costly, is the male *peʻa* (the Samoan bat called "flying fox", *Pteropus samoensis*) tattoo that leads to the organization of the ritual[4].

Despite its scriptural dimension, the primary aim of this ritual of inserting images under the skin is not the revelation of symbols or the exegesis of an esoteric iconographic corpus, but rather an ordeal. The initiates – whom we can also describe as patients – are not informed of the

4 Female tattoo markings called *malu* are often planned at the occasion of a male initiation in so far as the operation on young women is completed in a few hours and requires less ritual prescriptions.

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motifs and their meaning. The context does not lend itself to this, and the information may be passed on to a family member at a later stage, but is not subject to any particular symbolic or emotional investment. Performed in a certain silence, without words, in a form of routine, this ritual appears at first sight to be a simple technical act of craftsmanship. In reality, it is nothing of the sort. The patient, with the psychological and financial support of his family group, undergoes a painful (for technical reasons mentioned above) and risky (from a health and spiritual point of view) operation, at the end of which he will have proved his commitment to the community and his personal worth. The ritual is successful if the tattoo is complete, and not before the *tufuga* has placed the final mark on the navel: a black rectangle decorated with small frigate bird motifs. The outcome is always uncertain, and depends on several factors: respect for the rules and prohibitions laid down by the *tufuga*, the patient's morality and the quality of relations between the various participants. Ultimately, although the *pe'a* represents two flying foxes inside each other (the smaller one in the middle of the back in the form of a triangular motif, and the larger one enveloping the patient's abdomen), what matters is the social value of such an ornament. This ornament makes the wearer a political subject embodying the Samoan ethos characterized by dignity, respect, devotion, egalitarianism, as well as physical and psychological strength[5].

Following anthropologist Alfred Gell (1993), whose intuition was that, in the pre-Christian era, this type of initiatory tattoo gives a privileged symbolic value to the healing phase in comparison with the other technical stages (of pricking or bloodletting, as well as the completed tattoo design), we propose to rename this step the "metabolization" stage. This is because it's not simply a question of strengthening the body and healing, but also of examining the reactions provoked by this potentially harmful invasion of the skin. In other words, what is represented or figured by graphic elements is secondary to the reception, in the patient's body, of

5 For a discussion of the "Samoan ethos" and its role in contemporary governance, see Huffer and So'o (2005).

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the *lama*, the black ink inserted by percussion on tools (Fig. 4).[6] As we shall see, it is the materials themselves, the work of the specialists and the presence of invisible agents that, on contact with the skin, can provoke unexpected reactions and lead to a series of assessments and judgments about the patient, the morality of his behaviour and the quality of his social relationships.

Figure 4

From the perspective of the actors and through an examination of their terminology, let's now take a closer look at how this central phase in the Samoan collective initiation ritual is managed. This means not asking about how the patient endures the operation, but rather how the tattoo behaves at the organic level of the skin, and what cultural devices accompany this process.

Similar to many other rituals, the *tāʻaga peʻa* (the hitting of the *peʻa*) combines the intervention of human and non-human agents: the *tufuga tā tatau* (himself inducted in a ceremony at the end of his apprenticeship),

6 For a more detailed discussion on tattooed iconography, see Galliot 2017.

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his assistant-stretchers (*toso*, from the Samoan verb "to pull"), the consecrated tools (*autā*), the pigment (*lama*), the participants (*autapua'i*), as well as invisible spirits (*aitu*). Only the initiates remain passive. In this context they are individually called *o le ta'oto* ("the lying down"), whose patience (*onosa'i*) is encouraged and acknowledged throughout the process.

As they chiefly involve technical know-how, the handling of tattooing tools and the stretching of the patient's skin do not pose any particular challenges of interpretation. However, in order to grasp the importance of the metabolization phase mentioned above, it is important to take a closer look at less visible stages of the process, as they are peripheral to the operation itself.

At this stage, tools, pigment and skin treatment deserve our full attention. The *autā* are made by the specialist prior to the operation, or simply sharpened by him. The number of needles in a tool depends on the design to be tattooed and there are three main categories of tools (from narrowest to widest: *aumono*, *ausogi'aso*, *autapulu*). Of mythical origin, tattooing implements are animated and endowed with revelatory powers. According to oral tradition they were brought to the archipelago by Taemā and Tilafaigā, two Siamese sisters with superhuman powers. It was during a long journey throughout the Samoan archipelago – during which they additionally performed prodigies in war and food consumption – that they handed over tattooing tools to the ancestors of today's tattoo specialists in exchange for their hospitality. Until the mid-19th century, this primordial act was connected to a place of worship called Lalotalie: in this case, a tree from the *Terminalia* family considered to be the abode of Taemā. This particular tree was looked after by a chief named Su'a in the village of Salelāvalu. It was burnt down in the 1860s at the request of a missionary from the London Missionary Society (Mallon/Galliot 2018: 52–53).

The Samoan mythological corpus is extraordinarily rich, and to this day remains a key political tool for establishing and reaffirming the sacredness and status of the clans, by homology with the sacredness of the ancestors from the time of the origins. In the ancient Samoan politico-religious system, the various clans were (and still are) ranked according

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to their genealogical links with spirits, different classes of living species or deified human ancestors, to whom a local cult was dedicated (at family or village level).[7]

Thus, on an ideological and mythological level, these *autā* – the tattooing utensils – materialize a link between tattoo specialists and tutelary deities. Just as is the case in the political sphere, the existence of a genealogical link between Taemā and Tilafaigā and the *tufuga* clans sanctions their status, their legitimacy and their magico-ritual "power". During the operation, the *autā* are simultaneously technical and mediating objects, animated by invisible forces which, according to some tattoo specialists, are the tools' principal agents. The tattoo experts themselves merely guide them.

The black ink called *lama* is another active substance that plays a central role in ritual. Like *autā*, it is not an inert component, although it has undergone significant transformation over the course of the 20th century. This pigment for the preparation of the ink was obtained from the soot of combusted nuts of the candlenut tree (*Aleurites Molluccana)*. In the second half of the 20th century, it was initially replaced by kerosene soot (*lama keleseni*), which was more readily available than *lama* nuts. Then, as trade and communication networks expanded, it was replaced by Indian ink and industrial pigments (*lama palagi*), which can, since the availability of online suppliers, be ordered and delivered through the internet.

Traditionally produced by the initiate's family, its making required a series of procedures designed to guard against attacks from spirits attracted by its glow at night. Today, the burning of *lama* nuts is still considered with fear. Production of the ink was strictly supervised by *nofotane* (wives living in their husband's household) who took turns at *afisā* (specially-built and restricted or tabooed fireplace) to ensure that the flame never went out, otherwise the pigment's colouring properties would be

7 For a presentation and discussion on the mythological corpus regarding Samoan tattooing, see Galliot 2019: 43–78.

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lost. The curse affecting abnormal discoloration of a tattoo and superinfections is called *lama'avea*[8] (spirit attack during pigment manufacture).

Lama produces a very deep black coloration on the skin. It is also considered a "hot" substance (*mū*, in the sense of "causing a burning sensation"). The warming effects of its insertion under the skin are treated with *nonu* leaves (*Morinda citrifolia*) applied directly on the skin. This plant is reputed to absorb the heat emanating from the wound. The *lama* also causes significant swelling of the dermis. So, after each daily tattooing session, the patient's wounds are soaped and massaged every two or three hours, to mechanically evacuate excess ink and lymph and accelerate healing.

Locally, the collective representations linked to these processes are not the subject of detailed elaboration, and the identity of the spirits involved in the theft of the *lama*'s colouring properties is not definitively known. This relative indeterminacy about the invisible forces involved is not attributable to a lack of interest on the part of the population, but to a rather strict separation of knowledge instituted in Samoa by the existence of ceremonial prerogatives of the *tufuga* (specialists in tattooing, canoe building and house building), and above all to a rejection of beliefs that hark back to the pre-Christian past.

Indeed, the process of Christianization[9] did not succeed in abolishing the tattooing ritual, but in just a few decades replaced the indigenous religious system, which was comparable to what anthropologist Raymond Firth described in Tikopia (a Polynesian outlier in the southeast of the Solomon Islands). In this context, Polynesian totemism is characterized by the "use of animal and plants species by deities as forms

8 In a 2007 press article entitled "Samoan Tattoo customers risk death – and an ancient curse", the president of the Samoan cultural association Malofie warns of the dangers of *lama'avea* and the rules surrounding the tattoo rite (Sunday Star Times, 24/06/2007).

9 Initiated in the 1830s by the Anglicans of the London Missionary Society and the Wesleyan Methodists, followed by the Marist Brothers in 1845 (See Gilson 1970, Meleisea 1987).

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of visible incarnation", (Firth 1930: 291). As a result of the massive conversion of the Samoan population during the 19th century, our Samoan interlocutors carefully avoid evoking spirits belonging to a past that they themselves consider dark, if not pagan, even if, as we see in the case of tattooing, the latter involves ritual procedures that do not sit well with Christian orthodoxy.

It should be stressed here that one of the principles common to pre-Christian religious systems in Oceania is the immanent and contagious nature of the sacred. In this context, a logic of body permeability prevails, by virtue of which vital force and reproductive powers can enter and leave persons and contaminate bodies and objects. Under these conditions, the skin is to be considered simultaneously as a porous organ that needs to be strengthened, but also as a reaction environment which, in the course of pigment metabolization, reveals the psychological, physical and relational state of the person receiving the tattoo.

In other words, before constituting a protective wrapping holding *mana*[10] dispersal – as it was brilliantly interpreted by Alfred Gell (1993) – the step of fixing the image under the skin seems central here. To fully understand this vernacular logic of tattoo reception, we must perhaps insist on the materiality of the pigment which, in a Western context of mass consumer goods produced in an aseptic setting, is generally perceived as a simple colour with little impact on the body. In Samoa, all ornamental motifs (which in the West we tend to interpret according to a more discursive logic) have a materiality of their own. As we have already said, it causes a thickening of the outer skin layers. In certain circumstances, the tattoo itself may swell so that the motifs appear embossed. This is particularly the case during dance performances, where

10 Codrington's classic definition states that *mana* "is what works to effect everything which is beyond the ordinary power of men, outside the common processes of nature" (Codrington 1957 [1891]: 118–19). Disserting on Tongan *mana*, Mills (2016: 77–105) understands it as metaphysical efficacy. He goes on providing several examples of actual actions on bodies that affect *mana* dispersal and concealment.

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some dancers slap their abdomens and inner thighs to highlight their tattoos, which have been oiled beforehand.

The tattooed image is doubly active. Before being appreciated for its graphic qualities leading to aesthetic judgments, it is first and foremost a compound of substances and foreign bodies animated by a set of entities (spirits, family relationships and ritual specialists). For example, a tool made by illegitimate persons (i.e. without the approval of a ritual specialist) or with inappropriate materials can produce harmful effects on the patient's body, and will be expected to cause spiritual sanctions. Unusually fading tattoos, or swelling that persists despite appropriate customary treatment with massage and *nonu* leaves, indicate either:

1) that ritual prescriptions and proscriptions have not been followed, or
2) that the patient's relationship with his or her family or village environment is problematic. This type of indication generally leads to the suspension of the operation until the supposed problem has been resolved.

Finally, during the last step called *samaga* (ointment ceremony) the initiates are formally presented before their family group, their ancestors and the Christian God. They are anointed with *sama* (Fig. 5, a mixture of coconut oil and turmeric), then adorned with a necklace of fragrant flowers (preferably *Cananga odorata*). This Samoan chrism is used both for its visual properties (the production of a golden sheen) and for turmeric's well-known antiseptic and anti-inflammatory effects.

The invisible forces contained in the tools by virtue of their link with Taemā and Tilafaigā in primordial times, the properties of the pigment (which derive from the quality of the work of the women who produced it), the know-how of the ritual specialist, the material and emotional support of the patient's group all together form a set of visible and invisible agents in direct contact with the median part of the body (the seat of *mana* in Western Polynesia). At the time of the ritual, this part of the body is interpreted not simply as a surface for inscription, but as a reactionary environment whose changes in state are scrutinized. We would like to

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emphasize the importance of what we have chosen to call the pigment's "metabolization" phase. It is during this stage that the participants, the specialist and his assistants concentrate their efforts.

Figure 5

Some silently pray for the operation to go smoothly. Others apply skills of perception to identify tattoo discoloration, an unexpected wound or any other unforeseen feature visible on the tattooed image, which in this case represents a clue to which the tattoo master is entitled to interpret. The risks involved, including those of an immaterial nature, are limited and neutralized by material actions, so that naturalistic knowledge about the properties of certain plants[11], religious conceptions (Christian and pre-Christian) and relational configurations are interwoven and act in concert in the transformation of initiates.

11 Mainly candlenuts (*Aleurites moluccana*), nonu leaves (*Morinda citrifolia*), turmeric (*Curcuma longa*), ylang ylang flowers (*Cananga odorata*).

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Parthenogenesis, endosymbiosis and interspecies mating in Aorigi (Eastern Solomon Islands)

The second case takes place at Aorigi, a small island society made up of around a thousand Melanesian horticulturalists, fishermen and sculptors, divided into a dozen lineages who speak Owa, an Austronesian language. Although they converted to Christianity in 1950, the Aorigi have maintained the ritual procedures to regularly address their human and non-human ancestors on whom their livelihood depends. Generally speaking, the entire secular and ritual life of humans is itself conditioned by the relationships they maintain with the non-humans with whom they cohabit in a common territory called *fenua* (Revolon 2003, 2007a, 2018, 2022).

This centrality of relations between humans and non-humans is manifest in the aesthetic system (Revolon 2007b), which convenes a large bestiary of aquatic, terrestrial and avian beings, as well as plant species. Among them, the female snake Kafasiqari, which acts on the reproduction of the living species, is omnipresent in figurative or abstract form. She can be seen on the wooden posts of houses erected for second funeral ceremonies (Figs. 6 and 7). Her sinusoidal layout is also visible on the surface of wooden ritual vessels, in the arrangement of beads on shell money; it is scarified on the faces of young children and, until the 1960s, was tattooed on women's bodies. Examining the mythology associated with this ubiquitous snake, we propose to examine the entanglements of human-non-human relations in the scope of the Aorigi's conceptions of procreation by taking at face value, in the light of naturalistic data, the human-non-human continuities they describe. In so doing, we will attempt to show that Kafasiqari mythology and its visual and plastic manifestations act as a form of low-tech bioart, since they work "on the living and the logic of life, by doing things differently from nature" – to get back to Kac's words.

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Figure 6: & 7: At the initiative of the elders of the lineages, great mourning closing ceremonies (farunga) are regularly organised for those who have died in previous years. These require the construction of collective ruma ni farunga houses, whose roof support posts are sculpted with beings that are often hybrids, particularly Kafasiqari. She appears in the form of a snake or a being combining human and reptilian attributes.

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The Kafasiqari myth, first recorded by Codrington (1891) on Makira, is shared by many Melanesian societies, including eastern New Guinea (Massim, Wogeo Island), the Solomons (Guadalcanal, Malaita, Makira) and Vanuatu (Banks Islands, Epi, Maewo) (Kongäs Maranda 1977). In the versions found in the eastern Solomons, where Aorigi is located, Kafasiqari is described as a gigantic serpent or an entity combining human, avian and reptilian morphological attributes (Fox 1924 *op. cit.*: 361). She is alternately presented as the origin of the first humans (Fox 1924 *op. cit.*: 362), the origin of a particular lineage, or is extended as a trope to represent the entire island (Scott 2007). In Aorigi, Kafasiqari is more specifically identified as *mwaa ni ano*, literally the snake of the deep or snake from below (*mwaa* serpent, *ni* of, *ano* depths); a name that refers both to the Pacific boa (*Candoia carinata*) and to all land snakes (as opposed to tree or sea snakes) (Mellow 2014). The Pacific boa (*Candoia carinata*) is a medium-sized snake (up to 120 cm long) from the islands of the southwest Pacific. It is mainly an inhabitant of the low forest of Sulawesi and further east from the Moluccas and New Guinea to the Solomon Islands (Wynn/Zug 1985: 15).

Aorigi mythological tales tell of a time when a first generation of non-human morphological entities – snakes, turtles, trees, birds, insects, fish – emerged spontaneously from the depths of land and sea. All these creatures gave birth to the first humans from whom modern matrilineal lineages have evolved, and to whom they taught the language, rules and knowledge that continue to govern human existence.

Mythology describes Kafasiqari as a gigantic female boa living deep in a cave in the Haununu region, on the large island of Makira nearby Aorigi. It is said that she gave birth without a sexual partner to a child with a human morphology, whom she named Kaugari. Kaugari married a human and in turn gave birth to a daughter named Kawasi. Every morning, on her way to the gardens, Kaugari handed her child over to her mother, who looked after her. One day, while the boa was taking care of the child, she became hungry and began to cry. Her grandmother coiled around her, put her head close to hers and whispered a lullaby. Returning from his fishing trip, the father heard the child's cries and followed them to the cave, where he had never seen Kafasiqari before and had no idea his part-

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ner's mother was not human. On discovering the snake wrapped around his daughter's body, he grabbed his adze, sliced the reptile's body into several pieces, picked up his daughter Kawasi and carried her back to the village. In the evening, Kaugari went to her mother's cave and found her dying. The snake's head continued to weep and sob. Upon Kaugari's question "Who did this?" the mother replied: "*Fungao ku*, my son-in-law". The daughter carefully gathered up the pieces, cast a spell and magically reunited her mother's body. The operation completed, the boa spat and its saliva formed the red-skinned, white-fleshed *qoruqoru* yam tuber. She vomited blood, which formed the other yams: *faga* (red yam), *futofuto*, *aufifei*, *tafoa*, *agogo* (white yams), *takai mafana* (red and white yam), *aikenesi* (red and white yam with red juice), *mwa* (some red, some white), *risu* (red skin, white and red flesh), *gope* (red and black yam). Kafasiqari showed her daughter how to slice the clones and plant the pieces. Each time she cut the tuber, it healed and changed colour. The young woman planted all the yams, resulting in the wide variety of cultivars that exist today.

Keen to get away from the humans who had mistreated them, Kafasiqari and Kaugari left the island, entrusting Kawasi with the horticultural knowledge and artefacts needed to grow tubers. The female boa emerged from the cave with her daughter on her back. She meandered through the forest to the sea, swam to the island of Guadalcanal, where she settled and whose fertile lands she has ensured ever since.

How do the Aorigi conceive of the spontaneous emergence of a female boa from a territory and the birth of a human by a female snake without sexual partnership? Two modes of interspecific procreation are at work here which, as we shall see, are based on elements borrowed from boa behaviour.

The myths tell that Kafasiqari, initially contained in the depths of a cave, emerged from the territory in what seems to be a morphologically different materialisation of the latter. As with their Are'are (Malaita) neighbours, the apical ancestors, initially fused with the territory, "rose" from it: crocodiles from the rivers, sharks from the sea, eagles from the mountains or, as here, snakes from the ground: "[…] ancestral authority is fused with locality, not only on the surface of the land but also vertically, in the depths of the earth, in the rivers, in the sea and in

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the sky. In fact, locality cannot even be conceived of without the apical ancestors and their subsequent deeds at each of the places of origin. If earth (*mako*), rivers, sea and sky previously existed materially, land proper (*hanua*) [*fenua* among the Aorigi] came into being with the apical ancestors […]" (Coppet 1985: 80).

We postulate that the begetting of a snake by the land evokes endosymbiosis, described by biologists as "a form of symbiosis between two living organisms, where one is contained within the other" (Ramade 2008: 202). Here the endosymbiosis involves the *fenua* - the inhabited territory considered as an alive entity – and the boa. One of the boa's singularities is its phenotypic plasticity, i.e. the ability of an organism to express different phenotypes depending on its environment, which explains researchers' continuous debates about the number of subspecies. So much so that van der Pols was able to write that "Each island has its own type with its own characteristics. However, it would be an exaggeration to consider each type as a subspecies" (van der Pols 1986: 161–162). *Candoia carinata* is described as "exceedingly polymorphic in colour and pattern in life, 'with everything from lemon yellow to charcoal occurring, including bright brick red, and with striped, spotted or zigzag patterns, dull to brightly contrasted…'" (Smith/Chiszar/Tepedelen/van Breukelen 2001: 290). Or the boas of the Solomon Islands " […] vary considerably in color and pattern, with colors including reds, pinks, oranges, yellows, browns, grays, and black. Patterns may be blotched or splotchy, lacking altogether (uniformly colored), or with an almost zigzag dorsal stripe. Additionally, these snakes can become lighter or darker in the course of a day. I have seen individuals change from a dark brownish-red with heavy patterning to a light pinkish-tan with faint patterning over the course of a few hours" (Carille 2012: 118).

Skin colour in vertebrates is determined by the pigments or crystals contained in chromatophores. Reptiles (and fish) have three types of chromatophores: melanophores for black and brown, xantophores for red and yellow, and iridophores for light reflection, enabling them not only to display a wide range of colours, but also to change them. These colour variations, a rather rare phenomenon in snakes, have been observed in particular in the *Candoia genus* (Hedges/Hass/Maugel 1989).

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Light and temperature conditions, degree of activity (linked to feeding) and emotional states are three of the parameters most commonly cited in the literature as inducing skin lightening and/or darkening, as well as cryptic coloration. For instance, "When disturbed, the juveniles would not defend themselves or try to escape as most other young snakes, but would become completely ridged. They would remain this way even when picked up. Their colour, co-ordinated with this behaviour, giving very much the impression that they are imitating a twig. This type of mimicry has also been observed in juvenile *Candoia carinata paulsoni*…" (van der Pols 1986: 164–165).

On Waigeo island (Papua New Guinea), *Candoia carinata* "…is by far the smallest and most variable in pattern of species in the genus. These snakes frequently are encountered on low shrubbery around human dwellings and plantations. New Guinea Tree Boas can be found climbing, coiled on the ground, and even burrowing. Individuals are usually blotched, with flowery patterning, but they can be striped, banded, or uniformly coloured. Ground colours can be grey, tan, yellow, cream, or reddish-brown, with most a mottled grey and white similar to *Hyla marmorata* (the Marbled Tree Frog). Mottled individuals are quite cryptic, blending extremely well with tree bark… Similar to *C[andoia carinata] australis*, *C[andoia carinata] paulsoni* has the ability to become darker and lighter throughout the day" (Carille 2012: 119–121).

In other words, not only are the boas' skins variegated, but they also have the ability to blend into the environment for camouflage purposes, as well as to simulate natural movement, in this case that of a motionless twig. Variable homochromia (adapting colouring to that of the environment at any given moment) and homotypy (the animal takes the form of an object), that is camouflage through mimicry of colour and form, make Kafasiqari's land affiliation – and that of the human matrilineal lineage to which she gave birth – to the territory and its localities patent: place of emergence from the earth, residence, cutting site, pilgrimage of her daughter, etc. Here, then, the territory, conceived by the Aorigi as the first living entity, gives birth to the snake, which is consubstantial with it, and to which it transmits some of its qualities, in this case its colour, shape and behaviour. The snake gives birth to the first human

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of the modern *mwa* (snake) lineage. As the generations go by, the conditions of reproduction become more conventional (conception, giving birth, breastfeeding).

The term used in the myth for begetting is *fagaworaia*. In human terms, *fagaworaia* means "to give birth", but also "to bear", in the sense of being pregnant, "to create", "to realize" and "to bring about". This verb contains the idea of a begetting in which sexuality is not necessarily required. It is used to characterize reproduction by cloning in the yam and by parthenogenesis in the boa. In the animal kingdom, parthenogenesis occurs in many taxa (nematodes, arthropods, etc.). In these cases, it concerns "unisexual" species that ensure their progeny through "obligatory parthenogenesis". Among vertebrates, cases of "facultative parthenogenesis" (within species also using sexual reproduction) were observed and described as early as the early 19th century in domestic chickens, then in turkey farms. Similar examples were subsequently recorded in zoos involving captive-born or captured females of condor, reticulated python, zebra shark and Komodo dragon. Scientists then thought that this "facultative parthenogenesis" only affected isolated animals deprived of a potential partner. Genetic analyses have shown that this mode of reproduction also exists in the wild in four taxonomic groups: sharks, birds, lizards and snakes (Booth *et al.* 2014). In the case of snakes, facultative parthenogenesis[12] is currently documented in various species[13] of rattlesnakes, vipers, pythons and boas, including *Boa constrictor imperator* and *Epicrates maurus*. This single-parent mode of reproduction, in addition to its viviparity, has not been specifically

12 There appear to be two mechanisms of facultative parthenogenesis in snakes leading to "opposite results in terms of sex ratio and conservation of heterozygosity: in the first case there are only homozygous males that can be conceived as half-clones, while heterozygosity is conserved in the second case: the offspring are clones of the progenitor" (Dorso 2012: 23–24).

13 More specifically, facultative parthenogenesis is attested in *Crotalus horridus*, *Crotalus durissus unicolor*, *Thamnophis marcianus*, *Thamnophis elegans vagrans*, *Acrochorus arafurae*, *Phython bivittatus*, *Malayopython reticulatus*, *Python regius*, *Boa constrictor imperator*, *Epicrates maurus*, *Agkistrodon contortrix* and *A. piscivorus* (Dorso *ibid.*: 2012: 23).

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studied for boas of the *Candoia* genus, and the question remains open – although not for the Aorigi – insofar as these snakes remain little studied. While this begetting belongs to the sexual mode of reproduction, since it requires the intervention of a gamete, it is akin to asexual reproduction due to the absence of the contribution of genetic material from another individual. This example signals a sexuality without otherness, a sexuality without the essence of the other, in the words of Pradelles de Latour (2001: 91). Kafasiqari, the sole progenitor, thus places her descendants under her exclusive and solitary maternal authority, instituting and legitimizing a matrilineal kinship system.

The parthenogenesis that enables Kafasiqari to sire her daughter is therefore a form of begetting that can be observed in non-humans. Moreover, phenotypic plasticity has also been confirmed by biologists in yams, as in most cultivated species. These elements lead us to hypothesize a conceptual continuity between animal parthenogenesis, plant cloning and accounts of the birth of morphologically distinct beings linked by substantial identity (Panoff 1968: 278; 1998: 39–40). The non-sexual, multispecific procreative basis of Aorigi kinship as presented in the myths and instantiated in the aesthetic system emphasises its inscription in a residential space (endosymbiosis) in the first generation, and in a female matrix (parthenogenesis) in the second generation. By adopting a sufficiently broad notion of procreation, both cultural and biological, the Aorigi insist on human-non-human continuity and supplement their human ontology with the non-human. And to defend the non-metaphorical nature of this kinship, they rely on biological processes: endosymbiosis and parthenogenesis. This approach seems to overlap with that of bioart – not in terms of the methodological aspects of biotechnologies (cultivation of living tissue, genetic manipulation) – but in terms of the reflexive aspects that aspire to question inter-species dialogue, explore the imaginary of hybridisation and open up to the otherness of others.

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Concluding remarks

The two cases presented here describe modes of figuration which, before stabilising in animal representations – the snake among the Aorigi of the Eastern Solomons and the flying fox in Samoa – are based on acute observation of living beings. In Samoa, it is at the organic level of a person's skin reactions upon the tattooing of images of bats which provide crucial clues for the continuation of the ritual. Among the Aorigi, it is the processes of biological reproduction involving humans and non-humans that feed their imagination (Godelier 2015) and serve as a framework for the elaboration of mythical thought. By approaching tattooing not within a representational and symbolic framework, but within an indexical, pragmatic and relational framework, we have attempted to show the extent to which this ritual of imagery accords a central place to the exploitation of vital processes, and to the patient's metabolism. That said, an in-depth ethological examination of this bat, specific to Samoa, remains to be carried out in order to better understand what motivates its schematisation on human bodies through tattooing. In the Solomon Islands, we hope to have demonstrated that the Aorigi's emic concepts of procreation extend to non-humans, creating beings with multi-species kinship. Within this recomposed family, a trans-specific filiation is born, constructed and nourished by indigenous naturalist knowledge.

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Part Two: animals and human animals

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Bowerbirds and Their Bowers
Bird Art before Bio Art

Concepción Cortés Zulueta

Bowerbirds constitute the avian family *Ptilonorhynchidae*, consisting of some twenty species distributed throughout certain regions of Australia and New Guinea (Frith, Frith, and Barnes 2004; Frith and Frith 2008). As their English name indicates, these birds have become well-known because of the bowers that most of these species construct, arrange, decorate, compose and judge, as part of their courtship. Often, both by academia and popular culture, bowerbirds and their bowers are presented as a challenge regarding what may or may not be considered art, according to a Western perspective (Amstutz 2021; Rosenfeld 2021). Since I also wrote along these lines elsewhere (Cortés Zulueta 2016: 524–51), in this chapter I will focus instead on how human and avian gazes coalesce and intersect within and around these bowers, enlightening diverse meanings and representations, created by both humans and birds.[1]

This requires examining how, in some specific cases, certain human gazes — here, mainly Western gazes — look towards bowers through certain frames. Conventional concepts and assumptions, such as the ones

1 I wrote this chapter while a Juan de la Cierva-Incorporación fellow (Spanish Ministry of Science and Innovation) at Universidad de Málaga, and it is part of the project Entomornithophilias (and Phobias): Impressions and Encounters of Birds and Insects (B1-2022_11), II Plan Propio de Investigación y Transferencia, UMA.

