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The Feral Life of Plastic Waste: Third Nature and Speculative Aesthetics

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ABSTRACT

This article explores the interactions between plastic waste and non-human animals from a non-anthropocentric and future-oriented perspective. After a first introductory section, I argue for a plane of analogy connecting animals and plastics. If extended into the future, this plane of analogy shows a new feature: ferality. Contra Hegel, Heidegger, and some contemporary scholars, I contend in the third section that ferality cannot be framed as a regression of “second nature” (human culture) to “first nature” (non-human nature), but should be understood as post-domestic “third nature”. The argument for the future ferality of animals and plastic waste also urges consideration of their evolutionary interplay, which I analyze in the fourth section through the lens of a speculative aesthetics of new materialist and feminist inspiration. The last section considers artistic projects that grant imaginative access to speculative, feral futures in which life and plastics can no longer be disentangled.

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Plastic Waste in the Wild

At a young age, a turtle gets entangled in a six-pack plastic ring. Unable to get out of it for the following years, the animal grows and its shell, squeezed in the ring of transparent plastic, slowly takes on a peculiar form. Rescued in 1993, the red-eared slider Peanut—named after the deformed features of its shell—has later become one of the most famous animals in campaigns for raising public awareness on the dangers of litter for wildlife.¹ In the meantime, on Midway Atoll, in the North Pacific Ocean, baby albatrosses are fed plastic waste by their parents. Mistaking trash for food when fishing, the seabirds ingest great quantities of plastics, which often prove lethal: the plastic fragments get stuck in the animals’ digestive tract, and they die from obstruction. Documenting this dreadful phenomenon in his film and photograph series *Midway: Message from the Gyre* (2009–2013), Chris Jordan provided us with striking images that show the birds’ partially decomposed bodies overflowing with recognizable plastic objects such as plastic lighters and bottle caps. A powerful warning against the deadly interactions between plastic waste

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and wild fauna, these images are now imprinted in the mind of the general public and of academics alike.²

When we think of the encounters between wild animals and plastic waste,³ these are the shocking images that spring to mind: weirdly shaped turtles and half-decomposed seabirds, dead sperm whales washed ashore with their stomachs full of plastic,⁴ hermit crabs mistaking plastic trash for inhabitable shells.⁵ Besides these hideous images, meant to move and outrage the audience, there is also general awareness about phenomena that are just as dramatic but less apt to find visual representation. For instance, the fact that micro- and nano-plastics have now entered the food chain and got inside the body of many individuals of the most diverse species, including *Homo sapiens*. It is in the light of these examples and imagery that we tend to conceive of the relations between animals and plastic waste: plastic pollution is a threat or menace for wildlife, leading to death and extinction. Plastics' toxicity is one of the main causes of the loss of biodiversity that contributes to the degradation of living ecosystems around the globe.

In this essay, I aim to analyze the relations between animals and plastics from a different perspective—one that decentres the role of humankind without erasing it. Waste is often seen as an extension of humanity, signalling our deferred presence (“our absence made visible”,⁶ as Serenella Iovino maintains), allowing us to recognize ourselves in a dynamic of self-awareness (as Mintautas Gutauskas claims), and embodying social relations of inequality (as in Marco Armiero’s argument for the Wasteocene, which frames waste as *wasting*: “a social process through which class, race, and gender injustices become embedded into the socio-ecological metabolism producing both gardens and dumps, healthy and sick bodies, pure and contaminated places”).⁷ These accounts are not only sensible and legitimate, but they succeed in shedding light on highly urgent issues. At the same time, however, they generally rely on the standpoint of human ethics and politics: in this sense, they cannot but be partial.⁸ Many aspects remain overlooked that might be of relevance from other (no less partial) perspectives: for instance, the fact that, for some species, plastic may even represent an opportunity to thrive.

Scientific literature on the “plastisphere”⁹ is explicit on this point: not all species are negatively impacted by plastic waste. Let us think of the “sea skater”, for instance: for this pelagic insect (*Halobates*), plastic waste is turning into a full-fledged new habitat.¹⁰ The same goes for some bacteria. At stake is less the objectivity of what is good and what is bad, and more the ways in which we attribute value to different animal species: we tend to place emphasis on the negative impact of plastics on the environment not only out of scientific analysis, but also because “it’s easier to empathise with a penguin than with a microorganism that requires an electron microscope to become visible to human eyes”.¹¹ From the sea skater’s perspective, the massive presence of plastics in the oceans takes on a different connotation. Why should we not give value to the experience of tiny life-forms?

In no way, however, do I intend to align with those discourses on the “good Anthropocene”:¹² this essay is not an apology for plastic waste, nor does it aim to glamorize plastic’s toxic pervasiveness; rather, it is an attempt to decentre our human perspective in order to build a future-oriented argument for a material and non-human politics. Its partiality is acknowledged from the outset, and its only aim is to give consideration to a perspective that is less commonly taken up. The aim is not to invalidate or marginalize those

discourses that emphasize the toxicity of plastics, it is simply to present a non-competing perspective that can be composed with other points of view that are equally partial.

