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Bio-aesthetics: The Evolution of Sensibility through Nature

Katya Mandoki

Abstract^[1]

This paper gathers a few points developed in my recent book, *The Indispensable Excess of the Aesthetic: Evolution of Sensibility in Nature*, where I explore the processes that involve *aisthesis* from their most primal manifestations to their more complex. I propose the concept of bio-aesthetics as the study of all forms of sensibility in living beings, and that, given the fact that it is a function of our corporeal condition, the required starting point is the evolutionary paradigm. Another crucial tool for understanding how different types of creatures value, understand, react, and relate to their environment is provided by the recent field of bio-semiotics, the study of the dynamics of signification in different forms of life. What becomes particularly salient is the role of female discernment and evaluation through mate selection and, consequently, in the future configuration of the species, a phenomenon that can be denoted as phylo-genetic poetics.

Key Words

aisthesis, Baumgarten, bio-aesthetics, bio-semiotics, Darwinism, epigenesis, evolution, female choice, onto-poetics, phylo-poetics, sexual selection, theory of sensibility

1. Introduction

For much of our philosophical tradition, the realm of the aesthetic has been placed in a superior, lofty position in a hierarchical relation compared to other human endeavors. For Plato, beauty is an object of high-minded contemplation at the top in the world of ideas and contiguous with goodness and truth. From Longinus to Hegel, art, beauty, and the sublime are higher than and superior to nature. Even a down-to-earth pragmatist as John Dewey placed art and the aesthetic at the very pinnacle of everyday experience.^[2] By looking at the world from above, this axiology of verticality predictably locates the spiritual at the peak and the material underneath, artistic beauty up and natural beauty down, the rational above the emotional, and the mind over the body. Yet this insistence on enhancing the aesthetic to such elevated altitudes seems to conceal what is, in fact, its original sin: the growing evidence that the sense of beauty actually emerges from underneath, from our pudendum. Judging beauty may be less an outcome of the spirit than of the body, less a matter of culture than of nature, and less a fruit of virtue than of lust. To understand the condition of the possibility of the aesthetic we must start with life itself, from the cell to the plant to animals and humans. We must, consequently, explore it from beneath.

We must also observe it from behind by looking into our past and reading backwards the traces left during millions of years in our inexplicable tenacity to survive and multiply. In our bodies we carry a legacy that includes not only organs for metabolism, breathing, and locomotion but also, and especially, sensory organs and neuro-cognitive processes that determine our modes of *aisthesis* and allow us to detect, select, and interpret the world, so as to remain in it as long as possible and pass on this gift to our offspring. Therefore, in addition to our genetic heritage, we have inherited an aesthetic legacy in specific forms of sensibility for valuing and reacting to our surroundings. Our senses, emotions, and preferences attest to an evolving aesthetics stemming from where else but our body.

For this task we are required to re-dimensionalize the roles of art and beauty, categories that are certainly relevant but not to the degree so as to monopolize the entire concern of aesthetics, since they share equal importance with aesthetic activities other than art and with categories besides beauty, such as the grotesque, the comic, the sordid, the cute, and the sinister. Furthermore, the full spectrum of the extra-artistic still remains to be explored, such as the creativity and valuation in seduction and mating, in assessment of the environment, in the fascination of rituals and celebrations, in the joy of achievement, in admiring excellence, in the figuration of myths, in the pleasure of playing, in empathy or sensibility with others, and especially in the miraculous opening up of every creature to the world.

This sums up the horizon explored and covered by what can be accurately called bio-aesthetics as contrasted with and complementary to socio-aesthetics or the display of the aesthetic in ordinary social interactions, specifically what I have proposed as "Prosaica" (1994, 2007), or everyday aesthetics in various social institutions. Prosaica is the other side of poetica, or artistic aesthetics, each obeying specific cultural conventions.^[3]

This is a complex task that requires more than propositional analysis,

the usual procedure of analytical aesthetics, to deal with these problems. On one hand, we need semiotic tools for understanding how meaning and significance are conveyed, and on the other hand we must stand upon evolutionary research for a scientific account of the complexity of corporeal and perceptive processes. Following Peirce's pragmaticist view of semiosis, von Frisch's spectacular findings on communication among bees and von Uexküll's work on animal perception, Thomas Sebeok returned semiotics to its roots in biology, initiating the field of zoo-semiotics that later became bio-semiotics.^[4] A century earlier, Darwin was already working unknowingly as a natural semiologist when he decoded the morphology and behavior in plants, animals, and humans as indices of their past imprinted upon their anatomy according to particular ecological niches.

