

CATHERINE WILSON

Another Darwinian Aesthetics

ABSTRACT

I offer a Darwinian perspective on the existence of aesthetic interests, tastes, preferences, and productions. It is distinguished from the approaches of Denis Dutton and Geoffrey Miller, drawing instead on Richard O. Prum's notion of biotic artworlds. The relevance of neuroaesthetics to the philosophy of art is defended.

Despite the bright sun, dew was still dripping from the chrysanthemums in the garden. On the bamboo fences and criss-cross hedges I saw tatters of spider webs; and where the threads were broken the raindrops hung on them like strings of white pearls. I was greatly moved and delighted. . . . Later I described to people how beautiful it all was. What most impressed me was that they were not at all impressed.

—Sei Shonagon (1991, 148)

. . . the most gorgeously coloured butterflies in the world. Fine specimens of the male are more than seven inches across the wings, which are velvety black and fiery orange, the latter colour replacing the green of the allied species. The beauty and brilliancy of this insect are indescribable, and none but a naturalist can understand the intense excitement I experienced when I at length captured it. On taking it out of my net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death. I had a headache the rest of the day, so great was the excitement produced by what will appear to most people a very inadequate cause.

—Alfred Russel Wallace ([1877] 2007, 257–258)

I. INTRODUCTION

Several themes important for the philosophy of art are touched upon in the two passages above: the

force of aesthetic experience; the impulse to try to share it with others; anxiety, embarrassment, or disappointment over the communicability of the experience; and the beauty of nature in form and color. There is, however, a difference between them: the beauty of a natural scene apparent to Sei Shonagon was produced by certain short-lived accidents of moisture and light, whereas the beauty apparent to Alfred Russel Wallace was produced by evolutionary forces over thousands or millions of years.

In his notebooks and in *The Descent of Man* of 1871, Charles Darwin brooded on the “taste for beauty” apparent across numerous taxa, wondered about its relationship to human artistry, and proposed that beauty in living nature was related to sexual selection, which he distinguished from natural selection. He had at least a passing acquaintance with eighteenth-century theories of the moral sense and the aesthetic sense, and he was puzzled, as Immanuel Kant had been, by the seemingly gratuitous beauty and variety of natural forms. He had come to believe that it could not be explained by reference to competition for food, liability to predation, or to other forces opposed to survival. Animals needed weapons and protective casings, but what, Darwin wondered, explained the beautiful convolutions of the shells of mollusks, the branching and coiling of antlers? What explained the acrobatic dances of birds, their songs, and their brilliant feathering? These

formations and performances seemed to use up a lot of energy, to limit mobility, and to make animals conspicuous to predators.

Noting that male birds tended to be more noisy, demonstrative, and brightly colored, he proposed that the females had shaped their appearance by responding to configurations they happened to like. Competition for a mate, he reasoned, could shape the appearance and behavior of organisms and account for features of sexual dimorphism that appeared to have no positive effect on viability. Darwin went on to ascribe the ornaments of some mammals and the different facial features of different ethnic groups to sexual selection, which he supposed to be chiefly exercised by females. The evolution of the male peacock's tail remained, however, the most celebrated example of this putative process.

Darwin's position was contested by the co-discoverer of natural selection, Alfred Russel Wallace. Wallace, for the reasons discussed below, found sexual selection implausible. Frivolous choice, he thought, could not have driven the course of evolution in a harsh world, and if females did seem to prefer the ornamented or beautiful animal, this could only be because they took his appearance to be a sign of underlying health and vigor. The controversy over the existence of purely aesthetic preferences in animals is still very much alive, and recently both Darwinian and Wallacean approaches to the study of aesthetic production and receptivity have been revived in books by Geoffrey Miller (2000), Denis Dutton (2009), and Stephen Davies (2012).

In this article, I investigate the relationship between ornament in living nature and the human practices of making and presenting beautiful objects and the responses of liking and wanting them. My aim is to show where the comparison is fruitful and where it is misleading in terms of biology and anthropology. I have called my approach "another Darwinian aesthetics" to distinguish it from the view that aesthetic experiences sometimes "[draw] us to more successful, fertile lifestyles" (Davies 2012, 46) or present for our enjoyment artistic reproductions of environmental features conducive to survival, such as edible flora or fauna, water sources, and good outlooks (Dutton 2009, 13–28). I also maintain a distance from claims about the origins of art that extrapolate too quickly from the case of the peacock's tail, a phenomenon that is in fact rather poorly understood.