In this paper, I therefore explore the ways in which plastic waste and non-human animals interact beyond narratives that frame their relation solely in terms of violence. First, I argue for the possibility of alliances and for a plane of analogy connecting animals and plastics. Second, I argue for the increasing ferality of both, to be described as post-domestic third nature. Contra Hegel, Heidegger, and contemporary scholars working in their wake, I argue that ferality cannot be framed as a regression of culture to nature, but should be understood as a further stage that makes dichotomic thinking withdraw in the face of the diffractive explosion of pluriversal differences. The paper's principal philosophical intervention is developed in this section. Third, I outline (in a deliberately programmatic manner) the foundations of a speculative aesthetics as a methodological framework for approaching the evolutionary interplay between animals and plastic waste—an interplay that is already taking place, and that will increasingly take place in the feral futures towards which the planet is headed. Finally, I consider selected artistic projects through the lens of speculative aesthetics, which allows us to gain imaginative access to the ferality of a future in which life and plastics can no longer be disentangled.

Non-human Alliances and Planes of Analogy

It might be surprising, but plastics were initially the unexpected, synthetic allies of wild and domestic animals. In the 1860s, the invention of celluloid as a substitute for ivory and tortoiseshell contributed to sparing elephants and tortoises' lives; the invention of "Char-donnet silk" first (1884–1891), viscose later (1892), and nylon finally (1935–1937) reduced, however partially, the exploitation of silkworms and domestic silk moths; the invention of Bakelite (1907–1909) offered some relief to female lac beetles, whose resinous secretion was used to make shellac, employed in the then rapidly growing electrical industry.¹³ In the cultural and economic system, plastics came to cover a position that partially overlapped with the one previously occupied by natural resources of animal origins.

The story of plastics' invention is usually told this way: in the second half of the nineteenth century, billiards was such a popular game in America that it sensibly increased the income of bars and taverns. There was only one problem: billiard balls were made of ivory, whose peculiar qualities made it the perfect choice for this use, but which was becoming more and more scarce and expensive. As the game started to become unaffordable, the firm Phelan & Collender placed an advertisement in the *New York Times* promising a \$10,000 reward to anyone capable of inventing an efficient alternative for making billiard balls without relying on tusk ivory. Inspired by the advertisement, John Wesley Hyatt and his brother Isaiah set up a laboratory in their shed and came up with a semi-synthetic material fit for this purpose: celluloid.¹⁴

Rarely does this narrative focus on the other actors of the story: elephants, which were experiencing a dramatic overhunting precisely because of the ivory trade. More than on the risk of elephants becoming extinct, these narratives focus on materials, their performances, and their value. Celluloid became the substitute for ivory in the fabrication of billiard balls, toiletry items, piano keys, umbrella handles, thereby coming to occupy quite

the same practical and social position as its counterpart of animal origins. The association between this early plastic and tusk ivory was so tight that celluloid circulated in the market under names such as “Ivoryne” or “Ivory Pyralin”. However, the connection between plastics and the living animals was generally overlooked (or, at best, sanitized, as in the trademark of the British Xylonite featuring an elephant and a tortoise walking upright arm in arm, as if anthropomorphised cartoon characters).¹⁵

Plastics and animals shared the same position of subjugation, at least in the beginning. Confronted with the same attitude of mastery and domination that humans displayed when interacting with wild and domestic fauna, synthetic polymers were treated as docile, malleable, disposable entities that were expected to behave. Disposability and exploitation were at the core of the very invention of plastics: no longer satisfied with hunting, taming, or domesticating the materials they needed, humans came up with artificial alternatives characterized by greater availability. Plastics are, in this sense, a material that has never been wild, as they have never been a natural resource. Synthetic polymers were born in captivity; they have never experienced a pre-domestication stage.¹⁶

Not only is it possible to claim that the dawn of plastics was marked by an unexpected alliance with non-human animals: it is also possible to establish an actual plane of analogy between the two.¹⁷ Such a plane of analogy comes to the fore when we recall, for instance, that celluloid was sometimes labelled “a chameleon material” because of its ability to imitate “tortoiseshell, amber, coral, marble, jade, onyx”,¹⁸ and, of course, ivory. Plastics display animal traits and are capable of performing animal behaviours, such as mimicry.

It is not only when we mistake a plastic countertop for a marble one that synthetic polymers behave mimetically and deceitfully; once they enter complex ecosystems, their mimetic ability turns into what we might regard as aggressive mimicry at the expense of wildlife. In general, aggressive mimics lure their prey by appearing as food or as sexual mates to them—they are often referred to as “wolves in sheep’s clothing”.¹⁹ In our case, “plastic bags in jellyfish’s clothing”, perhaps. Another case in point is represented by pre-production plastic pellets (“nurdles”) that seabirds often mistake for fish eggs; but many other examples could be mentioned—not only in marine environments but also on land, as opportunistic feeders such as camels in Dubai and sacred cows in India know well. Captain Charles Moore, the discoverer of the Great Pacific Garbage Patch, put it this way: “Plastics could [...] be considered [...] “predators”, given the deadly nature of “ghost fishing” and entanglements of marine turtles, mammals, pinnipeds, and cetaceans. Though plastic is not a living organism, *it acts like one* and has the impact of one and should be taken into account in characterisations of the ocean biome”.²⁰

A plane of analogy connects plastic waste and wildlife, making them behave in comparable ways that allow for unexpected interactions. Here, plastic waste does not function as humans’ surrogate: it is endowed with a non-human and material agency of its own. We are not dealing with a “secondary agent” that merely represents the actual agent acting behind or through it: plastic waste cannot be reduced to a mere “social parrot”,²¹ to an entity that *stands for* human agents. Captain Moore understands plastic waste as a predator, but then he almost entirely traces back plastics’ agency to the human actors who produced them. Such a surreptitiously reductive attitude makes

it impossible to take into account the many entanglements that diagonally connect different parts of reality beyond human control and presence. If Captain Moore dedicates his book “to the generation, not yet born, that creates a world where plastic pollution is unthinkable”,²² I believe that the point worth addressing, as perhaps an unthinkable and certainly as an unthought, is the more-than-human future in which plastic pollution cannot be disentangled from life. The plane of analogy that connects plastic waste and wild fauna in meaningful relationships already points in this direction.