The relevance of semiotics to aesthetics has been surprisingly neglected, regardless of its fertility and rich methodological contributions, in addition to the amazing yet little known fact that in the mid-eighteenth century, at the very foundation of aesthetics as an autonomous discipline, Baumgarten already attempted to follow a semiotic approach *avant la lettre*, as can be confirmed in the table of contents of his unfinished *Aesthetica* (1750). Notice that the first part of *Aesthetica Theoretica* was divided into *heuristica*, *methodologia*, and *semiotica*, in a different sense from modern semiotics yet significant in itself.^[5]

2. The body in theory

Since aesthetics is a natural result of evolution and not a divine celestial gift, we must reflect upon it from the perspective of corporeality and its evolution. Therefore, we ought to consider the umbilical cord that ties it to biology in retrospection instead of projecting biology upon culture by a prospective approach. Thus, it is necessary to proceed by the so-called reverse engineering method that Darwin tacitly applied for understanding the conditions that shape organisms by deducing the design of a body organ from the contexts and needs from which it evolved. This method, together with the hard work of observation and very detailed, often tedious, annotation, resulted in the most important paradigm revolution in the natural sciences.

Focusing on aesthetics from the body means focusing on it from its evolution as a biological phenomenon, since "nothing in biology makes sense except in the light of evolution," as Dobzhansky's well known affirmation states.^[6] By definition, every corporeal creature, no matter what its size, is a sensitive creature relative to its organs and modes of perception. Since the body is first and foremost a biological phenomenon, I propose the concept of bio-aesthetics, as it accurately denotes the study of sensibility in the whole spectrum of nature, from the cell to the plant to the bird to Bach.

Perhaps something was floating in the air in mid-nineteenth-century Britain that led both Marx and Darwin to implement the in-corporation of the body into theory, if one may be so redundant. The worker's body is the source of labor for Marx, that is, what is exploited is his or her very life and muscle. Marx understood commodities as coagulated vital, physical energy. In turn, Darwin began a genealogy of the body because evolution is precisely the development of corpo-reality. The animal origin of humankind and the exploitative nature of capitalism sprung forward to explain crucial social and natural phenomena, starting from the body in theory. From such observation of the body emerges the concept of natural selection that would prove as fruitful for biology as surplus value was for political economy.

Unfortunately, the prolific consequences of Darwin's approach were, in many cases, demonized and reduced to superficial formulas such as "the survival of the fittest", translated by vulgar Darwinism as the law of the jungle in line with Hobbes's view of *homo homini lupus*. However, who really is the fittest? The most aggressive? The richest? The most fertile? The most beautiful, perhaps? It all sums up tautologically as the survival of the survivor.

The phrase "red in tooth and claw" from Tennyson's famous poem, "In Memoriam A. H. H." is frequently used as a metaphor among Darwinists referring to the cruelty in nature by predators' teeth and claws dripping with their victims' blood. This sense of ferocity has been exacerbated in Richard Dawkins' selfish gene theory explaining the process of evolution by the dynamics of sheer gene replication.^[7] For Dawkins, evolution is a mechanical consequence of blind genetic replicators that utilize bodies as gene vehicles or replicating machines best suited to guarantee such replication in various ecological niches. One wonders why, then, so much effort would be spent into producing such an amount and variety of phenotypes when that energy could likely have been more efficiently used in the multiplication of just naked genes, without wasting resources on such excessive devices as bodies. I am inclined to think that this waste could perhaps be explained by a sort of Hegelian curiosity of objectifying for the sake of contemplating the inherent possibilities of evolution and contradicting Dawkins. Moreover, as we shall see later, that a blind and insatiable replicating machine is operating in nature does not seem to be always or only the case. On the contrary, what we

are witnessing is really a very stubborn subject avid to live and play out by trial and error the various possibilities of being in this world with the skill of an expert gambler. This individual subject, whoever he or she may be, fits his or her senses to see better, hear better and play better, as the wolf in *Little Red Riding Hood* would have said.

This could explain why such an impressive variety of species and prodigious forms of life violate the law of entropy because, instead of tending to homogeneity, evolution projects the physical world towards a never-ending diversity. One suspects that what is at stake here is a perspicacity in integrating and blending the simple towards the complex and peeking into the unknown. From the binding of matter and energy, to quarks forming hadrons into a variety of atoms, to inorganic and then organic molecules, to replicating DNA, plus the shuffling and combinatorial diploid eukaryotic organisms to sexual preference choice up to the generation of varied biomes with multiplied interactive webs and the emergence of human culture and language, all appear to be the development of a world out of mere curiosity. And God saw that it was interesting ... and got excited.