These include Dutton's view that artistic productions are costly displays that attract according to the "handicap" principle and Miller's view that artistry is a male display feature that was selected for in the environment of early adaptation. Instead I follow and develop the view of the ornithologists Nancy Burley and Richard Szymanski (1998) and Richard Prum (2012, 2013) on biotic display and attempt to relate their schemes to human artistry.

Before getting into the details and aware that there is much skepticism about any appeals to evolution and neuroscience in connection with aesthetics, some general comments on this approach are in order.

II. PHILOSOPHY OF ART VERSUS AESTHETICS

Frequently it is said that naturalistic approaches to aesthetics fail to address the central questions of the discipline. "Art," says Alva Noë, "isn't really a phenomenon at all, not in the sense that photosynthesis or eyesight are phenomena that stand in need of explanation. Art is, rather, a mode of investigation, a style of research, into what we are" (2015, 59). "The trouble, finally, with evolutionary theories of art," he goes on to say, "is that they tend to be empty. They don't tell us why we make art or why art is valuable for us. . . . [T]hey don't get so far as even to say something substantial about art" (59). "Art affords revelation, transformation, reorganization" (62). It is not technology.¹

The view that art is, well, irreducibly artificial, not a biological phenomenon, goes back to G. W. F. Hegel. In his *Introductory Lectures on Aesthetics* of 1803, Hegel insisted on narrowing the field of aesthetics for his purposes from the science of sensation and feeling in general, a Kantian usage, to the science of human artistic productions. Although he did not exclude the decorative arts from the category of objects of aesthetics, including "the rude adornments of the savage [and] the splendour of the temple with its untold wealth of decoration" (2004, 5), his focus was on European painting, sculpture, music, and poetry and the beauty to be found therein.

What Hegel did especially intend to exclude in the *Lectures* was the beauty of nature. In common life, he said, "we are in the habit of speaking of a beautiful colour, a beautiful sky, a beautiful river, and moreover, of beautiful flowers, beautiful animals, and above all, of beautiful human beings"

(2004, 1). Perhaps these things were beautiful, but, he said, “the beauty of art is higher than the beauty of nature” (4). This was because art is the free production of a self-conscious intellectual being, a being with a mind, capable of perceiving the truth. The human imagination, the “free activity of fancy” outstrips the form building powers of nature (5). It liberates, he said, “the real import of appearances from the semblance and deception of this bad and fleeting world, and imparts to phenomenal semblances a higher reality, born of mind” (11). Fine art, like religion and philosophy, is “a mode of revealing to consciousness and bringing to utterance the Divine Nature” (7).

Hegel insisted that there had never been (implying that there never could be) a science of natural beauty. The science of nature was addressed to the useful, for example, to the medicinal properties of plants and minerals. By contrast, although fine art was associated with deception, with appearance, and with entertainment and diversion from the cares of life, seemingly rendering it unfit for scientific treatment, the *Lectures* would dispel that superficial impression. The science—in the German sense, a rigorous, systematic enquiry aiming at knowledge—of the aesthetic was henceforth to take fine art as its subject.

For all his praise of human freedom and human mentality, Hegel departed explicitly from Kant, whose philosophy of beauty was addressed to the beautiful in nature and the decorative arts, which often reproduced natural forms. Anticipating Darwin in this regard, he could see no survival-related function to many features of plants and animals. “Consider,” he said,

flowers, blossoms, even the shapes of entire plants, or consider the grace we see in the structure of various types of animals, which is unnecessary for their own use but is selected, as it were, for our taste. Consider above all the variety and harmonious combination of colours, so likeable and charming to our eyes (as in pheasants, [molluscs], insects, down to the commonest flowers): since these colors have to do merely with the surface and . . . have nothing to do with . . . [what] might be needed for these creatures’ inner purposes—it seems their sole purpose is to be beheld from the outside. (Kant, 1987; 5:347–348, §58)²

The existence of these features was profoundly puzzling to Kant because he could not bring himself to believe that either God or nature had in fact produced anything whose sole purpose was

to be looked at from the outside. Kant’s God was a moral idea of practical reason, and the building forces of nature, being “blind,” could not construct objects according to a design, either for utility or for beauty. He went round and round with this problem in the *Critique of Judgment* without really solving it.