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derived from the sterile white cubes of museums or galleries, pre-condition how we categorise art, and their influence extends beyond those spaces. For instance, at times, when looking at bowers, humans see a plainer picture, almost a two-dimensional composition, as if they were looking at a painting. Or they treat bowers as some kind of sculpture, forgetting aspects like the singing or the movements of the birds. While others emphasise aspects such as materials, textures, or solid shapes, consider them in terms of land art, or present these ensembles as artistic installations.

Figure 1: Satin bowerbirds at their avenue bower, in a backyard

Photograph by doug [Flickr]. CC BY 2.0 Deed (Attribution 2.0 Generic)

Meanwhile, the mobile and embodied gaze of bowerbirds shapes the structure and disposition of the bowers and their decorations in different ways, depending on the basic form characteristic of each species, ordinarily variations of either a maypole or avenue configurations. Maypoles — organised around one or more central posts and thatched by some of the species — and avenues — with stick walls that run parallel

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along a longitudinal axis — lead, enhance or block that gaze, echoing and responding to it. Bowers, as well, blend gazes with sound, interweave it with other sensory dimensions, and enable or frame certain movements. Lastly, human and avian gazes gather around the illusionist tricks displayed by great bowerbirds, or the step-back look that some bowerbirds use to evaluate and to rearrange their bower's decorations and composition, and that humans tend to anthropomorphise and associate with that of a human painter or other artist, tilting their heads and leaning or stepping back to look and judge the ensemble from a distance. On the whole, it is as if most human gazes are trying to dissect and embalm bowers, to turn them into a more conventional kind of art in a human sense, whereas what the birds are doing is more lively, vibrant and vital, in many ways.

Looking at bowers before and beyond Bio art, allows us to reflect on the issues outlined above, and on the entanglements of avian and human gazes surrounding them. Likewise, this stresses how bowers were and are, indeed, Bio art long before and beyond the human concept of Bio art. As ephemeral but recurring structures maintained during the months of the breeding season, abandoned when it ends, and then rebuilt in the following season, bowers — and bowerbirds — enact annual and biological cycles of the ecosystems to which they belong. Bowers, attended (or not) by bowerbirds — some males building and furnishing them and their collections, some females visiting and judging them, some young females or males learning how to do either one or the other —, flourish and decay following these cycles. When abandoned or in the off-season, the sticks or orchid stems that formed the walls, posts or thatched roofs of the bowers lie in disarray, scattered by the winds or damaged by the rains, and the collections of ornaments appear spoiled or dismantled, if they have not been taken away. In contrast, during the breeding season the bowers are continually arranged and rearranged by male bowerbirds, and undergo constant reparations due to damages caused by the weather, by the actions of rival birds or by other animals, humans included. The birds also tend the moss and the surroundings, removing fallen leaves or anything that tarnishes the overall effect. Since a significant number of the collected items are organic, and also perishable —

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flowers, fruits, mushrooms, leaves — they have to be replenished over and over, to make the bower look and feel as fresh, pristine and alive as possible, for the female bowerbirds to judge, and to choose.

Beyond this organic immediacy, several other temporal dimensions and layers converge into bowers. In stark contrast with this instantaneity, and in principle and in accordance with standard evolutionary processes, bowerbirds have been making bowers across millions of years (Ericson et al. 2020: 824–26), with different essential layouts remaining similar across long periods of time — yet again, Bio art long before the term itself. But then, other temporal layers overlap and are also manifested through bowers. To begin with, in the collections displayed in them. Because, besides perishable organic matter, these assortments also contain feathers, elytra, shells, bones, or pebbles, among others, or even past or current human objects, which is relevant when reflecting on how bowerbirds' selections and collections affect human archaeological sites and studies (Dwyer, Minnegal, and Thomson 1985). On the other hand, although different populations of the same species of bowerbirds share a similar bower typology, their collecting or decorating styles differ. Depending on the populations, they could be more colourful and diverse, darker and barer, or favour certain kinds of hues or objects over others, in what have been discussed as distinct cultural or artistic trends that can change more swiftly and that have to be learnt — learning to make it, learning to judge it — from other individuals (Diamond 1986; Madden 2008). Additionally, each individual bowerbird has his or her personal preferences that affect what they built or choose.

So, all these layers and their temporal dimensions, from the evolutionary through the cultural to the individual preferences, interact and are materialised in bowers, through the actions of bowerbirds, and embodying their gazes. Bowers become, then, a lively manifestation and portrait of the meanings enclosed in those layers through the bowerbirds' choices and their selections from among what is available in their environment, via decisions which are informed by both biology, culture and individual experience. And human gazes linger over these configurations, imposing some of their own terms and assumptions.

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On a handful of human gazes over bowerbirds and their bowers

Theoretical discussions around the concept of the gaze, and its role in defining, deploying, imposing and reinforcing certain hierarchies and power relations, have been very prominent and influential for decades, and still remain current. Among others, a noteworthy instance is that of Laura Mulvey's article "Visual Pleasure and Narrative Cinema" (Mulvey 1975), addressing the construction of an objectifying and sexualising active male gaze over a passive and 'just something pleasurable to look at' female body. Mulvey scrutinises how this male gaze is constructed through cinema, specifically. Analyses such as John Berger's (Berger 1972) had a broader range, from art history to visual culture. My own scope will be ample regarding media examples as I will approach a series of cases drawn from popular science books, wildlife films, an exhibition or a defined corpus of paintings, mostly dating from the late 20th century to the first decades of the 21st century, with the occasional earlier example from the 1970s.[2] Despite the variety of sources used, I will narrow my approach focusing on how human gazes frame bowerbirds and their bowers in these samples, in terms of which facets, categories or conventions of the involved concept of art and the artistic are emphasised, and which are minimised, forgotten or denied. Hence, these gazes tend to project a flatter vision of bowers, conditioned by Western art conventions and often limited to sight or to fixed visual aspects while simultaneously denying or minimising bowerbirds' own embodied gazes.

In the Western framework, there is a thoroughly established and dissected tendency of ignoring or negating the gazes and agencies of subjects considered inferior or subaltern. Since bowerbirds are animals other-than-human — even other-than-mammal —, there are other factors to take into account. As birds, they are conceived as belonging to the realm of science, of biology, and gazed prioritising that context. Due to how objectivity in general, and scientific objectivity in particular, has been historically shaped in close association with the preeminence

2 Western 'discovery' and perception of bowerbirds in the 19th century is another topic of great interest, that I am planning to address it in a future publication.

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of the visual domain and understandings concerning distance and disembodiment (Daston and Galison 2010), this adds towards solely considering the human gaze on bowers, isolated from other sensorial dimensions. Also, towards a reluctance to acknowledge bowerbirds with agency and abilities usually depicted as paradigmatically human, which brings to mind the notion of anthropodenial, a term coined by Frans de Waal to refer to the "a priori rejection of shared characteristics between humans and animals when in fact they may exist" (de Waal 1999: 258).

Animal architecture

In 1974, the ethologist and Nobel laureate Karl von Frisch published the popular science book *Tiere als Baumeister* with the collaboration of his son, Otto von Frisch (Frisch and Frisch 1974b). Although a more accurate translation of its original German title would be 'animals as master builders', or 'animals as architects', the English translation of the volume by Lisbeth Gombrich — elder sister of art historian Ernst Gombrich — appeared under one that shifted the emphasis from the animals to their constructions, from recognising certain abilities of the animals involved to providing a technical and conceptual umbrella that could encompass — and, in a way, partially dissolve — their creations, and introduced them in a slightly less 'anthropomorphised' manner: *Animal Architecture* (Frisch and Frisch 1974a).

The book encompasses a compilation of cases, starting with those animals — Radiolaria, sponges, corals, snails — whose living bodies are perceived as architecture, then to continue with proper "builders" (ibid: 22), as organised in taxonomic sections, from arthropods — here, spiders and insects — to vertebrates — fishes, amphibia, reptiles, birds and mammals —. Frisch deals with bowerbirds and their bowers at the end of the bird section (ibid: 236–47), setting them and their courtship "in a class by itself" (ibid: 237), and stressing that their shyness and isolation

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make them difficult to observe.[3] He then discusses three examples of avenue bowers — that of satin, great and Lauterbach's (or yellow-breasted) bowerbirds —an example of a thatched maypole bower — and that of the orange-crested gardener (or streaked) bowerbird. He provides details on the appearance of each species, the building process and characteristics of their bowers, their favoured decorations, their courtship displays, stories on how some of these courtship ceremonies were finally filmed (ibid: 241–44) or on their use of human materials: glass beads (ibid: 238); "[b]ottle tops, metal buttons, hair curlers, nails", teaspoons, car keys (ibid: 240), or a tin mug (ibid: 241), as illustrated by a drawing featured on the cover of some editions of the book.

As a testimony to the bowerbirds' singularity, Frisch devotes an additional epigraph to the question: "What passes in the mind of a bowerbird when he builds and decorates his bower?" (ibid: 244–47): "[n]aturally", neither him nor anyone else can answer such a question, since "there is no means of bridging the gap to the consciousness of other living creatures" (ibid: 244). To a certain extent, what follows is a balancing act in which the ethologist takes a couple of steps forward, then pauses and takes a step back. Afterwards, he keeps going back and forth between two opposing stances. At first Frisch states that in contrast to the conviction of other scientists — irrefutable at that point, he warns—, he doesn't believe "that only we humans possess the faculty of thought", and in fact he does believe that, with regards to "thought processes and aesthetic feelings in animals", "significant traces can be found in bowerbirds" (ibid: 244). Some of this can be seen as striking from our current standpoint of acknowledging that other animals do have thoughts and feelings, but at the time of Frisch's book the scientific consensus had disputed this for decades, until it was defied by figures like Donald Griffin (1976).

Probably this explains Frisch's step back as, next, he cautions that "it would be wrong to expect too much thought behind the actions of birds", because "[t]hey build cleverly constructed nests without having been taught and without much trial and error" (Frisch and Frisch 1974a:

3 Another theoretical dimension that is relevant but that I am not going to address here is the issue of animal privacy.

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245). He mentions that these activities are led by innate drives and proceeds to allude to instances from other parts of the book that confirm this, starred by birds lacking insight: female ducks building their nest in the middle of a busy city or on a dangerously high roof, or a hummingbird mother unaware that her nest was being stolen bit by bit while she sat inside of it. Frisch also offers a minor counterpoint, arguing that "it would not do to generalize" from these records, since there are "considerable differences in the mental levels of birds and their activities" (ibid: 246). Although, in the previous passage, the weight was clearly on the other side of the scale.

In the end, he concludes with a final step forward on behalf of the bowerbirds, given that

> [...] it would not do to generalize. [...] Nor would it be meaningful to argue, as some scientists have done, that a bowerbird cannot have an aesthetic understanding of his displays because they are triggered off by his sex hormones[4], and that without these there would be neither building activity nor courtship display. (ibid: 246–247)

On the one hand, Frisch sets apart bowerbirds from the rest of the animals included in his book. On the other, his swaying stance also reflects the tensions behind the scientific gaze towards bowers and bowerbirds, which in the mid-70s still denied that these birds were purposely looking at what they were doing. And ultimately, bowerbirds were now securely located on the realm of *Animal Architecture*, with its accompanying connotations. Actually, the original German version of the title — *Tiere als Baumeister* — can be traced back to the widespread tradition of portraying animals as industrious beings, devoted to their trades. Additionally, the umbrella notion of architecture frames the matter, and the gaze, in a very specific manner. Despite being one of the three fine arts, together with sculpture and painting, architecture tends to have more technical and functional overtones connected with an emphasis on material structure. A definite distinction between structure and decoration

4 Here, he might be referring to A. J. Marshall (1954).

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was theoretically deepened throughout the 20th century, often favouring the former. This might explain why the notions of animal architecture or animal architects became readily accepted and disseminated, as if they were considered less threatening for human uniqueness than those of animal art or animal artists, that could be viewed as granting a gaze, as associated with more creative and transcendent endeavours beyond instinctual or mechanical automatisms.

In one way or another, the successors to Frisch's book kept insisting on function or structure, often with a matching title and tilted either towards biology or architecture. On the side of the former was the volume of the biologist Mike Hansell, again *Animal Architecture* (2005), with chapters on functions; building materials; construction; work organisation and building complexity; mechanics, growth and design; building costs, animal architects as ecosystem engineers and evolution. In the section discussing design and aesthetic sense he highlights bowerbirds, like Frisch, as the best candidates to study regarding if, for them, it is relevant that an artefact or architecture looks right, besides being functional (ibid: 158). Previously, he had explained how spotted bowerbird females used bower walls to screen themselves from the male, relating it to threat reduction, or how tooth-billed bowerbird hid themselves behind a tree when a female arrived, emerging later (ibid: 31). Hansell also describes bowerbird displays as multimedia presentations (ibid: 160), expands on the relevance of female choice to shape the bowers and to select for certain kinds of male brains (ibid: 158–60), and proposes an art school hypothesis, which assumes that both males and females would have to train for years as artists — "to develop an appreciation of the effect their displays may have upon females" (ibid: 161) — and art critics[5] — to judge bowers—, respectively (ibid: 161).

In turn, on the side of architecture it feels like in *Eläinten arkkitehtuuri / Animal Architecture* (1995) — then revised and published as *Animales ar-*

5 Interestingly, referring to males Hansell uses the term "artists" without inverted commas, but he employs them with "art critics" when alluding to females (161).

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quitectos – Animal architects – Architekten der Tierwelt[6] (2001) — the architect Juhani Pallasmaa had decided to take a few steps back, although he was relying in sources like Frisch or a previous publication by Hansell. His chapters cover functions, construction methods, engineering, landscape architecture, ecological and economic issues, and a series of lessons to apply, while mainly stressing structure and materials. Throughout the book, and although he vindicates aspects of animal architecture as its integration in its surroundings, Pallasmaa reduces it to mere instinctual and mechanical impulse, and ascribes beauty — and presumably, aesthetic sense — exclusively to the mind and the human eye (ibid: 17–18), and when addressing bowerbirds, he interprets that Frisch is the only author who sees traces of aesthetic sensitivity in the behaviour of either these birds or chimpanzees (ibid: 67–68). If on the side of biology caution stems from a resistance to anthropomorphising but leads to anthropodenial, on the side of architecture — and humanities, in general —, the tendency is that of denying transcendence, which here implies a very reductive gaze, indeed, towards bowerbirds and their bowers.

Sculpture: Why not land art (or bowerbird installations)?

In a sort of point-of-view shot, the camera bumps and treads along a dense rainforest, betraying every single step of the person who carries it. As convention dictates for wildlife films a male voice-over, that had been referring to the eye and the look — a mating never seen, the need of a practiced eye —, indicates that there is a bower that is impossible to miss, in these forests. The shot changes, and we see the man walking a few steps and then crouching and leaning on the leaf litter covered ground, very close to the empty structure. He encourages us to imagine how baffled early European travellers were "when they found something like this in the depth of the forest". The camera proceeds to follow, from top to bottom, the stem of a tree fern, revealing a crescent stack of sticks

6 The full English title is *Animal Architects: Ecological Functionalism of Animal Constructions*.

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surrounding it until it flows into a green foundation, neatly encircled by a concentric ringed hollow and a thick wall of moss. The man begins to explain the different elements of the structure while touching and manipulating some of them, the twigs around the tree fern, the orange caterpillar pendants hanging from them, the rim of compacted moss, the rare black fungi placed on top of it. A series of interspersed close-ups ensue, detailing the twigs, the pendants, the man's hand holding and showing a fungus over the moss rim.

Figure 2: David Attemborough explaining a MacGregor's bowerbird bower

Bowerbirds: The Art of Seduction, 2000

This is the opening of the segment devoted to the bower of MacGregor's bowerbird (*Amblyornis macgregoriae*) in David Attenborough and BBC's 48-minute wildlife film *Bowerbirds: The Art of Seduction* (2000). An adapted and slightly longer version of this film was aired as an episode of the United States popular science program Nova under a catchy title that also alludes to seduction but personifying it: *Flying Casanovas* (2001). In both documentaries the MacGregor's bowerbird sequence runs along the same lines and is very similar, mostly with matching

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editing. Nonetheless, since there are some small differences — changes in the voice-over, a few additional shots of the bird placing decorations — I am going to base my analysis in the 2000 version.

This version's subtitle dares to bring forward the term art, although restricting its implications by linking it solely to courtship and seduction. In this sense, the MacGregor's bowerbird segment is central to the film because of the comparison and reflection it offers. After Attenborough has presented the bower in absence of the bird, he introduces his owner through commented footage of him putting back the fallen black fungi on top of the moss, eating the food that he has stored in the joints of the branches nearby, or struggling to suspend from a twig one of the sticky caterpillar droppings. As it is important to have as many of the latter as possible because the bird's "reproductive success will depend in his having, on the eyes of the females, the most impressively ornamented bower around."[7]

Once more leaning over an absent bower, Attenborough comments on how females don't look for a good father or helper — since male bowerbirds don't do that — but judge and choose on the basis on how a bower has been built, decorated and how a male dances within it, meaning that "the females must have some kind of aesthetic sense, artistic sense". Smiling, the host likens the artistic and aesthetic preferences of these females to that of some sculptors[8] in recent years, pertaining to land art. The subsequent shots and explanations propose a comparison between the sculptor Andy Goldsworthy and the previously introduced male MacGregor bowerbird through parallel editing, accompanied also by some statements voiced by the former. In alternating shots, the camera shows Goldsworthy selecting and picking up some branches, then the bowerbird doing the same with some twigs. Goldsworthy gradually stacks up the branches in the shape of a giant egg, while the male bird

7 This and the following quotes are literal transcriptions of Attemborough's voice-over (Bowerbirds: The Art of Seduction 2000).

8 "European sculptors", although land art is an international art movement closely associated with North America. Attenborough also uses "environmental art" as another denomination for land art.

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arranges the top of his maypole by adding and arraying more twigs. After one further scene of Goldsworthy, the bowerbird appears inside the bower's inner ring, looking up and down at the maypole, maybe even delivering a glimpse towards the camera. Goldsworthy is then seen making his finishing touches, stepping back and looking around his egg-shaped structure. And Attenborough's voice wonders: "if this is a work of art [...] why is this not?", while the camera slowly pans over the empty bower, bottom to top, from the moss wall and the black fungi to the inside circle, and the maypole foundation upwards.

It is noticeable that the comparison focuses on building males instead of the judging females that started it. Besides, in his commentary, Goldsworthy insists on segregating himself and his art from birds or animals, although he recognises that some parallels can be made, and later he expands on the materials.

Along the sequence, the concepts of sculptor and sculpture — another one of the three fine arts — are reiterated, both spoken and visually suggested. The bower, as a sculpture, is critiqued in the absence of the bowerbirds, and analysed on its forms, composition and elements, exhibited in detailed shots. Its empty appearance, devoid of birds and movement, is gazed upon top to bottom at the beginning, and then bottom to top while being posited as art, during symmetrical and mirrored shots. Moreover, despite the convergences between land art and bowers, and land art's ruptures with the conventions of Western academic sculpture, the comparison fails in other senses. Precisely because of that rupture, in land art the accent tends to be in letting the artworks change, even decay, with the environment. During the breeding season the aim of the bowerbirds is the opposite, to keep the bowers fresh and pristine. Besides this, bowers are not sculptural forms in relation to the landscape but rather scenarios that come alive through displays and interactions between the birds. Although these scenarios do have certain forms, these are inextricable from the movements and displays of each species. In a way, these movements and forms come first, and that is why bowerbirds actively look for and select suitable materials, even if they are uncommon. Instead of the other way around, as Goldsworthy explains about

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his own process, in which materials like curvy or straight branches can take him in one direction or other.

After the bowerbird-Goldsworthy comparison, Attenborough continues exposing the "multimedia" displays of the bowerbirds in the bower. But, altogether, the gaze that prevails in this segment that wonders on bower as artworks, is a sculptural one. As if that gaze was considering bowers as artistic installations on a plinth or pedestal, empty, frozen, timeless, abstracted from everything else. Just like bowers were presented in the exhibition Laubenvögel – Ein Leben auf der Bühne (Bowerbirds – A Life on Stage, Landesmuseum Natur und Mensch, Oldenburg, 2017), mixing elements of art galleries and installations with that of natural history museums, since the bower of each species was shown together with a male specimen inside a glass case, sidestepping females, life, or movement.

As if painting with flowers... or bits of plastic

> Every time the bird returns from one of his collecting forays, he studies the over-all color effect. He seems to wonder how he could improve on it and at once sets out to do so. He picks up a flower in his beak, places it into the mosaic, and retreats to an optimum viewing distance. He behaves exactly like a painter critically reviewing his own canvas. He paints with flowers; that is the only way I can put it. A yellow orchid does not seem to him to be in the right place. He moves it slightly to the left and puts it between some blue flowers. With his head on one side he then contemplates the general effect once more, and seems satisfied. (Sielmann, 1970: 152 [cited in Frisch and Frisch 1974a: 243–44])

This excerpt by the wildlife filmmaker and biologist Heinz Sielmann on the orange-crested gardener or streaked bowerbird (*Amblyornis subalaris*), reproduced by Frisch, provides an account of the bowerbirds' step-back look and uses it to compare these birds to painters and their bowers to paintings. That is, as pieces belonging to the remaining one

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of the three fine arts, architecture, sculpture and painting. This other kind of painterly gaze imposed upon bowerbirds and their bowers is not uncommon, and it usually fixates on facets like colour or composition, especially the former. Likewise, if looking at bowers as sculptures empties and freezes them, looking at them as paintings also tends to reduce them to a flat surface, like that of a canvas.

As for colour, Frisch identifies the preferred tonalities of decorations of the bowerbird species whose bowers he describes: dark blue and yellow-green for satin bowerbirds (Frisch and Frisch 1974a: 238), white or pale yellow for great bowerbirds (ibid: 240), mainly blue with some touches of red for yellow-breasted bowerbirds (ibid: 241–42) or a wider palette of bright and glistening colour for the streaked bowerbird painting with flowers, or with moss, fruit, beetle elytra or snail shells: yellow, red, blue and dark green, glittering and shiny (ibid:242-44). Colour, together with positioning or composition, is also very prominent in Jared Diamond's scientific paper *Animal Art: Variation in Bower Decorating Style Among Male Bowerbirds* Amblyornis inornatus (1986), — a New Guinea species that customarily makes thatched maypole bowers, also known as Vogelkop bowerbirds. In fact, as suggested by this title, he claims the differences in bowers' styles, either between populations or within populations and individuals of the said species, stem from cultural traits connected to the preferences watched, learnt and developed by each bird. And these differences and preferences are mainly characterised in terms of colour. In contrast with the South Kumawa Mountains's population, which favours black elytra, dark brown acorns, grey or brown snail shells, dark brown stones, black sticks and moss (ibid: 3042), the Wandamen Mountains's bower feature green moss and decorations of many colours: fungi, leaves, bark, fruits, flowers and butterfly wings either orange, black, red, yellow, green, blue, grey, brown, purple or green. However, among Wandamen birds one individual specialised in orange fruits, flowers and seed; another in butterfly wings; two more in yellow or purple flowers respectively, and one more in orange fungi (ibid: 3044).

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Figure 3a: A satin bowerbird's bower, surrounded by blue objects

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The 'painting with flowers' (among others) trope is brought to mind when Diamond details the piles of items of the same kind grouped by colour with the odd one with a similar hue — at times, human objects, as his Kodak cartons among yellow fruits or a blue matchbox close to blue fruits (ibid: 3045) —, or the occasional combination of dissimilar hues, like brown and grey snail shells in the same pile although in different parts of it (ibid: 3044). He also discusses positioning — in a way, akin to composition —, how the individual birds seem to place their favoured colours inside the thatched structure, and the less preferred ones outside. The trials and changes of mind in some bowerbirds, adjusting the placement and colour pairings of some of the decorations, recall to *pentimenti* (ibid: 3045–46). Overall, colour is a central matter, and this is confirmed through the round and flat plastic poker chips that Diamond chooses to test the birds' preferences, erasing the variability of natural

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objects and leaving behind just samples of seven colours, finally reaching the conclusion that Vogelkop bowerbirds select their decorations "possibly, but not provenly, by hue"[9] (ibid: 3046).

Figure 3b: Detail of a great bowerbird's bower, displaying white objects

Photograph by Gary Leavens [Flickr]. CC BY-SA 2.0 Deed (Attribution-ShareAlike 2.0 Generic)

This focus of the gaze on colour is also very present in wildlife films which compile bowerbirds among other animals. Particularly, in the case of satin bowerbirds (*Ptilonorhynchus violaceus*). Their fascination towards blue and plastic blue things has translated into a standard, even expected sequence. Often repeated, the usual scene shows a male offering a blue decoration (bottle cap, straw, clothes peg) to a female and it has garnered enough global attention and public acclamation as to become replicated and adapted in social media in the form of illustrations

9 Although he cautions that bowerbirds' sight and perception in general may differ considerably from human perception.

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or viral memes, both insisting in the bird's blue obsession (Day 2020). Another typical and iterated content that documentaries have picked up from scientific papers is that of bowerbird painting, which involves "a male masticating plant material and wiping the plant-saliva mixture onto the inside walls of the bower" while, during their visits, "females nibble at this paint" (Bravery, Nicholls, and Goldizen 2006: 77). Initially reported as an instance of tool use in which some satin males used a piece of bark as a brush to apply the substance (Marshall 1954: 51–53), the painterly gaze has conditioned how this phenomenon is both presented and understood. Again, the change of colour or visual appearance is what tends to be emphasised (Diamond 1986: 3042). Probably because of the perceived parallelisms with human painting, this behaviour is anthropomorphised or insinuated as an argument towards supporting the artistic abilities of bowerbirds, above others. But this framework reduces and flattens the matter, even though the females nibble on the impregnated walls of the bowers, other relevant senses, like taste or smell, are often forgotten or left out of this issue, and weren't thoroughly addressed until more recently (Bravery, Nicholls, and Goldizen 2006: 77).

On the whole, gazing at bowers through painting, or as paintings, turns them more or less into "a flat surface covered with colours assembled in a certain order" (Denis 1998 [1890]: 863). Somehow, as if they had been transformed into one of the canvases depicting bowers by the artist Mary Jo McConnell, displaying the structures and decorations in their rainforest milieu with haunting colours and light patches but also empty, not a bird in sight, and thus unchanging, devoid of any insinuation of movement. McConnell's paintings are part of a series for which the artist made several visits to the Arfak mountains in West Papua, Indonesia (New Guinea island), in order to portray the efforts of several individual Vogelkop bowerbirds in their bowers along the years (PBS 2009; Cortés Zulueta 2016: 544–50). McConnell talks about these bowerbirds as fellow artists and above all as fellow painters, nicknaming them Leonardo or Andy Warhol in accordance with their artistic preferences. On the one hand, this approach and the time that McConnell spent carefully and patiently observing and portraying each bower on site made it possi-

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ble for her to offer fascinating insights and realise certain parallelisms between the pictorial resources she puts into practice and that of the birds regarding, for example, the use of light and its effects on the decorations at certain times of day. On the other hand, it also translates as if her stance towards bowers was addressing them as paintings. As if she thought about the relationship between bowerbirds and their bowers along similar lines of her own relationship with her paintings as flat objects outside of herself, that can be finished and then looked at from a distance and a vantage point, instead of being continuously kept, run, and lived.

Figure 4: The bower of a Vogelkop bowerbird by Mary Jo McConnell, from her series of bowers painted in situ

Courtesy of Mary Jo McConnell. [https://www.mjmcconnellart.com/]

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Dancing with the bowerbirds

Dancing with the birds (Cordey 2019), a wildlife documentary filmed in New Guinea and South America, focuses on the courtship displays of a series of birds, which it labels as dancing. Its high-quality and close-up footage is combined by a voice-over delivered by Stephen Fry, swaying between science popularisation and jesting puns. The birds are grouped and presented in five sections titled The Swinger, The Pole Dancers, The Artists, The Teamsters and The Greatest Showman. Around 15 minutes of the 52-minute movie, located on its central segment, are starred by two male individuals from two distinct species of bowerbirds, *Sericulus ardens* and *Amblyornis macgregoriae*. Respectively nicknamed as Flame and MacGregor's according to the vernacular designations of the species, one has a simpler bower of the avenue type and the other one a complex maypole.