3. The aesthetic compass

What is life? For Schrödinger it is the property of self-assembly against the tendency toward disorder and entropy. Gerald Joyce of NASA defined it as a self-sustaining chemical system capable of Darwinian evolution.^[8] From a cybernetic perspective, Bernard Korzeniewski understood "life ([as] a living individual) is defined as a network of inferior negative feedbacks (regulatory mechanisms) subordinated to (being at service of) a superior positive feedback (potential of expansion)." ^[9] For Jack W. Szostak, "[w]e can consider life as a property that emerges from the union of two fundamentally different kinds of replicating systems: the informational genome and the three-dimensional structure in which it resides." ^[10] Finally, from our aesthetic perspective, we can define life as *aisthesis*, matter perceiving matter and thus ceasing to be only matter, thus opening the dimension of subjectivity.

We thus embark on this exploration with our compass aligned upon *αἰσθητικός*, what relates to sensibility. *Aisthesis* is receptivity, openness to the environment, the sentient and sensorial on any scale.^[11] Not only Beethoven and Rembrandt had sensibility but dragonflies and bacteria also do, at a different level of complexity and *qualia*.

Two activities make *aisthesis* and semiosis possible: detecting a stimulus or source, and linking it to a meaning. Whenever a process of semiosis takes place, matter is no longer only matter, as it becomes also meaning. Perception and signification, *aisthesis* and semiosis, allow the body to open up and distinguish between self and other by *autopoiesis*, to decide to go near or distance itself from a signal by approaching or escaping, and to absorb nutrients or avoid toxic substances by attraction or repulsion. The body cyclically performs *aisthesis* by opening toward its objects, *semiosis* by signifying them, and *praxis* by acting in accordance. In other words, it detects its object by *aisthesis*, signifies it in *semiosis*, and decides action *inpraxis* through a triadic survival cycle.

4. Problems in evolutionary aesthetics

Two major obstacles come up in various attempts to apply evolutionary approaches to aesthetics. On the one hand is the temptation to automatically project concepts from biology upon the field of culture without any mediation. On the other hand it is common to transfer the traditional restriction of the term aesthetics to the study of art and beauty; and thus when considering evolutionism, reduce its scope to art in nature or to nature in art to qualify objects instead of an activity that relates sentient beings with their world. In Baumgarten's foundational book *Aesthetica* (1750), aesthetics is clearly defined as *scientia cognitionis sensitivae*, not as the theory of art but as the science of sensitive knowledge or that acquired by means of the senses. Aesthetics has been traditionally dedicated to dealing with other issues of greater social demand at the moment of an emerging art market, namely establishing criteria for assessing the value of art, of justifying a social class's idea of good taste, and setting up an objective basis for the judgment of beauty according to a particular culture and social group.

Given the ambiguity of the term, not only in everyday language but also in specialized texts on this topic, we must comply with a protocol that seems to be a life sentence imposed upon any research on aesthetics, the operational definition of the concept. Although authors such as Thornhill deny that the domain of aesthetics can be defined, as did other philosophers before him like Morris Weitz, and intend to work with only the traditional topics of aesthetics from an evolutionary model. Many of the problems that the emerging Darwinian aesthetics is inheriting also and again result from the vagueness of the term and its implications.^[12] Works of great erudition are less influential for not complying with this requirement, as the imprecision they tolerate in the concept places before them dangerous traps by the opportunistic use of its various and often contradictory meanings, such as metaphorical or literal, or evaluative, descriptive or prescriptive. These theoretical and

terminological problems are common to different neo-Darwinist works, where the term "aesthetics" keeps metamorphosing to denote preference, pleasure, art, decoration, good or bad taste, perception, fashion, style, or quality and beauty.