The contemporary discipline of philosophy of art has followed Hegel’s lead against Kant’s. In Richard Wollheim’s *Art and Its Objects*, Hegel’s differentiation becomes an accusation: that Kant’s point of departure introduced confusion. Wollheim argued that what he called “uncontrived nature” could be regarded aesthetically only in a derived sense. He was definite on this point: “A serious distortion,” he says, “is introduced into many accounts of the aesthetic attitude by taking as central to it cases which are really peripheral or secondary,” including Kant’s rose or Edward Bullough’s fog at sea (Wollheim 1980, 96). He compared our taking such experiences as focal instances of the aesthetic attitude to “an attempt to explicate our understanding of language by reference to the experiences we might have in listening to a parrot ‘talking’” (97). He admitted that “once the aesthetic attitude has been established on the basis of objects produced under the concept of art, we can then extend it beyond this base,” and he gave as an example Paul Valéry’s meditations on the sea shell³ and, at the turn of the previous century, “a wholesale transfer of primitive artefacts from ethnographical collections . . . to museums of fine art, where, it was now thought, they were more appropriately located” (98). Where Hegel wanted to narrow the significance of a concept and so focus a field of enquiry, Wollheim began from the narrowed and focused concept and field and admitted to their contingent extension.

I have much sympathy for this perspective because there is plenty of anecdotal evidence that the “aesthetic attitude” adopted toward nature is stimulated and shaped by our early experiences with fine art. I will return to his claims in connection with the two quotations above later in the article. But first I will try to persuade you that nature nevertheless comes first in the order of analysis, if not the order of experience.

III. DARWIN ON BEAUTY AND DISPLAY

Kant’s question—why does nature produce beautiful-to-us superficial characteristics along

with useful-to-the-organism characteristics—was a problem for anyone who did not believe in a great designer and especially for anyone who believed that nature should ruthlessly eliminate the frail, fancy, and delicate in favor of the mighty, streamlined, and robust. Natural selection favors efficient metabolisms; resilient internal organs; and strength, cunning, and speed, and nowadays we would add, for some species at least, not only impulse inhibition, devoted child care, learning from errors, and avoidance of futility, but also curiosity and tenacity and all sorts of other survival-related bodily and mental traits.

Darwin realized nevertheless that survival was not enough. In order to pass on its characteristics to the next generation, the animal needed to charm a mate or to be charmed by one, and so beauty in looks, sounds, and behavior could be targets of selection by other sentient organisms. Being attractive to the other sex could well compensate for weakness along other parameters. Darwin (1987, 604) believed that consciousness was found far down the phylogenetic scale, extending to planaria, and he claimed to find precursors of the moral sense in group living animals. There was good reason to propose an aesthetic sense in animals as well. Females, he observed, have “acute powers of observation, and they seem to have some taste for the beautiful both in colour and sound. . . . [They] occasionally exhibit, from unknown causes, the strongest antipathies and preferences” (1879 [2004], 473).

So Darwin applied his belief in the proto-aesthetic sense and aesthetic selection to the problems of ornament and the formation of “races.” Convinced as he was of the continuity of humans and other animals, he had a priori reasons for believing that aesthetic liking was an independent motive for certain animal behavior.

The exercise of female choice in mating has since been sustained across a variety of species, including elephant seals, mice, fish, rats, gorillas, monkeys, and birds.⁴ Human females are normally successful in controlling the pacing and outcomes of courtship offered by males.⁵ Female control is usually said to follow from the greater parental investment and so cost of “mistakes” born by females and the greater variance in many male traits leaving more for selection to work on. What females choose is not, it should be noted, “the best male” but the one they like the best, and Darwin noted that they could be highly competitive in

going after that one. At the same time, different individuals, even in the same species, have different strategies for mate selection, ranging from accepting the first animal of the opposite sex encountered to sampling and rejecting a large array before settling on one, sometimes for no apparent reason. For both males and females there will be inhibitions and defenses against mating as well as affordances and incentives. Pursuit and choosiness can be a waste of time or dangerous and costly.⁶

Since Darwin’s time, sexual selection has been proposed as the driving force behind the coloration and diversity of the appearances of birds, reptiles, fish, insects, spiders, and mollusks. Animals do seem to be judging their prospective mates on the basis of their appearances, and they often seem to like exaggeration, symmetry, and novelty. Female mannikins (birds) in which both sexes are drab preferred to mate in experimental situations with males adorned with red feather, though males preferred unadorned females (Witte and Curio 1999). Snails appear to evaluate other snails before mating by crawling over their shells, and this has been proposed as the means by which the remarkable variety and elaboration of forms in these mollusks, hard to explain by selection for viability or fecundity, unless these variations really do succeed in confusing predators, has arisen.⁷ Female tarantulas reject males that have lost one of their leg tufts.