Of course, these two bowerbirds are referred to as the artists, and their alternating stories and images follow the usual patterns of each of them picking sticks to build their bowers, shaping their walls or maypole, choosing their colours, struggling with their placement and with decisions on composition, or dealing with dangers such as a rival bird, a raptor, or a pig. Nonetheless, the climax of the segment is definitively the dancing, when the females make their appearance. MacGregor proves himself capable of several accomplished mimicries, that he puts into practice to attract a female, who lands inside the moss ring and proceeds to listen in what the commentary calls a "blind audition" from him, while hiding behind the maypole: of birds from the forest and of the sounds of a village nearby, including barks, pigs, woodchopping, human talk in the local language or children playing. This is followed by "a game of hide-and-seek": the female advances towards the male and the sound source, while the male steps sideways in the opposite direction to keep the maypole between them, so they go round and round enacting the ring moss, while only glimpsing each other, if at all. The musical soundtrack, at this point a bit tango-like, envelops the pair's movements as if they were part of a choreographed ballroom dance. The interaction culminates with episodes of what is named as the "crazy thistle head",

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with the male opening his yellow crest and thrusting himself forth and back towards the female while the soundtrack adopts an accelerated dixie or swing rhythm suitable for an acrobatic circus act[10]; until she flies away, finally not that interested.

Figure 5: MacGregor, the MacGregor's male bowerbird, singing and imitating for the female, while hiding behind the central pillar of the bower

Dancing with the birds (Cordey 2019)

Flame, in the presence of a female, exchanges calls and tries to convince her to enter his walled bower by expanding and contracting the pupil of his yellow eye, striking over the deep-orange feathers of his head. At first, without success, but when the female returns Flame offers her a blue berry, she walks into the bower, and Flame can resume his routine while carrying the berry in his beak. This implies his "signature dance, the matador", announced by an evocative and romantic waltz-like combination of violin and guitar: a series of slow circular movements with his crouched body and left wing executed while he rises, as punctuated by *castañuelas*, then followed by a "clockwork" step

10 I am grateful to Borja Cortés Zulueta for his help with the soundtrack's tunes.

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downwards, and an "odd" final series of head bumps to the female already inside the bower, consummated with brief copulation, and ending with him chasing her out of the bower. The sequence's editing opts for a shot/counter shot structure, and it relies heavily on the exchange of gazes between male and female. Because, although the focus of the film is still on the males, "the females are not swept to the sidelines" and "[t]he female gaze is perhaps the real star of the film" (Waters 2019). The extreme close-ups capture the gazes and some of the slightest reactions of the flame bowerbird female, how she barely opens her beak and tilts her head in consideration, how the feathers of the top of her head bristle and she raises it almost negligibly accompanying the movements of the male.

Likewise, the small avenue bower stands out as an intermediary between the bowerbird gazes, since its walls frame and mould the exchange of looks and movements — or maybe it is the other way around, and gazes and movements shape the bower. As it focuses on the birds' gazes, the film displays — and thus, gazes at — female and male flame bowerbirds as seen through the bower, since they look at each other across it — the female at the male's display, the male at the female's reactions —, and it also encompasses their movements. Reciprocally, and conversely too, in the case of the MacGregor's bowerbirds the maypole contributes a moveable spot for the male to hide from the female's gaze and a way to decide when to offer glimpses of himself while they both retrace the form of the moss ring. All in all, despite the constructed editing, the anthropocentric comments, and the accompanying music tinging the birds' interactions, looking at bowerbirds as if they were dancing lets certain things shine through, due to the emphasis in movement, in the birds' presence and bodies, and in their gazes too.

It also converges with how some New Guinea people like the Kalam talk about the bowerbirds they know and live with. That would be MacGregor's bowerbirds, or *kwŋb*, in Kalam. The naturalist Ian Saem Majnep explains that a *kwŋb* builds a *gow* or platform piling sticks against a sapling and then:

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> […] hangs cobwebs, insect frass, and little bunches of fruit and flowers from the sticks […] like a man heaping up sticks of sugar cane and hanging bunches of bananas from this, to display and give away after a dance[11]. (Majnep and Bulmer 1977: 73)

Figure 6: An exchange of gazes between the female flame bowerbird and Flame, the male, mediated by the avenue bower

Dancing with the birds (Cordey 2019)

Besides, he points out that these birds are easily caught at their bower. He also tells the story of a big dance festival of the birds and animals, akin to the *smy* or major ceremonial with which the Kalam celebrate the initiation of boys, requiring careful planning and preparations. For Kalam, *kwŋb* "is a very appropriate sponsor for the *smy*" due to the circular dance-ground of moss it constructs around at sapling, and also because through its "noisy and spectacular" display it "invites other species of birds […] to its dance ground: and some of the rodents and marsupials also come and dance there at night". (ibid: 166)

11 I learned about this source through Amstutz (2021), for which I am grateful.

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Glimpses of bowerbird gazes

Along the various sections of this chapter I have exposed how different kinds of human gazes condition our understandings of bowerbirds and their bowers. I have also attempted to offer glimpses of the bowerbirds' own gazes shining through these frames imposed to them, occasionally in part because of them, often despite or in opposition to them. Most of the time, when trying to claim or to wonder about them as art, it feels as if human gazes are trying to dissect and embalm bowers (and bowerbirds) to freeze and to fix them. Somehow, as if it was necessary to think about bowers and bowerbirds along the lines of a more conventional or academic kind of art in order to claim them as artistic, or as artists, while what the birds are actually doing is lively, vibrant and vital.

Bowerbirds' gazes shape bowers, and the other way around, simultaneously and in varied manners depending on the types of bowers and, down to the smallest details, on the preferences and experiences of the individual birds involved, both males and females. More broadly, in maypole bowers such as MacGregor's, the central shaft marks the axis around which the gazes and movements of the two birds intertwine, as encircled by the moss ring. In turn, the stick walls of avenue bowers work as a frame and an amplifier of the crossroads of looks, while in some cases the ensemble of decorations serve as a background during the display. Bowerbird gazes not only move but are more-than-visual, multisensory. They not only summon a wider range and ampler threshold of colours, down to ultraviolet, but also enable being heard and not seen, and reveal a string of spots from where to articulate or listen to sounds: behind a maypole, as channelled by a stick corridor, from inside the shaded gallery of a thatched structure. Besides, bowers can also be nibbled and tasted, as the females do with the paint the males apply, and if the courtship is rounded off, the final step involves touch, and an intimate contact between the birds.

Looking at bowerbirds gazing at bowers… At times, bowerbird and human gazes get entangled in particularly intricate patterns (Cortés Zulueta 2019: 37–39). Like in the enthralling scientific findings that unfold how great bowerbirds (*Chlamydera nuchalis*) create size gradients

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and optical illusions in their avenue bowers, putting into play a complex illusionism intended for other birds — especially, for the females (Endler, Endler, and Doerr 2010; Kelley and Endler 2017). In particular, great bowerbird males arrange their predominantly white and grey decorations by situating the smaller ones close to the opening of bowers' walls, and then placing progressively bigger ones as the distance increases. The results have been called "theaters with forced perspective" (Endler, Endler, and Doerr 2010) and inversely to what happens in some baroque theatres, this implies the perception of a more levelled and even background from the point of view and gaze of the audience — the females inside the bower— that contains and enhances the display of the involved males.

This vantage point, necessary for the forced perspective, is defined and framed by the bower's avenue, and from it we can either gaze with the female towards the male and the background of decorations, and evaluate and appreciate the merits of that perspective, or we can gaze with the male towards the female, and take into account her reactions, perception, and wonder about how the display and the arranged decorations look to her and from there.

Human and bowerbird gazes also coalesce around the step-back gaze that bowerbirds embody when they are evaluating and perhaps rearranging the bower's decorations. For instance when, as seen in a popular on-line video, a Vogelkop bowerbird flies in and lands in the moss floor of his thatched bower — "his deep forest architectural wonder" (Cornell Lab of Ornithology 2015) — with a bunch of small magenta bellflowers in his beak, he delivers and places them in the chosen spot for a matching small monochrome stack, with some orangish leaves nearby. Then, he composes the flowers with care and takes a step, or hop back, and looks closely at the effect, easily bringing to mind the artists, sculptors, painters that I have been discussing in the different sections. Above all when the bird, with a quick gesture, removes the blemish of a minute speck. In part, this implies imposing certain assumptions and human projections on bowerbirds and their bowers. Even so, it can also turn into an acknowledgement of the gaze of bowerbirds, of how at those moments they are looking, and not only looking, but wondering

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how something looks, for themselves and possibly for the gazes of other birds, including the female bowerbirds that will later look and judge themselves. And thus, bowers are the lively and constantly replenished ensembles that encompass these crisscrossings of movements and gazes, which shape and are shaped by them.

In the same video, the Vogelkop bowerbird flies away and comes back, hopping with another bunch of flowers. Adds them to the neat pile, steps back and looks down and checks, and for a brief moment, pauses and looks towards the camera, as if he was aware of its presence at that precise moment, and likewise as in other moments during the video. For an instant, this works as a reminder that bowerbirds, males and females, can also gaze and look back at us humans.

Figure 7: The eye (and the gaze) of a satin bowerbird

Photograph by Will Brown [Flickr]. CC BY 2.0 Deed (Attribution 2.0 Generic).]

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Animal Architecture in Friedrich Wilhelm Joseph von Schelling's *Philosophy of Art*

Francesco Di Maio

> "[I]s not the shell of the mollusc a more perfect artwork than even the cells of the bees, and don't all of these appearances have their common cause in Nature?"
> *F.W.J. v. Schelling* (2004 [1799]: 135–6; SW I.3: 203)

Within the reflection of philosophy on the subject of architecture (Feldtkeller 2000; Fisher 2016 [2015]; Gleiter 2022), Friedrich Wilhelm Joseph von Schelling's thought emerges for its uniqueness. Indeed, if not the first, he is a thinker that reserves a specific role for architecture insofar as it is conceived through the instance of space. This particular element differentiates Schelling from his contemporary readings that relegated the *ars ædificatoria* to a lower status in their system of art. In fact, authors otherwise dissimilar, such as Georg Wilhelm Friedrich Hegel (1975 [1826]: 83–90, 630–700; cf. Whiteman 1987; Kolb 2007; Houlgate 2018; Farina 2019), or Arthur Schopenhauer (2018 [1859^3]: 428–35; cf. Schwarzer 1996; Korab-Karpowicz 2012), are significantly closer to this point of view. As Eduard Führ (2009: 55–6) noticed, it was precisely the anomaly of Schelling's aesthetics that allowed later architectural theory to return to this point and reflect philosophically on the *proprium* of building science. For this reason, in this contribution, the reflection

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on architecture in *The Philosophy of Art* (1802–1805) and other works by Schelling will be briefly analysed. Starting with the early commentary on Plato's *Timaeus*, it will be highlighted how Schelling borrows three metaphors to describe the production of nature: that of the architect, of musical harmony, and the great animal organism. Specifically, in *The Philosophy of Art*, these metaphors return in the proposal of architecture, understood as frozen music. Schelling's cosmology shows how nature develops by degrees, from the most undifferentiated of the anorganic to the threshold of the human. The further one travels along this continuous scale, the greater the distance that the living can establish between their bodies and their architectural productions. As it will briefly be shown, this "artistic drive" (*Kunsttrieb*) is a mode of the "formative drive" (*Bildungstrieb*), contrary to the sexual one. Therefore, in architectural production, it is possible to discern the results of this still pre-thetic and unconscious process. The limits of this approach clash at the extreme points of production, namely in the human, specifically in the reflections on urbanity. Insofar as the city does not allow for a proper distance for analysis, Schelling can only propose two opposing solutions, the praise of the city as a living work of art, in which animality and rationality merge, or a rejection of the urban and a eulogy of rurality. In any case, it seems that the importance of his reflection lies in considering art as a living, animal, natural process. Therefore, his invitation to his readers is to consider the unconscious shaping dynamics of this process.

The System of the *Philosophy of Art* and architecture

In the *Philosophie der Kunst*, Schelling proposed one of the most famous systems of art at the turn of the 19th century. Here, in fact, the classification distinguishes two series of arts, the real one and the ideal one. The first set is those of the formative arts, the *bildende Kunst*, the second those of verbal, the *redende Kunst*, literally the "speaking arts" (Schelling 1989: 18; *SW* I.5: 371). In accordance with his approach in *Identitätsystem*, the "system of identity", that he was developing at the time, the philosophy of art, like that of nature, and that of history (Schelling 1989: 15; *SW*

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I.5: 368), puts forward two logical categories in a polar relationship, to which a third pole stands as their indifference, their identity, and their potentiation (*Potenzierung*).

As many readers have underlined (Fischbach 2000: 339; Matthew 2011: 258 note and 28; Goudeli 2013: 74 note 5), an anticipation of Schelling's doctrine of powers can already be found in *Commentary* to the Plato's *Timaeus*, specifically in the concepts of *apeiron* (ἄπειρος) and *peras* (πέρας) (cf. *Phil.* $25a^7$-b^3; Schelling 2008 [1794]: 231–6; *HkA* II.5: 182–92). Following this theme, in the German philosopher's thought, every element is determinate as an independent form that emerges from an undifferentiated ground, while a true philosophy of nature—according to an indirect Neo-Platonic heritage (Beierwaltes 1972: 83–153; 1982; 2002 [1999]; 2003 [2002])—has the task of considering the link (*Band*) between the supposedly autonomous individual and the substrate from which it comes.

Following this logical setting, *The Philosophy of Art* develops a threefold articulation of forms for each artistic genre, each for every series. As a result, the actual forms are produced through a process of *Einbildung* (imagination), to be considered literally as a process of formation (*-bildung*), from the universal to the unity of the particular (*Ein-*). It produces an allegory, in which the infinite is received in the finite (Schelling 1989: 32; *SW* I.5: 386). On the contrary, the symmetrical process describes the formation of the particular into the universal One, in which the finite is represented in the infinite. Schelling referred to these dynamics with the neologism *In-eins-bildung*, that Douglas W. Stott (1989: xliii) decided to translate into English as "*informing into unity*".

For the sake of coherence, the metaphysical system thus described is translated into a system of art in which each artistic genre is placed in polar relationships. Overview tables of the entire system are easily accessible (e.g. Simpson 1989: l; Griffero 1996: 123, fig. 5; 33, fig. 6). Ergo, in the real series music is posed as an allegory of the anorganic, whereby melody is achieved through the unity and indifference of rhythm and modulation (Schelling 1898: 109; *SW* I.5: 491). Colour in painting—art that reproduces the scheme of the organic—is obtained both from the lines of drawing, and from the volumetric effect of chiaroscuro. Lastly,

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plastic art is the symbol of reason as a synthesis of the organic and the anorganic. Sculpture, in fact, can be articulated in space, such as in architecture, whilst also escaping from matter, characteristic of relief, whether alto- or bas- (Schelling 1989: 180–1; *SW* I.5: 243–4). Hence, this tripartite structure reinforces in each new phase the same dichotomous categories as the other arts in the same series. For this reason, architecture, placing itself as anorganic arts in plastic ones, will have a relationship of proximity to music (Schelling 1989: 164; *SW* I.5: 574).

Famous is Schelling's designation of architecture as "solidified music [*erstarrte Musik*]" (Schelling 1989: 165, 177; *SW* I.5: 576, 593), "music in space" (Schelling 1989: 165; *SW* I.5: 576) or "spatial music [*Musik im Raume*]" (Schelling 1989: 178; *SW* I.5: 595), and—anticipating Pierre Schaeffer (2012 [1952]) in what had become a fundamental trend in the 20th century neo-avant-garde—"concrete music [*concrete Musik*]" (Schelling 1989: 166, 177; *SW* I.5: 577, 593). Just as music is directly produced by matter itself, according to the model of "music of the spheres", Schelling can claim that the planets are themselves the music they produce. As Schelling says in the *Rede* "On the Relationship of the Plastic Arts to Nature", the "most sublime art of number and measure is native to the stars and is performed in their movements without the stars having any concept of it" (Schelling 2021 [1807]: 139; *SW* I.7: 299). Similarly, architecture, in its proportionate modules, does not produce the music, but *is* itself the music (Schelling 1989: 116; *SW* I.5: 502; Schuller 1957; Pareyson 2003 [1977]; Wanning 2011 [2003]; Jacobs 2005; de Moraes Barros 2007; Petersen de Barros 2011; Lydon 2018: 341–4).

Cosmic animal and the music

The principle of harmony that brings architecture closer to the art of sounds—beyond the echo of Schelling's formulas (Tilliette 1978: xxviii)—holds a classic place in reflections on beauty in general, well before Alexander Gottlieb Baumgarten's canonisation of aesthetics as a discipline (Albert 2011). Schelling, in this regard, takes up an instance peculiar to Pythagoreanism (Schelling 1989: 116; *SW* I.5: 502) which he

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inherited through Platonic *Timaeus*, and already wrote about at the age of 19. His philosophical interest in art, therefore, is not due to his contingent attendance at the Jena circle from 1798 to 1800; on the contrary, the problem of production (in the general sense, i.e. absolute) is at the heart of his philosophical interest from the time of his first formal education. His *Bemerkungen* relied on the Edizione Bipontina as a reference text, which contained the Latin version by the humanist Marsilio Ficino, as well as, among others, the studies of Friedrich Victor Leberecht Pleßing. These sources take on additional value as a place where Schelling punctually borrows terms, such as the metaphor of the architect who builds the world on the basis of music patterns, specifically harmonics. In the part of the *Commentary* where Schelling relies on the Pleßing's *Versucht* (1788: 82), he borrows a particular conception of the Demiurge. The *Timaeus*' God is just a mere figure of the nature process that takes place according to necessity and reason. So he obtains the appellative of "world architect [*Weltbaumeister*]" (Schelling 2008 [1794]: 232; *HkA* II.5: 158), a figure that returns in other late works of the German philosopher, such as the *Allgemeine Anmerkung die Lehre vom Verhältniß des Endlichen zum Unendlichen betreffend* at the end of the *Aphorismen zur Einleitung in die Naturphilosophie* (*SW* I.7: 192: "*Architekt der Welt*"), or the Munich lesson *On the History of Modern Philosophy* dedicated to "Spinoza, Leibniz, and Wolff" (Schelling 1994 [1833–7]: 91: "architect of the world"; *SW* I.10: 69: "*Weltarchitekt*").

The architect metaphor captures just one aspect of the production process, namely that of the nexus between reason and necessity. The second figure used by Schelling is that of the great *zoon* (ζώον), which indicates both animality and life in a broader sense. Schelling embraces here an underlying hylozoism, a classical theory, in which the principle of life is considered intrinsic to matter. As Carlos Zorrilla Piña explained, the "Idea is thus generative precisely insofar as its identity is not a logical but a natural—or even better—a *naturing* one". That of a "generative universal containment" is a philosophical story rooted in the "Pythagorean musings of the older Plato, readily available in his notion of a cosmic animal (*κόσμον ζώον / kósmon zôon*) as the organization which comprehends all other organizations", as shown in *Timaeus* 30c, as well as in "his ac-

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count of what he calls the divine method or way (*ὁδός / hodós*) which one must follow in order to trace the concretions which the ontogenetic dialectic between unity and unlimitedness is capable of yielding", as indicated in *Philebus* 16*c–e* (Zorrilla Piña 2021: 32, and annot. 26). This tradition continues in other thinkers who probably influenced Schelling, whose matrix has to be traced back to Plato. Examples of the epigones of this approach can be found in "Leibniz's analogy of a garden whose every plant is a new garden, Herder's postulation of a main organizational plasma at the base of all existing things, Kielmeyer's doctrine of the *ratio* of forces, and even Immanuel Kant's principle of thoroughgoing determination (minus the organic character of this determination)" (Zorrilla Piña 2021: note 26), to which Baruch Spinoza can be certain added (Follesa 2022: 45).

In observance of the triadic articulation that characterizes his thought, in addition to the architect and the great animal, Schelling borrows a third metaphor to indicate the relationship of individuals produced within the great process of nature. The individual living beings, organs of the great animal that is the cosmos, are instead formed according to the principles of musical harmony. For this reason, Schelling reports a model of schematisation whereby the living forms are *ab æterno* and eternally formed, inserted into the great life process as spatially limited figures on the universal chaotic background. Music-architecture, thus, is linked to this conception of traits, resonating with each other, over the abyss of universal disharmony (Galland-Szymkowiak 2019; Barbarić 2021; Heller-Roazer 2011). Schelling here is strongly influenced by §65 of the *Critique of the Power of Judgment* from Kant (1987 [1790]: 251–55; AA5: 372–6), in which it is shown that the recursive system of the organism exhibits a mereological structuring in which no determinative judgment, but only reflective judgment, can prevail. Said in other words, if a relation of proportion can be stable between the single parts, it is not possible to indicate a highest category that can subsume all living individuals, otherwise they fall into *Schwärmerei*. The musical articulation of the living reports as its correlative an animal and pre-thetic reserve of disharmony. As Schelling commented in the *Timaeus* notebooks: "Plato viewed the entire world as a ζώον, that is,

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as an organized being, thus as a being whose parts are possible only through their relation to the whole, whose parts are reciprocally related against each other as means and end, and thus which reciprocally bring themselves forth according to both their form and connectedness". Following Kant, we "must keep in mind that we, according to the subjective orientation of our power of knowing, simply cannot think the emergence of an organized being otherwise than through the causality of a concept or idea"; it is necessary to "think that everything that is contained within a being must be determined a priori and—just as the particular parts of the organized being bring themselves reciprocally in relation to each other and so bring forth the whole—on the contrary, the idea of the whole must be thought as determining a priori and in advance the form and parts in their harmony" (Schelling 2008 [1794]: 213; *HkA* II.5: 158–9). Schelling so concludes that: "Plato now further describes the different proportions according to which God built the world, a harmony that is never to be understood by us!" (Schelling 2008 [1794]: 219: *HkA* II.5: 166).

Animal unconsciousness and the shell

As anticipated, Schellingian aesthetics will never abandon the dynamic described in the *Timæus* commentary through the metaphors of the architect, the animal, and harmony, and, as already advanced, these will return in the German philosopher's reflections. For this reason, any description of an artistic genre for Schelling can only show determined and limited figures, reciprocally articulated according to proportional laws, whose exposed composition emerges from an undifferentiated and unknowable ground.

This tension between figure and amorphous runs through the entire Schellingian system of art, to the extent that it does not develop Gotthold Ephrain Lessing's dichotomy between the arts of space and the arts of time (Lessing 1984 [1766]: 40; Lippert (ed.) 2017), rather it articulates an "antithesis" [*Gegensaß*] between the figurative and verbal arts (Schelling 1989: 18; *SW* I.5: 371). The latter are in fact positioned as polar extremes

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with respect to space. The paradigm of logocentrism, as deconstruction has indicated, also pervades German idealism's aesthetics of architecture. Hegel conceives the speaking voice as the paradigm through which he thinks of architecture. In his *Aesthetics* lectures, he produces a dialectic of two contradictory principles, of life and death, represented with the inner pit of the soul, and the Egyptian pyramid, its cenotaph (Derrida 1982 [1968]). Although, even in Schelling, all the arts are based on the model of human language, in contrast to his former Tübingen *Stift* fellow, the dialectic is no longer between two contradictory elements, but between two deictics instances: indeed, the human voice does not deny the inarticulate sound of concrete music or animal verse, but constitutes an element of its individuation, its elevation to power. As Schelling says: "Very few people realize that even the language [*die Sprache*] in which they express themselves is the most perfect work of art [*das vollkommenste Kunstwerk*]" (1989: 9; *SW* I.5: 358) and the "Language [*Die Sprache*] in itself is the chaos from which poesy is to construct the bodies [*die Leiber*] of its ideas" (1989: 205; *SW* I.5: 358). For this reason, "in *song* [*in dem* Gesang], itself *music* [*wieder* Musik], the identity attained in language [*in der Sprache*] is once again broken down or dismantled, and speech returns to elementary tones [*zu den Elementartönen*]" (1989: 205; *SW* I.5: 256). The human, in Schelling, never leaves the animal background from which it emerges.

As a consequence, this conception of language is a significant element of Schellingian anthropology, in which the difference between animals endowed with *logos* and those without is determined by a capacity for self-reflection that the latter lack (Formigari 1977: 61–73; Hennigfeld 1984; Whistle 2013). Animals produce, they build, according to an instinct that flows back to the anorganic, and their work can assume consistence at a distance separate from their body the higher their capacity is for symbolism. The further the degrees of nature descend towards the anorganic, the greater will be the indistinction between body, work, and environment [*Umwelt*]. As explained in the 1807 *Rede*, this formative process "clearly appears in the living knowledge of animals, although they themselves cannot grasp this knowledge". The animals, in fact, "perform countless acts as they unconsciously wander along, acts that are far more magnificent than the animals themselves: the bird,

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intoxicated by music, which surpasses itself with soulful tones or the tiny artistic creature that executes simple works of architecture without either practice or instruction" (Schelling [2021 (1807): 139; *SW* I.7: 299). For this reason, birds' nest by retrieving material from long distances, so beavers for their dams. Bees wall up their cells, while spiders and silkworms secrete their warp by extracting it from their bodies. And so, moving further towards the amorphous, the productions resolve into deposits adhering to their own bodies. Schelling's examples in *The Philosophy of Art* are also the octopuses that inhabit corals and molluscs and oysters dwelling their own shells. Even in the exoskeletons of insects and crabs the architectural work of art is an extroflexed bone structure (Schelling 1989: 163–4; *SW* I.5: 163–4). As 1807 *Rede* explains, the "conflict between life and form really seems to begin in the realm of animals: it conceals its first works in hard shells, and where these were eliminated, the animate world, through the art drive, rejoined the realm of crystallization" (Schelling 2021 [1807]: 142; *SW* I.7: 304). From this point of view, it is clear how critics have been able to advance an appreciation for the aesthetics of Schellingian architecture with more contemporary biomimetic architecture (Galland-Szymkowiak 2022 [2020]).

The animal production process is based on an *Unbewusstsein*: in Schelling, the unconsciousness is animal. The German philosopher asserts that the "artistic impulse [*Kunsttrieb*] of animals is nothing other than a specific direction or modification of the general formative impulse [*Bildungstrieb*]" (Schelling 1989: 163; *SW* I.5: 573). Schelling links a peculiar connotation to the art drive, specifying that the "so-called artistic impulse [*Kunsttrieb*] of animals is nothing other than a specific direction or modification of the general formative impulse [*Bildungstriebs*]". As proof, he provides that the "artistic impulse in most species emerges as the equivalent of the reproductive instinct". Therefore, it "is the genderless bees that produce the anorganic masses of their cells externally. In other species the manifestations of the artistic impulse accompany the manifestations of the metamorphosis or sexual development, such that the artistic impulse also disappears with developed sexuality. In other species the expressions of the artistic impulse precede the time of mating" (Schelling 1989: 163; *SW* I.5: 573). As stressed

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by Xavier Tilliette (1991: 124–9; 132–3; 1999: 69), starting from the essay *On World Soul* (*SW* I.2: 533), Schelling is influenced by Johann Wolfgang von Goethe's studies on plant morphology, thinking of the principle of individuation as a process of sexual differentiation. Consequently, the natural, pre-individual instance of Nature, or the Absolute, is a dimension of sexual indifference. As declared in a note of the *First Outline of a System of Philosophy of Nature*, "Nature *hates* sex [*Die Natur* haßt *das Geschlecht*], and where it does arise, it arises against the will of Nature" (Schelling 2004 [1799]: 231; *SW* I.3: 324 note 4). On this point *The First Outline* is the source of *The Philosophy of Art*: "Sexlessness is equally as little demonstrated in the animal realm, for even in polyps, since the discovery of Pallas, one cannot doubt the sexual functions. Where there actually is sexlessness, there is yet another direction, specific of the formative drive. The sexual drive and the technical drive are equivalent for most of the insects before they have passed through their metamorphoses". As previously reported, the "sexless bees are also the only productive ones, and yet without doubt they are only the mediators through which the formation of the one queen bee is achieved (in which the formative drive of all the remaining bees seems to be concentrated). Most insects lose all technical drive after sexual development" (Schellling (2004 [1799]: 36; *SW* I.3: 105). Schelling has to assume that animal acts and productions are driven by a "blind exigency" determined by constraints: "Philosophers who deny all rationality to animals have allowed them to be driven not only to their actions, but also to their productions, by the feeling of pleasure. They did not know that instinct and impulse do not exist together in the feeling of pleasure, and at bottom they cancel all instinct, while they carry human baseness into Nature.—It is no better to say that the bees, for example, are driven by *pain* to build their cells" (Schelling 2004 [1799]: 132–3; SW I.3: 199).

On the contrary, the human process of architectural production certainly takes place through the same animal instinct, but it involves externalization, of *Entäußerung*, which leads to a distinction between author and produced object, between maker and buildings, between musician and performer (Schelling 1989: 163–4; *SW* I.5: 572–4). For this reason, art, in its exposition, in the *Darstellung* of its object, stands as an

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instrument of reason, as its *organon*, insofar as it offers the possibility of intuiting the two poles of the production process, conscious and unconscious, animal and human (Schelling 1978 (1800): 219–33). Architecture, therefore, insofar as it establishes itself as a production close to the anorganic, requires a prior spatialisation. Consequently, architecture *is* space, it is its prior constitution. According to a *mimesis* model that underpin all of Schelling's aesthetics and justifies the analogical dynamic underlying his entire system, architectural shapes reproduce the living forms closer to the formless, that is, those of plants, as already pointed out for some years by Goethe (cf. Robson-Scott 1956; Bernstein 1999; Calhoon 2011; Purdy 2011: 162–92), or Karl Wilhelm Friedrich von Schlegel (Pisani 2005). Accordingly, it is space that also makes a specific difference to the other *bildenden Künste*, sculpture and painting: if architecture is space, on the one hand, sculpture is positioned as a space within matter that expands to produce the expressive forms of statues: sculpture for Schelling is a restrained explosion (Schelling 1989: 182–201; *SW* I.5: 602–27). Painting, on the other hand, places the human figure as its first and supreme object and extends the landscape outside of him to stand out, reiterating Schellingian anthropocentrism (Schelling 1989: 126–57; *SW* I.5: 517–72).