Among the directions taken by evolutionary aesthetics we can count surveys of preferences in artifacts (Volland), in parks and landscapes (Orians and Kaplan), experiments in neurological perception of color and form (Seki), reactions in infants to attractiveness in photographs of female faces (Etcoff), the anthropology of customs, crafts, and rituals of native cultures (Dissanayake), an exploration of aesthetic pleasure in animals (Welsch), the moving body (Grammer), the evolution of artistic creation and imagination (Velez), and even debating problems of art forgery and styles of *avant garde* and conceptual art, and interpreting preferences in painting (Dutton).^[13]

The problem does not lie in the variety of topics that Darwinian aesthetics addresses. On the contrary, it is involved in a wide spectrum of phenomena that goes beyond established notions of aesthetic aspects or the ontology of beauty. The difficulty lies in the alteration of meaning in each case, as the term keeps slipping and shifting for the sake of the argument. Against the uncertainty that Thornhill tolerates, it is necessary to determine its definition, and the etymological denotation of *aisthesis* is enough together with Baumgarten's foundational concept. From *aisthesis* all the rest springs forth: attraction, valuation, appreciation, fascination, interpretation, creation, and contemplation. Without perception, there can be no artistic expression, nor appreciation of the graceful or of the tragic, and certainly no beauty. As Berleant clearly emphasizes, "For nothing is more primary in human experience than sensory perception, and the satisfactions and dissatisfactions of experience are a principal motivation in our behavior. I take this primacy, then, as the originating idea of the aesthetic, *aisthesis*, literally, perception by the senses."^[14]

Consequently, the aesthetic compass we'll use to guide us here has a trembling little needle pointing to a very different direction from art-centric and beauty-centric aesthetics with its tenets, but also from gene-centric Darwinian aesthetics and its obsession with fitness, enabling us to concentrate on Darwin's "small trifling particulars" that are everything but trifling. Cyril Aydon, Darwin's biographer, points out his "almost superhuman ability to see things that other people did not notice. His powers of observation were as different from the average person's, as a hawk's are from a mole's. He also had a quite breathtaking ability to see, not only the thing itself, but its significance."^[15]

5. What it like is to be a peahen?

.... I remember well the time when the thought of the eye made me cold all over, but I have got over this stage of the complaint, and now small trifling particulars of structure often make me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick! ...

Darwin really found the devil in the details, since to explain the evolution of species, the starting point had to be in these "small trifling particulars" of everyday life, be it the cricket's elytra, the rubbing of a petiole, a woodpecker's beak, or the gesture of a monkey. It meant yielding our metaphysical musings and instead being attentive to these minute details.

The enigma of the peacock, a singular aesthetic and absolutely excessive event in nature, was so enigmatic that it literally made Darwin sick, as he confessed in a letter to his friend Asa Gray on April 3, 1860.^[16] No wonder. This magnificent peacock tail questioned the explanatory principle of evolution by random mutation and natural selection in *The Origin of Species*, which predicts that a peacock with a short tail would have been selected over one with the long tail simply because it is more practical for survival. So hard to maintain and show off, exhibiting its flaws to females, so inconvenient by making its owner more conspicuous to predators, heavier for escaping danger, in need of more nutrients and more vulnerable to parasites, this huge tail did not seem to find a coherent explanation in Darwinian theory. Facts fitted so wonderfully in place before Darwin realized this anomaly until it became like a ghost that haunted the evolutionary paradigm, threatening to collapse it.

Darwin's sickness turned into a real passion for explaining it. Despite the criticisms and objections even from those who could help him solve it, like his co-evolutionist Alfred R. Wallace, Darwin assumed this enormous challenge notwithstanding the great intellectual cost of effort to write *The Descent of Man and Selection in Relation to Sex* which, at 899 pages, is almost double in size of the *Origin's* 502 pages, and the consequence of having to remain almost in the darkness of academic publishing for a century. In this second text, Darwin confessed that he collected notes on the origin of man with the intention of never publishing them, since merely the slight mention that "light will be thrown

on the origin of man and his history" in *the Origin of Species* caused such commotion as to discourage anyone.

Under the new version, the process of evolution is explained not only as the blind and fierce mechanism of natural selection of the fittest by random mutations and selective retention of traits in the struggle for survival, but as something different and more radical: the idea that the female of each species could be running part of the selection process. To top it off, this occurs by aesthetic criteria, superfluous almost by definition under standard and conventional practical criteria. Biology at the hands of the aesthetic whim of females!

This attests to Darwin's intellectual honesty considering his misogynist bias, immersed as he was in the Victorian milieu, with such bad taste as to write that: "The chief distinction in the intellectual powers of the two sexes is shewn by man's attaining to a higher eminence, in whatever he takes up, than can woman—whether requiring deep thought, reason, or imagination, or merely the use of the senses and hands."^[17] So now the eternal feminine billed Darwin's prejudice dearly. Again, as with Eve, Lilith, Pandora, Malinche, Helen of Troy, and Cleopatra, evolutionary eccentricities are entirely the female's fault.