Sometimes, however, animals like averageness: a very deviant male might not be of the same species, resulting in infertile offspring and wasted investment.⁸ And when a popular trait becomes fixed, there is little for female choice to work on. Enormous controversy has arisen over the supposedly exemplary case of the peacock’s tail. After careful observation over eight years, a group of Japanese researchers found little variance among peacock tails and surmised that although male tail display was a part of mating behavior, female peahens were now at least making their choices on some other basis.⁹

As noted, Darwin’s view that female birds possessed “some taste for the beautiful” that had been a driving force in evolution was contested by Wallace. Wallace approved of Darwin’s scientific approach to natural beauty. “The bright and often gorgeous coloration of insect, bird, or flower, was either looked upon as having been created for the enjoyment of mankind,” he commented, “or as due to unknown and perhaps undiscoverable

laws of nature. . . . Darwin . . . showed, clearly, that some of the colours of animals are useful, some hurtful to them; and he believed that many of the most brilliant colours were developed by sexual choice” (Wallace 1889, 187).¹⁰ He went on to describe the importance of color in camouflage, mimicry, luring prey, and permitting the recognition of conspecifics. He agreed that “there seems to be a constant tendency in the male of most animals—but especially of birds and insects—to develop more and more intensity of colour, often culminating in brilliant metallic blues or greens or the most splendid iridescent hues” (273). But for all his own aesthetic sensitivity and dismissal of teleology, Wallace held to the view that the shapes and colors *we* admire in birds and other animals were just incidental effects of physical and chemical processes that produced color and pattern everywhere in the mineral, vegetable, and animal kingdoms. He rejected the notion that female choice of aesthetic qualities could really influence the size of a lineage when the other forces of natural selection in insects and birds were as rigorous as they were.

Color, Wallace argued, is selected against in females, not for in males, and this is because the female is more vulnerable. “Natural selection is constantly at work, preventing the female from acquiring these same tints, or modifying her colours in various directions to secure protection by assimilating her to her surroundings, or by producing mimicry of some protected form” (273). In species that are protected by their nasty tastes, he noted, drabness is not necessary. In some birds, including kingfishers, woodpeckers, toucans, parrots, and turacos, the females are as brilliantly colored and conspicuous as the males, which he explained as following from the fact that their nests completely conceal the incubating bird.

Wallace recognized that male birds display their plumage to best advantage and perform stunts (288), and, he agreed, “it may also be admitted, as highly probable, that the female is pleased or excited by the display” (285). But, he said, “it by no means follows that slight differences in the shape, pattern, or colours of the ornamental plumes are what lead a female to give the preference to one male over another; still less that all the females of a species, or the great majority of them, over a wide area of country, and for many successive generations, prefer exactly the same modification of the colour or ornament” (285). He offered the

analogy of a suitor who, “when courting, brushes or curls his hair, and has his moustache, beard, or whiskers in perfect order.” This pleases his girlfriend, but she does not choose him on that basis (286). Further, he continued, “we cannot conclude . . . that the whole series of male costumes, from the brilliantly coloured, puffed, and slashed doublet and hose of the Elizabethan period, through the gorgeous coats, long waistcoats, and pigtailed of the early Georgian era, down to the funereal dress-suit of the present day, are the direct result of female preference” (286). Natural selection was too harsh and rigorous a process to allow the frivolity of aesthetic preference to have any significant role in influencing the direction of evolution (295).

Wallace’s arguments were reasonable. They were based in part on a selection of Darwin’s own observations and included the following:

1. Displays often occur after the pair has bonded, so they cannot function as selection criteria.
2. Females (in the henyard anyway) prefer “the most vigorous, defiant, and mettlesome male,” not the prettiest (Wallace 1889, 286).
3. The “surplus of strength, vitality, and growth-power” in males is sufficient explanation of their ornaments and of the seeming correlation between ornament and preferences (293).
4. The female’s perceptual apparatus is not sharp enough to “cause her to choose her mate on account of minute differences in their forms, colours, or patterns” (294).
5. Acting on aesthetic preferences implies making a voluntary choice beyond being stimulated and excited, and this is beyond the capacity of the animal mind. “We have, thus, no reason for imputing to her any of those aesthetic emotions which are excited in us, by the beauty of form, colour, and pattern of these plumes” (294).¹¹
6. Partner choice often appears to be arbitrary or to select seemingly unattractive individuals. Wallace had been assured that moths choose their mates pretty much at random, and he cited Darwin’s anecdote of some peahens who had a strong liking for an “old pied peacock” (285).