Wildness, Domestication, Ferality

Our plane of analogy thus extends into the future. After a first idyllic phase in which they seemed well-behaved and docile materials fit for all purposes, synthetic polymers “began to emancipate”: they became more and more recalcitrant, starting to take on autonomous trajectories and refusing to stand still. Stacy Alaimo effectively points out how ironic the situation is: “Plastic, arguably the quintessential substance for efficient domination, somehow manages to escape, mocking both the human mastery of the material world and the green ideal of wildness, as it multiplies and roams, garish and ghastly”.²³ Such sudden indocility, which recalls the unruly behaviours of non-domestic animals, becomes apparent if we think of the difficulty of catching plastic bags in the wind, as the mockumentary *The Majestic Plastic Bag*²⁴ makes clear with its uncanny but poignant shots that follow a plastic bag “return to the wild”.

However, as I would like to argue, neither domestic animals nor well-behaved plastics will ever have the opportunity to “go wild” again. My contention is that both plastics and animals will go *feral* instead.

What are the differences between wildness and ferality? To answer this question and make a philosophical framework out of it, we must look into the concept of domestication first. Domestication is one of the main endeavours ever accomplished by human civilization, consisting in a long-lasting evolutionary partnership between animals and humankind through artificial selection. Changes induced by domestication occur through generations and are expressed in the form of morphological, physiological, and behavioural modifications.²⁵ But humans and domestic animals can also part ways. Animals that are no longer domestic (both single individuals and their progeny) make us encounter the notion of *ferality*. Feralization has often been defined as a process of “de-domestication” or “domestication in reverse”: a process that would return the animal to its ancestral wild stage.²⁶ In contrast to this view, I claim that ferality should be regarded as *post-domestication*: the stage that comes chronologically and ontologically after domestication. Since “humanity’s fingerprints remain inscribed on the animal’s genome long after the coevolutionary partnership breaks down”,²⁷ the feral animal might as well seem to “return to the wild”, but it will substantially differ from its wild ancestors.

As an example, we can think of dogs. The dog (*Canis lupus familiaris*) is the domesticated descendant of the grey wolf (*Canis lupus*), differing from it not only in physiology but also in behaviour. Let us take their respective feeding and predatory behaviour: wolves hunt, most dogs do not. This is not only because pet dogs are fed by humans, but also because many dog breeds do not have a complete set of predatory motor patterns. The complete set consists in the sequence “orient, eye, stalk, chase, grab-bite, kill-bite, dissect, consume”, with one pattern triggering the next. The Golden

Retriever, for example, has a focus on the “chase and grab-bite” section of the predatory sequence, with an emphasis on the gentleness of the grab-bite and with no drive to dissect and consume; the Border Collie, just to mention another popular breed, performs extremely well the first part of the predatory sequence, but is completely inhibited as regards the second section, which is what makes it the perfect herding dog, capable of disciplining the livestock without threatening it.

Contrary to what one might think, feral dogs (i.e. “dogs living in a free state with no direct food or shelter intentionally supplied by humans [...], showing no evidence of socialization to humans [...], [displaying] strong continuous avoidance of direct human contact [...] and a lifestyle restricted mainly to natural environments”²⁸) do not tend to re-acquire the predatory sequence in its integrity. Quite the contrary, they tend to dismiss predation as a whole and become scavengers.²⁹ Feral dogs forage for themselves, but in a radically different way than wolves do; moreover, they are not wolflike in their physical appearance. Here we see that feralization cannot be equated with a process of de-domestication: feral dogs are not wolves, even though wolves, domestic dogs, and feral dogs can be regarded as a “series”, a continuum on a spectrum.³⁰

On a philosophical level, the transition from wildness to domestication could be framed within the Hegelian distinction between “first” and “second nature”. “Second nature” refers to the dimension of the Objective Spirit, which consists of institutions and social relations that structure the social, ethical, and political life. As some have argued, the notion of “second nature” can be regarded as overlapping with that of human culture, while “first nature” could be simply traced back to the immanent, non-reflective nature that characterizes the condition of non-human domain and non-human animals.³¹

The Heideggerian distinction between earth and world functions in a rather similar way: on the one hand, the earth is conceived as a non-metaphysical equivalent of Heraclitean *physis*; on the other, the world is the cultural dimension proper to humankind. The relationship between earth and world is one of reciprocity that never hypostatizes them as two still entities, maintaining their “strife” constantly at work: the earth sets up a world and the world sets itself back on the earth.³² And yet, for Heidegger “the earth is silent [...], human language *worlds* it”.³³ It is against this background that we can recall Heidegger’s famous threefold thesis on animals’ poverty in world and stones’ complete lack of it: “1. The stone is worldless; 2. The animal is poor in world; 3. Man is world-forming”.³⁴ Here, both non-living plastics and non-human animals would be excluded from the possibility of having their own worlds, but they would be allowed to participate in human worlding when tamed and employed for cultural purposes. Within this kind of philosophical framework, wildness would correspond to the first nature that is grounded in the dimension of the earth, whereas domestication would be traced back to the world, to the dimension of culture and social institutions, thereby representing the second nature that can be attained by means of a reflective movement: an ontological transition to a hierarchically superior stage.