Darwin was ridiculed for his idea of female selection, and still in 1960 an explanation holding that females were wooed not because they could choose partners but because they were too lazy to mate naturally and too afraid of being touched, since when a predator touches them they die, was taken seriously.^[18] Such a theory is false as proven by the highly selective sense of females in various species, such as *Physalaemus postulosus* frogs in Michael Ryan's experiment showing that they are able to accurately distinguish the size of the male by the simple croaking tone, and therefore select the largest, one example among thousands.^[19]

Thus, the female is at the helm of the evolution of multiple species as she requires to be captivated by the male whose particular features she chooses to pass on to the next generation. In many cases, she does not wait to be seduced but goes straight to the male that is most attractive to her and copulates with him. The selection of exotic luxuries of nature, such as birds of paradise, pheasants, and peacocks, has no other explanation than this aesthetic taste of females in total rebellion against evolutionary instrumentalism. Thus, the peacock phenomenon is a challenge not only to theoretical misogyny but to the pragmatic heart and marrow of evolutionary theory, because choosing the beautiful rather than the useful requires some explanation. We must at least recognize that we owe to the females of each species the variety of colors, shapes, and ornaments of nature by selecting and cultivating the finest for reproduction.

Just as man can give beauty, according to his standard of taste, to his male poultry, or more strictly can modify the beauty originally acquired by the parent species, can give to the Sebright bantam a new and elegant plumage, an erect and peculiar carriage—so it appears that female birds in a state of nature, have by a long selection of the more attractive males, added to their beauty or other attractive qualities. No doubt this implies powers of discrimination and taste on the part of the female which will at first appear extremely improbable; but by the facts to be adduced hereafter, I hope to be able to shew that the females actually have these powers.^[20]

And he was! This female frivolity implies that at stake is not only a direct instrumental criterion but, and who would have imagined, aesthetic criteria. This is a scandal that not only upsets misogynists with their biases by recognizing that females drive the evolution of certain species but also puts into question the evolutionary formula of blind mutation and natural selection to the opposite, a deliberate and very discerning mode of selection. Darwinian functionalism derives, paradoxically, in hedonism and caprice.

During the 1920s, Ronald Fisher proposed an answer to the peacock enigma by the runaway process hypothesis that assumes that preferences are inherited, and thus traits that are preferred have an advantage in selection.^[21] For Fisher, the case of the peacock is a result of female preferences transmitted to their daughters just as the preferred traits in males are inherited by their male offspring, who subsequently will be favored for mating. What we do not understand yet is how preferences are inherited, and why some particular eccentric phenotypes are preferred to others. But we may come to understand this.

6. Phylo-genetic and onto-genetic poetics

The process by which females select particular traits for the next generation can be properly called *phylo-genetic poetics*, or the conformation of the species through many generations as a result of female sexual choice of particular male traits in color, size, sound,

attitude, or posture. On the other hand, we can denote as *onto-genetic poetics* the activity generally performed by males when deliberately constructing attractive artifacts like bowers or decorating nests for their alluring visual effect, in addition to training themselves and developing individual dexterity in song, dance, or antics to impress the female. Phylo-poetics centers on alteration of the phenotype, whereas onto-poetics deals with the extended phenotype or acquired features through individual display of adroitness.^[22]

Females in many species are not necessarily forced to mate with the bravest and most competitive male that wins contests at the birds' *lek* or public square but rather are seduced by the most charming. "The rock-thrush of Guiana, birds of Paradise, and some others, congregate; and successive males display their gorgeous plumage and perform strange antics before the females standing by as spectators and choosing the most attractive partner," Darwin notes.^[23] He adds that "the exertion of some choice on the part of the female seems a law almost as general as the eagerness of the male."^[24] By "eagerness," Darwin is implying males' low discriminatory sense, as in turkeys, which is very low indeed, as some can get sexually aroused by a mere wooden female head.

This explanation opens up yet another puzzle even more difficult to solve: Why do females require beauty to mate? Do they feel pleasure at the sight of a male peacock's tail? How important is the beauty of the male to a female, if she stays away from him immediately after copulation anyway, as is the case with peacocks, since they are polygamous? To these enigmas we may add the riddle of whether the female cricket is actually moved by listening to the stridulating music of the male? Does she really interpret it as something close to beautiful or consoling or something else? Does the peahen admire colors and proportions or is she just calculating the quality indexes of the genotype and its resistance to parasites by the phenotype? As Nagel asked, "What is it like to be a bat?" To solve this mystery, I would really like to know what it is like to be a peahen.