Unlike some of his contemporaries, Wallace did not deny that females exercised choice or argue on the basis of some supposed Victorian notion of natural female passivity. As an opponent of

eugenics, he advocated more female empowerment, more free choice for women who needed to be unconstrained by economic and social needs. But those choices, he thought, not only should be, but would be directed to morally worthy qualities rather than superficial appearances. Unlike Darwin, who was probably a materialist, Wallace believed that there had been a second “act of creation, a giving to man, when he had emerged from his ape-like ancestry, of a spirit or a soul. Nothing in evolution can account for the soul of man. The difference between man and the other animals is unbridgeable.”¹²

A very popular contemporary view about the evolution of beauty goes under the headings of honest signaling and handicap theory and reflects Wallacean rather than Darwinian assumptions.¹³ The idea is that the healthiest, most robust organisms, unmenaced by too many life-draining parasites, can produce elaborate and highly symmetrical, hence beautiful, structures and dances. An animal that does so advertises its underlying vigor and its ability to have survived the encumbrances of fancy tails or heavy antlers. The male bowerbird, on the honest signaling/handicap view, is indicating that he is a healthy bird with surplus resources. He can spend time collecting material for the bower and arranging it, rather than needing, for example, to eat or escape predators. The female bowerbirds are selecting “good (nonaesthetic) genes.”

By contrast, Darwin’s view was that a trait could be preserved or enhanced simply because prospective mates had a taste for it. The male trait did not need to signal anything except “Look at me! . . . I am available.” The female preference for it did not need to indicate “I see you have a good metabolism and have the sensory acuity and speed to have escaped predators so far,” but only “Nice! . . . OK.”

But why does the trait persist and get enhanced unless it is heritable to some degree, of some benefit to the possessor of the display trait, and at least neutral and possibly advantageous to the organism that has a taste for it? The potential benefits to the female of exercising taste are twofold. First, her mate search is terminated when another animal impresses her sufficiently and she can get on with reproduction. The search for food and a mate requires “stop” signals, lest we go on interminably looking for something better. Second, her female

offspring may inherit her tastes and be similarly decisive, and her male offspring may inherit the display trait and be attractive to other females. Ronald Fisher (1930) confirmed Darwin’s supposition that a heritable trait with no positive correlation to male viability could become exaggerated and widespread. Darwin appears to have been correct in his supposition that natural and sexual selection could be in competition.¹⁴

To summarize, light and matter, as Wallace insisted, can produce striking color effects and symmetrical and interesting shapes, including those of our internal organs. Many beautiful forms have no evolutionary significance, including those of snowflakes, sunsets, waterfalls, the shapes of crystals, diatoms, and viruses. And many forms of no particular beauty, such as that of the human heart, have been shaped by evolutionary forces that do not depend on the existence of sensory systems. But beautiful forms arising in plants and animals that are noticed by other organisms form a subset of those of beautiful nature. Dragonflies evolved by degrees to look the way they do because of the effect their appearance had on members of their own or other species, whereas crystals, diatoms, and viruses did not. Bees and other pollinating insects like the appearances and scents of flowers. At issue in the case of animals is only whether females (or pollinating insects) infer viability (or nutritional quality) from prodigious display or the alleged “handicap” of ornament, or whether they are, at least sometimes, impressed by the beautiful on its own account. In the latter case, beauty may even compensate for genetic weaknesses that impair viability or, in animal species that engage in paternal care, behavioral tendencies that reduce such benefits to the female.¹⁵

Establishing that some particular characteristic was or remains, historically, a target of sexual selection is technically an impossible task; we are always dealing with likelihoods. The trait in question has to be uncorrelated with other candidate traits that could have been the targets; it has to have been present in nature, to be heritable, and to be effective in promoting mating. Some traits that females prefer in experimental situations are not present in nature, or they are not effective in promoting mating; males with the trait may be no more reproductively successful despite the females’ preference for it.¹⁶