These classical philosophical perspectives, as well as more recent positions elaborated in their wake, cannot account for ferality, as they would reduce it to a mere regression to first nature. The point is showcased by Gaetano Chiurazzi, according to whom many contemporary attempts to criticize the nature-culture divide are cases of “naturalism by elimination”.³⁵ As an instantiation of eliminativist naturalism, generalized feralization

would indeed be the same as a return to pre-domestic wild nature after the obliteration of human culture.

But ferality cannot be reduced to de-domestication, since the changes that occurred in the stage of domestication cannot be simply undone. Domestic features continue to evolve beyond human control, and result in a *post-domestic nature* that gathers feral animals but also plastic waste, since both are coming to populate the existing ecosystems against human will and beyond human control. “Second nature” is not obliterated by a return to the wildness of first nature, since such return could never be attained—as radically altered polluted ecosystems most clearly attest.

Against an understanding of ferality that sees it as a regression of second to first nature, I would like to contend that ferality marks an ontological transition to *third nature*. The “thirdness” of third nature should not be mistaken for a dialectical gesture of synthesis: it rather opens up to the possibility of setting off a *series*, so that such third nature could be followed by a fourth nature, and a fifth, a sixth, a seventh ... Even whether it should be considered a third, fourth, or twelfth nature depends on the perspective one adopts when counting: what would prevent us from understanding the Great Oxidation Event,³⁶ for instance, in terms of one of these transitions?

Setting off a series can be a strategy to eschew the dichotomic thinking that distinguishes first and second nature, earth and world—no matter the tensive, conflictual, intimate relationship in which they are entangled. If the ontological transition from first to second nature is described in terms of “raising to a power” (as in mathematical exponentiation) that elevates humankind above nature,³⁷ the ontological transition in the series can be seen as a *sidestep* that conceives difference as the heterogeneity of a same plane. The insufficient alternative between monism, flat horizontality, and immanence on the one hand, and dualism, verticality, and transcendence on the other gives way to an ontological framework of lateral plurality and originary diffraction without unity. Third nature nourishes the diffractive explosion of non-hierarchical differences, thus teaming up with the concept of *pluriverse*: “a world where many worlds fit”.³⁸

Because of the diffractive explosiveness of the series, third nature is less about ontology (“the discourse of the Being of beings”) than it is about *hauntology*, in which full presence is replaced by an uncanny and ambiguous “present absence”.³⁹ The series also sheds light on the temporality and irreversibility of the transitions: third nature is a matter of futurity, it is both post-nature and post-culture. At the same time, such futures cannot be disentangled from the previous stages, which will keep exerting a spectral influence on them: this means that the past of domestic “second nature” (understood, this time, as a stage in the series) will keep haunting the future of feral “third nature” without it synthesizing them. Domesticity will work as a spectre, an internal difference that will haunt animals and materials of the future, just as the wildness of first nature could not be disentangled from the second.

In this theoretical framework, the negativity of dialectics that characterized the argument for a second nature is not erased: rather, it becomes a negativity of hauntological diffraction, as in Derridean dialectics without synthesis.⁴⁰ Unruly plastic waste and feral animals will inhabit the future of the planet while being haunted by their own domestic past. This urges us to turn our attention to yet another way in which animals and plastics interact beyond human mastery: how will animal life evolve on a planet where

plastic waste is ubiquitous? How can we imagine the feral futures of the planet, and what can the meaning of this imaginative gesture be?

Speculative Aesthetics

The complex interplay of plastic waste and non-human animals also concerns the role of the former for the evolution of the latter. Biologists working on the “plastisphere” explore precisely the ways in which such an evolution is already taking place. This may be understood as the biological counterpart to the geological hypothesis of the Plasticene—a hypothesis that, when developed into a full-fledged theory, concerns not only earthly strata but living beings as well.⁴¹

Referring to the “thin film of life”⁴² of microscopic organisms that colonize floating plastic marine debris, the plastisphere includes not only micro-organisms but also small macro-organisms, such as insects.⁴³ Plastic waste floating on the ocean turns into a hydrophobic surface that fosters microbial life and biofilm formation: a “microbial reef”.⁴⁴ Moreover, some of the species involved are developing the ability to digest plastics rather than simply ingesting them. These animals can metabolize plastics and biodegrade them: they are *plastivores*,⁴⁵ with examples ranging from bacteria to insects.⁴⁶ In the plastisphere, plastics become a habitat—one that is indeed toxic, as most authors point out, but also capable of offering new opportunities for life to develop and perhaps even thrive. The observation of the plastisphere authorizes us to think that plastics will play an evolutionary role in the future: by becoming embedded in every ecosystem, plastic waste will change life’s shapes and behaviours, forcing surviving lifeforms to adapt to their new plastic environment.