7. Aesthetic adaptations

Evolutionary psychology assumes that our choices and reactions are a product of mental and anatomical conformations that our ancestors acquired 2,000,000 years ago when they roamed the savanna as nomadic hunters and gatherers.^[25] We should therefore recognize that we partly contain, as matrioshkas, elements of our antecessors *homo ergaster*, *erectus*, *habilis*, hominids, primates, mammals, vertebrates, metazoids, eukaryotes, and prokaryotes, from whom we ramified and descended, and thus of their forms of perception. The origin and development of human adaptation to living conditions in this stage gradually determined the morphological stability we acquired. Isn't it amazing that already 200,000 years ago a creature existed that played the flute, learned to sew, and painted animal and human figures with great expressivity?

Darwin used the strategy of studying the organism in reverse as a set of adaptations through thousands of generations to explain the mechanics of evolution. Certain traits and organs are formed by infinitesimal changes until structures emerge as spectacular as the spherical eye lens of fish and fly, or the canine sense of smell able to perceive traces left by others not only in space but in time, and as the Broca and Wernicke's area in the neurocortex that enables sophisticated human language.

It must also be stressed that the transformation of the phenotype is due not only to the random genetic mutations and selective retention of favorable traits in Darwin's formula but also to the impact of an environment that can cause changes without mutations in the development of an organism simply by activating dormant parts of the genotype that reveal genetic variants already present in a population. These variants are later captured by natural selection to be reshuffled in sexual reproduction, the combinations of which result in more effective survival phenotypes. The fact that alterations during cell development may become hereditary is explained by an interaction between the epigenetic level (epi, around) and the genes which affect each other in both directions.^[26] Therefore, the variation of species depends not only on mutations but also on environmental changes that accelerate evolution to produce different phenotypes from the same genome.

Whoever was able to detect dew drops on leaves or on desert stones, discern the resistance of ice on a lake, and quickly identify the fur of a bear or a tiger through the foliage, the scales of a reptile among the weeds, or ripe fruit at a very long distance had an evolutionary advantage and passed its own life to its descendants. In other words, our survival and reproduction depended on our keen sense of *aisthesis* or perception and the attribution of meaning to a variety of relevant cues. Perhaps the origin of our passion for gold and precious stones, for the color red, and the craving of many for animal furs may be found in our ancestors' experiences in life or death situations that depended on these perceptions.

Cosmides et al. propose a basic distinction between two key terms of

Darwinism, adaptation and adaptive, and note that "an *adaptive problem* is a problem whose solution can affect reproduction, however distally. Avoiding depredation, choosing nutritious food, finding a mate, and communicating with others are examples of adaptive problems that our hominid ancestors would have faced."[\[27\]](#)

Adaptive implies a particular purpose and is focused on the future, contrary to adaptations, which result from the past and are read as evidence of interactions with the environment. In the discussion between Stephen Jay Gould and Richard Lewontin against Edward Wilson and Richard Dawkins's neo-Darwinism, the main quid of debate was located in the relevance of this relation to the environment. Gould and Lewontin argued that organisms not only adapt to their surroundings but are also part of it and transform it, all within a multi-way interactional dynamic between organisms and others that constitute their life milieu.[\[28\]](#) Such dynamic interaction, moreover, has been reinforced by the advances in our understanding of these epigenetic processes on the activation or the silencing of genes by context effects. As pointed out by Eva Jablonka, a learned response to the environment can become an innate behavior.[\[29\]](#) We do not yet know how, but it points to the fact that the rejection of Lamarckism needs to be reconsidered.

Adaptation is the key concept in evolutionary theory and it is as crucial to the Darwinian paradigm as the concept of commodities to the Marxist, since each adaptation can be read as an index of the evolutionary processes that have shaped it, as commodities are indexes of congealed workers' labor. Thornhill defines an adaptation as "a phenotypic feature that is so precisely organized for some apparent purpose and that chance cannot be the explanation of the feature's existence."[\[30\]](#) An adaptation is the effect of a response to material selection, where the selection is defined as a non-random differential reproduction of individuals. Every organism is an integrated web of phenotypic adaptations to survive and reproduce. The body of a creature can be deciphered as a map of the environmental pressures it had to confront throughout its evolution. On the other hand, adaptiveness is not a criterion in evolutionary paradigm. According to Thornhill, the only criterion for understanding evolved adaptation is functional design.[\[31\]](#) Therefore, each adaptation is a physiological and cumulative memory of the past forces and choices that shaped it. There are adaptations that help to integrate the organism to the environment, and maladaptive adaptations that obstruct it, as pointed out by Boyd and Richerson.[\[32\]](#)