So architecture is that which produces a distance, a hiatus. In this regard, it is interesting to note how Schelling, in the second part of his lectures on the *Philosophy of Art*, proposes the following definition of image: the "image [*Bild*] is always concrete [*concret*], purely particular, and is determined from all sides such that only the definite factor of the space occupied by the original object prevents it from being identical with the object itself" (Schelling 1989: 46; *SW* I.5: 407). Based on this principle, a specific cosmology arises, in which the degrees between anorganic and organic increase the more distinction is made between bodies and images. The difference between humans and other animals is the wider *Einbildungskraft*, that means 'power of imagination', the ability to create a space between us and our products. As a consequence, architecture becomes the first form of the "real" art by human production. To the extent that humans are on the one end of an extreme of natural production with God on the other. As §11 of *The Philosophy of Art* declares:

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> "Complete revelation of God [*Vollkommene Offenbarung Gottes*] only occurs where in the reflected world itself [*in der abgebildeten Welt selbst*] the individual forms resolve into absolute identity, and this occurs only within reason [*Vernunft*]. Reason [*Die Vernunft*] is thus within the All itself the full reflected image of God [*das vollkommene Gegenbild Gottes*]" (Schelling 1989 [1802–5]: 27; SW I.5: 378).

Humans, extremely distanced from God, intended as animal production, also coincide with the divinity, understood as deployed reason. Animal artistic production show in this way their role as a mirror of affinity and indistinguishability of rationality and *bêtise*.

City and the work of art

And distance is precisely what establishes the pivot and limits of Schelling's reflection on architecture. The German philosopher, in order to discuss this art as one of the *Beaux arts*, according to an 18th century canon, must necessarily distinguish its utility function from its aesthetic component. He justifies it by explaining that beauty exceeds the specific need, borrowing the category of adherent beauty (*pulchritudo adhaerens*) from the third *Critique* (Kant 1987 [1790]: 76–8; AA5: 229–31). Thus, after indicating that the function of need is mainly fulfilled by interiors, the Leonberg philosopher relies on examples of architecture with a social and symbolic function, i.e. temples, Gothic cathedrals, or castles. This justifies two consequences: on the one hand, his reflection on the aesthetics of architecture cannot consider cases of buildings with other functions, e.g. housing. On the other hand, he does not seem to turn his gaze on the external environment surrounding the cathedral or castle, i.e. the urban context.

It is then necessary to specify that there is no structured reflection on urban aesthetics in Schelling's writings, but some specific remarks can be found. It is also true that Schelling, using the Greek city-states and their Italian Renaissance analogue as references, spoke of the state in terms of a "work of art" during his lectures *On University Studies*

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(Schelling 1996 [1802]: 110, and 151; *SW* I.5: 312, and 353). As remainder by Edgar Wind (1985 [1969]: 96–7, note 1), this syntagma provoked indignant but direct reaction Hegel (1991 [1820]: 219) —"The state is not a work of art [*Der Staat ist kein Kunstwerk*]"—. Similarly, this position could be extended to Walter Benjamin's indirect dialectical backlash arguing for political aesthetics against aesthetic politics (Benjamin 2008 [1936]: 42). For Schelling in those lectures, all elements of the state—but in the same years he will also address the Church from a similar perspective (Schelling 1996 [1802]: 90, *SW* I.5: 293)—should behave like the organs of a living work of art, approaching the idea of a total work of art [*Gesamtkunstwerk*], a concept of which he was the first theoretician, as proposed by Odo Marquard (2003 [1983]). On the basis of political unity, it is no longer possible to distinguish between means and ends, between instruments and objectives.

It is significant that all of Schelling's reflections on the subject of the city borrow the landscape model. Here, in fact, by placing a figure corresponding to the human at the centre, Schelling should place an open, wide surrounding wideness. In the dialogue *Clara*, the main character asks:

> "Why do people usually think that monastic life is so pleasant and beautiful? Is it because everyone likes to think that behind the monk's habit there lies the ideal of a clear and peaceful person who has found his own equilibrium; an ideal that everyone wants to realize, but which they nevertheless don't know how to? For certainly only the mob can be influenced by external motivations, the life of luxury, the carefreeness of this state, and similar such things". (Schelling 2022 [1810]: 15–6; *SW* I.9: 21–2)

Theresa, another character, answered her: "Only the beautiful location of the cloisters could win me over […], the hills on which they are so often built, the fertile valleys that surround them" (ibid.: 21–2). Further, Clara responds saying:

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> "Nevertheless, I answered, the arts and learning would suffer more than a little if all these rich cloisters with their magnificent buildings, their considerable collections of books, their churches with their many altar pieces, their murals, and their artistic wood carvings were to disappear" (ibid.: 22).

Theresa was agreeing:

> "[…] the whole area would become dreary. Indeed, I don't know what sight is more beautiful than a magnificent building with towers and domes rising up in the middle of nature's riches, surrounded by rippling cornfields with water, woods, and vineyards in the distance, where everywhere everything is alive with the hustle and bustle of people. The most beautiful town does not have this effect on me; it represses nature such that only at some distance from the city can nature come to be found once more. But the simplicity of mixing the unbounded richness of a country district with what is magnificent and great, this alone is what is true and fitting" (Schelling 2022 [1810]: 16; *SW* I.9: 22).

This seems to be the challenge of Schellingian aesthetics: insofar as the human is the animal that produces images of itself, its architecture is the primary element through which it produces a distance. Since animal instinct remains unconscious, the production of the work of architecture allows us to achieve the object distance, that reason needs in order to unify reality. But the unknown background remains, just as what lies beyond the cathedral is not considered by Schelling: is this a negligence or an instance that denounces the impossibility of a distance for the analysis? Similarly, one wonders if Schelling abandoned the model of the living work of art. For him, states no longer adhere to the model of the organism, but to that of an imposition from above (Bruff 2021; Habermas 2004 [1961]). It is therefore possible to notice an ambiguity, or an oscillation, in Schelling's reflection on the urban. On the one hand, in his first production, there was the proposal of a model that we might call utopian, in which the city was considered as a living art form. Here we could see how the reflection on art, animality and distance reached a concise and

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conciliatory proposal. On the other hand, his second reflection, linked to the themes of melancholy and groundlessness, seem instead to explicate a rejection of the urban and rather an enhancement of isolation and the bucolic. In other words, here Schelling seems close to a sculptural and monumental model. This is certainly the cost to be paid by a reflection that excludes any consideration of the utilitarian function of dwelling. In any case, this oscillation is possible precisely through the polar model that has always been promoted.

Otherwise, using Schelling's philosophy beyond himself, in the extension to urbanity, the human gaze finds itself as if drawn towards the anorganic context, as if to say that it can only run into unconscious elements. Cities, in Schelling's view, can reduce the human to the animal from which it always comes and always is. If Schelling is the one who introduced the value of the unconscious into artistic production, perhaps it can be a building block to start thinking about the development of an "urban unconscious". In Schelling's aesthetics, buildings are organs used to project movements that crawl through the city, a paradigm with some proximities to that used to analyse the post-pandemic city (Latour 2021 [2021], §2). That is the anorganic, vegetal, animals, one positive element out of reason, and its own contrariety (Di Maio 2022). The city, in other words, cannot be a total work of art. Against the risk indicated in Schelling's "identity philosophy" by Marquard (2003 [1983]: 100), the later Schelling is increasingly aware that there is no paradigm that can describe the entire complexity of urbanity. In any case, a work of architectural art can be a good *organ* to intuit it.

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From Beast to Machine

Transformations of Non-Human Actors in Performing Arts of the 18th and 19th century

David Krych

"Mundus universus exercet ursiludium"

About the popularity of animal fightings and baitings

The focus of this contribution is on theater forms that are not necessarily part of conventional history of performing arts. Retrospectively, these forms are usually just considered as historical side notes, despite the immense popularity they enjoyed in their time. We will look at theater types with animals or non-human actors, like animal-baiting, animal dressage and machine theater in the 18th and 19th centuries and see a particular shift in the practices and thus the social/cultural status of non-human actors.

The starting point is a special performing practice. Rather, we normally associate it with the Spanish-speaking world (*corrida*) or as it is known to us from Shakespeare's time (bear-baiting) or going more back in time from Roman Antiquity (*venationes*). It is a theater that was highly popular in its respective time. Yet, with the hegemonial establishment of theater as "moral institutions" (Germ.: moralische Anstalten), as Friedrich Schiller called them (1785), they fell prey to being removed from the cultural consciousness.

The Latin phrase "mundus universus exercet ursiludium", that is "all the world is but a bear-baiting", dating from the time of Henry VIII (Gomme 1905: 76), is meaningful in many ways. It gives an indication of

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how popular and ubiquitous this type of theater was, that it found its way into a typical *theatrum mundi* metaphor. It is debatable whether the whole world is or was "a bear-baiting", but it definitely was Eurocentric. Up until the 18th and 19th centuries, animal fighting or baiting arenas could be found all over Europe. For example: in Bayreuth (Lindner 1964: 211), Berlin (Fidicin 1843: 79), Bratislava (Nicolai 1785: 437), Brno (d'Elvert 1852: 80), Budapest (Binal 1972: 39), Graz (Fleischmann 1974: 96), former Königsberg (Bekmann/Bekmann 1751: 787), Moscow (Reimers 1803: 147), Nuremberg (Hampe 1902: 114), Paris (Fayt 2009: 28), Prague (Svátek 1899: 347), Regensburg (Fendl 1988: 136), Warsaw (Frankowska 2003: 231) and in Vienna, which we will focus on.

Theater practices with non-human actors, with animals, were an integral part of European cultures even before the establishment of what we understand today as circus. Such types were not limited to a certain social or cultural milieu, they were part of courtly festivities and of commoner's festivities. An extraordinary insight into this is provided by Hanns Friedrich von Fleming's (1670–1733) "*Der vollkommene teutsche Jäger*" (Engl.: The Perfect German Hunter) from 1719. Fleming gives an overview about various hunting and baiting practices that were performed for the amusement of the nobility. Among them is the so-called fox tossing (Germ.: Fuchsprellen): In a cordoned-off area, were several people, each facing the other and holding a long cloth at the ends. Animals (for example young boars, foxes, hares) were let into this area. As soon as one of the animals stepped on the cloth, it was tightened by the opposing person and the animal was thrown into the air (see fig. 1). This practice, which from today's perspective would undoubtedly fall under massive animal cruelty, was an integral part of courtly festivities, such as the wedding ceremony between Leopold I (1640–1705) and Margarita Theresa of Spain (1651–1673) on December 16, 1666 in Vienna (Rink 1708: 158).

From the perspective of theater and cultural studies, three fundamental aspects are recognizable here, among others: (1) The spatial arrangement, which was created decidedly for an audience and contains central theatrical elements; (2) The fact that a certain openness to results was present in the process of fox tossing also shows that a quasi-play-

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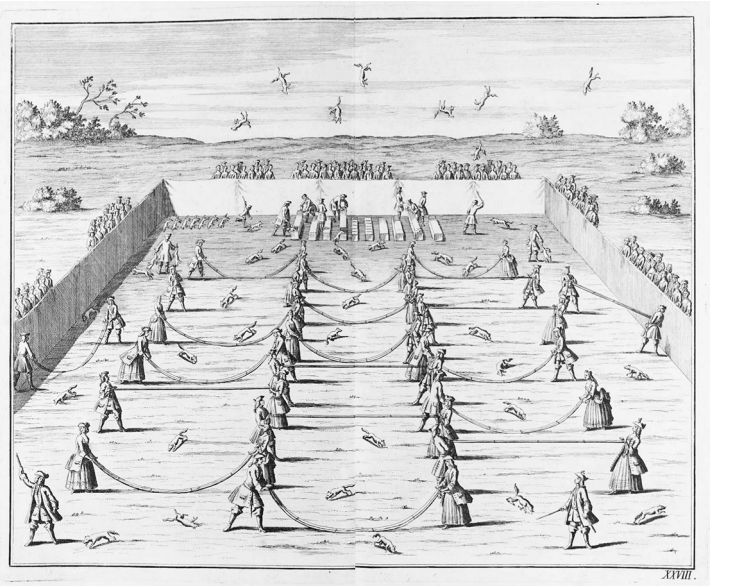
ful element is present here for the human actors; (3) This practice (and others of this kind) demonstrate that in the course of European cultural histories up to the 19th century, a change becomes recognizable regarding the death of animals. The death of tossed animals is hardly related any more to the satisfaction of primary needs, i.e. the acquisition of food, but shifts to the realm of 'secondary pleasures', i.e. a symbolic, representative and thus representational level.

Figure 1: Von dem Fuchs-Prellen



In: Fleming, Hanns Friedrich von (1724): Des Vollkommenen Teutschen Jägers Anderer Haupt-Theil, Leipzig: Johann Christian Martini, between p. 182–3.

However, animal baiting and fighting were culturally also part of the non-aristocratic milieu. Particularly worthy of mention here are the practices of the historical carnival. A very vivid example of this is

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provided by the description of a carnival in Venice in the mid of the 18th century, in which the author describes an oxen and bear baiting that consisted of three parts: firstly, oxen were driven through the streets and alleys of Venice, which also posed a danger to bystanders and pedestrians. In the second part, oxen were taken to squares where they were baited with dogs. This part usually ends with a bear baiting i.e. a tethered bear was also baited with dogs. The end of this carnival section was the oxen decapitation (Köhler 1765: 62). From a cultural history perspective, the striking difference to a large part of aristocratic practices is that here, despite the theatrical aspect, there is a satisfaction of the primary needs. The eating of the killed animals was still an essential part of this festive culture (Weichmann 1999: 178), combined with the sociability of these practices.

In the course of the 18th century, with the emergence of a bourgeoisie class alongside increasing urbanization, these quasi-separate structures or practices (the separation of courtly festivities and people's festivals) seem to merge. Regarding performing arts involving animals, this is aptly illustrated by the example of the baiting arenas (German: *Hetztheater*). These often significantly shaped the architectural townscape in the cities listed and were often designed as circular buildings. Such a theater in Vienna was located outside the city walls in a rather rough district mainly associated with butchers and tanners – and in this district of mainly low buildings, a large, tall, round theater building stood out.

Recalling the assertion that the whole world was a bear-baiting, it becomes obvious that the baiting practices appearing in various socio-cultural milieus and subsequently the round buildings – against the background of the theatrum mundi metaphor and in memory of the architecture of Shakespeare's Globe Theater with its universal claim – suggest to us that this practice was much more strongly anchored in the European cultures (in practices and in a symbolic way) than one could often believe from a current cultural-moral or -ethical view.

Theater reforms during the 18th and 19th centuries were instrumental in excluding certain performing practices and arts from the term "theater" (especially in the German speaking areas). As the 18th century

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progressed, we see that the concept of theater became increasingly narrowed, ultimately leading to what we currently define as theater – primarily a literature-based spoken theater (Kirchner 1985). Performing practices involving animals, especially the "Hetztheater", were eradicated from the conventional understanding of theater, making this an exclusive term.

"Mundus inversus" – "mundus mixtus"
Anthropomorphizations and bestializations of animals in the Viennese Hetzamphitheater

The exclusive cultural morality of society is undoubtedly of enormous importance in every era. From a historiographical perspective, however, it can decisively lead to a selection and emphasis of certain historical events and a neglect of others, according to Bertolt Brecht's historical-theoretical assessment, "The victor always writes the history of the defeated"[1] (Brecht 1964: 261) – which probably comes to light not only on a political level but also on a moral one. Thus, it is not surprising that the baiting practices, the multitude of Hetztheater in Europe hardly found their way into common theater and cultural histories.

One of the largest European Hetztheater was in Vienna and was called the "*kaiserlich-königlich priviligiertes Hetzamphitheater unter den Weißgerbern*", it can be translated as the: "Imperial-royal privileged baiting-amphitheater under the White Tanners" (here simply Hetzamphitheater).

1 Orig.: "Immer schreibt der Sieger die Geschichte des Besiegten" (translation by David Krych).

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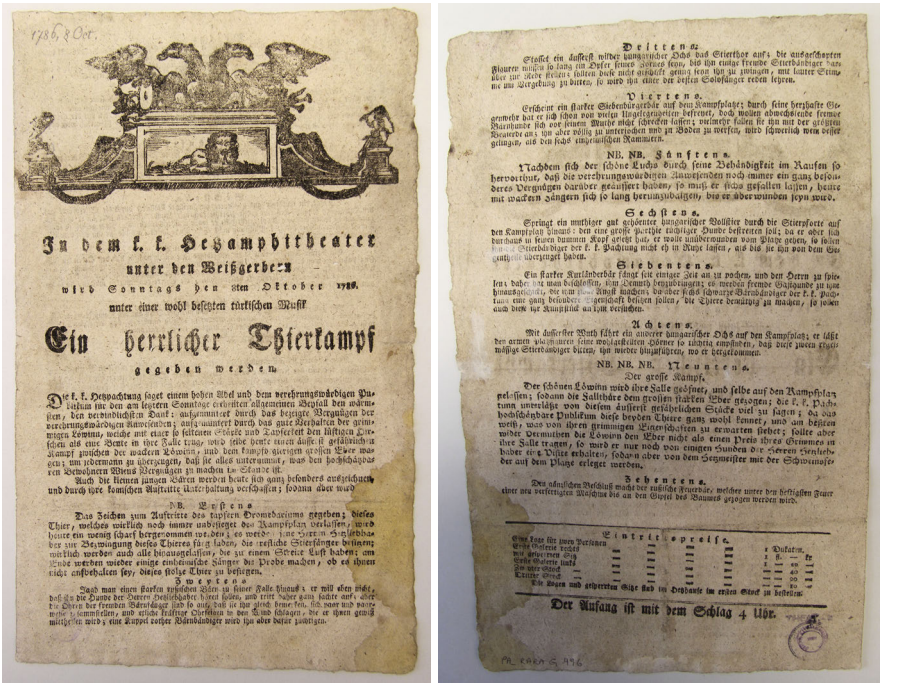
Figure 2: Hetzzettel: Ein herrlicher Thierkampf



In dem k. k. Hetzamphitheater
unter den Weißgerbern
wird Sonntags den 8ten Oktober 1786.
unter einer wohl besetzten türkischen Musik
Ein herrlicher Thierkampf
gegeben werden.

Die k. k. Hetzgesellschaft saget einem hohen Adel und dem verehrungswürdigen Publikum für den am letztern Sonntage erhaltenen allgemeinen Beyfall den wärmsten, den verbindlichsten Dank: aufgemuntert durch das bezeigte Vergnügen der verehrungswürdigen Anwesenden; aufgemuntert durch das ganz Kleinkalibrige der grimmigen Löwinn, welche mit einer so seltenen Grösse und Tapferkeit den lüstigen Hirschen als eine Beute in ihre Fälle trug, wird diese heute durch Lüfte gefährlichern Kampf zwischen der wackern Löwinn, und dem kampfbegierigen grossen Bäre machen; um jedermann zu übertreffen, daß sie alles unternimmt, was den hochschätzbaren Bewohnern Wiens Vergnügen zu machen in Stande ist.

Auch die kleinen jungen Bären werden heute sich ganz besonders auszeichnen, und durch ihre komischen Lustsätze Unterhaltung verschaffen; sodann aber wird

NB. Erstens

Das Zeichen zum Auftritte des tapfern Bromberiums gegeben; dieses Thier, welches wirklich noch immer unbesiegt den Kampfplatz verlassen, wird heute ein wenig scharf hergenommen werden, es werden seine Kräfte in Erstaunen setzende Beweglichkeit hier zur Bewunderung dieses Thieres stark laden, die resolute Stierfänger heute wirklich werden auch alle hinausgelassen, die zu einem Streite Lust haben; am Ende werden wieder einige andenkische Hunde die Heide machen, ob es ihnen nicht einfallen soll, dieses stolze Thier zu besiegen.

Zweytens

Nach nun einen starken tyrolischen Stier zu seiner Falle hinaus, er will aber nicht, daß sie die Hunde der Herren Hetzliebhaber hetzen sollen, und tritt daher ganz sachte auf, aber die Herren der fremden Hetzhunde sind so auf das ist gar gleich bemerken, sich voor und dann wieder zusammenstellen, und ersten kräftigen Oberstier in den Grund schlagen, die er ihnen gewiß mittheilen wird; eine Kuppel rother Hühnerhunde wird ihn aber bester zudringen.

Drittens.

Staffet ein äusserst wilder ungarischer Ochs das Stierthor aus, die ausgeschnittenen Flouren müssen so lang ein Opfer seines Zornes seyn, bis ihn einige brave Stierbändiger dazu über ihr Bedauern halten, diese nicht ausgeht genug seyn, ihn zu zwingen, mit lauter Stimme um Vergebung zu bitten, so wird ihn einer der besten Solofänger reden lehren.

Viertens.

Erscheint ein starker Siebenbürgerbär auf den Kampfplatz; durch seine beyhabte Gewandheit hat er sich schon von vielen Hetzliebhabern bekannt, doch wollen abwechselnde starke Bärthunde sich vor seinen Mauler nicht schrecken lassen; vorzüglich sollen sie ihn mit der größten Bravourde um ihn aber völlig zu unterjochen und zu Boden zu werfen, wird schwerlich wem besser gelingen, als den hoch eingeschulten Kammern.

NB. NB. Fünftens.

Nachdem sich der schöne Luchs durch seine Behändigkeit im Raufen so hervorthut, daß die verehrungswerdesten Anwesenden noch immer ein ganz besonderes Vergnügen darüber genossen haben, so muß er heute gefallen lassen, heute mit wackern Hängen sich so lang herumzubalgen, bis er überwunden seyn wird.

Sechstens.

Springt ein muthiger gut gehetzter ungarischer Bullster durch die Stierpforte auf den Kampfplatz hinaus: den eine große wurthe tüchtige Hunde bestreiten soll; da er aber sich durchaus in seinen dummen Kopf gesetzt hat, er wolle unüberwunden vom Platze gehen, so sollen seine Stierbändiger der k. k. Pachtung nicht eh in Ruhe lassen, als bis sie ihn von dem Gegentheile überzeugt haben.

Siebentens.

Ein starker Auerländerbär schnaubt seit einiger Zeit an zu pochen, und den Herrn zu spielen, daher hat man beschlossen, dem Löwinn beyzukommen; es werden fremde Gassenhunde zu ihm hinausgelassen, die nun ihr Möglichstes tun werden, sich vor seine schwarze Bärenkrallen der k. k. Pachtung eine ganz besondere Ehrengesellschaft bringen sollen, die Thiere demüthig zu machen, so sollen auch diese vor Kampfbiß zu ihm bestehen.

Achtens.

Mit äusserster Wuth fährt ein anderer ungarischer Ochs auf den Kampfplatz, er läßt den armen ehrlichen seine wohlgestalten Hörner so tüchtig empfinden, daß diese zween Thiere nöthige Stierbändiger bitten, ihn wieder hinaustreiben, wo er hergekommen.

NB. NB. NB.

Neuntens.

Der grosse Kampf.

Der schönen Löwinn wird ihre Falle geöffnet, und selbe auf den Kampfplatz gelassen; sodann die Fallthüre dem grossen starken Bäre gezogen; die k. k. Pachtung unterläßt von diesem äusserst gefährlichen Stücke viel zu sagen; da das hochschätzbare Publikum diese beyden Thiere ganz wohl kennet, und am besten weiß, was von ihren grimmigen Eigenschaften zu erwarten stehet; sollte aber wider Vermuthen die Löwinn den Bär nicht als einen Preis ihrer Grimmen in ihrer Falle tragen, so wird er nur noch von einigen Hunden die seinen Ehrenliebender auf dem Platze erleget werden.

Zehentens.

Den allgemeinen Beschluß macht der tüchtige Hirsch, welcher unter den heftigsten Feuerwerken und verfertigten Maschine bis an den Giebel des Baumes gezogen werden wird.

Eintrittspreise.

Eine Loge für vier Personen	—	—	—	—	2 Dukaten.
Erste Galerie rechts	—	—	—	—	1 fl. — kr.
Erste Galerie links	—	—	—	—	1 — 30 —
Im Parterre	—	—	—	—	— 45 —
Dritter Platz	—	—	—	—	— 30 —

Die Logen und gedeckten Sitze sind im Orchestre im ersten Stock zu besetzen.

Der Anfang ist mit dem Schlag 4 Uhr.

Vienna: k.-k. priv. Hetzamphitheater, October 8, 1786, paper/print, Theatermuseum Wien: reference PA_RaraG496.

The dimensions of the Hetzamphitheater convey the importance and popularity of this practice. Even in view of the rise of Vienna's population from c. 175,000 in 1750 to over 230,000 around 1800 (de Vries 1984: 278), the immense size of the Hetzamphitheater is remarkable. It is also remarkable in comparison to all the other theater institutions or entertainment venues that existed in Vienna or in the Viennese suburbs at the time, such as the *Theater nächst der Burg*, *Theater am Kärntnertor*, *Theater in der Leopoldstadt*, *Freihaustheater*, *Theater in der Josefstadt*, *Landstraßer Theater*, or Georg Stuwer's (1732–1802) fireworks. The Hetzamphitheater was built in 1755, modified in 1766 and 1786 and burned down on Septem-

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ber 1, 1796 after a show. In the incident, almost all the animals either burned alive or were shot by the military. With an inner diameter of 42,6 m, an outer diameter of approx. 53 m, a height of 11,4 m and a capacity for 3000 people, it was the Habsburg capital's largest theater at the time (Tatzer 1969). However, the size itself does not directly provide any information about the performing practices that prevailed there. In the end, one has to rely on other documents or contemporary reports of experience. Regarding the Viennese Hetzamphitheater in particular, there is a uniquely diverse collection of documents. On the one hand, there are the playbills, or *Hetzzettel* (see fig. 2), an extraordinary source, which will be at the focus of further considerations here. These documents served, among other things, to advertise the baiting events and express a positive attitude towards these practices. On the other hand, there are contemporary descriptions of the Hetzamphitheater that attempted to discredit it. It is precisely through these texts, strongly influenced by morals and ethics, that we obtain more detailed information on baiting practices. Enlightenment thinkers who spoke out decisively against the Hetzamphitheater and described animal baiting, in some cases in great detail to emphasize how undignified such practices were, contributed significantly to the abolition of this performing practice and its suppression from society's cultural consciousness. In retrospect, some of these descriptions are incredibly helpful for gaining any understanding of what animal baiting spectacles were like. They even provide detailed information that make it possible to bring the Hetztheater back into a cultural-historical consciousness.

These contemporary views are thus immensely helpful in understanding certain aspects of the Hetzzettel and how the animal fights were staged. Only about 10 percent of the Hetzzettel have been preserved,[2] but they give us unique insights into how the (linguistic and

2 The largest collection of the Hetzzettel is preserved in the Wienbibliothek im Rathaus (the Vienna Library in the City Hall). Otherwise, isolated copies can be found in the Theatermuseum in Vienna and in the Landstraße Bezirksmuseum in Vienna. Based on the existing Hetzzettel and the average number of

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theatrical) relationship to animals has changed during the last decades of the Hetzamphitheater.

From a certain moment on, the Hetzzettel differ significantly from all other theater announcements. In addition to the usual information about the place, time and ticket prices, they provide remarkable information – although here only the linguistic aspects will be dealt with. For example, from the 1780s onwards, animal baiting took place to the accompaniment of music. It was announced as "Turkish music"; or Janissary music, adopted from the Ottoman army by the military of several European countries. This music accompanied the animal fights and gave the events some oriental exotics. Animal baiting has been announced by titles since the 1780s. The titles always promised an exceptionality and were usually peppered with certain superlatives. The fact is, however, that the multitude of these animal baiting events resembled each other in their basic dramaturgical structure. The organizers of animal baiting mainly expressed the specialness via the linguistic level. Animal baiting followed a (in German so-called) *Nummerndramaturgie* (number dramaturgy). This dramaturgy refers to the organization or structure of a performance based on distinct, numbered elements or scenes, which can be found in circus, variety performance, music or dance theater, where the sequence of musical numbers or scenes plays a crucial role in the overall narrative and dramatic development. There are three types of such a dramaturgy of the Hetzzettel, closely connected with the special linguistic development of these playbills: number-Hetzzettel, number-narrative-Hetzzettel and narrative-Hetzzettel.

With these types of Hetzzettel we can see a change in the description of animals: a twofold relationship of anthropomorphization and bestialization becomes recognizable. This evolution is best seen when comparing animal baiting from the three said types Hetzzettel.