If the plastisphere of the present is studied with the tools and methods of scientific disciplines such as biology and chemistry, the feral future to which it already points requires to be tackled with different means: those of a *speculative aesthetics*. “Speculative aesthetics” is an expression already relatively widespread; however, it is still loose enough to encompass different kinds of accounts. In conceiving of speculative aesthetics, I hereby draw on the literary and artistic genre of *speculative evolution*, which builds upon scientific bases in order to formulate plausible yet imaginative hypotheses on future scenarios. A work of pivotal importance in this field is Dougal Dixon’s *After Man*. Published in 1981, the book stages a possible feral future: humankind is extinct, 50 million years have passed, “the world [...] is one [man] would still recognise [...], [but] the animals [...] are remarkably different”.⁴⁷ Even though Dixon does not take plastics into account, and even though his speculations are rather mammalocentric (whereas the plastisphere suggests to look in a different direction for successful candidates in evolution), his theoretical gesture is worthy of attention: by combining arts and sciences, Dixon offers a vivid and troubling visualization of a post-domestic third nature.

Along with speculative evolution, another fundamental reference for speculative aesthetics is *feminist speculative fabulation* (also called “SF”, which encompasses “science fiction, speculative feminism, science fantasy, speculative fabulation, science fact”⁴⁸). Here, again, we witness the encounter of the artistic and scientific dimensions, but bent in a markedly political direction. Feminist speculative fabulations project us into trans-specific and more-than-human futures⁴⁹ by means of a political gesture that is, at once, temporal and material. Dixon already posited that his purpose with speculative

evolution was to offer not “a firm prediction” but rather “an exploration of possibilities”.⁵⁰ Similarly, speculative research aims not to “close up” the future: the accuracy of its predictions is never objective; it rather holds the power to “open up” multiple futures and to re-conceive of the present on these bases. The goal is therefore to exceed those futures that are a mere “prolongation of the present”⁵¹ and its logics, subverting the very conception of temporality that sees the future as calculable and manageable.

Speculative aesthetics too attempts to eschew the traps of the “collapsed future” and speak in the “future conditional” instead.⁵² In this sense, speculative aesthetics concerns *chronopolitics*. But it also takes from speculative feminism the focus on situatedness⁵³ and materiality, thereby opening to *material politics*—an aspect that is all the more important when dealing with plastic waste and its non-human agency. It is indeed from the perspective of new materialisms that the plastisphere has often caught the attention of scholars whose work can be ascribed to speculative feminism.⁵⁴ As Myra Hird and Kathryn Yusoff note, the interplay between non-human lifeforms and plastic waste redefines both our understanding of waste and our understanding of life:

Bacterial mutation can be seen as a form of *material speculation* that generates new forms of life, which throw off the category of “waste” as it is designated within a subject/object relation [...]. While focus [usually] remains on human waste as a stratification of the Anthropocene [...], bacteria are re-stratifying this waste stream with largely unknown results. As bacteria digest waste, [...] empirical questions about microbiological life forces raise ontological questions about what counts as waste matter, and how we should begin to apprehend the capacities of such matter to speculate in evolutionary and materially inventive ways.⁵⁵

But speculation is also a dangerous concept, and its dark aspects should not be overlooked.⁵⁶ First of all, speculation is commonly associated with financial practices that “turn [...] uncertainty into profit”.⁵⁷ This kind of speculation aims at predicting the future by extending the neoliberal logics of the present into it, and it is therefore very different from the speculation that is of interest to us. Yet, it is important to keep in mind that where there is speculation, and where there is art (which tends to go hand in glove with commercial value and market dynamics),⁵⁸ there is always also the risk of speculating *on* the future in the financial sense: that is, performatively reducing it to the present and thus erasing it. Instead of purifying speculative aesthetics from all dangerous associations, it is best to keep in mind its dark sides and the intrinsic “slippery” character of its conceptuality.

The second “risky association” is the one that ties speculation to certain strands of contemporary philosophy, especially “Speculative Realism”. In spite of the many internal differences, Speculative Realism is generally characterized by a commitment to metaphysical speculation against what Quentin Meillassoux has called “correlationism”, that is, the claim that humans can only access the correlation between thinking and being (which excludes the possibility of accessing things “in themselves”, beyond their relation to a knowing subject). Philosophers working along the lines of speculative realism have also ventured into a *Speculative Aesthetics*, which claims for the need to return aesthetics and the arts to the natural and social reality.⁵⁹ In this sense, my proposal for a speculative aesthetics partially aligns with them. However, many of these thinkers

perform such theoretical gesture by prioritizing cognition and rationality. Unlike them, I believe that the focus should rather be on sensations and affects.

This brings us to the last defining elements of speculative aesthetics as I intend it, that is, its *aesthetic* and *ecological* aspects. Here, aesthetics is not summoned merely because the arts may be at stake: rather, aesthetics is relevant because it evokes the field of *sensation*. Not only the sensation of human beings, though, but also that of animals and materials in their affective engagement with the environment. Whereas speculation and its etymology (from the Latin *speculari*, “to observe”) still authorized us to maintain the privilege of sight unquestioned, aesthetics and its etymology (from the Greek *aisthētikós*, “perceptive, sensitive”) open towards a generalised, non-human sensation that goes beyond ocular-centrism. In this sense, speculative aesthetics outlines the possibility of imaginatively speculating about material and animal sensations and affects, and about new sensory ways of engaging with the environment. The environment, in turn, should rather be conceived in terms of milieu,⁶⁰ which stresses the sensible intra-actions between the different yet entangled entities that participate in its constitution. The focus is on the relationships internal to the milieu: on its *ecology*. In this sense, the methodology disclosed by such speculative aesthetics invites us to consider the unthinkable sensible relations between, say, the sea skater and the stretch of plastic waste floating on the ocean’s surface. Speculative aesthetics prompts us not only to imagine, but also to value the experience of non-human animals and non-living materials.