Thornhill believes that "the psychological adaptation causally underlies *all* human feelings, emotion, arousal, creativity, learning and behavior" and assumes that these adaptations are always defined by fitness.[\[33\]](#) Consequently for that author, perception of symmetry, harmony, truth, unity, and order have a specific purpose in sexual, social, or environmental selection, rather than merely for contemplation. He proposes ten categories of human psychological adaptation for aesthetic valuation: 1) of landscape features; 2) of nonhuman animals; 3) of the acoustic behavior of nonhuman animals; 4) arising from daily or environmental cues that signal a need to change behavior; 5) of human bodily form; 6) of status cues; 7) of social scenarios; 8) based on skill; 9) of food; and 10) judgments of ideas.[\[34\]](#) As with the Chinese encyclopedia mentioned by Borges with the most bizarre classification of animals (embalmed, trained, suckling pigs, mermaids, fabulous, stray dogs, those included in this classification, those that shake like crazy, the innumerable, and so on), it is difficult to know what criteria operate in this taxonomy, what is meant by acoustic behavior, what is the difference between the first and fourth, why doesn't he include movement, animals' body language, smell, ornamentation, and other elements of sensory evaluation that were so important to Darwin and that have such a key role in selection and evolution. But the main problem with this characterization is its anthropocentrism, which is inconsistent with a Darwinian perspective, and which I attribute to the projection of very culture-specific notions of beauty and art from mainstream aesthetic tradition unto biology.

8. Conclusions

Darwin's explanation that random changes in organisms favorable to their survival and reproduction are retained while the harmful are lost by limiting the reproduction of their carriers, and now reinforced by DNA and molecular biology breakthroughs, game theory, computer simulation models and population genetics have consolidated a paradigm that extends its elucidation power from the field of biology to the humanities. However, such a formula would be only part of the explanation, and Darwin was the first to acknowledge it. Other types of selection must be considered, namely sexual selection, to which we can now perhaps add organic (Baldwin), genetic, epigenetic, symbiogenetic, and behavioral, group, social, and cultural forms of selection that are still under debate.

The reverberations caused by the controversy surrounding nineteenth-century social Darwinism and twentieth-century neo-Darwinism and Wilson's sociobiology are still in the air. The differences within evolutionary theory are also many and intense but they have kept the

discussion of humanities at ground, empirical level. Aesthetics is not exempt from these debates.

On sexual selection, Darwin emphasized "their courage and pugnacity—their various ornaments—their contrivances for producing vocal or instrumental music—and their glands for emitting odors, most of these latter structures serving only to allure or excite the female."^[35] The main consequence of this approach is that the evolution of creatures appears not to be blind at all but very smart, sensual, and selective to the extent that by contributing to it we are now rewarded with the sense of beauty, and warned by the sense of ugliness. In other words, the sense of beauty is what points towards the direction of evolution as the sense of ugliness towards involution and decay. This implies that beauty and usefulness are not contradictory, as mainstream aesthetic theory has held, particularly derived from Kant's concept of aesthetic disinterest, but complementary.

Summing up:

1. There are species that contradict the law of natural selection in that they are focused on reproduction not precisely of functional fitness.
2. There is evidence on the preference of certain traits over others in some species that do not appear to relate directly to any useful purpose.
3. To our knowledge we have no proof, nor can we be sure, that there is some sense of beauty in other species but that their preferences for vivid colors, symmetry, proportion are consistent with human aesthetic evaluation criteria is a fact.

God could be a bad mathematician when he calculated the origin of the world at 5,777 years ago instead of 13.73 billion years, an error of only seven zeros. Nevertheless, by the biblical command to Abraham, "Be fruitful and multiply," God proved to be an excellent Darwinian. He is also a superb aesthetician for having elected female sensibility as the guiding direction through much of evolution.^[36]

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Endnotes

^[1] This article sums up a few points dealt with in my most recent book *The Indispensable Excess of the Aesthetic; Evolution of Sensibility in Nature* (New York London: Rowman & Littlefield, 2015).

^[2] John Dewey, *Art as Experience* (New York: Perigee Books, 1980).