The first announcement, on a number-Hetzzettel, of such fight analyzed here is from August 13, 1775. It was published in the newspaper *Wiener Zeitung*: "Furthermore for the first time, there is a strong boar that

events (between 1755–1796), it can be assumed that about 90 percent of all announcements no longer exist.

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has recently been brought here and is caught and held by a beautiful and strong solo-dog."[3]

A similar fight is featured in an announcement from March 23, 1794, on a number-narrative-Hetzzettel: "The boar eager to fight enters as a shot the battlefield; full of bad humor about the arriving guests, it welcomes them so rudely that some conspire not to visit this rough pig any more."[4] (Hetzzettel 1794a)

Another boar-dog-fight was announcement on May 20, 1782 on a narrative-Hetzzettel, promising a kind of re-enactment of the Trojan myth: "A Trojan whore, as wild as a boar, adorned with fire feathers and hell flowers, also looks at the horse, and immediately gets a hidden warrior as a lover; but who instantly despises her because of her ugliness, and tugs her braid."[5] (Hetzzettel 1782)

We see here a far-reaching change in the narrativization of the numbers. While the first example is written in a very sober style, detailing which animals will fight each other (as background information we only learn that the wild boar was newly acquired and the supposed outcome of the baiting), there are fundamental linguistic changes in the following two examples. The second example shows a particular narrative structure: an introduction (the boar "enters as a shot the battlefield"), a human disposition is attributed to the animal, which comes about as a reaction to the dogs. The dogs are no longer referred to as dogs, but as "arriving guests". Then a specific linguistic inversion takes place: the generic

3 Orig.: "Weiters folgt zum erstenmal ein neu herbeygeschaftes starkes Wildschwein, das von einem schönen, und starken Solohund gefangen und gehalten" (translation by David Krych).

4 Orig.: "Schießt das kampfbegierige Wildschwein auf den Platz; voll übeln Humors über die ankommenden Gäste bewillkommt es dieselben so unhöflich, daß mancher sich verschwört, dieser groben Sau keine Aufwartung mehr zu machen" (translation by David Krych).

5 Orig.: "Eine trojanische Dirne, so wild, wie ein Wildschwein, mit Feuer= federn und Höllenblumen geschmückt, beschauet das Pferd ebenfalls, und bekömmt gleich einen ver borgenen Krieger zum Liebhaber; der sie aber wegen ihrer Häßlichkeit augenblicklich verachtet, und beym Zopfe herumzerret" (translation by David Krych).

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designation "boar" or "pig" becomes a human character designation. The first type of Hetzzettel (number-Hetzzettel) consisted of unrelated fight scenes, the short narratives in the second type (number-narrative-Hetzzettel) were self-contained with no overarching narrative. The third example goes even further in this way, offering such an overarching narrative – and only the metaphorical paraphrase ("as wild as a boar") alludes to which animal it is. Again, the dog is not referred to as such, but as a "warrior." The fight between the two animals is given a metaphorical euphemism, an 'act of love' between a harlot and a suitor.

The double-bind of anthropomorphization and zoomorphization (i.e. humanization and bestialization of non-human actors) is constructed by language, i.e. by insinuating motivations, intentions and narratives. The basis for this narrativization and this kind of linguistic construction is, on the one hand, anthropomorphization and, on the other hand, a human understanding of morality. Anthropomorphization makes it possible in the first place that such narratives can be created. Further, anthropomorphization is accompanied by a moral understanding that makes it possible to bestialize animals – because ultimately, they only become beasts by having anthropomorphic ideas projected onto them.

These examples reveal two relationships, affecting both the linguistic and visual level (the representation and the presentation). On the linguistic level, a zoomorphism of the textual actors is created with adjectives and comparisons. In contrast, the animal-human relationship is reversed on the visual/performative level, because here the animals have been humanized by masking. Such "disguises and travesties", as Mikhail Bachtin describes them in the "Grotesque" (Bachtin 1995: 239), as well as the creation of human-animal hybrids, provide the Hetzamphitheater with a grotesque or carnivalesque conception. The last example (the narrative-Hetzzettel) presents a doubling of the relationship between anthropomorphization and zoomorphization. The non-human actors (announcements presenting them as humans) are provided with animal metaphors. In this way, proverbial animalization (e.g. "wild as a boar") is presented visually.

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The next example of another Hetzzettel shows what a remarkable theatrical function this had. The announcement dates from June 15, 1794, i.e. during the Revolutionary Wars with France and the uprisings in Poland:

> "A great fight worth seeing, where some animals will fight *a la mode de Paris* [original emphasis], but some in good German, but the baiting-master Stadlmann will appear as a German referee mounted on a pucephalus, and teach this riffraff respect. Now the cage is opened to the fat *Santér* [original emphasis], in German brewmaster, and immediately afterwards to a strong Russian, then to two quarreling Poles, to a big *Urs de France* [original emphasis], to a *Petit maitre* [original emphasis], who knows how to dance well, and to two rhythmic Transylvanian bears, to the big, beautiful deer, who is not up to any cunning or deceit, like *Mr. Orleans* [original emphasis] the wolf, a disguised red-clad *Mr. Bœuf* [original emphasis], and the *Madame Sangulier* [original emphasis] who wanted to make this fight extremely twisted, if not the baiting-master on a well-trained Hungarian Ox appeared mounted, who, as a German referee, seeks to preserve the French-minded, with due respect through his fearless courage and bravery, like a true noble German beseemed, and with the charging ox, if he does not have to leave it by force, he takes away all the animals present, and he finally takes up a duel with one of these two oxen, so that the baiting-master leaves the battlefield all alone as the undefeated one."[6] (Hetzzettel 1794b)

6 Orig.: "Ein großer sehenswürdiger Kampf, wobey einige Thiere *a la mode de Paris*, einige aber auf gut deutsch sich herumschlagen werden, der Hetzmeister Stadlmann aber wird als deutscher Kampfrichter auf einen Puzephalus beritten erscheinen, und dieses Lumpengesind in Respekt erhalten. Jetzt wird die Falle den wampeten *Santér*, auf deutsch Bräumeister, gleich darauf einem starken Rußen, nachgehends zweyen zanksüchtigen Pohlen, einem großen *Urs de France*, einem *Petit maitre*, welcher weis gut zu tanzen, und zweyen taktfesten siebenbürger Bärn, dem großen schönen Waldhirschen, der keine List und Trüge im Schilde führt, wie *Mr. Orleans* der Wolf, ein verkappter ganz roth gekleiderter *Mr. Bœuf*, und die *Madame Sangulier* die diesen Kampf äußerst verzwirnt machen wollten, wenn nicht der Hetzmeister auf einen gut ab= gerichteten ungarischen Ochsen beritten erschiene, der die Französischgesinnten als deutscher

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On the one hand, a total of three actors (most likely bears) are ascribed an anthropomorphic status, namely "a strong Russian" and "two quarrelling Poles", in that the nationalities are substantivized adjectives. On the other hand, further animals are subjectivized mainly with French terms. With "Santér" (probably meaning *santé*, i.e. "cheers"), alcohol consumption is referred to, which is why the "brewmaster" is also given as an explanation. The "Urs de France" (probably meaning *ours de France*) means something like French bear. The "Petit maître" (actually *Petit Maître*) stands for a dandy, who was probably also a bear, since the reference to his dancing abilities is given. The wolf participating in the fight, which as usual has a negative connotation, is declared to be "Mr. Orléans", and further appear gentleman oxen ("Mr. Bœuf") and a lady boar ("Madame Sangulier", actually *sanglier*).

About three months before this baiting event, on March 24, 1794, the Polish general Tadeusz Kościuszko (1746–1817) proclaimed an uprising in Kraków, ultimately in response to the second partition of Poland (1793), and historically known as the Kościuszko Uprising. The national nouns of the animals used in the baiting in the Hetzamphitheater, as well as their respective attributions, namely "strong" on the one hand and "quarrelsome" on the other, point to those events condemning revolutionary behavior of the 1790s.

This interpretation becomes even clearer when the anti-French vocabulary of this number in the Hetzzettel is examined more closely. It is obvious that negative connotations are involved here, because French is associated here with alcoholism, dandyism, and deviousness. At the same time, a double devaluation is formulated with "Mr. Bœuf" and "Madame Sangulier": in this linguistic usage, the oxen and the wild boar do not merely function as a reference to the animals but express an

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Kampfrichter im gehörigen Respekt durch seinen unerschrockenen Muth und Tapferkeit, wie es einen wahren edlen Deutschen gezimmt, zu erhalten trach= tet, und mit dem stürmmischen Ochsen, wenn er ihn nicht mit Gewalt verlassen muß, alle anwesenden Thiere abschaffet, und er zuletzt erst mit einem dieser zweyen Ochsen einem Zweykampf aufnimmt, so daß der Hetzmeister ganz allein als Unbesiegter den Kampfplatz verläßt" (translation by David Krych).

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insult via the anthropomorphization by means of "Mr." and "Madame." Thus, a human being is equated to an oxen and a wild boar, respectively. The further decisive indication of a political reference is found in the attributes attached to "Mr. Bœuf", namely that he appears as "disguised and red-clad." Here, the adjective "disguised" can, on the one hand, express furtive, clandestine or veiled behavior. On the other hand, the circumlocution "red-clad" refers to a cap, namely to the Phrygian cap or Jacobin cap (*bonnet rouge*), the symbol of revolutionary and republican France.

If other military events of the year 1794 are now considered in this context, then in addition to the Kościuszko Uprising, the Austro-Russian Turkish War and the First Coalition War or First Revolutionary War (1792 to 1797) with Austria, Prussia and smaller German states fighting against revolutionary France were still in the foreground. In this sense, the consequences of the revolutionary events seem to have found their way into the Viennese Hetzamphitheater in a theatrical-propagandistic form, where animals became political actors or representatives on a linguistic level, where the wording provides evidence of an antagonistic position the public of Vienna held towards France and Poland.

The obviously anti-French attitude seems more emphatic here, if the view is directed to the human involvement of the number of June 15, 1794. Again and again, the baiting-master Mattias Stadelmann, who was announced in it, is praised as a "German referee". With the nouns "bravery" and "courage" as well as the adjectives "undaunted," "noble," and "true," he forms the character antithesis to the "French-minded." His appearance on the "Pucephalus," i.e., on the "ox-headed," expresses a reference to the warhorse *Bucephalus* or *Boucephalas* of Alexander the Great, elevates him both literally and symbolically: thus, seated on the ox, Stadelmann towers above all in height and in historical scope.

Accordingly, the already inflationary attributions of nationality and origin have a double function: on the one hand, they could suggest a multi-national animal gathering under imperial and royal patronage, which also advertised a cultural-political feat. On the other hand, it becomes apparent that this inclusive, suggestive method, could reference current events. But an exclusive character of nationality formations

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was possible, too. According to Eric Hobsbawn, it is thus evident that the creation of a nation, namely the German or German-speaking, shimmers through in distinction to France (1991: 19). We could even go so far as to say that such opposition was the basis, for the founding of a German nation, if we consider the Franco-German War of 1870/1871. But considering the linguistic construction, a discourse of superiority emerges here: the "German" baiting-master Stadelmann stands out with a loftiness, superiority, and an extraordinary position in the multinational animal turmoil. Whether it is the obviously negatively connoted Polish and French or positively attributed Russian participants, they are non-human actors. From this perspective this means: On one side the *animala inferioria* and on the other the human Stadelmann as *dominus terrae*, or *dominus nationum*.

By using these linguistic instruments, the non-human actors can become politico-military representatives. Thus, current events could be processed theatrically. It makes a big difference when the boar on the battlefield is referred to as "Madame sangulier" by the audience.

These reversals or linguistic masking show up on another level: with the audience. The paradoxical circumstance has already been noted that it is largely thanks to those who spoke out against such events that we can nowadays understand what animal baiting looked like. Probably the most concise and most detailed example of this is provided by Friedrich Nicolai (1733–1811), the prominent Berlin Enlightenment philosopher who published the record of his journey in 1781 through Europe in book form. This journey led him, among other places, to Vienna, where he also visited the Hetzamphitheater. As expected, his verdict on animal baiting was terrible. But in this description Nicolai also undertakes an inverse reversal to the Hetzzettel. Thus, he describes "vicious laughter […], which the spectators emit, and the intemperate clapping with the hands, and the stamping with the feet"[7] (Nicolai 1784: 635). In this

7 Orig.: "[…] das viehische Gelächter […], welches die Zuschauer ausstoßen, und das unmäßige Geklatsche mit den Händen, und das Getrampel mit den Füßen" (translation by David Krych).

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context, he writes about a "ghastly laughter of the spectators"[8] as well as the "guffawing laughter of the raw crowd that feasted on the death agonies of the animal"[9] (Nicolai 1784: 635ff.). With these descriptions, rich in imagery, Nicolai inverts the relationship between non-human and human actors by subjecting the animals to be fought to his expressions of pity while at the same time bestializing the audience.

At a first glance, the Viennese Hetzamphitheater seems to represent an inverted world (*mundus inversus*): Animals are anthropomorphized and humans are bestialized. What is more apparent in this context, however, is that this is much more a mixed world (*mundus mixtus*). In every respect, it can be seen that at least two contrary realities met there: the linguistic reality, which anthropomorphized (and thus bestialized) the non-human, met the physical reality, where animals were forced to fight until death. This blending of human and animal culminates on the side of Nicolai's audience description ultimately follows the logic of the Hetzzettel and transfers it to the entire theater, where humans become the bestial actors in its perception and linguistic reality.

"... ac si cadaver essent"
From external violence to internal obedience

With the 1796 fire of the Hetzamphitheater, not only did this theater form came to an end but during this period we can also observe a general shift or transformation of the animal-human relationship in cultural performances. Twelve years after the end of the Hetzamphitheater, the so-called *Circus gymnasticus* opened in Vienna under the direction of Christoph de Bach (1768–1834).

However, we must not see this development as a direct transfer. Parallel to the Hetzamphitheater, theaters that included forms and practices of the circus existed and established themselves in Vienna, such as the

8 Orig.: "[…] gräßliches Gelächter der Zuschauer" (translation by David Krych).

9 Orig.: "[… das] wichernde Gelächter des rohen Haufens, der sich an den Todesqualen des Thieres weidete" (translation by David Krych).

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Landstrasser Theater or the Royal Circuit of the British equestrian artist Johann Hyam (1733–1816). Likewise, the Hetzamphitheater was not only used for baiting performances but also as a guest venue for horsemanship and acrobatics.[10] In this respect, the change was not a sharp break, a caesura suggesting the advent of something 'new' (as often depicted in historiography), but took place in parallel with the old.

The *Circus gymnasticus* represents what we would also call a circus today, both conceptually and through the arts shown there. The wooden building with a glass dome designed by the famous architect Joseph Kornhäusel (1782–1860) was built in the Prater (Vienna's recreation and entertainment area). There de Bach became particularly well known with his dressage of deer: "The circus rider de Bach in Vienna has a deer which obeys his word, prostrates himself at his command, and stands quietly in the fireworks that pop and spray around him. It doesn't move when a pistol is fired from between its antlers."[11] (Chimani 1820: 175)

The comparison between deer-baiting with dogs in the Hetzamphitheater and trained deer in the *Circus gymnasticus* illustrates a new principle of rule and domination that is emerging through theatrical practices. During the 19th century, this development took on even greater proportions, particularly in Vienna. Initially only active as a touring troupe, the so-called "*Großes Wiener Affentheater*" (Engl.: Great Viennese Monkey Theater) was established in Vienna from the middle of the 19th century (Krych 2013: 146ff.) under the direction of Heinrich Schreyer (1793–1847). Scenes with animals (primarily monkeys and dogs) disguised as human beings were presented in a number dramaturgy.[12]

Compared to the practices in the Hetzamphitheater in Vienna, we can observe a certain development that affects both anthropomorphiza-

10 Compare the collection of Hetzzettel in the Wienbibliothek (signatory: C16361).

11 Orig.: "Der Kunstreiter de Bach in Wien hat einen Hirsch, der ihm auf das Wort gehorcht, sich auf Geheiß niederwirft, und ruhig im Kunstfeuer steht, welches um ihn herum knallt und sprühet. Er bewegt sich nicht wenn eine Pistole zwischen seinen Geweihen losgeschossen wird" (translation by David Krych).

12 Compare the collection of Affentheater announcements in the Wienbibliothek (signatory: D-79738/05).

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tion and the domination of nature in general. In the Hetzamphitheater, domination over nature is expressed in an ambivalent relationship: on the one hand, through the relationship between life and death and, on the other hand, through the double-bind of anthropomorphization and bestiality. In contrast, the principle of rule and domination in de Bach's *Circus gymnasticus* or in Schreyer's Affentheater is based on discipline, dressage and control: bestiality is tamed by the trainer, and anthropomorphization (especially of dogs and monkeys) is not only shown by masking but must also be reflected in their actions. In this transformation of the principle of rule and domination over non-human actors, we see a shift from violence to obedience as means of control. On stage, the effects on the non-human actors are shifted from the body to the soul: In this case the animal does not have to die; it should function and serve in blind obedience. In German the phrase "*Kadavergehorsam*" is used, it means "cadaver obedience". Ignatius of Loyola (1491–1556) provided the most striking formulation. The rules of the Jesuit order he wrote demand that the faithful submits himself, his will and his body to God as if he were a cadaver, "ac si cadaver essent" (Loyola 1998: 740). In this sense, in terms of theater practices, we see a shift towards the animals' inward: they must obey. The spectacle is no longer based on the representation of external violence, ironized or satirized through linguistic anthropomorphization. It is based on both linguistic and representational anthropomorphization, i.e. a congruent relationship between language (the announcement) and the representation (the actual performance). This 'blind obedience' or 'cadaver obedience' implies a form of denaturalization which relegates non-human actors to the realm of mechanical beings.

"Duo corpora animalis"
On the mechanization of life

The history of ideas on the mechanization of life did not first appear in the context of the industrial revolutions in the 19th century. Here too, parallel or synchronous developments took place, which thwarted the pre-

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vailing structures and often did not actually develop until later. In this thematic context, one philosopher stands out whose writings were called "*mauvais livres*" by his contemporary Voltaire (Voltaire 1990: X). This is Julien Offray de la Mettrie (1709–1751).

In his book *L'homme machine* (1747), De La Mettrie presented one of the most radical philosophies regarding the mechanization of life. He radicalized and totalized Rene Descartes' mechanical model of animals. De la Mettrie understood not only the non-human animal as a machine, but also the human animal. And so he comes to the provocative statement that "those haughty, vain, self-praising beings who are marked off by their pride more than by the label 'men' – are basically only animals and upright-crawling machines"[13] (Bennett 2009: 29). And conversely: He believed that self-education were not the sole cornerstone of human dominance over animals. He illustrates this point by focusing on monkeys:

> "I am virtually certain, given the ape's similarity to us in structure and operations, that if we went about it in the right way we could teach this animal to utter sounds and consequently to learn a language. Then it would be no longer a 'wild man' or an imperfect man, but a perfect man, as small 'man of the town' – as against 'man of the wood' –, with as much material – as much *muscle* – for thinking and profiting from its education as we have."[14] (ibid: 9)

13 Orig.: "[…] que ces êtres fiers & vains, plus distingués par leur orgueil, que par le nom d'Hommes, quelque envie qu'ils aient de s'élever, ne sont au fond que des Animaux, & des Machines perpendiculairement rampantes" (Mettrie 1748: 96).

14 Orig.: "[…] que je ne doute presque point, si on exerçoit parfaitement cet Animal, qu'on ne vînt enfin à bout de lui apprendre à prononcer, & par conséquent à savoir une langue. Alors ce ne seroit plus ni un Homme Sauvage, ni un Homme manqué: ce seroit un Homme parfait, un petit Homme de Ville, avec autant d'étoffe ou de muscles que nous-mêmes, pour penser & profiter de son education" (Mettrie 1748: 30).

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If we think now of the practices of the Großes Wiener Affentheater, where monkeys had to perform small scenes disguised as human beings, then it seems that almost 100 years after the publication of these ideas from L'homme machine, they have been presented theatrically.

De La Mettrie's mechanistic conception puts culturally formed hierarchies, which present themselves as ontological, in the background, since there is now no difference between human and non-human actors. He defines the constitution of a human superiority from a lack of instincts, so that we could say here that the human characteristics of education and knowledge are simply based on a deficiency: "So nature made us to be beneath the animals, or at least to exhibit vividly the great achievements of education, which is the only thing that can remove us from that level and eventually place us above the animals."[15] (ibid: 15)

Knowledge of mechanization seems to be the basis of human dominance (not only education). With this knowledge, there is also a progressive strengthening of economic-capitalist and bourgeois structures. That means: the increasing displacement of a festival culture, where animals were not only viewed as mere economic beings. This method of domination over nature does not mean that there were no animal trainings before the 19th century, but it shows a progressive economization with capitalist-industrial transformations.

The course from Beast-Machine to Man-Machine, which is historical in terms of ideas or philosophy, as described by Leonora Cohen-Rosenfield in her study of the same title on the animal-soul problem from Descartes to La Mettrie (1940), is not fashionable in such a teleology with other cultural-historical practices. In a temporal parallel to the baiting-events in Vienna, to those popular culture elements in which the dividing lines between human and non-human actors were partially dissolved, a further dissolution of the animal-human difference is shown in the sense of de La Mettrie: this was achieved by means of

15 Orig.: "La Nature nous avoit donc faits pour être au-dessous des Animaux, ou du moins pour faire par là même mieux éclater les prodiges de l'Education, qui seule nous tire du niveau & nous élève enfin au-dessus d'eux" (Mettrie 1748: 48).

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mechanics performed. With Jacques de Vaucanson's (1709–1782) "*Le Canard digérateur*", a mechanical duck, a technical implementation of such a mechanistic idea has taken place (D'Allemange 1900: 222). Wolfgang von Kempelen (1734–1804) attracted attention with his "*Schachtürken*" (Engl.: "Chess Turk") so that he also appeared with it at the Viennese court (Wiener Zeitung, August 16, 1775): A chess-playing, orientalized, anthropomorphic mechanical figure, which, however, was operated by a human hidden in the case underneath the chessboard. From the 1810s onwards there was an increasing spread of these forms in Vienna, which was dubbed "*Automatentheater*" (Engl.: "Automata Theater"). Matthias Tendler (1753–1825) became particularly well known in this context. This is how it was reported about Tendler's creations: his "mechanical artists and their horses" do "everything that any vivacious circus rider company is able to do; they imitate in the most natural way all and every admirable art, jumps, turns and vaulting, which have been presented by the most famous English riders."[16] (Jassoy 1819: 215f.)

The statement "*plaisir superbe de forcer la nature*" made by Henri de Saint-Simon (1760–1825) with regard to the Versailles Garden, i.e. "the magnificent pleasure to do violence to nature" (Laurent 1818: 75), could suggest that an external impact of violence describes the pleasurable experience (the cutting of plants, the external, representative arrangement of nature, i.e. dominance by means of external force), such as the aristocratic hunting events with thousands of animals killed, the carnivalesque forms of a carnival ox or the Hetzamphitheater with the killings of animals based on economic reasons. But here the aforesaid shift to the inward becomes apparent.

Already shimmering through the 18th century was the increasing separation of so-called real value and the show value (in German *Realw-*

16 Orig.: "[die] mechanischen Kunstreiter und deren Pferde [… leisten] alles dasjenige, was nur irgend eine belebte Kunstreiter=Gesellschaft zu leisten im Stande ist; sie ahmen auf das natürlichste alle und jede bewunderungswürdige Künste, Sprünge, Wenden und Voltigirungen nach, welche von den berühmtesten englischen Bereitern vorgestellt worden sind" (translation by David Krych).

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erte and *Schauwerte*), with the latter dominating in the following century. The aristocratic hunting events, animal baiting in the Hetzamphitheater may have been characterized by a spectacular and staged character, but there were still moments of real value. Certain killed animals were ceremoniously eaten after the hunt, and the Hetzamphitheater participated in subsidizing the poor fund (Tatzer 1969: 112). Real and show values still belonged together, even if the real values only functioned as a means of social and moral compatibility with the show values, so that one can assume a double value for certain animals. With regard to the dressage animals, this is no longer an option. The mechanization of life and the shift to the inside with the anthropomorphic coherence it brought about (Schreyer's monkeys were announced as human beings and appeared disguised as human beings) seem to have played a decisive role in the separation of a physiological and psychological consumption, as described by Alfons Paquet in *Das Ausstellungsproblem in der Volkswirtschaft* (Engl: *The Exhibition Problem in Economics*):

> "[… T]he enterprises created for the amusement of wide circles of people, some stationary, some wandering from place to place, for the presentation of objects worth seeing in exchange for direct equivalents. This category includes establishments that serve exclusively to satisfy lower and higher psychological consumption needs, such as show booths, circuses, panopticums, panoramas and theaters."[17] (Paquet 1908: 38)

The double value of animals or non-human actors is thus dissolved because the use value of the performers is linked to a symbolic equivalent, which is exclusively determined by the show value. The dissolution of

17 Orig.: "[… D]ie zur Belustigung weiter Volkskreise geschaffenen teils stationären, teils von Ort zu Ort wandernden Unternehmen zur Vorführung sehenswerter Gegenstände gegen unmittelbare Äquivalente. Als in diese Kategorie gehörig erscheinen die ausschließlich der Befriedigung der niederen und höheren psychologischen Konsumationsbedürfnisse dienenden Betriebe, wie Schaubuden, Zirkus, Panoptikum, Panorama, Theater" (translation by David Krych).

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the double value, the double body of the animal (*duo corpora animalis*) also means stricter social classifications of animals. Animals intended for the physiological consumption of humans, such as an ox or a bull, are reduced to a pure real value, for slaughter or for work. And those animals that can perform dressage or are not intended for physiological consumption are reduced to a show value. In all cases, the *raison d'être* of animals seems to be based solely on value categories assigned to them by humans.

The dissolution of the double value is also accompanied by the division of the double body of the animals. While there was an increasing linguistic-discursive anthropomorphization of the animals in the Hetzzettel (fictional level of reality), this being contrary to the baiting practices themselves (physical level of reality), the double value of oxen and bulls manifesting both a show and real value body are reduced to only one body due to changes in theater practices during the 19th century. In the connection of real and show value, of an anthropomorphization and bestialization, of a contrast between written application and actual baiting practices, a double structure is revealed in the Hetzamphitheater: the physical and fictional levels of reality do not seem to be separated in such a clear way. The physical level is not removed completely, so that the double body of the animals still shows up.

The night of September 1 to 2, 1796, i.e. the fire of the Hetzamphitheater, and the subsequent ban on baiting events in Vienna give reason to assume that a historical rupture took place that banished this institution not only from the cityscape but also from cultural memory. Despite the popularity of baiting theaters such practices were selectively separated from an increasingly hegemonic form of literature-based spoken theater. Hetztheater were excluded from the lofty ranks of theater history since they did not reflect progress nor function as moral institutions. If this supposedly Enlightenment desire existed or continues to exist to see history as a steady upward movement, a look at 18th century Hetzamphitheater reveals how the human relationship to animals changed and how the practical ethics associated with it are each a child of their time.

These changes include the mechanization of life, i.e. the progressive economization and industrialization of being, it ascribes very clear roles

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and functions in society. The changes within the principle of domination over nature, as we have seen it in performing practices with non-human actors/animals, seem to be an expression of the maintenance of power, of violence required to maintain it. The *dominium terrae* as obedience simply conceals violence in the cloak of discipline, which corresponded to a bourgeois understanding of the world.

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Part Three: arts – science – technology

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Duelling Epistemologies

How Artists Hack Laboratories and Alter the Futures of Science

Regine Rapp and Christian de Lutz

On bio art and the living

Bio Art challenges a number of western pre-conceptions about what art is and what art is supposed to do. By its nature ephemeral, and in a constant state of flux, the use of living materials runs contrary to centuries of art preservation and the ideal of art as eternal. But an art that goes hand in hand with science now ends two centuries in which the arts and science were seen as separate (and increasingly distant) disciplines. Moreover, Bio Art does not aim to 'illustrate' science (something which often confuses novice scientific collaborators) but to place the life sciences, and the organisms, cells and complex molecules studied, in a new focus. Many Bio Art works question whether Biology is, or can ever be, truly objective; and also seek to uncover the cultural and ideological baggage that the natural sciences carry with them, making clear that this baggage hinders both any true sense of objectivity – if this is even possible – and a deeper understanding of the living world. Bio Art has left the artist's studio, as it ventures into new terrain, but it is also something more than "art made in the laboratory". Along with new "post-humanities", such as Science and Technology Studies (STS), the philosophy and history of science, and the new directions in Anthropology, Bio Art examines our civilisation's cleft between scientists (and all humans) and the more than human world. But unlike those academic disciplines, Bio

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Art is about practice. After all the theory has been included, the artwork still has to function. It is a uniquely difficult practice that has to bridge both the 'laws of nature' and the debates of humankind. This essay was first published in *Proceedings of Politics of the machines – Rogue Research 2021*, in 2021.