IV. BIOTIC DISPLAY: PRUM ON BIOTIC ARTWORLDS

The most prominent modern advocate of the minority, Darwinian view is the ornithologist Richard Prum. Prum, who has studied ornament and feathering in dinosaurs, believes not only that sexual selection based on pure preference accounts for the beauty and diversity of birds, insects, snakes, and reptiles, but that it is appropriate to speak of “artworlds,” like those proposed for human societies by Arthur Danto (1964), as widespread in nature and composed of participants in the process of “aesthetic expression, evaluation, judgement and change” (Prum 2013, 813). “Every time you find co-evolution between advertisement or expression and evaluation,” Prum says, “then I propose that you have art. And that means that flowers are art, most of them; and that birdsong is art; and lots of aspects of bird plumage are art. And crickets chirping” (quoted in Shufro 2011). The sensory systems of other vertebrates in particular are “elaborate and integrated” and so broadly similar to ours that “there is no biological reason to assume that non-human organisms lack the sensory capacity for aesthetic experience” (Prum 2013, 814).

We can accordingly think of plants, as well as nonhuman animals, as “attempting” to exploit the sensory systems and behavioral responses of animals and as “experimenting” by unconsciously, unintentionally evolving appearances such as the various shapes and colors of flowers, which lure pollinating insects, or stripes or shadings, which hide an animal from parasites or prey, or the warning coloration of certain snakes or toadstools, or the skunk. The sensory, emotional, and behavioral systems of animals are experimenting as well. They try out sensory presentations of a world to discover which works best, which tastes and preferences and responses to the presented world are keeping them—that is to say their lineages—going. As Prum points out, flowers do not converge on a single “optimal” form and odor that “elicit[s] apian foraging response with the greatest efficiency” (2013, 815–816). By contrast, roots do not partake of biotic display. They are simply optimized for collection and transport of water in ambient soils and do not show the same variation.

Darwin’s view, Prum argues, should be considered the “null hypothesis.” We cannot prove that females who seem to be making purely aesthetic choices are not responding to indicators

of nonaesthetic “good genes.” But, he points out, “honest signaling” of vigor and character is liable to subversion by dishonest signaling, and in any case, why assume that all choice is directed to viability as a methodological principle? We have ample evidence that animals’ sensory organs prefer and are attracted to as well as being repulsed by and disliking the visual appearances, tastes, and smells and sounds of other animals of their own and other species, plants, and fungi. There are forms whose origin and continuing existence depends on the fact that they can provoke a rewarding visual, tactile, odorific, or other sensory response in another organism, encouraging interaction with it, on account of the effects on its nervous system.¹⁷ They belong to a “marketplace of animal sensory experiences and choices” in which animals can “evaluate, differentiate, and remember” (Prum 2013, 816). Fine art in the human world, according to Prum, involves the same schema of invention, expression, evaluation, judgment, and patterns of stability and change. The aesthetic goodness of good art objects is a feature of coordinated presentations and preferences that are under human control and reflect cultural forces such as education.

The bioworld presents us with coordinated pairs of signalers and evaluators. The signalers sometimes try out new displays, some of which flop, some of which succeed. They disguise from, warn, repel, or attract targeted others. There is coordination: the bee gets nectar, the flower gets pollinated, the dragonfly gets a mate, the snake and the mushroom are unmolested. There is also victimization through the exploitation of the target’s sensory systems: the fly gets eaten by the Venus Flytrap, and the gazelle doesn’t see the tiger in the tall grass. The most sweetly singing bird gets a chance to pass on some “bad genes.” Old-fashioned novels tell us that a woman can be “ruined” by a handsome rake with disastrous consequences for her reproductive success.

If coordination between appearances and preferences has been achieved, why do tastes and appearances change? Plasticity underwrites the ability of organisms to cope with changing environments, and female preferences may reflect changing criteria of mate quality following environmental alterations.¹⁸ But evolving a new display trait might provoke a favorable reaction just by happening to push another animal’s buttons. Evolving a new taste can get you a

mate that all your competitors have fortunately overlooked or just get you to settle down and make some choice or other.¹⁹

What then *is* beauty on such an account? A possible answer is this: it is the quality of an object that makes its audience want to gaze on it or to hear it, follow it, sniff it, run its hands over it, possess it to the natural point of satiation. Eventually, the neurotransmitters are depleted, we are bored or conscious of duty awaiting, or its possession has become indifferent to us. In the case of a pretty pebble this can happen fast. We want to be “near” the sources of these experiences, sometimes to be their producers or to copy them and where possible to secure the objects to have access to this pleasurable stimulation, anticipating that they will be a joy forever. Beauty, I suggested earlier, is what makes us halt: beauty floors you: you stand there rooted to the spot. “I never wanted it to end,” people say. “I couldn’t take my eyes off him.” “I could have gone on looking at that picture forever.”