Plastic Life

Plastic waste will most certainly play a role in the evolution of the animals to come. If speculative aesthetics equips us with methodological tools to tackle the issue theoretically (a task that certainly requires further development), certain artworks allow us to access this evolutionary process experientially, at least to some extent. Rather than functioning in a representational or illustrative way, the artistic projects that work along the lines of speculative aesthetics *perform* the entanglements of life and plastics, presenting us with speculative critters that come from the diffracted feral future.

The perfect case in point is offered by the often-mentioned bio-artistic installation *An Ecosystem of Excess* (2014), by Turkish artist Pinar Yoldaş. Drawing on scientific research on the plastisphere, Yoldaş populates her speculative ecosystem with animals that interact with plastics in beneficial ways thanks to organs capable of digesting, sensing, and filtering plastics. Such organs include the “Stomaxiums”, for instance (a digestive organ in which different specialized bacteria break down specific synthetic polymers, allowing the animal to metabolise some plastics), or the “E-Plasticeptor” and “P-Plasticeptor” (organs that allow the animal to detect diverse kinds of plastics, selecting them as food).⁶¹

If Yoldaş focuses on the ecological interactions between animals and plastic habitat as they occur at the interface represented by specific organs, Catalan artist Alvaro Soler-Arpa focuses more strictly on anatomy, stressing the teratological effects of plastics on animals’ morphology. In his *Evolución tóxica* [*Toxic Evolution*] (2011), he combines animal bones, wire, and plastic waste, presenting us with the uncanny skeletons of a speculative fauna: “perhaps located in the near future, [these animals] straddle the boundary between the possible and the impossible, the real and the imaginary, the graceful and the tortuous”.⁶²

Strange feral anatomies are also imagined by French artist Marguerite Humeau—for instance in *Migrations* (2022), presented at the Venice Art Biennale 2022. Made from “biological and synthetic resin and polymers, salt, algae, seaweed, bone, pigments, mineral dust, ocean plastic, glass, and stainless steel”,⁶³ the three biomorphic sculptures of the installation present us with mysterious marine lifeforms that show the intimacy of grief and survival, extinction and evolution.

Non-human sensation and ecological interplay come to the fore again, combined with biomorphic but alien anatomies, in the work of Dutch artist Theo Jansen. His *Strandbeesten* [*Beach Beasts*] (1989-present)⁶⁴ are not usually regarded as artistic research on plastics and animal evolution, but they have a clear speculative potential. Big kinetic sculptures, the beach beasts are made exclusively of yellow PVC pipes and they represent, in the artist’s intention, a full-fledged new form of life. Comprising multiple species, the *Strandbeesten* go through selection and evolve, reproduce, store wind as a source of energy (a process comparable to nutrition), adopt camouflage strategies, live in herds, learn through simulation and mistakes, and can become extinct. Their potential for ferality becomes clearer when we consider that they are developing the ability to survive on their own in the coastal environment close to The Hague, where they actively participate in their milieu by moving the sand and contributing to dune formation—a delicate process that partially prevents coastal erosion.⁶⁵ Their many responsive ecological interactions are made possible by perceptual and sensing abilities, which are due to analogic sensory devices: “sensory organs” such as the “water-feeler” and the “soft sand-feeler”.⁶⁶ Plastic pipes, here, have their own “sensations”, reconnecting us to the aesthetic aspects of our interpretative lens. If we imagine a future in which the *Strandbeesten* run on the beach on their own, reproducing themselves and shaping dunes, we speculatively access a world in which not only life evolved in interaction with plastics, but plastics, too, evolved a non-biological life of their own.

What I aimed to show by briefly reviewing these cases, sometimes even in a provocative manner, is that contemporary culture has already started to consider the intertwine between biological life and plastics in a future-oriented perspective. Importantly, the focus on the feral life of plastic waste is not meant to depict an irenic situation, nor does it intend to romanticize plastic pollution and its violence, or to relieve humankind from its responsibility. Yet, I believe that discourses on responsibility should move away from an ethics of control (“being in charge of”), whose flip side is a rhetoric of guilt, and instead take the form of an ethics of care (“being response-able”). The meaning of elaborating on the feral life of plastic waste through the lens of speculative aesthetics lies in the fact that these discourses “contain counter-narratives, alternatives, [...] a strangeness that disorients”, even though they run the risk of being read as “escapist or compensatory”.⁶⁷ Considering the ferality of the future radically decentres humankind and offers a new perspective on the category of waste, which remains otherwise all too human.

Conclusion

When discussing the interplay between non-human animals and plastic waste, the trend is that of depicting plastic pollution exclusively in terms of a menace for biodiversity and wildlife. This often results either in a paralyzing eco-pessimism (the fear of the death of

the species as a magnification of the fear of the death of the individual), or in renewed Promethean gestures that express the desire to solve the ecological crisis by re-enacting the same behaviours that caused it in the first place—that is, by taking control of the non-human all over again (techno-solutionism). Policies of recycling or rewilding are often underpinned by more or less implicit attempts of this kind. In contrast with such trends, this paper examines the relations between animals and plastics from a perspective that aims to radically decentre the role of humankind, while avoiding any dismissal of human responsibility.