Introduction

Donna Haraway's concept of 'Situated Knowledge' can be understood as feminist critique of scientific 'objectivity', but there are more factors to critically challenge knowledge production – from the perspectives of race, gender, and class, as well as contemporary economic ideologies. Looking specifically at the interaction of Hybrid Art and the life sciences in the late 20th and early 21st century science we would like to formulate two lines of critical approach: 1) How can Hybrid Art, and specifically artistic research – in lab – criticize the effect that the market logic has on determining what is researched and what is not. Research funding can also be seen as a means of shaping and disciplining scientific research and knowledge, to ensure it follows the desires of the market. Can cross-disciplinary exchange between scientists and artists be a catalyst for liberation from market constraints and obligations? 2) What are the effects of 'engineering' as ideology on both science and Hybrid Art? Especially in the case of the life sciences, where money and attention are focussed on bioengineering, the ideal of efficiency creates an obstacle in the pursuit of knowledge. Efficiency, mandated by the market, plays a major role in bioengineering. But this is in contradiction to nature and life, where complexity and redundancy play a very important role in evolutionary success. Further, we live in an era where the 'hype' surrounding biotechnology creates a platonic mirage of the actual state of science. We propose, for example, that the CRISPR genetic engineering technique is not going to radically change nature as we know it and sustainable biomaterials are unlikely to replace plastics. Are both artists and scientists capable of sifting the hype from their research and practice, and if so, how?

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Many hybrid artists do challenge the epistemology of natural sciences. They bring in questions of epistemology, ontology, ethics, and politics, yet remain true to principles of science. Instead of a 'pure research' which, despite its pretension for purity, in reality exists to provide marketable products, their hybrid artistic research seeks to (re)contextualize both knowledge and our species within a planetary ecology. In the long run (as opposed to market economy short-term profit goals) the approach of these artists asks questions about the survival of *Homo sapiens*. Also, their engagement with a diverse public, through their work but also new forms of media such as DIY science workshops ("do it yourself"), talks and inter-species performance broadens both knowledge and debate, as well as offering lay persons tools and knowledge for scientific literacy within a broader ethical, ontological, epistemological and political framework.

Reflecting situated knowledges

In her 1988 essay *Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective* Donna Haraway places natural science's claim toward 'objectivity' under a wider scope of investigation. She claims that historically, science has been carried out in tandem with militarism, capitalism, colonialism, and male supremacy (Haraway 1988: 581). While the purpose of Haraway's essay was to propose a 'feminist science' which would acknowledge and locate its bias, we think the power of the essay itself is in this initial questioning of the possibility of an objective science, and the locating of this so called 'objectivity' within the realm of power – gender power, racial power, and above all economic power. The point here is not to overturn 'science' as some sort of belief system, but indeed to create a stronger, more accurate concept of science, by examining and acknowledging the innate biases that are part of every action. In fact, it might be better to understand science from the get go as 'scientific method', or as a verb 'to science' – or 'do science', or carry out research by scientific method – rather than as a noun which, in the public imagination at least, occupies territory.

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That said, doing science still takes place within a world controlled and regulated by political and economic powers, whose desires support, hinder and shape most of the research actually taking place. Funding is probably the most important determinant of what is actually investigated – or on the contrary, what knowledge is left undiscovered. There is no simple formula here though, but rather a complex set of constantly re-aligning currents that determine what resources go where. In the last three decades since Haraway wrote her essay there has been an additional point of input into this complex system: calls for inter- and transdisciplinary practice, first within academia, and more recently from several generations of artists who have sought access to laboratories and research institutions with the goal of following their own hybrid practice.

While the numbers of artists actually participating in research in scientific institutions and their influence upon these institutions is rather small – perhaps minuscule – we think it is interesting to ask here what role they might play, now or in the future, in challenging existing biases in the science, as well as opening up currently closed avenues of inquiry. But first we want to explore some of the biases in our current world that determine what is researched and how that research is carried out.

Looking specifically into late 20th and early 21st century science, we would like to formulate two lines of critical approach:

- How does scientific research take neoliberal mechanisms as fact instead of ideology? Not only taking this questionable economic theory as fact, but how funding and 'ambition for success' determine what is researched, but negate outcomes that might contradict capitalism. And how is funding used to discipline science into following the market, and often with a lack of logic?
- Understanding engineering as ideology: This is the case especially in life sciences, where the money and the attention are on bio engineering. The ideal of efficiency plays a major role in engineering – and in capitalism. This is often in contradiction to living systems, where complexity and redundancy play a very important role in evolutionary success. Given the limited space allowed here, we will only briefly touch on a few points.

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How neoliberal mechanisms form research

Bias in research is often finessed through the framing of the research: which questions are asked, how comparisons are made. For instance, research on the effect of perchlorates (used, for example, in pyrotechnics industry) on thyroid iodine uptake (by humans and rats) differed markedly when carried out by a National Academy of Sciences panel as opposed to researchers working for companies that had the responsibility to clean up perchlorates (Michaels 2008). All too often "tricks of the trade" are used, for example in comparative studies, such as drug trials, where "testing your drug against too low or too high a dose of the comparison drug because this will make your drug appear more effective or less toxic" (Michaels 2008). In corporate-sponsored systematic reviews of pharmaceutics, the use of "inappropriate comparators to the product being investigated" was a major factor in outcomes favouring the sponsor (Lexchin 2003).

Bioethicist David B. Resnick states from the start that scientific research is a form of business: "The business of science is to produce new discoveries and innovations that advance human knowledge and society." He also notes that scientists and their sponsors and institutions have financial interests related to the outcome of research. Additionally, decisions made outside the scope of research (such as those made by journal editors) also influence what research is published and indirectly influence both what is researched and the outcomes of that research (Resnick 2014).

Beyond these direct influences from the capitalist system in which scientific research is embedded, there are more issues, intrinsic to scientific research such as institutional structures and dominant paradigms, inevitably influencing and constraining scientists' thinking and causing bias. In *Philosophy of Biology: Philosophical bias is the one bias that science cannot avoid*, Fredrik Andersen, Rani Lill Anjum, and Elena Rocca mention, as an example, a default position in molecular biology claiming that entities (such as proteins) are more fundamental than processes. They point out recent research that takes the opposite approach, and explore the tension between these two ontological positions. They inter-

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pret this phase of tension within Thomas Kuhn's concept of paradigms and paradigm shifts. In *The Structure of Scientific Revolutions* (Kuhn 1962), Kuhn had labelled this phase 'normal science', and argued that

> "[…] the role of the scientist was to fill in the gaps in our knowledge within the paradigm. Therefore, in times of normal science, there is little need for or interest in philosophical discussions on the foundations of a subject. However, according to Kuhn, when scientists start engaging in philosophical debates about their subject, a paradigm shift might be imminent." (Anderson/Anjum/Rocca 2019)

Certainly, as radical changes within the life sciences in the last 50 years have led to a number of paradigm changes, it will be interesting to see if more interaction between biologists and practitioners from different disciplines, such as hybrid artists, will encourage and accelerate paradigm changes. This interaction can also take place within institutions – such as SymbioticA, a biological laboratory for hybrid artists, that is itself part of the University of Western Australia's School of Anatomy and Human Biology. It can also be found in the extraordinary transdisciplinary practice of individuals such as biologist and artist Brandon Ballengée, microbiologist and artist François-Joseph Lapointe (Lapointe 2012) or Špela Petrič and Kat Austen, both of whom have PhDs, in Biochemistry and Chemistry respectively, and who we will discuss later.

Capitalism has especially encouraged a fusion of biological research and engineering bringing about the biotechnological revolution of the last half century. But this marriage of disciplines also means an intermingling of ideological positions. Engineering implies the practice of changing the world to suit human needs and goals. It also emphasises the importance of simplicity and efficiency as both the 'proper way of doing things' and a form of maximising profit, the latter being a key goal of the markets. On a ground-eye level, Chemist Derek Lowe has a noteworthy blog post *Engineering Biology, For Real?* that criticizes the engineering view prevalent in some sectors of the life sciences. Referring on the biotechnologists' metaphor of 'building blocks' of proteins and enzymes:

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> "So when you casually say 'Once we identify the Legos in biology' you're actually asking for a great deal, and by disguising it in terms of similarly-sized little building blocks, you actually are confusing the issue. Let's say that the Lego blocks in this case are the five major nucleotides in DNA and RNA. We've identified them. Does that mean that we understand their systems well enough to mix and match them? Well, crudely, yes – we can go in and change a genomic sequence. But do we know what happens when we do that, and why? Not so often, not at all." (Lowe 2018)

Here one may argue that the ideal of efficiency creates an obstacle in the pursuit of knowledge. Efficiency, mandated by "the market", plays a major role in engineering. But this often contradicts nature and life, where complexity and redundancy play a very important role in the evolutionary process. Beyond the confines of research and 'pure science' the waters become murkier. Important knowledge and developments are 'packaged for consumption' by audiences outside science (Kolker 2016). Thus, science becomes not so much an approach towards seeking out and verifying the world around us, but rather playing a part in some grand human narrative (and often this narrative is adapted towards dominant ideologies). The farther you get from scientific publications, and into more and more general publications, new developments like CRISPR-CAS9 are framed according to the desires of the medium and its audience. While CRISPR-CAS9 is certainly an improvement on previous forms of genetic modification, studies also show problems with unintended deletions of genetic materials and other issues.

Similarly, the recent hype on bioplastics attempts to offer a simple feel-good narrative to a very complex problem (Galla 2021). Certainly, continued plastic production and the waste it produces is a major problem which will plague both our species and the planet for a very long time. But none of the 'sustainable' replacements on offer can really replace the strength, versatility, and current low cost of plastics. Some bioplastics have their own negative issues concerning degradability and sustainability (Zimmermann 2020). There is no simple answer here. Some bioplastics become a realistic option, but only *if* governments find

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ways to limit competition from fossil fuel-based plastics – for instance, by substantially raising their costs. But this probably requires eschewing some very convenient items (such as plastic bags, synthetic textiles, laminate furniture) and utilising plastics only when we absolutely must. But it is more likely that plastic production will continue to increase well into the future (International Energy Agency 2018), not only because of the convenience for consumers (with a high cost in the future) but also because its production is vital to fossil fuel companies and their political and economic allies.

If doing science depends on a point of objectivity – which in turn is only a Platonic ideal – then certainly this point is situated in a maelstrom. But most scientists remain true to scientific method and adjust the state of science according to the knowledge at hand. Still, Haraway's *Situated Knowledges* presents a more honest approach to the ideal of objectivity, one that may better serve both the natural sciences and society in a troubled future. Having offered this thumbnail sketch of the situation, we now look at outside players intruding into the sphere of science. In contrast with established collaborators – from the humanities, philosophers proposing scientific ethics, historians of science, or science journalists – the interesting thing about hybrid artists is that they too practice science. Bioethicists are rarely 'lab-ready'; bio artists, almost by definition, are. And yet they bring with them a bag of tools – the tradition of 20th century aesthetics, the discourse of relevant fields of humanities such as science and technology studies, posthumanism, anthropology, a working knowledge of electronic media – that not only compliments 'doing science' but can be most helpful in locating 'situated knowledge.'

The following sections shall exemplify how artists hack laboratories and contribute to altering the futures of science. We see a small group of (mostly women or non-binary) hybrid artists challenging the epistemology of natural sciences, without breaking from scientific method or 'doctoring' the results of their inquiry. As opposed to the artist as a visionary, here the artist is a deep critic: Tarsh Bates, Špela Petrič, Mary Maggic, and Kat Austen – to name only a few.

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Hacking heteropatriarchal medical practices

Figure 1

Tarsh Bates: Surface dynamics of adhesion, 2016, exhibition view Art Laboratory Berlin, photo: Tim Deussen

Artist and researcher Tarsh Bates is interested in the aesthetics of interspecies relationships and the human body as a multispecies ecology. Already in her educational training, she combined science and arts: After completing her Bachelor of science in Biotechnology (environmental biology), she has been part for many years as a researcher at SymbioticA, the artistic lab at The University of Western Australia (Many noteworthy artists received essential experience at SymbioticA. Canadian artist WhiteFeather Hunter, for instance, is currently realizing her PhD at SymbioticA. She dedicates her biotechnological art practice to the topics of postcolonial ecofeminism, witchcraft, microbiology and cellular biology with performance, new media and craft; Hunter 2020). There, Bates shaped her artistic paths and realised both her Master thesis and her PhD.

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Figure 2

Tarsh Bates: Surface dynamics of adhesion, 2016, detail, photo: Tim Deussen

The latter is titled *The Unsettling Eros of Contact Zones. Queering evolution in the CandidaHomo ecology* (Bates 2013). Her collaborator, co-partner and subject of artistic attention is the fungal micro organism *Candida albicans*, who she is particularly enamored with. "I am particularly interested in the microbiopolitical 'response-ability' of CandidaHomo ecologies because the infections attributed to *Candida albicans* are almost exclusively human induced", Bates remarks. "What we do to our bodies – antibiotics, prosthetics, feminine hygiene products, dietary choices, hormone adjustment, immune suppression, biomedicalisation, latex and silicon sex toys, prophylactics, biomedical devices – encourages *Candida albicans* proliferation." (Bates 2019)

While challenging hetero patriarchal medical approaches of *Candida albicans*, she has centred this yeast in her artistic works. One of her outstanding art projects is *Surface dynamics of adhesion*, created for the exhibition *The Other Selves. On the Phenomenon of the Microbiome* at Art Laboratory Berlin in 2016 (Rapp/de Lutz 2016). This work puts the living candida

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in a cultural, social, and psychological context. At the same time, it reveals essential microbiological aspects of *Candida albicans* (Rapp/de Lutz 2016).

In this installation, prepared as living artwork at Deutsches Herzzentrum Berlin Charité, there is a red-brown frieze on the wall, resembling flocked wallpaper.

> "The living *Candida parapsylosis*, which is applied in five acrylic plates on agar with the blood of the artist, grows in a pattern very similar to the first drawings of its relative *Candida albicans,* made by the biologist Charles Philippe Robin from 1853. The formal aesthetic combination of microbiological knowledge and social-historical decoration is fascinating. Especially in the Victorian era, the awareness of hygiene increased rapidly. Thus, Bates integrates subtle historical references to the mid-19th century in several respects." (Rapp 2019)

Exploring Human-plant Relationships

Being a hybrid artist with a PhD in biochemistry, internationally renowned artist Špela Petrič very consciously follows her dual epistemological approaches: Her work is dedicated to the Plant Kingdom as part of a multi-species collaboration exploring the ontologies, methodologies, ethics and practices of care involved in our relationship to the vegetal. The green kingdom, a central point of interest for the artist, functions on a biological basis radically different from that of humans: seemingly inert, literally vegetative and endowed with unexplored forms of intelligence. Yet science reveals an intricate world of mysterious chemical conversations, interspecies networks and non-centralized operations alien from our own existence. Through her radically transdisciplinary artistic research Petrič "proposes novel modes of human-plant communication, intercognition and exchange." (Rapp/de Lutz 2018)

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Figure 3

Špela Petrič: Phytoteratology, 2020, installation view Art Laboratory Berlin, photo: Tim Deussen

An excellent example is the installation *Phytoteratology,* based around thale cress, *Arabidopsis thaliana*, which Petrič lets grow from embryo form in a bath of chemicals from her own urine. The resulting plants are by consequence partially biochemical chimeras with the artist as a hormonal – but not genetic! – co-mother (Petrič 2018). "In *Phytoteratology* blood kinship and genetic lineages give way to subtler streams of radical trans-species intermingling and category mongrelisation" the artist says. "The project embodies my desire to conceive and mother a trans-plant, to conjoin the gentle green alien, metaphysically dubbed the most primal of life forms, the barest of bare life." (Petrič 2016)

The artist Špela Petrič critically questions the dominance of genetics versus other criteria such as bio chemistry. Her work can be understood as a challenge to the biotechnological canon, proposing a biochemical inheritance instead of the genetic inheritance, which can be understood as masculine, coded and connected to patrimony and ownership.

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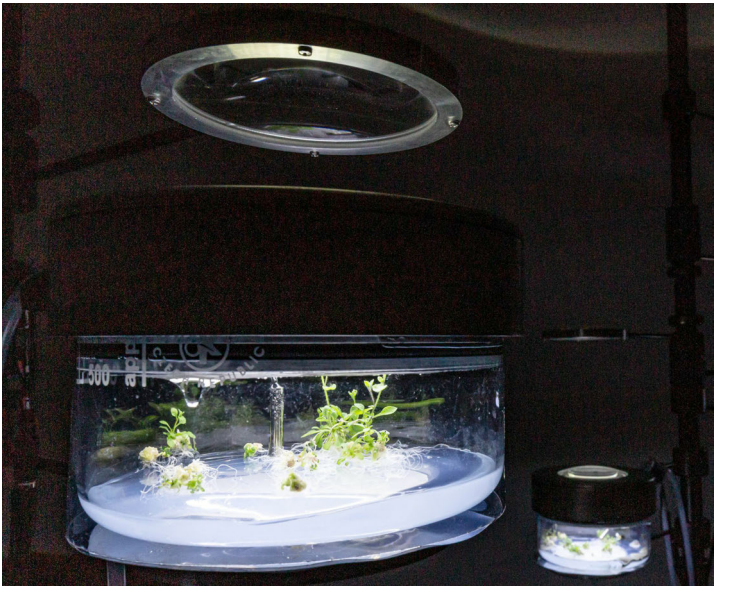
The hormonal and biochemical is fluid, crossing boundaries, and therefore harder to define.

Figure 4



Špela Petrič: Phytoteratology, 2020, installation view Art Laboratory Berlin, photo: Tim Deussen

Hacking the river and molecular fluids

Artist and biohacker Mary Maggic works at the intersection of biotechnology and cultural discourse, having studied Biological Sciences and Art at Carnegie Mellon University as well as Media Arts and Sciences at MIT Media Lab. Their artistic work spans documentary filmmaking, DIY science, and public intervention and has been exhibited intensely and internationally. Their refreshing radical artistic research is essentially based

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on civil disobedience and uses workshopology, DIWO ("do it with others") and hacking to collectively gain transdisciplinary knowledge (Maggic 2021; Maggic 2018; Rapp/de Lutz 2019).

Figure 5

Mary Maggic: Milik Bersama Rekombinan (Recombinant Commons), 2020, installation view Art Laboratory Berlin, photo: Tim Deussen

A good example of Maggic's artistic research approach based on open science is the work *Milik Bersama Rekombinan (Recombinant Commons)*, for which the artist spent the year 2018/19 researching in Yogyakarta, Indonesia as Fulbright scholar. They explored the surreal landscape of Code ("cho-deh"), an urban Indonesian river in Yogyakarta, colonised by plastic, with toxic implications for nearby inhabitants. "While water is the medium that connects us all, it is also the primary carrier of harmful industrial molecules that 'queer' both the river and the bodies of its inhabitants," states Maggic about their art project. Maggic points out the multi-facetted and complex root of the problem – poverty, lack of infrastructure, and pollution as a form of colonialism. The artist sees an

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urgency to rethink toxic conditions with empathy, care, and collective survival (Rapp/de Lutz 2020).

Figure 6

Mary Maggic: Milik Bersama Rekombinan (Recombinant Commons), 2020, installation view Art Laboratory Berlin, photo: Tim Deussen

Maggic considers the assumption that science was 'neutral' as a cultural myth, as scientists constantly take sides. "The tools and apparatuses used in the lab are especially not neutral because they supposedly produce 'truths' while making biased cuts in the deep web of entanglements", Maggic remarks by referring to Karen Barad. The artist considers these truths rather "as fictions in order to challenge the authority of science, and show that we don't have to be scientists to construct our own fictions. That's why so much of my work and research is in do-it-together science—to see how we can produce our own tools and knowledge, and ways of seeing." (Maggic 2018).

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Watery Ecologies and Artistic Research

Figure 7

Kat Austen: *The Matter of the Soul* (2017-ongoing), exhibition view Art Laboratory Berlin, photo: Tim Deussen

Berlin-based artist Kat Austen, who holds a PhD in Chemistry and has a background in science journalism, combines scientific knowledge, hacked equipment and ethnographic research with a strong aesthetic approach (Austen 2021). Central to the artist, who is one of the founding members of *DIY Hack the Panke* (Rapp/de Lutz 2021), is the experience of living in a time of dramatic climate change, such as the melting of the Arctic ice shield. Climate change is the most essential aspect she evolves her approach and artistic research around – and with this she is keen on finding and creating empathy for a planet in crisis. In her project *The Matter of the Soul* (2017-ongoing), part of the exhibition project *Watery Ecologies* at Art Laboratory Berlin in 2019, she examines the impact of cli-

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mate change in the Canadian High Arctic through a multimedia sound work, sculpture, and performance (Austen 2021).

Figure 8

Kat Austen during the workshop DIY Hack the Panke: Microplastics, Art Laboratory Berlin, 2018, photo: ALB

During the last few years, Kat Austen has also been working on the subject of microplastics in the wild, first in sea life, then in urban waterways, and more recently in trees. An important part of her artistic research and practice has been an evolving series of workshops in collaboration with scientists, artists, and DIY science practitioners (Austen/MacLean/Rapp/de Lutz 2018). In the context of DIY Hack the Panke, and jointly with microbiologist Joana MacLean she realized the workshop *(Un)Real Ecologies and Microplastics* several times between 2018 and 2020. In the workshops Austen and MacLean, together with participants, examined the 'plastisphere' of the river Panke (in Berlin Mitte) and

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observed how organisms interact with plastic, including a microscopic observation of the collected particles, in order to get a closer look at plastics and living creatures.

In the online event *Microplastics and Coexistence* with Austen and MacLean, we discover their art and science research on microplastics and become aware of the potential of open format DIY/DIWO approaches mediated by workshopology: "[They] allow us to rediscover our agency in the world, the ability to research and make sense of the world is to have agency within it," remarked Kat Austen, "and when you are aware of your agency you are more able to and likely to act, and to act in a constructive way that will change the problem you are looking at. And so, for me, the development of these DIY techniques is a political act." (Austen/MacLean/Rapp/de Lutz 2020). This is only one of numerous examples we could offer to show that workshops can be understood as an artistic performative medium for the 21st century – not only interactive but also participatory.

Final note

As we have shown in this short paper, hybrid artists propose current and essential questions of epistemology, ontology, ethics and politics, refreshingly transgressing the political boundaries of research – yet in their practice they remain true to principles of science. Instead of 'pure research' which, despite its pretension for purity, in reality exists to provide marketable products, hybrid artistic research seeks to recontextualize both knowledge and our species within planetary ecology. In a long-term sense the approach of these artists asks vital questions about the survival of *Homo sapiens*.

Be it challenging hetero-patriarchal medical practices (Bates), critically exploring human-plant relationships (Petrič) as a means of discussing the epistemologies of science, hacking the river and molecular fluids (Maggic) or providing research on watery ecologies (Austen) – artistic research shows an impressively versatile approach to 'doing science' beyond the confines of short-term economic interest. Additionally,

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their engagement with a diverse public, through both their artwork and new forms of media such as DIY/DIWO science workshops, talks and inter-species performances, do broaden both knowledge and debate. The workshop as artistic performative medium for the 21st century radically broadens the fields of knowledge production. These new formats also offer the lay person tools, structures and impetus for scientific literacy within a broader ethical, ontological, epistemological and political framework.

Finally, a strong awareness of discourse enables hybrid artists to situate their own knowledge (which includes relevant fields of the humanities and post-humanities) in a way that not only compliments 'doing science', but can also aid in building an awareness of issues of 'objectivity' and 'situated knowledge' in the natural sciences.

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On the Ecologies of Contemporary Art

Power Plants, *Variants* and Other Technical Milieus

André Rottmann

> "For the first time in the history of the planet, a species of its animate inhabitants is awakening to the awareness that it itself is always already intervening (i.e. technically, spontaneously) in a control loop of ecological structure, in which, on the other hand, it itself is always already integrated for the purposes of its conservation. The progress of technology [...] directly threatens [...] the life of our species accustomed to this and this temperature [...]. [...] The spontaneous control loop of technology will either be able to ward off the negative consequences or [...] adapt us to the new situation [...] which is now imagined to be unlivable. Certainly, a price will have to be paid [...]: either more and more non-human (perhaps also human) life on earth will be eradicated or other planets will have to be exploited. [...] When man will no longer reflect only on environmental pollution, but on this [...] universal structure [...], then the [...] romantic talk of the spirit that creates a nature for itself should also become intelligible [...]." (Kittler 2015: 189–90, transl. by A.R.)

Power Plants and Variants

In spring 2019, Berlin-based artist Hito Steyerl premiered her work *Power Plants*, which consisted of a total of six video sculptures, at the Serpentine Galleries in London. In the darkened rooms of the exhibition building in the middle of Kensington Gardens, 240 differently sized LED monitors of varying heights and orientations were mounted on metal scaf-

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foldings. On these high-resolution screens, large-scale recordings without sound of plant blossoms that appeared to be opening or proliferating, but immediately closed or disintegrated again, were shown in highly saturated colors in endless loops against a deep black background. The light emanating from these short videos bathed the gallery space in a palette of red, pink, orange, white and green tones, while the scaffold structures as a whole were reminiscent of labyrinthine landscape architecture.

Figure 1: Hito Steyerl: Power Plants, 2019

For the exhibition, an artificial garden was created inside a neoclassical pavilion, located in the Gardens. However, the unsteady morphology and fraying contours of the luminous botanical motifs, even in view of their movement, already indicated that these were by no means depictions of real life. Rather, these plants owe their existence to the predictions of an artificial intelligence (AI) based on machine learning processes modeled on neural networks. Steyerl's *Power Plants* show technical images of fictitious vegetation calculated by an algorithm that purports

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to predict the future. In collaboration with the artists and programmers Jules LaPlace and Damien Henry, Steyerl used existing film sequences documenting plant growth in fast motion and fed them into the program "Pix2Pix", specially adapted for her project via the network-based software development project called "GitHub". Within each sequence, the following cinematic image was calculated and generated by using pixel macro blocks from the previous section, identifying repetitive amounts of information, the patterns of which were respectively processed, thus gradually helping to form an artificial memory in the progressive recursion to previously called functions of the process. With each additional algorithmic process and the steadily growing amount of data associated with it, this memory was trained so that it could ultimately predict the continuity of a video for 0.04 seconds into the future with a high degree of probability and translate it into simulations that were combined with the digital source material in loops. Artistic creation (or design) was thus delegated to a digital automatism. Due to the extreme brevity of the calculated sequences, which paradoxically took months to create, Steyerl's mediatized *Power Plants* are characterized by oscillating between the poles of "expansion and corrosion" (Ebner, Gaensheimer, Krystof, Lista 2020: 112). In other words, their unfolding is interrupted and reset in a circular fashion, creating less the impression of a straightforward computer simulation than that of a *cadavre exquis* of digital textures and techniques.

In the early history of the first paradigmatic visual medium of modernism, botanical illustrations – notably Anna Atkin's 1840s cyanotypes of algae – already held prominence because, among other things, nature itself supposedly was written with light in the short circuit of photography and photosynthesis. These literal blueprints of the plant world were particularly suggestive in their ability to visually convey organisms and their milieu at the same time (cf. Armstrong 1998: 179–255). Under the high-tech conditions of the present, however, the viewers of Steyerl's *Power Plants* were confronted with views of an ecology that no longer seems to maintain any material, let alone indexical, relationship to nature. In Steyerl's work, blue (and other-colored) flowers, referring to Walter Benjamin's much-quoted photo- and film-theoretical essay

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on "The Work of art in the Age of its Technical Reproducibility" from 1936, are defined and exposed as components in a "land of technology" (Benjamin 1969: 233). This land's cartography and constitution has fundamentally changed in that it is now characterized by an indissoluble interweaving of natural phenomena and their representation with technical systems that seem to operate according to recursive principles of self-organization and self-regulation.

A virtual interweaving of living organisms and digital operations is equally fundamental to Pierre Huyghe's work *Variants*, which was presented as a permanent site-specific installation at the Kistefos Museum, north of Oslo, in the summer of 2022. Located on a previously inaccessible island on the edge of the Norwegian institution's sculpture park in a wooded area near Jevanker, which is periodically closed off from the mainland due to flooding, the French artist's work initially appears as a dislocated diaphanous screen on which film sequences of this very area are continuously reproduced.

Figure 2: Pierre Huyghe: Variants, 2021

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Screen and scenery thus appear to be interlinked – in part almost in a kind of *trompe l'œil*. Spectral sequences of branches, roots and trunks, leaves, earth and stones, honeycombs, bodies of water, insects, animals and mushrooms move past the viewer of Huyghe's work *en plein air* on seemingly mechanical tracks. The low-slung perspective of a freely roaming creature is adopted. However, *Variants* does not merely represent the local environment from such an implied perspective – albeit in a technological aesthetic that seems to favor contours over matter and thus purports to illuminate flora, fauna and minerals. Rather, the procedures and routines of this literally dynamic project measure, generate and modify the landscape permanently and in such a way that *natura naturans* and *natura naturata* become indistinguishable: Based on an extensive scan of the forested island using LiDAR technology ("light imaging, detection and ranging") – i.e. a laser-based variant of radar for atmospheric, distance and speed measurement in 3D – this is a real-time simulation. As Huyghe himself emphasized in a brief description of his project, the physical and digital environments should be permeable.[1] As in Steyerl's work, the moving images on the screen are primarily the result of the capacities of an artificial intelligence whose rules and prompts are derived from a fictional (and undisclosed) narrative by the artist about the island. According to the model of neural networks, the digital processes of machine learning constantly and automatically reveal unpredictable mutations of the habitat, which in turn participate in the subsequent and progressive algorithmic recursions within the successively but aimlessly unfolding simulation.