But why do *we* like the peacock’s tail, or the rose, or the mollusk’s shell when its advertisement is not directed at us? Why the near universal human liking, Kant’s point of departure, for feathers, shells, flowers, sunsets, gemstones, fireworks, and so on? Our nervous systems must have enough in common with those of birds, bees, and perhaps even snails that certain formations, such as symmetrical or fractal structures, are both easy for nature to make and easy for animals, whose nervous systems are equally constructed by nature, to like. Dutton denies that these objects work on our nervous systems as a recreational drug does. Painting, he says, is not “a pill that alters brain chemistry and gives us ‘beautiful landscape’ feelings” (2009, 101). But why not? Hallucinogenic drugs and other altered states of consciousness, as Aldous Huxley argued, give us powerful experiences of beauty simply by releasing and inhibiting neurotransmitters.²⁰

It may be objected, in a Hegelian spirit, that art involves ideas and links us to history, the human life cycle, and our practices and emotions in a sophisticated and even transformative way, and that natural beauty can never possess this special kind of “aesthetic significance.” Connoisseurship in the human artworld can enthusiastically attach to things like the Venus of Willendorf or the paintings of Francis Bacon whose aesthetic significance is remote from that of birds and flowers. I will return to this question after evaluating

the other Darwinian theory, that of Miller and Dutton.

V. MILLER AND DUTTON

Prum’s artworlds are inhabited by birds, lizards, fish, butterflies and insects, not our nearest nonhuman ancestors. Darwin supposed, however, that apes might be impressed by, as he put it, “the beauty of the coloured skin and fur of their partners in marriage” (Darwin [1879] 2004, 150). The facial features of some apes and monkeys are believed to have been shaped by female choice, and the sexual swellings of female chimpanzees may for all we know be perceived as beautiful, not just as informational. Nevertheless, ornamentation does not seem to have been pushed to extremes in our nearest primate relatives. Individuals are evaluated and selected as mates for their status, their age, their familiarity, and their novelty, but there is no evidence that their beauty is noticed and responded to, nor that beautification is under deliberate control as it is in bowerbirds. Where we might take human morality to be an embellished, developed, corrected form of primate protomoral behavior, we have no basis for taking human aesthetic behavior to be an embellished, developed, corrected form of primate protoaesthetic behavior.

Dutton, for his part, insisted that art had to be considered as an exclusively human production: “Animals construct stunning objects and put on spectacular performances” (2009, 99). Nevertheless, he says, they “do not create art.” Art, he maintains, requires intention and control over a formative process and an ongoing interest in the products. When animals are interested in the product of a formative process, as in the case of plumage, it was not created intentionally, and when the product is created intentionally, like the paintings of chimpanzees and elephants, he rightly observes, they are not interested in it. This leads him to propose the appearance of an “art instinct,” a trait that emerges *de novo* in the human phenotype.

But why suppose we are dealing with an instinct, to use this somewhat quaint term, at all? Well, art is ubiquitous: all human societies engage in manufacture and decoration. Furless, featherless humans with their broad chests and frontal postures, display themselves with face-painting, hairstyles, tattoos, jewelry, and clothing,

and it is difficult not to see this as behavior intended to attract as well as to serve other functions such as intimidating others or affirming group identity. Darwin wrote to Wallace *a propos* of his book on the Malay Archipelago in March 1869,

In Vol. II., p. 255, you speak of male savages ornamenting themselves more than the women, of which I have heard before; now, have you any notion whether they do this to please themselves, or to excite the admiration of their fellow-men, or to please the women, or, as is perhaps probable, from all three motives? (Marchant 1916, 1:237)

Unfortunately this letter was not answered, or else the reply has been lost. In 2000, Miller's book *The Mating Mind* proposed an answer that made a strong impression on Dutton. Artistic production, Miller argued, is a form of "creative intelligence" that was selected for in human males by human females in the Environment of Early Adaptation.