Of pivotal importance for my argument is the concept of ferality: a post-domestic, future stage of life on the planet. Conceived in continuity and analogy with the ferality of animals, the ferality of plastic waste posits a challenge for thought: where classical philosophy sees a regression to the dumbness of mute nature, feminist speculative aesthetics sees the opportunity for the feral future to explode and diffract in a number of non-hierarchical pluriversal experiences.

Notes

1. Nova & Disnovation.org, *Bestiario del Antropoceno*, 71.
2. Available at: <https://www.chrisjordan.com/>, see “Midway”. See Boetzkes and Feldman, “From Plasticity,” 93–4; Boetzkes, *Plastic Capitalism*, 234; Thill, *Waste*, 8–12; Moore, *Plastic Ocean*, 215–22.
3. This paper concerns plastic waste, animals, and humans. Humans are obviously animals, but for the sake of simplicity, all references to “animals” within this text will refer to non-human animals. On the other hand, I will often refer to humankind in general and use the first-person plural. This simplistic choice is not aimed at overshadowing the important differences in race, gender, and class that make it impossible to speak of a universal “Anthropos”; rather, this rhetorical strategy is merely aimed at simplifying the argument within the limited space and purposes of this essay.
4. Oppermann, *Blue Humanities*, 31; Balzano, *Eva virale*, 102–16.
5. Nova & Disnovation.org, *Bestiario del Antropoceno*, 69; Lavers et al., “Entrapment in Plastic Debris.”
6. Liboiron, “Plasticizers,” 134; Kuenz, “The Plastic You”; Ragusa et al., “Plasticenta”; Ragusa et al. “Artificial Plasticenta”.
7. Iovino, “Naples”, n.p.; Gutasukas, “Phenomenology of Waste”; Armiero, *Wasteocene*, 10.
8. I do not understand partiality as an epistemic flaw, but as situatedness (along the lines of feminist standpoint theory) and as need for pluriversal composability. See Iacobone, “Anthropocene or Plasticene?,” 178–9.
9. Zettler et al., “Life in the Plasticsphere”; Amaral-Zettler et al., “Biogeography of the Plasticsphere”; Eriksen, “Plasticsphere”; Rodineliussen, *Underwater Worlds*, 97–124.
10. Nova & Disnovation.org, *Bestiario del Antropoceno*, 51; Goldstein et al., “Increased Oceanic Microplastic Debris.”
11. Taffel, “Technofossils of the Anthropocene,” 361.
12. Hamilton, “Theodicy of the Good Anthropocene.”
13. On these topics in more detail, see Meikle, *American Plastic*, 10–30, 31–62, 125–62; Feni-chell, *Plastic*, 38–77, 80–103, 117–24, 134–74.
14. A fictionalized recount of these facts is offered by Miodownik, *Stuff Matters*, 124–53. The actual story is more complicated than I recounted, involving also Alexander Parkes’ Parke-sine and Daniel Spill’s Xylonite.
15. Beaujot, *Victorian Fashion Accessories*, 148.
16. Of course, plastics have a petrochemical past, which is an aspect rightly stressed by petro-culture studies. Yet, chemically, materially, and culturally, plastics differ from oil: they are

born with an act of synthetisation. It is in this sense, and not to dismiss the petrochemical foundations of these materials, that I claim they were never wild.

17. Here, the plane of analogy is conceived of in the sense outlined by Roger Caillois. Drawing on Caillois' "diagonal sciences" as well as on assemblage and affect theory of post-structuralist descent, I built an argument for a plane of analogy connecting living organisms and inorganic materials, also with regards to mimicry (which is discussed here in what follows), in Iacobone, "Material Mimeticism".
18. Bensaude-Vincent, "Plastics, Materials and Dreams," 19.
19. Kang and Hancock, "Mimicry," 675.
20. Moore, *Plastic Ocean*, 253.
21. Morphy, "Art as a Mode of Action," 8. On the distinction between primary and secondary agents, see Gell, *Art and Agency*, 36–8.
22. Moore, *Plastic Ocean*.
23. Alaimo, *Exposed*, 136.
24. Available at: <https://www.youtube.com/watch?v=GLgh9h2ePYw>. On plastic bags and their agency, see Hawkins, "Plastic Materialities"; Boetzkes, *Plastic Capitalism*, 177.
25. It is certainly simplistic to depict domestication as one-way modifications of animals' appearance and behaviour, since domestication can more aptly be described as the co-evolution and co-constitution of animals and humans. Even though important scholars in the field describe a domestic animal as "one that has been bred in captivity for purposes of economic profit to a human community that maintains complete mastery over its breeding, organization of territory and food supply" (Clutton-Brock, *Domesticated Animals*, 21), it should be noticed that domestic animals *shape* humans in turn. Domestication is thus better defined as a "symbiotic ecological relationship between two [species], with evolutionary benefits to both" (Morey, *Dogs*, 67), where such interplay does not even necessarily involve a human actor (Pierotti and Fogg, *The First Domestication*, 190–3). Therefore, domestication is more than "the paradigmatic act of masculine, single-parent, self-birthing, whereby man makes himself repetitively as he [...] creates his tools" (Haraway, *Companion Species*, 27): it also consists in practices of reciprocal attunement that transform human and animal by providing both with new identities (Despret, "The Body We Care for", 122, 125, 130). I agree with Donna Haraway and other feminist scholars that domestication functions collaboratively as co-constitution of new "mongrel" identities; however, in this essay I cannot tackle the topic in its complexity and will therefore stick to a simpler depiction of domestication.
26. In line with this understanding of ferality as de-domestication, some have resorted to the concept of ferality also when discussing *rewilding* policies and practices (e.g. Monbiot, *Feral*). Being a conservation strategy, rewilding represents in fact the paradox of a controlled decontrolling (Wynne-Jones et al., "Feral Political Ecologies," 72).
27. Gibson, *Feral Animals*, 2. See also Daniels and Bekoff, "Feralization." I agree with them in claiming that feralization is not a reversion to the wild form, but I disagree with them when they argue that this is due to the fact that ferality is a developmental process rather than an evolutionary one, and that therefore it concerns individuals rather than populations.
28. Boitani et al., "Ecology and Behavior," 343.
29. Ibid., 363; Coppinger and Coppinger, *Dogs*, 116.
30. The question on whether the transition from wolf to dog (and to domestic dog to feral dog) involves speciation or not is highly debatable because it depends on which of the many definitions of "species" is adopted. See Hey, "Species Problem."
31. See contemporary commentators, e.g. Chiurazzi, *Seconda natura*, 11; Novakovic, *Hegel on Second Nature*, 70; Menke, "Hegel's Theory of Second Nature."
32. Heidegger, *Off the Beaten Track*, 26–31.
33. Gevorkyan and Segovia, "Earth and World(s)," 60.
34. Heidegger, *Fundamental Concepts*, 184.
35. Chiurazzi, *Seconda natura*, 9.
36. Margulis and Sagan recall that "the first bacteria were anaerobes: they were poisoned by the very oxygen some of them produced as waste". In this sense, they speak of the Great