The artificial intelligence, calculating and storing the possibilities of an island for mutations and permutations and simulating them on the cleared screen, not only follows its own algorithmic protocols in a solipsistic manner, and on the basis of an automatically expanded set of data. At the same time, it is in direct, yet highly mediatized contact with the environment and its changing facets and factors: A self-monitoring camera eye screens the landscape and, just like the environmental sensors distributed and concealed throughout the entire terrain, constantly

1 https://www.kistefosmuseum.com/sculptur/variants.

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provides real-time information on geochemical and biological activities, the local weather, the presence of animals (but also people, i.e. museum visitors), recurring flood water and its chemical composition, etc. Taken as a whole, this data influences the constantly running calculations and consequently produces effects on the screen in the form of modulations of the visible. Huyghe's work also supplements the soundscape of the forest by using an echo relay system to transpose sounds such as birdsong, cracking and crackling in the undergrowth or a train passing by in the distance into a soundscape that accompanies the AI mutations of the forest as a soundtrack. "There is", as art historian Ina Blom has phrased it, "[…] active growth within the model, just as there is growth in the island forest – growth that accelerates and decelerates based on the data feeds from the forest and the memories lodged in the simulation." (Blom 2022: 63) The environmental information flow remains unaffected by any human presence and attention. Nevertheless, living organisms and digital technologies are virtually interwoven in such a complex ecology. And this circumstance is first and foremost indicated and negotiable through the constitutive and inexhaustible alterity of the artwork itself, by way of the reflexivity that it can fundamentally activate, in the formulation of the art historian David Joselit, through the "unstable alliance of matter and image […]." (Joselit 2023: 12)

Since 2011, and with increasing intensity and complexity, Huyghe has been locating the previously discrete art object in hybrid networks of organic and non-organic elements, almost dissolving it in the process. It may hardly be coincidental that a series of aquariums entitled *Zoodram* marked the artist's ecological 'turn', as historians of science have argued that the aquarium around 1900 not only served as an instrument for researching marine biology, but also as a catalyst for the development of the very concept of "milieu", i.e. for understanding the reciprocal relationship between living organisms and their more or less technical environment (Vennen 2018: 121–124, 265–273; Wessely 2019). Instead of simulating habitats, Huyghe's biospheres stage theatrical settings that define their inhabitants as actors in a scenario and emphasize their own artificiality. His surrealistic *Zoodram 6*, for example, used a replica of Brancusi's iconic sculpture *Slumbering Muse* from 1910, which, in the spirit of

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Jakob von Uexküll, became not only an *Umgebung* but also an *Umwelt* for a hermit crab (Uexküll 1956: 30–31; Lütticken 2015: 117). At the same time, this milieu appeared as a zone beyond even the man-made geological era of the Anthropocene, as a landscape in which only relics of so-called civilization can be colonized by other organisms. In contrast to these obviously still limited or confined dioramas, Huyghe's more recent projects, which measure the boundaries between artwork and environment, create completely operative habitats of interdependence and coexistence. However, they pose "the question of technology" (Heidegger 1977) all the more emphatically.

Ecologies of technology and contemporary art

It therefore seems apposite to define the works of Huyghe and Steyerl as reflections and manifestations of a "general ecology". Significant contributions to the development of this paradigm in cultural studies have been made by the media theorist Erich Hörl, who, following thoughts of Félix Guattari in particular, states that "there are thousands of ecologies today", be they social, political, technological or biological in character, and concludes that "there is hardly any area that cannot be considered the object of an ecology and thus open to ecological reformulation." (Hörl 2017: 1). In contrast to the original definition of the term in Ernst Haeckel's zoology, it is now also understood as an "ecology without nature". The term undoes its "sutures" with nature and shifts towards the once dichotomous field of technology; this, for its part, is likewise subject to a transformation, as it no longer obeys the "instrumental logic of means-end relations", but under the aegis of digital technologies has advanced to become an "absolute agent" without any given purpose, and expressing its own rationality (Hörl 2017: 2–3). The "new historical semantics of ecology" thus no longer indicate the sphere of nature, but concern, according to Hörl, "an environmental culture of control that is radically distributed and distributive, manifest in computers migrating into the environment, in algorithmic and sensorial environments." (Hörl 2017: 4–5). "Its main problem is the capture and control, the man-

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agement, the modulation of behavior, of affects, of relations, of intensities, and of forces by means of environmental (media) technologies […]." (Hörl 2017: 10). The basis for this imperative is the collection of data in cybernetic environments, which is accumulated and utilized for the purpose of pre-empting possible preferences (in consumption or politics) or with the aim of anticipating a potentially controllable situation. Although Hörl's argumentation, in the tradition of so-called "German Media Theory", tends to privilege technological factors over all others or even to declare them the sole determinants of socio-political development, it goes far beyond a mere description of, for example, the extensive networks of "ubiquitous computing" or the "Internet of Things" (Hansen 2013; Easterling 2012). Following Michel Foucault's work on the history of modern government technologies from the 1970s, "general ecology" is defined not least as a new technology of power: "[M]edia technological 'infrastructures of distribution' render environmental even what used to be called *Umwelt* or 'environment'. Thus Environmentality, which is first implemented by media technology, is the contemporary form of governmentality." (Hörl 2017: 5)

Hörl's emphasis on an ecology beyond nature obviously inherits Kittler's invocation of a technical, i. e. primarily computer-based, intelligence that spiritualizes nature, as suggested in the epigraph. In both cases, precisely that separation of nature on the one hand and culture, technology and the social on the other is addressed, which, according to French sociologist of knowledge, anthropologist and philosopher Bruno Latour, has always failed to recognize the real and resolvable links between human actors and technical actors in the formation of modern sociality (Latour 1993). In view of the "New Climate Regime", in which the Earth's "critical zones", after Latour, are anthropomorphizing due to human influence while humans, for their part, are threatening to petromorphize in the sediments of their climate-damaging activities, the "nature/culture format" is becoming all the more obsolete. In one of his eight lectures titled *Facing Gaia* from 2013, Latour explained accordingly: "[…][T]he anthropocene does not 'go beyond' this division [between the social and the natural, A.R.]: it circumvents it entirely. […] Where we were dealing earlier with a 'natural' phenomenon, at every

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point we now meet the 'Anthropos' […] and wherever we follow human footprints, we discover modes of relating to things that had formerly been located in the field of nature." (Latour 2017: 115–120) As a result, there is "a radically new distribution of the forms granted to humans, societies, nonhumans, and divinities." (Latour 2017: 119)

In view of projects such as Steyerl's in the Serpentine Galleries and Huyghe's in the Kistefos Sculpture Park, it could be argued that contemporary art in particular is becoming increasingly "environmentalized". From the 1960s onwards, art practices in Western Europe and North America were increasingly defined by reference to the circumstances of their production, distribution and reception: From Minimalist sculpture to so-called "Land Art" (cf. Nesbit 2014) to site-specificity or institutional critique, the artwork was no longer understood as a closed form and autonomous object, but appeared to be open to an expanded field of forces; since then, aesthetic experience and reflection are always referring to architectural, landscape, institutional, social or economic spheres. Following Hörl's concept of a "general ecology", a "realism of relations" (Hörl 2017: 7) is now predominant in art, too. Against this backdrop, Steyerl's *Power Plants* and Huyghe's *Variants* can serve as examples for a multitude of recent practices that create a changed relation to the contexts of global contemporary art in that they themselves implement concatenations between (seemingly) natural and increasingly informational elements, between different infrastructures and intelligences.

Such "ecologized" practices thus focus less on questions of sustainability and nature conservation; rather, *mutatis mutandis*, they aim to measure the virtual and real rapports between art and increasingly comprehensive environments, which are "interconnected" with the rationality that is owed to the applied calculation of algorithms. Beyond case studies on Steyerl's *Power Plants* and Huyghe's *Variants*, it is thus possible to outline an area predestined for contemporary art (history) and its genuine ecological imperative, which, in the light of concrete material practices, is able to indicate the interactions and tensions between the coexistent but by no means identical fields of aesthetics and technology (cf. Jones 2022: 20). Accordingly, the following considerations are guided by the question of how art recurs and reacts to

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the technical milieu, i.e., in the apt phrasing of art historian Sebastian Egenhofer, to "the heterogeneous totality of tools, energy- and information-processing machines, sensors and channels, systems and vehicles" (Egenhofer 2020: 77) as their very own new ecological environment.

Mixed techno-geographical environments

The title of Hito Steyerl's project from 2019 is polysemic in that it not only interprets "plants" ambiguously, but also alludes to the different semantic registers of the English term "power" in three respects: Reference is made to electricity as the basic prerequisite of all data transmission and processing. At the same time, it refers to the simulated plants, to be regarded as "power plants" because they will develop sustainable abilities within future technical environments, which are described in short texts under female heteronyms from the (literary) history of botany (such as Johanna von Goethe, Bettina Stoetzer or Federica Campagna). However, these quotations from books that allegedly only appeared later in the 21st century were not conveyed through the conventional parerga of an exhibition (wall texts, signs, handouts, brochures, etc.), but were visually integrated into the digital infrastructure of Steyerl's project itself. Visitors to the Serpentine Galleries were able to download the *Power Plants OS app* onto their smartphones or use this application on iPads suspended from the ceiling to decipher QR codes embedded in microcement plinths, whereupon floating and animated blocks or spirals of text designed by typographer Ayham Ghraowi became visible on the respective screen – as an "augmented reality" between the video sculptures or near the walls, ceilings and floors of the gallery space, and all in various colors and based on the aesthetics of early internet browsers. While the promise of a glimpse of the future in the AI videos of plants tends to be disappointing, as argued above, these texts offer the results of an almost exuberant imagination. For example, an excerpt from the book *Pharmakopeia* by fictious author Dalia Pendell (a tribute to poet and ethnobotanist Dale Pendell who passed away in 2018), announced for 2021, on the efficacy of future algae species – as an evident tribute to Anna

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Atkins' *Blue Prints* – read: "In the future, algae capable of near-infrared photosynthesis will produce valuable oxygen. Near infrared photosynthesis is light that is not visible to humans, just to cheap cameras, some Actual Reality applications and bees. Only specific algae are able to utilize the invisible spectrum of light to produce energy." (Steyerl 2019: 12) Steyerl is also known as the author of numerous speculative-theoretical texts on the connection between art, politics and media aesthetics (Steyerl 2017). In projections such as these, she creates alternative scenarios of the agencies distributed between biotic and abiotic, artificial and organic elements in milieus that, in the sense of the philosopher Gilbert Simondon, are only constituted through the existence of technical objects, as mixed techno-geographical environments (Simondon 1958: 55). Through the *Power Plants OS app*, both the space of the exhibition and the visitors were drawn into such a virtual milieu. However, the coupling of modified plant, optical apparatus, software and bees, as the quasi-scientific passage quoted (or rather penned) by Steyerl describes for the future, imagines material processes and effects that will largely elude human consciousness.

In this respect, and even in the present day, phenomena such as bioindication can be positioned at the supposed antipole to technology. Bioindication consists of microbiological processes in which chains of different organisms perceive environmental stimuli and indicate them through physical changes, behaviors, conditions and forms of colonization. As Jennifer Gabrys, a sociologist of technology, has put it: "Bioindication is a process occurring across multiple organisms as they are affected by, sense and even transform their environments." (Gabrys 2018: 350) Gabrys further explained, vis-à-vis NASA's "Ozone Bioindicator Garden Project", that it is important to understand the concept of nature beyond taxonomic orders of individual organisms as "*ecological* configurations of entities" (Gabrys 2018: 352), in which non-organic actors are also involved – and whose description is subject to technical routines and operations. An example is provided with the investigation of air pollution using lichens, characterized by being less plantlike than amalgams of fungi, algae and cyanobacteria, which, lacking their own roots, are closely conjoined to rocks and soils.

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Huyghe's most recent project within the techno-geographical and biological milieu of a forest area could be understood as the material implementation and intensification of such *ecological* configurations of entities in the medium of art. Analogous to sympoiesis, i.e. the underground networking of trees, plants and fungi for the purpose of nutrient exchange, the technological processes in *Variants* and their underlying principles and logics (as Hörl states for "general ecology" as a whole) do not follow any comprehensible causal relationship of cause and effect. Accordingly, they remain beyond human perception and are consequently operative and active even and especially when the island is inaccessible to viewers due to the water level. In this aspect, *Variants* in Huyghe's practice continues the attempt to design concatenations between biotic and abiotic, artificial and organic elements in newly forged milieus, as it was already characteristic for his contribution to Skulptur Projekte Münster 2017: For *After A Life Ahead*, the artist created a sculptural palimpsest of interlocking components based on an extensive excavation of the geological layers beneath the playing field of a former ice rink, including a beehive, an incubator for HeLa cancer cells and a weaving cone in an aquarium, algae, mineral formations, building details (especially the roof lights), amorphous matter and natural sediments and a drone sound, all of which coexisted and interacted through sensors and subfloor cables, various algorithms, the simulations of an augmented reality cell phone app and machine mechanisms. The environmental sensors underground, among other occurrences, registered the flight frequencies of the bees in or out of the clay steles, and they were connected to the incubator and controlled the growth of HeLa cancer cells in it. In the cell phone app, this data made black triangular shapes appear on the visitors' screens, while similar shapes floated underneath the ceiling, next to the roof lights, and multiplied whenever the number of pathological organisms in the cooling unit increased. These virtual epiphanies disappeared when the cells died again, only to initiate a new life cycle. Associated with the processes of growth and decay, one of the roof lights opened with a creaking mechanical sound and closed again; light, rain, pollen and other influences entered the arena and affected the local climate as well as the tracked behavior of the bees. In this and many other ways,

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Huyghe imagined and realized a landscape whose rationality and incessant processualism human actors could neither fully comprehend nor actively influence (Rottmann 2019; Ströbele 2024: 351–377). According to Latour, the "Old Climate Regime" was dominated by the image of the globe as a sphere inhabited by humans but visually distant at the same time, suggesting totality and passivity. In the reciprocal relationships of elements, as implemented in *After Alife Ahead* as well as in *Variants*, the "passage through connections" became tangible instead of "a relation between parts and the Whole" (dominant before). "[T]he hard lesson of actor-network theory", says Latour, "according to which there is no reason to confuse a *well-connected* locality with the utopia of the Globe, holds true for all associations of living beings."(Latour 2017: 135–136) With regard to his *Variants*, Huyghe stated accordingly: "You do not separate them between nature and simulation. It is neither one nor the other. It is not a binary. It is a chimera. A blur, an indifferentiation."[2]

In the Kensington Gardens surrounding the Serpentine Galleries, Steyerl exposed "a *well-connected* locality" by making another smartphone application available for visitors to download: As the above-quoted passage attributed to Dalia Pendell already suggests, in the change from inside to outside, a shift of emphasis from an augmented to an actual reality, from the supposed future to the present, is carried out on a referential, albeit not technological, level: This is because the *Actual Reality OS app* served to provide information about the social fabric surrounding the exhibition site in London, which is characterized by a stark inequality in the distribution of property, capital, mobility and resources, particularly in the boroughs of Kensington and Chelsea, on the basis of data and statements provided by local NGOs. The third level of meaning of "power" in Steyerl's project finally can be brought into focus, with which the authoritative, if not authoritarian dimensions of environmental technologies of power are addressed – and with it the question of the possibilities and strategies not only to identify these, but also to confront them critically and reflexively in the course of an

2 https://artreview.com/the-poetics-and-pitfalls-of-allegorithmic-art-pierre-huyghe-kistefos/

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actualization of institutional-critical approaches in art. The power of fiction in *Power Plants* was replaced by that of a factography, which – unlike in canonical works of institutional critique (such as Hans Haacke's *Shapolsky et al. Manhattan Real Estate Holdings, A Real Time Social System, as of May 1, 1971*) (Deutsche 2015) – did not record economic conditions (such as those of domestic workers) from a distanced position, but from a structurally implied one, which almost inevitably results from the mechanisms of an environmental culture of control.

After scanning a QR code on one of three plinths in the park, visitors to Steyerl's London exhibition found themselves suspended in an environmental milieu interconnecting data and site that entailed an electronic soundtrack that uses so-called data sonification and a "deep mind" synthesizer to translate the underlying statistics into harmonious tone sequences. Visitors were immediately directed to the architecture of the art institution, which received an annex by Zaha Hadid in 2013 and was now modulated on a scale of 1:1 into three-dimensional virtual diagrams of the social inequality surrounding it. These virtual diagrams constantly adapted to the point of view of visitors and their technical devices; the data collections were complemented by floating lettering of the statements of workers employed in households or hotels in the area. Under the conditions of environmentality and its unconscious operations, this component of Steyerl's work creates an awareness of a reality that obeys the laws of profitability different from what the predictive calculations of artificial intelligence would suggest. Given the multitude of references to centrifugal facts and factors within a comprehensive technical milieu saturated by images, texts and media, Steyerl's project *Power Plants* may have exposed itself to the danger of itself being distributed within the coordinates of an incessantly expanding algorithmic and sensory environment. However, it harbors an exemplary and prognostic value of its own in giving contemporary art a perspective onto an open future in which the yields and excesses of this media ecology become equally tangible and negotiable.

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Toward an aesthetics of the non-conscious

The media theorist Marie-Luise Angerer has claimed that "media-technological transformations and human-machine couplings" not only reorganize the concept of nature, but also introduce a "digital unconscious" that can hardly be dealt with in psychoanalytical terms (Angerer 2022: 15; see 67–68, transl. by A.R.). Angerer's argument expands on US media and literary scholar N. Katherine Hayles' 2017 book *Unthought. The Power of the Cognitive Nonconscious*, in which the latter introduced the term "non-conscious". On the one hand it denotes neuronal processes in the body that protect human consciousness from being overwhelmed by stimuli at intervals of milliseconds; on the other hand, Hayles discovers parallels not only to other life forms (such as plants in particular), but also to the capabilities of technical systems, so that biological and mechanical parts are de facto inextricably interwoven in medially expanded ecologies. The "non-conscious" manifests itself, for example, in technologically implemented intelligences and infrastructures – or, as Hayles calls it, "cognitive assemblages", when these merge with the perception of human subjects (as in the augmented reality app in Huyghe's *After ALife Ahead*) (Hayles 2017:2). In his project *UUmwelt*, on show at the Serpentine Galleries before Steyer's, the French artist accentuated such an aesthetic of the non-conscious in (at least) two ways: Fundamentally, the exhibition was based on the principle of the interdependence of biotic and abiotic actors insofar as flies were present in the gallery spaces alongside the visitors or hatched from breeding grounds in the floor shafts. The insects' behavior was influenced by skylights that were opened at irregular intervals, projections of warm light, computer-generated sounds (based on brainwave measurements transcoded by AI software) and artificial smells. The floor was covered with dust from the previously sandblasted walls, so that particles of matter were dispersed through the viewer's passage and fed into the gallery's climate. All of these factors of the exhibition dispositive contributed to the already changing light conditions, temperatures and humidity levels, which were in turn recorded by interacting sensors that ultimately controlled the image sequence and rate on five large-format LED screens on the

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walls. On these luminescent panels, rapidly moving and changing digital images were shown, with sudden interruptions. All this was set up with a specific AI application, which also helps (Japanese neuroscientists claim) to read or to visually externalize thoughts: At Kyoto University, following Huyghe's instructions, members of the research lab there were shown a series of (20 to 30) images and image descriptions which followed the taxonomy of human, animal, machine. They were then asked to recall these motifs and ideas while an fMRI ("functional magnetic resonance imaging") scanner captured their brainwave data and fed the memory images into a "deep neural network" which in turn constructed synthetic representations of what the lab team members remembered by recourse to a photographic database. Huyghe, however, did not use an optimized single result per source, but rather assembled thousands of variants and played them back on the LED walls in the darkened rooms of the Serpentine Galleries as hectic, low-resolution proliferations with unclear references, whereby the sequence and rhythm were determined by the environmental sensors, which reacted not least to the presence of viewers (cf. Skrebowski 2019). Under the sign of the digital, the unconscious of machines and of the people become virtually indistinguishable.

Huyghe's "environments" exhibit networks of association in which, according to Latour, "any given interaction seems to *overflow* with elements which are already in the situation coming from some other *time*, some other *place*, and generated by some other *Agency*". Thus, "action is always dislocated, articulated, delegated, translated." (Latour 2005: 166) While the diverse data obtained from Kistefos island allows the AI algorithms to repeatedly modify the motifs of the filmic reproduction of the forest, some of these simulated entities leave the frame of the screen and can be found by visitors in nature at the outermost edge of the sculpture park in the form of 3D prints, precisely at the address mapped in the landscape's simulation. This is undeniably a predetermined breaking point, or at least the breaking function of this project, in that the immanence of the computer-based operations on which it is based is suspended in favor of a selective externalization and exposure of singular formations. Viewers encounter the carcass of an elk, for example, or de-

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tect a flesh-colored structure reminiscent of mushrooms on a branch. These materializations of a bio-art oscillate between the poles of growth and decay, form and *informe*, the aesthetic and the abject.

The comparison between the appearance of this configuration on the LED screen and its coagulated sculptural realization suggests the surrealist *écriture automatique* as a genealogical point of reference insofar as Huyghe also translates a found morphology into an identifiable form – albeit not through the dynamics of the unconscious so often invoked by the avant-gardes, but by means of a "non-conscious" technology. However, the aporias of psychic automatism remain even in its contemporary transcription, by way of a "digital unconscious", into an automated algorithm. Media theorist Matteo Pasquinelli has recently described artificial intelligence and machine learning as "the *automation of automation*" (Pasquinelli 2023: 248). For Max Ernst's series of collotypes after frottages entitled *Histoire naturelle* from 1925/26, the art historian Ralph Ubl has emphasized that the artist, in his attempt to use the automatism of drawing to create authenticity, was confronted with the epistemological problem of visualizing the objective reproduction of a nature that had already disappeared before the appearance of the first human being (Ubl 2013: 69–75). Huyghe's project reverses this temporal (or primordial) perspective by imagining the (coming) ruins of the era of the Anthropocene. However, this prognosis is in turn determined or limited by the current capacities of the AI application used to project the ruins. According to Ubl, Ernst's mimetic impulse also meant that his images of a natural history in search of deep time hidden in the layers of childhood memory were always relegated to secondary and surrogate sources (such as natural history books and adventure novels) (Ubl 2013: 108–109). And even in *Variants*, the digitally calculated mutations of the landscape remain limited to the supplements of their representability. Using Alexander Galloway's term for virtual "gaming", it could be stated that Huyghe's ecologies function less completely algorithmically and more "allegorithmically", as they always remain synchronized with the legibility, or at least decipherability, of the given reality in the tradition of allegory (Galloway 2006: 91; see Rottmann 2019: 89).

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At the interface of the digital and physical milieu, Huyghe *Variants* presents the idea of a nature on the horizon of our crisis-ridden present: successively contaminated and colonized by its own, technically induced mutations. Steyerl's *Power Plants* likewise holds out the prospect of new potent species in the convergence of (images of) biology and technology. In *Facing Gaia*, Latour called for an aesthetic in the sense of the "capacity to 'perceive' and to be 'concerned' […]." (Latour 2017: 145) Through forms of saturation and alienation, Huyghe and Steyerl create the highly mediatized aesthetic experience of interconnected environments, through which an ecology is thrown into vibrant relief in which the difference between nature and technology would once have been almost impossible to make. In his previously cited reflections on *Art's Properties*, Joselit argued that "[t]he history of art is drawn from […] socially embedded performances of alterity. […]. The temporality of these effects is distinct from the rhythms of conventional politics. Alterity's elsewhere or otherwise does not take place in the exclusively human realm of the state, or civil society. Art's special capacity is to configure multiple registers of experience (the spiritual, the terrestrial, the abstract, and the material) rather than remaining embroiled in the ephemeral conflicts of day-to-day politics. Its power *is its capacity to activate alterities*."(Joselit 2023: 3) This particular ability to activate reflections and affects by being strange and making strange is what gives "ecologized" contemporary (bio-)art its reach and relevance in the face of both our new climate regime and the cybernetic control circuits of environmental media that enclose us.

This text was delivered in part (on the work of Huyghe) as my Inaugural Lecture for the Professorship for "Theories of the Arts and Media" at The Faculty of Social and Cultural Sciences of the European University Viadrina in Frankfurt (Oder) on May 23, 2023. It also refers to a paper (on the work of Steyerl) given in the context of Section V, "Der ökologische Imperativ: Anschaulichkeit und Spekulation der Kunst" (organized by Toni Hildebrandt and Peter Schneemann) at the 5th Swiss Congress for Art History on June 23, 2022 at the University of Zurich.

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Figure 1: Hito Steyerl; Power Plants, 2019; Stainless steel scaffolding structures, LED panels (3,9 mm pitch), multichannel video loop (12

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video motifs, color, silent), LED text panels; Installation dimensions variable; Exhibition view: Hito Steyerl: Power Plants, Serpentine North Gallery, 2019; AR application design by Ayham Ghraowi, Developed by Ivaylo Getov, Luxloop; Courtesy the artist, Andrew Kreps Gallery, New York and Esther Schipper, Berlin/Paris/Seoul; © the artist / VG Bild-Kunst, Bonn 2024;Photo © 2019 readsreads.info.

Figure 2: Pierre Huyghe; *Variants*, 2021-ongoing. Scanned forest, real-time simulation, generative mutations and sounds, intelligent camera, environmental sensors, animals, plants, micro-organisms and materialized mutations: synthetic and biological material aggregate. Courtesy of the artist; Kistefos Museum; Hauser and Wirth, London and Esther Schipper Berlin/ Paris/Seoul; Photo © Ola Rindal.

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Crosscutting Arts, Science and Technologies

A New Understanding of The Bonds with The Living?

Emeline Gougeon

In 2023, it has been well documented and widely accepted within the scientific community, major NGOs, national and international public institutions that the habitability of our planet, as we know it, will undergo many changes by the end of the century. Prospective studies are drafting case scenarios often with a bleak future and/or irreversible effects, some of which are already visible. Across the globe, there is a shared assessment: the need to radically change pollutant and destructive ways of Living and to develop new relationships with our environments and among humans and non-humans. The multiple dissonances of humanity, as societies and individuals, with regard to our capabilities to think and act in more sustainable ways tend to confirm the following hypothesis: environmental issues cannot be solved by science and legislation only. Indeed, despite the dissemination of knowledge and initiatives, political advances made are not accompanied by a reversal of overconsumption, overproduction and the destruction of endangered ecosystems as reported by the Millennium Ecosystem Assessment (2005). Some of the reasons for this could be a certain inefficiency of top-down management (Fraser 2006: 114), a persistence of ideological blockades for addressing climate change and threats to biodiversity as well as recasting negative environmental impacts of human activities as negligible. Concurrently, a guilt-inducing and/or moralizing communication neither establishes the conditions for a dialogue nor makes it the public more committed and responsible. Yet, to be an active agent when facing a situation is a key aspect towards change. To foster change and

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awareness from an audience, whether at an individual or collective level, requires stimulating the sensitive, affective and behavioural dimensions of peoples' personalities. Consequently, science popularization and data processing, mainly addressing the cognitive part of human personality, do not produce the expected results (Clavel 2012: 438). Indeed, while demonstrating facts about climate change, biodiversity loss and destruction in the most objective and rational ways, science data and lectures do not automatically lead to a desired level of rationality and coherence in decision-making and behaviour.

Baptiste Morizot (2020) points out that the environmental crisis, which is a crisis of our human societies, is above all, a crisis of our "sensibility", of our affiliation with the Living, a crisis in the way we consider living beings inside or outside our affective, perceptive and political world. It is a crisis of our culture (Pierron 2013: 45); a culture that has emptied nature of meaning and frozen its presence to a reservoir of resources to be exploited; a culture that has led to an impoverishment of what it is possible to feel, perceive, understand and weave as relationships with regard to the Living. Henceforth, seeking to develop a more sensitive and enriched relationship with the Living seems to hold, as Philippe Descola suggested (2005), the potential to break with the deleterious modern tendency of reducing nature to inanimate matter.

What is articulated under the general term as ecological crisis is a clear call for a re-introduction of meaning, responsibility and sensitivity into our actions; a call for a greater availability and attention to the Living. According to sociologist, philosopher and anthropologist Bruno Latour (Latour 2021), new synergies, agencies and methodologies are indispensable to be able to embrace the complexities we are facing, and to engage in a "*politique du sensible*" (Chardel et al. 2021: 81). Such a sensibility-oriented policy would foster a wider understanding, availability and responsibility towards nature and our environments, towards the other.