^[3] On the concept and scope of *Prosaica* or everyday aesthetics in various social practices, institutions, and conventions and its method of analysis, see Katya Mandoki, *Everyday Aesthetics: Prosaics, the Play of Culture and Social Identities* (Aldershot, UK: Ashgate, 2007).

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^[5] Alexander Gottlieb Baumgarten, *Aesthetica Scripsit Alex and Gottlieb Baumgarten* ... (Hildesheim Zurich New York: Georg Olms Verlag, 1750).

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^[7] Richard Dawkins, *The Selfish Gene* (Oxford; New York: Oxford University Press, 1976).

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- [11] I have amply argued this position in Mandoki, *Everyday Aesthetics: Prosaics, the Play of Culture and Social Identities*. In particular, for the concept of aisthesis, see Part II, chapters 5-8.
- [12] Randy Thornhill, "Darwinian Aesthetics Informs Traditional Aesthetics," in *Evolutionary Aesthetics*, ed. Eckart Voland and Karl Grammer (Dordrecht: Springer, 2003), pp. 9–35. Morris Weitz, "The Role of Theory in Aesthetics," in *Philosophy Looks at the Arts*, ed. Joseph Margolis, 3rd ed. (Philadelphia: Temple University Press, 1987), p. 153.
- [13] Eckart Voland and Karl Grammer, *Evolutionary Aesthetics*, ed. Eckart Voland and Karl Grammer (Dordrecht: Springer, 2003). Gordon H. Orians and Judith H. Heerwagen, "Evolved Response to Landscapes," in *The Adapted Mind*, ed. Jerome H. Barkow, Leda Cosmides, and John Tooby (Oxford; New York: Oxford University Press, 1992). Stephen Kaplan, "Environmental Preference in Knowledge-Seeking, Knowledge-Using Organisms," in *The Adapted Mind*, ed. Jerome H. Barkow, Leda Cosmides, and John Tooby (Oxford; New York: Oxford University Press, 1995), pp. 581–600; Semir Zeki, "The Neurology of Ambiguity," in *The Artful Mind: Cognitive Science and the Riddle of Human Creativity*, 2006; Nancy Etcoff, *Survival of the Prettiest: The Science of Beauty* (New York: Anchor Books, 2000); Ellen Dissanayake, "What Art Is and What It Does: An Overview of Contemporary Evolutionary Hypotheses," in *Evolutionary and Neurocognitive Approaches to Aesthetics, Creativity and the Arts*, 1st ed. (Amityville New York: Baywood Publishing, 2007); Wolfgang Welsch, "Animal Aesthetics," *Contemporary Aesthetics*, 2004. Karl Grammer et al., "Darwinian Aesthetics: Sexual Selection and the Biology of Beauty," *Biological Reviews*, 2003, 385–407; Ana Cristina Vélez Caicedo, *Homo Artisticus: Una Perspectiva Biológica-Evolutiva*, 1st ed. (Medellín: Universidad de Antioquia, 2008); Denis Dutton, *The Art Instinct: Beauty, Pleasure and Human Evolution* (Bloomsbury Press, 2009).
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- [15] Cyril Aydon, *Charles Darwin: The Naturalist Who Started a Scientific Revolution* (New York: Carroll & Graf, 2003), p. 286.
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- [23] Charles Darwin, *Origin of Species* (London: John Murray, 1876), p. 89.
- [24] Darwin, *Descent of Man, and Selection in Relation to Sex* p. 222.
- [25] Cf. Jerome H. Barkow, Leda Cosmides, and John Tooby, *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (Oxford University Press US, 1992).
- [26] Eva Jablonka and Marion J. Lamb, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life* (Cambridge: MIT Press, 2005).
- [27] Jerome H. Barkow, Leda Cosmides, and John Tooby, *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (Oxford University Press US, 1992), pp. 8-9.
- [28] Richard C. Lewontin et al., *Not in Our Genes: Biology, Ideology, and*

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[29] Jablonka and Lamb, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*, p. 286.

[30] Thornhill, "Darwinian Aesthetics Informs Traditional Aesthetics," p.13.

[31] *Ibid.*, p. 341.

[32] Peter J. Richerson and Robert Boyd, *Not by Genes Alone: How Culture Transformed Human Evolution* (University of Chicago Press, 2005), ch. 5.

[33] *Ibid.*, p. 13.

[34] *Ibid.*, pp. 27-31.

[35] *Ibid.*, pp. 210-211.

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