Oxidation Event as an “oxygen holocaust”: “a worldwide pollution crisis that occurred 2,000 million years ago” in which oxygen played the role of the “ultimate toxic waste” and microbes responded “by inventing various intracellular devices [...] to detoxify the dangerous pollutant” (Margulis and Sagan, *Microcosmos*, 17, 99). By presenting the point of view of microscopic life, Margulis and Sagan show how each narrative about pollution, waste, and toxicity is dependent on the perspective one adopts to produce it.

37. Chiurazzi, *Seconda natura*, 33–4.
38. Escobar, *Designs for the Pluriverse*, xvi. See also De la Cadena and Blaser, “Pluriverse.”
39. Derrida, *Specters of Marx*, 63.
40. Derrida and Ferraris, *Taste for the Secret*, 32–3. Diffraction and hauntology are also key elements of Karen Barad’s agential realism, that draws on Derridean philosophy and quantum physics to outline a new materialism with which my perspective is fundamentally aligned.
41. Iacobone, “Anthropocene or Plasticene?”
42. Amaral-Zettler, “Biogeography,” 541.
43. Haram et al., “Plasticene Lexicon,” 2.
44. Amaral-Zettler, “Biogeography,” 541.
45. In contrast with authors who resort to the term “plastivore” to refer to any animal that ingests plastic waste, including those that are damaged by it (Haram et al., “Plasticene Lexicon,” 2), I use the term “plastivore” to refer exclusively to those animals that can actually be nourished by plastics, making it fruitfully enter their metabolism.
46. E.g. Bombelli et al., “Polyethylene Bio-Degradation.”
47. Dixon, *After Man*, 33.
48. Haraway, *Staying with the Trouble*, 2, 10.
49. E.g. Haraway, “Fabulaciones especulativas”; *Staying with the Trouble*, 134–68. On future-oriented feminism and feminist speculation, see Balzano et al., *Conchiglie, pinguini, staminali*; Angerer and Gramlich, *Feministisches Spekulieren*; Curti, *Femminismi futuri*.
50. Dixon, *After Man*, 10.
51. Savransky et al., “Lure of Possible Futures,” 4.
52. I use the expressions “collapsed future” and “future conditional” in Zoe Sofoulis’ sense: the collapsed future tense is regarded as “futureless” (its “perversity [...] [lying] in its ability at once to invoke and deny the future”) and the future conditional is considered as “the imagination of alternatives” (Sofoulis, “Exterminating fetuses,” 57).
53. Halewood, “Situated Speculation.”
54. E.g. Davis, “Toxic Progeny”; Grillmayr, “Wilde Spekulationen.”
55. Hird and Yusoff, “Subtending Relations,” 322.
56. In fact, the “conventional meanings” of speculation are much more associated with these aspects than with those mentioned up to this point. See Diprose, “Speculative Research,” 39–40.
57. Savransky et al., “Lure of Possible Futures,” 6.
58. Vishmidt, “Introduction.”
59. Mackay et al., *Speculative Aesthetics*.
60. On the conceptual differences between “environment” and “milieu”, see Sabolius, “Forget the Environment.”
61. Yoldaş, “From *An Ecosystem of Excess*,” 89.
62. Photographs and description by the artist are available at: <https://www.solerarpa.com/en/toxic-evolution/>.
63. Warner, *Humeau*, 618. A photograph of *Migrations* is available at: <https://www.whitecube.com/artists/marguerite-humeau>.
64. Photographs, videos, and various materials available at: <https://www.strandbeest.com/>.
65. Herzog, *Strandbeest*, 17.
66. Jansen, *The Great Pretender*, 157; 195–9.
67. Byrne-Smith, “Introduction,” 18.

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