Even though art is a field of human activity that needs contextualisation to be understood, its real-sensitive approach, involving all dimensions of human personality (cognitive, affective and behavioral), may indeed address key aspects of the equation. Being a marker of societal and technical evolutions, art has always accompanied human

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life, enriching the links societies and individuals have developed with their environment and the other. According to prehistorian Jean Clottes (2011), the artistic experience could even be consubstantial to the human mind, and this access to the first symbolic and abstract values and thoughts having enabled us to question our environments and our future. This helps to understand why the environmental issues and challenges have entered the field of contemporary art (Demos 2009: 17). Artists have seized on these issues in a wide variety of forms, proposing collaborations with other disciplines and knowledge, involving diverse communities and technologies and by taking over public spaces. An example of such an intersection between art, science, philosophy and ethics, whilst seizing the public space is *Wheatfield – A Confrontation* (1982) by artist Agnes Denes; an artwork retrospectively considered in a 2018 New York Times article as a watershed moment in public art (Jacobs 2018). This landmark piece was a two-acre field of wheat grown on an empty landfill next to the World Trade Center. Planted on May 1, 1982 and harvested on August 16 of the same year, the wheat field was maintained for four months by Denes, two assistants and rotating volunteers.

The diversity of forms and proposals of contemporary artworks echo indeed the wide range of environmental issues as many challenges are breeding grounds for the artists. Artworks have been produced by taking the form of shared habitats between humans and non-humans (Fritz Haeg, in 2005–2013, Lynne Hull, in 2009): shamanic experiences (Marcus Coates, in 2004); landscaping in the city (Alan Sonfist, in 1978); unexpected encounters with the Living in museums (Pierre Huyghe, in 2014–2015, Mark Dion, in 1991 and 2002); films allowing us to see the world through the eyes of other animals (Sam Easterson, in 1998). Contemporary artists have also presented archives and/or workshops made up of exchanges with local communities (Collins & Goto Studio, since 2007, ongoing): works immersed in tar (Minerva Cuervas, in 2007); or even floating gardens (Christian Philipp Müller, in 2006); and 3D bio-prints transcribing the complexity of urban spaces (Allison Kudla, in 2010). Facing the ecological crisis, contemporary artists have also investigated areas of socio-environmental disasters in Brazil

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(Paulo Tavares, in 2013), the conditions of world food production (Uwe H. Martin & Frauke Huber, since 2007, ongoing), possible correlations between futuristic imaginaries of biotech companies with current political struggles over land use, energy policy and GMOs (Kyungwon Moon and Joonho Jeon, in 2023), or even the impacts of nuclear energy (Diana Thater, in 2011) and transnational approaches to designing new modes of social organization (World f Matter, since 2008, ongoing).

The evolution of technologies has also a role in the ecological crisis as well as in artistic practices. The production and use of new technologies has both positive and negative impacts on the environment. While many recent technologies have been developed with the aim of reducing the negative environmental impacts of more traditional technologies, such as low-tech and slow-tech innovations, there is a consensus that multiple environmental problems have been caused and aggravated by diverse technologies. The manufacture and use of smartphones and touch screens, the predominant use of algorithms and artificial intelligence, generally grouped under the generic term of "digital technology", are probably some of the most significant examples. In a techno-symbiotic societal trend, the links established between these technologies and the ecological crisis, taken in its broad sense, are not only beneficial. These new practices are damaging the environment. According to a study published by the GreenIT collective (2019), which brings together experts in digital sobriety and responsible digital approaches, the manufacture and use of new technologies are a major source of energy consumption. Air pollution, climate change, water pollution, thermal pollution, and solid waste disposal are some environmental problems that are directly linked to energy production and consumption.

Simultaneously, technical systems are also cultural systems. Computers and algorithms have biases and meanings embedded into their structures. Indeed, technologies are not only tools (Harrell 2013: 57); they are evocative objects, leading us to see ourselves and our world differently. Computers play a role in shaping culture by facilitating the construction of shared knowledge, shared beliefs and shared representations, highlighting the active role of both programmers and users.

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Just as the technological revolution of digital communication systems has led to a profound and global change in societies, modifying the structure of relationships between individuals themselves and the collective, digitalization challenges art and traditional figurative techniques. Indeed, art and technology are even inseparable. Artists, throughout the ages, have resorted to new instruments stimulating their imaginations, such as the *Five Senses* sculpture series (2001) developed by artist Annie Cattrell, and transcribing the experimentation with the senses by a subject; artwork that was made possible through collaborations with neuroscientists and functional magnetic resonance imaging (fMRI) technology. Since the 1960s, artists have used computers and new technologies as tools for aesthetic research, creation and as exhibition mediums. The digital has thus become not only a support for the mediation of art but also an artistic medium in itself. New digital technologies are exploited as brushes, canvases, tools and support, making art more complex and interdisciplinary endeavor. These perspectives enable the emergence of new questions and thoughts regarding art and communication, renewing the aesthetics of creation, the mediation of art and its reception. Playing a considerable role in our techno-symbiotic societies, whether positive or negative, contemporary artists have grasped the opportunities offered by new technologies, proposing interactive and immersive installations, creating "new worlds" such as the ones created by the international art collective TeamLab, or exploring what "life" might mean in a post-singularity, post-climate change future such as the underwater robotic installation by Anna Dumitriu and Alex May *ArchaeaBot: A Post Climate Change, Post Singularity Life-form* (2018–19). Experiments with data sonification are also developed, such as for the multidisciplinary art-science project *Micro Lux Chants* by ArtSciLab and Gassensmith with the aim to understand the life cycle of the bioluminescent bacterium *Aliivibrio fischeri*.

Commentators on interactive media suggest that digital systems invoke imaginative meaning-making processes that involve both perception and motor action. Thus, interactions with generative animation systems form motor and sensory loops that intertwine with everyday life experiences, engendering metaphorical understanding (Harrell, Chow

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2010: 256). Thus, crosscutting projects between arts, sciences, and technologies seem to hold interesting opportunities to renew our apprehension and representations of the Living to which we belong. These opportunities include increasing awareness on phenomena that escape our immediate perception, broadening our imagination and a greater attention to the Living, all of which are key for facing the ecological crisis and its ethical challenges (Chardel et al. 2021: 84).

Making phenomena visible: human invisible pollution and interferences

A large part of human activities has now become detrimental to ecosystems. Some of these effects are more apparent, while others are almost invisible and/or largely unknown. However, invisible pollution and interferences cause major issues. How do interdisciplinary artistic works capture and bring light to some of these consequences? How do these projects add value to current knowledge and change our perception?

Plankton serves as the primary basis of the marine food chain and is, as a result, a crucial component of the Earth's ecosystem, contributing between 50 to 85% of the oxygen in the atmosphere. Still, the effects of sound and noise resulting from human activities on these organisms are largely unknown. The interdisciplinary installation Noise Aquarium has been developed in order to address that lack of public awareness, seeking to immerge audiences in a "3D aquarium" of diverse planktons, with projectors enlarging these to the size of whales. Initiated by media artist and professor at UCLA Department of Design Victoria Vesna, director of the Science Visualization Lab of the University of Applied Arts Vienna Alfred Vendl, and computer animated visualization scientist Martina Fröschl, the project has also gathered biologists, digital artists, and sound designers. Made up of 3D-scans of micro creatures, the installation has been designed to be interactive; the moving 3D creatures react to the body movements of the viewers, simulating how the former would respond to representing noise sources in nature.

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Figure 1: Noise Aquarium concept proposal by Victoria Vesna, Karina Lopez and Martina Fröschl, 2016

Live binaural sonic layering on the animations of plankton was also performed during the covid-19 pandemic. Through its wide representation, the immersive and interactive dimension involving the viewer's body, *Noise Aquarium* offers a unique 3D audio-visual experience of the effects of noise pollution on plankton.

Among invisible pollution, chemical pollutants, notably residues of pharmaceutical consumption discharged into most of our fresh and saltwater environments represent a significant problem. *Aqua_forensic* by artists Robertina Šebjanič and Gjino Šutić is a hybrid project which is gathering a research program coupled with a science and art residency, taking a citizen science approach to visualize the effect these chemicals residues have on aquatic micro-organisms, and to better understand what kind of impact we humans have on aquatic habitats (from micro to macro level).

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Figure 2: Aqua_forensic by Robertina Šebjanič and Gjino Šutić, photo by M.E.Koch (WRO Biennale)

Focusing on specific localities in Europe (Donau River in Linz, Austria, and various localities on the Adriatic Sea in Dubrovnik and Dubrovnik-Neretva County), the research resulted in two scientific papers and visual data (research artifacts) which were used to create an interactive art installation, referred to by the authors as a "spatial morphing sculpture". *Aqua_forensic* takes the form of a piping system displaying holographic videos of the effects of pharmaceuticals on protozoa and other micro-organisms. The installation, which connects copper pipes and holographic videos, shows the timing of in-vitro experiments of microorganisms dying in pharmaceutical solutions 20,000 times lower than the average dose permitted for humans. Thus, the pipe system connects everything in an immersive environment, where the viewer is intertwined with it and invited to look at the modules where the holograms are presented. The production of the installation took place at the Projekt Atol Institute in Ljubljana, Slovenia. The artistic installations were exhibited in 2018 at Ars Electronica festival, at the Festival Rencontres Bandits Mages in Bourges, and at UNAM University

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in Mexico, allowing different audiences to be confronted and informed about this issue. Among the other developments of the project, *Adriatic Garden | Aqua_forensic 2.0* sought to open a wider discussion about our solidarity and empathy with the waters beyond human perception; offering on-site and online exhibitions, panel discussions and workshops.

The preservation and restoration of forest ecosystems are another crucial ecological area. Forest ecosystems are at the heart of a functioning "Earth organism". However, despite their incredible capacities for adaptation and resistance, these organisms have become vulnerable. The beneficial influence of a significant number of studies goes well beyond the scope imagined until recently. While being threatened, for forest and timber sciences specialist Ernst Zürcher (2016), the tree represents the lever, on a human scale, which makes it possible to act for the conservation and even the restoration of the vital functions of our planet. Among the various threats, the impacts of electromagnetic fields on trees have been scientifically demonstrated. Ambient levels of nonionizing electromagnetic fields (EMF) have risen sharply in the last five decades to become a ubiquitous, continuous, biologically active environmental pollutant, even in rural and remote areas (Blake Levitt et al. 2021: 327). Studies have shown that in areas where a mobile phone antenna is installed, trees almost immediately show changes in their trunks, leaves and branches. Many species of flora and fauna, because of unique physiologies and habitats, are indeed sensitive to exogenous EMF in ways that surpass human reactivity (Blake Levitt et al. 2021: 327). Usually, a disturbance heralds another disturbance. Hence, *Arboreal Receptors* developed by transmedia narrator and sound artist Ioana Vreme Moser aims to disclose the occurrences of radio-electromagnetic disturbance moments, from the perspective of a tree. *Arboreal Receptors* is based on two large networks, which are on the one hand the radio-electromagnetic fields of our communications systems, expanding in the air and crossing urban and natural landscapes. On the other hand, a network linking the trees to the mushrooms, tangled in the roots and expanding in the underground. This network is based on the impulses circulating chemical information between the trees and the mycelium, establishing mutual partnerships, in a very deep and essential exchange

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to balance the two organisms. Trees have evolved to live in cooperatives maintained by a collective-like intelligence. What happens when these very sensitive ecosystems are interfered with? What kind of landscape dynamics emerge when these two different types of networks meet? Has human-made electromagnetic radiation changed and shaped natural ecosystems and environments?

Inspired by the operating principles of previous experiments with radio reception from trees, *Arboreal Receptors* is composed of sound sculptures forming sculptural instruments, kinetic garments, gently suspended from tree trunks. These objects incorporate thin toroidal coils wound around the trunks that intercept field fluctuations. The sculptures thus react on radiation whenever it is involuntarily captured by the trees, creating movements in a small electronic circuit.

Figure 3: Arboreal Receptors, installation, 2021

© Ioana Vreme Moser

Placed in an arboreal collective, the circuitry thus converts the radiations to an audible and visible movement. The sonification through various noises and rhythms materialises the invisible conflicts from the clash

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of two fundamentally different systems of information and exchange. Commissioned and funded by the Federal Government of Lower Austria, the City of St. Pölten and the Federal Ministry of Arts, Culture, Civil Service and Sports BMKÖS, exhibited at the Institute of Media Archeology St. Pölten, *Arboreal Receptors* initiates a close investigation towards the daily operations of a tree, from its perspective, and its exposure to human interferences.

Towards an enriched presence and a careful listening to our environments

Participating in seeing the world in other ways, the question of our awareness, our attentive listening and our contacts with our environments, natural, technological, with humans and non-humans, is of utmost importance. The art-science research project *Interactions férales. La réponse de la baleine à bosse* (*Feral Interactions. The Answer of the Humpback Whale*) was first developed (2012–2017) to imagine the relationship woven between humans and whales, these fragile and endangered cetaceans. Based on similarities between the sounds of the bassoon and the humpback whale vocal generator, electroacoustic composer and radio documentary maker, Aline Pénitot, and bio-acoustician, cetacean sound specialist, Olivier Adam (Sorbonne University) conducted research, with other experts in biology, bioacoustics and musicians, and designed a first interface with the aim to build a bidirectional interaction between human musicians and humpback whales. In their motivation to consider the discrete tonal sounds of humpback whales and to measure the interaction level with some objectivity, Pénitot and Adam were driven by the necessity to go beyond human musical instruments, which have their own acoustic limitations and constraints and to allow opportunities for one-on-one interactions at the same level. Indeed, each family group of whales has its own set of unique sounds, or distinct calls, which together form a unique dialect. The songs of the humpback whale, which can last for hours, are among the most complex in the animal kingdom.

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In 2018 and 2019, Aline Pénitot made several trips, notably to Reunion Island, and was able to experience this relationship in vivo. From an underwater human-whale sound interface (an aquatic loudspeaker and underwater microphones), Pénitot and Adam recorded each situation, each outing, each song, each whale breath and above all each response to sound stimuli. Observing the whale staying around the aquatic loud speaker, without any fears, was a moving experience for the researchers.

The sound material of these recordings and the responses of the whales make up the second phase of the project. After scientifically demonstrating the similarities between the sounds of the bassoon and the humpback whale vocal generator, the next step, as explained in Frontiers in Psychology (2019), is to design a new human-whale interface called *Gestural Underwater interactive Whale–Human interface* (GUiWHi). This interface is developed to enable an enhanced communication with whales. With interactions still based on humpback whales' own language, GUiWHi proposes a new configuration. While for the first phase, the musician was on the boat, the new interface and its specific equipment and configuration would allow the composer to be under water to potentially add a visual contact with humpback whales.

Since its beginning, the project *Interactions férales* has been shared and presented in France to various audiences through events combining conferences, live performances, immersive and spatialized concerts. Opening inspirations to compose new music pieces in different styles, based on "*musique concrète*" to be as close as possible to humpback whales' sounds, the interdisciplinary team look for entering a new kind of relationship with these cetaceans.

Technologies can enrich our listening to the Living and our environments, bring us closer to what surrounds us or what escapes our immediate perception. Yet, our perspectives can also be infringed by the large scale use of technologies which cause a loss of curiosity-driven exploration in the world.

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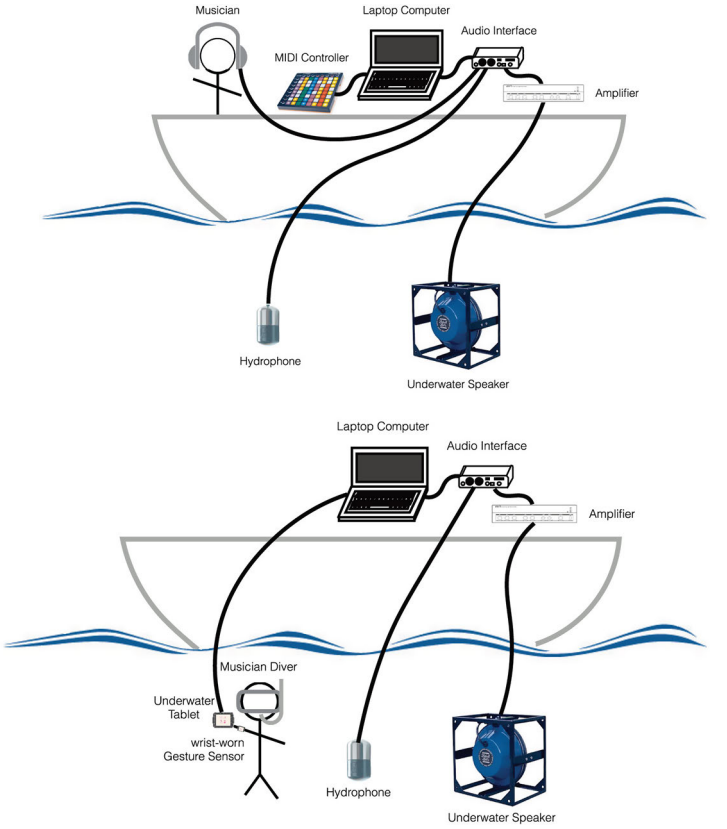
Figure 4: Interactions férales, La réponse de la baleine à bosse, illustrations from the published article, Frontiers in Psychology, 2021



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To counter the influence of technologies that tend to constrict our perception, researcher and engineer Gershon Dublon proposes, at the crossroads of science and artistic creation, alternative technologies that would extend perceptual presence, amplify attention, and leverage intuitions. Creating systems and methods to apprehend massive and longi-

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tudinal data from sensors and AI systems at the service of a connection to the individual and environment, Dublon aims at critically reinventing presence in a world of ubiquitous computing and distributed sensing (made of spatially distributed autonomous sensors monitoring environmental conditions and passing the data at real-time to a data processor). What are the roles of senses in the future of our understanding and experience of landscape? What opportunities are created by weaving a geographically dense, continuously sampled sensor network into the natural environment, from the ground up? Transforming sensor networks into extensions of individual human perception, Dublon explores these questions holistically, and has showcased his work on a large-scale environmental sensor network, the *Living Observatory*. Designed to support a wide range of applications, interpretations and expressions, from primary ecological research to musical composition, the objective of the *Living Observatory* is to understand how the data produced by this type of network could improve a natural feeling of presence for on-site and remote visitors.

Aiming at making this frontier between the inside and outside world as thinly as possible, and to increase the feeling of presence, Dublon designed *HearThere*, an augmented reality (AR) headset that expands perception and amplifies attention, connecting its wearer to distributed sensor networks in the surrounding environment.

Using bone conduction transducers and on-board sensing, *HearThere* produces a digital layer of auditory perception that blends into the wearer's natural hearing. The user's attention and listening state are inferred from the user's motion, pose sensors, EEG and eye tracking which accordingly adjust the sound presented. *HearThere* and its research platform were originally designed for use at the Tidmarsh Wildlife Sanctuary, a restored publicly accessible wetland in Plymouth, Massachusetts. Formerly a large-scale industrial freshwater cranberry farm, it now houses hundreds of real-time environmental sensor nodes measuring a wide range of environmental conditions (air and ground temperatures, humidity, barometric pressure, light, soil moisture, water levels and wind) and dozens of live streaming microphones capturing the different soundscapes of space.

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Figure 5: HearThere, 2017

© Gershon Dublon

HearThere comes with a mobile app, *Sensorium*, to allow users to easily switch between real-time and recorded audio streams. Two modes are thus available. In "real-time mode", users experience an amplified present moment. In "history mode", users can immerse in and explore the sound of the previous morning, the last season, or any time period

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contained in the database. On the Tidmarsh site, at least five years of recordings are available, corresponding to more than 300,000 multichannel hours.

Gershon Dublon also created *Hakoniwa*, an augmented reality landscape miniature also based on Tidmarsh's sensor and microphone arrays. Conveying the idea in the Japanese tradition of box gardens and using Microsoft's Hololens, *Hakoniwa* renders a scene, visualization, sonification and sound, in real time at the scale of a table (1/1000), driven by the sensors and microphones of the wetland landscape. Users can experiment in a virtual cloud of visualizations and sonifications of sensor data on a 3D terrain. Live audio and recorded sounds are presented spatially on the miniature landscape. Events such as bird and insect calls are detected by a deep neural network audio classification system and rendered on the scene as icons. Thus, *Hakoniwa* increases visual and auditory detail in the user's field of vision, allowing the user to focus smoothly. Multiple users can share a viewing experience, both in co-located scenarios (where the mini-landscape is rendered on the same table for all participants) and in remote scenarios (where two or more users can watch the same activity on the site from afar). Designed as a new way to share and experience complex ecological processes as they unfold, Dublon creates sensory landscapes and physical sites that merge distributed sensing and sensory perception to offer new perceptual sensitivities.

Citizen participation and environmental public policies

The development of cross-disciplinary projects jointly by artists and scientists has enriched their respective practices and methods. These projects demonstrate the richness of cooperation and insights that can be achieved through collaboration between arts, sciences and technologies. Art-science research can give new interpretations of scientific data from nature, proposing unique immersive and sensitive experiences on the complexity of the Earth system, its vulnerabilities and specific modes of enunciation. However, more specific operating procedures need to be addressed and developed.

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The ongoing research program EDEN ARTECH (Ethics, Design and Empowerment for Nature through Arts and Technologies) has identified the importance of aesthetics as a condition for environmental ethics and how the alliance between arts, sciences and ethics can generate empowerment. How can media art and art sciences arrangements contribute to a new care of and concern for nature? How can the creation of artworks and artistic experience help humans immerse themselves in nature and adopt a sustainable relation to it? Co-ordinated in its first phase by Pierre-Antoine Chardel, a professor specializing in the ethical-political issues of digitalization and hypermodernity (Institut Mines-Telecom), Jacob Dahl Rendtorff, professor of philosophy of management and business ethics (Roskilde University), and Olga Kisseleva, artist whose work involves science, installation and media art, the project EDEN ARTECH pursues interconnected objectives. Among these goals is the development of a socio-philosophical approach led by an arts-sciences alliance, which proposes interdisciplinary modes of education, and the hybridization of perception through a dialogue between different systems of knowledge. Science is no longer the only source of knowledge; it is now possible to think of knowledge beyond the Anthropocene. With a focus on the vegetal world and the life of trees as emblematic phenomena that we are not able to perceive, the three researchers, their team and their areas of expertise allow them to combine scientific data, ancestral knowledge and immersive experiences to rethink our coexistence with nature.

From a fundamental need to clarify the ethical significance of nature, forests and trees, and the role of aesthetics as a condition for environmental ethics, the research program combines various theoretical horizons. The theories of care which extend to non-humans, and to natural environments; the attention given to vulnerability that is re-framed no longer negatively, as a weakness, but positively as an expectation of a healthy relationship (Pierron 2013: 48), are contributing to the project's development. Through principles of applied ethics, in the plurality of its expressions, EDEN ARTECH also works towards the perspective of bioethics and biolaw. How can bioethics and biolaw make

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sense of artworks and artistic experiences for public policy towards sustainability and a green transition?

With the purpose to help formulate fundamental ethical and legal principles for environmental protection, sustainable governance, ethics and legal dimensions of the relation between human beings and trees in society, EDEN ARTECH aims at proposing new dynamics of interaction and citizen participation through integrative synergies and immersive installations. Assuming to confront the "complexity" of these issues, the research program thus intends to create a new arrangement of knowledge and actions to participate in a paradigm shift. In contrast to an exploitative relation to nature, the ethical and aesthetic dimension of an artistic approach, such as proposed through EDEN ARTECH and its consortium, opens up new imaginaries and conceptualizations of the relationship between human beings and nature.

Immersive installations between arts, sciences and technologies

There is an urgent need to change our worldview in the face of ecological crisis, and to learn new ways of inhabiting the Earth. From an anthropocentric perspective, where humankind is seen as separate from nature and superior to it, other entities (animals, plants, minerals, etc.) are viewed through science and technology solely as resources for humans to exploit. In the light of the current classification of living organisms and of the ecological crisis, anthropocentric notions of superiority and being "more evolved" have been challenged substantially. Centuries of dominant exploitative culture and modern naturalist ontology that have enabled the hegemonic deployment of our technical, economic and procedural systems globally are recently being challenged by other approaches, for which it is necessary and urgent to make room (Descola 2005: 242). Knowledge resulting from objectivity are, according to philosopher Michel Bitbol (2016), only the structural residue of the world. This residue has thus little by little replaced the world of experience, located and embodied, by abstract, delocalized, disembodied

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mathematics (Bitbol 2016: 66). This echoes the call of anthropologist Arturo Escobar (2018) for a plurality of worldviews and a new experience of the relationships between human beings and territories inspired by the concept of "feeling-thinking with the Earth". Drawing the contours of a "pluriverse" to be inhabited in solidarity, a "pluriversal" political future, both at the societal level and through the academic and institutional world, the anthropologist emphasizes the need for designing a radical transition, detached from its rationalist base, decontextualized data and knowledge that have led to an impoverishment of our social contacts and understanding of the Living.

Today, our societies, or at least part of them, increasingly understand that the values of nature are richer than an approach viewing them solely in terms of resources. The challenges raised by the ecological crisis require rethinking and developing a broader, systemic, integrated and encompassing vision, going beyond the compartmentalization of knowledge, based on an anchored rationality and taking into account the human personality in its entirety and its presence. This ongoing change of perspective highlights the importance of openness and making meaning in the ecological crisis. Presence and attention are fundamental within this process. As premises of contact and encounters with the world, presence and attention create experience which is, alongside sensory motor stimuli, at the roots of meaning making (Harrell 2013: 72).

Henceforth, transversal and immersive projects between art and science are of pressing relevance. Science and art are surely two different ways to approach the real, however, they are not in opposition to one another. They have in common the purpose to make phenomena visible and approach the real through an experimental mode; one through proof systems and replicable experiments, the second through a sensitive experience. Cross-cutting artistic projects are hybridizations of techniques and processes, sometimes interweaving real and virtual space, in which the imagination finds new fields of exploration; hybridizations through which presences are recreated. The immersion principle which is an important part of transdisciplinary creation, participates as a present and porous way of being in the world. The temporality and the apparent three-dimensionality of the immersive virtual space is also

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conducive to the manifestation of the concept of "Life Flow" or of a living fabric where interdependencies are key; a living network to be mended in reference to the exhibition curated by Annick Bureaud in 2018 in France and titled "*Raccommoder le tissu du monde*" (Mending the world's fabric).

Experiencing contemporary and transversal artworks thereupon holds significant opportunities regarding the issues that threaten life in its richness and diversity. In creating situations where emotions, sensory perceptions and concepts combine in unique ways to structure meaning and enrich our perspectives (Minissale 2013: 339), a work of contemporary art can lead to a massive and dynamic integration of concepts into complex networks. This process of absorption through art calls on conceptual fusion, long-term memory, relational knowledge – also involving our bodies as valuable and indispensable systems of relational knowledge (Minissale 2013: 200), rational induction, analogical reasoning, proprioceptive and embodied experience, emotional and sensory integration. These unpredictable connections between concepts that lead not only to a kind of metacognitive activity, but also to new solutions and systems of knowledge may also lead to new forms of commitment and participation. Displacing conventional concepts of art as something envisioned in advance by the artist and placed before the viewer, contemporary art enables the reimagining of art as a reciprocal creative process involving reflective and participatory work (Kester 2011: 7).

In many ways, art is the most complex of our psychological engagements. Involving all dimensions of human personality, through immersive and interactive installations, cross-cutting artistic projects bring together different methods and knowledge. They propose experiences that enable us to see things and phenomena differently, not exclusively from the human perspective. Accompanying societal changes, artists, activists, researchers, writers, designers, scientists and more highlight this need to work across borders and disciplines to urgently rethink together our defective ways of being in the world.

In predominantly techno-symbiotic societies, cross-cutting projects between arts, sciences and technologies lead the viewer into a sort of experimental precipice; a moving experience through which it is possible

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to question and redefine conceptual categories and to produce meaning, developing new opportunities for imaginary, symbolic, cognitive and sensitive enrichment of our relationship with nature (Carlson, 2009). For philosopher Marshall McLuhan (1968), it is even the role of art to create the means of perception by creating counter-environments that open the doors of perception.

In a time of accelerated change, where the need to perceive the environment has become urgent, new perspectives can reset our sensory thresholds. We are fully human only in relation to nature and likewise nature as an environment requires interactions with humans (Pierron 2013: 48). Through an unstable reality and shifting knowledge, environmental issues reveal that the crisis of modernity is also a crisis of our societies, its relationship with the world and the rest of the living species, a crisis of our "sensibility", of our openness and care for each other. We find ourselves in a challenging era, in solidarity with what we thought we could indiscriminately extract ourselves from (Pierron 2013: 45).

Reshuffling the cards of our conceptions and representations hitherto accepted, as it was in the case of the separation and distinction of nature/culture, human/non-human, ecological challenges fundamentally question our existence. After having interpreted the world, then actively transforming it, it is therefore time to preserve it, to be more present and responsive, to be more responsible. Synergies bringing closer arts, sciences and technologies through immersive practices and citizen participation are necessary more than ever; to discover new paths, foster new ways to see the world, and to develop more responsible behaviours and caring connections with the Living.

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