This idea is not absurd. In 1982, Richard Dawkins introduced the term "extended phenotype" to include animal behaviors and productions that are heritable with variation and so involve a genetic component. This concept allows us to consider as part of our "animal" not just its body, but the structures it builds, such as nests, burrows, and dams, its behavioral dispositions and habits, and its vocalizations. The nest of the bowerbird on this view is as much a part of the animal as the shell of the snail secreted from its mantle. The concept of the extended phenotype opens the door to treating human artifacts, not only species-specific tools and weapons such as digging sticks, arrows, and spears, which can be seen as versions of claws, horns, teeth, and beaks, but indeed a variety of other objects that humans use to gather, cook, or to raise their young, such as baskets, pots and slings, as parts of the phenotype. The inclination and ability to produce them can be considered to belong to the phenotype as well.

But how was the selection process envisioned by Miller supposed to work and what is the evidence cited for it?

Miller agrees with the majority of students of human evolution that the human brain—roughly three times the size of the chimpanzee brain—could not have evolved for foraging, hunting, predator avoidance, and infant care, for other primates accomplish these tasks with their smaller ones. Rather, he thinks, the brain evolved to display an ornament—the mind. The human mind's

most impressive abilities—linguistic ability, wit, insightfulness, and artistic competence—he argues, are "courtship tools, evolved to attract and entertain sexual partners" (Miller 2001, 4).

Mentality, for Miller, evolved as a male display feature, analogous to the peacock's tail, with witty, insightful, and artistic men preferred as mates. Because of genetic correlation between the sexes, women's brains got to be almost as big and their general intelligence and their aesthetic aptitude just as great. Yet, Miller says,

Sexual selection theory would predict sexual dimorphism in the public behavioral manifestations of intelligence, because the reproductive benefits of such displays would always be higher for males than for females given some degree of polygyny. . . . Demographic data on the production of costly, difficult, public displays of intelligence, such as painting pictures, writing novels, producing jazz albums, and publishing philosophical speculations, reveals a very strong dimorphism, with males producing about ten times more displays than females, and male display rates peaking in early sexual maturity. (2000, 268; compare 2001, 82–83)

For Miller, such displays unleash true "Fisherian" selection: their precursors must have aroused attraction that rapidly exaggerated the trait collection of "creative intelligence" including artistic competence and performance.

Dutton follows this approach in the *Art Instinct*. "With human beings," he says, "sexual selection explains some of the most creative and flamboyant aspects of human personality, including the most gaudy, profligate and show-off characteristics of artistic expression. . . . Adding sexual selection to natural selection, we begin at last to see the possibility for a complete theory of the origin of the arts" (2009, 5, 152). He then adds some Wallacean elements to Miller's more authentically Darwinian approach.

Dutton takes beauty to be an indicator of health and "high quality genes" (2009, 137, 156), and he believes the same of language use: that it is an honest signal of intelligence and capability contributing to viability (152). He cites examples of human males displaying ornaments to females or bringing them pretty gifts to encourage them to have sex. And he introduces handicap theory to argue that artistic objects achieve their effects in virtue of being "among the most opulent, extravagant, glittering, and profligate creations of the human

mind" (136). They squander "brain power, physical effort, time, and precious resources" (136).

These views should be considered without prejudice. Maybe there is an art instinct, and its anatomical and physiological basis was implanted in the human genome by the sexual selection of men by women in the Environment of Early Adaptation. The appeal of the Miller–Dutton theory is that it regards not only the human body as a target of preference and selection, but also the mind. It links human self-decoration and hair-dressing to animal plumage and grooming and the impulse to build and adorn to such exercises as nest and bower building. Further, it explains why, despite being past prime reproductive age, alcoholic, unhealthy, and mean, high-achieving novelists, poets, and musicians subject to addictions, malnutrition, and vehicular accidents can attract young, beautiful, intelligent women: either the handicap principle is kicking in, indicating those "good genes," or women's liking for creative intelligence trumps all indicators of low paternal interest and competence.

However, in trying to estimate the likelihood of this account, we need to consider not only what phenomena it could explain, but what phenomena it explains better than competitor theories and what would have to be the case for the processes envisioned to work. Male humans *use* their collections of etchings and swapped YouTube videos, declare their liking for museums, and choose restaurants to impress and seduce others. Sometimes it works; other times it does not. But the use of self-made and otherwise assembled aesthetic objects can be equally well explained by the presence of an incidental "taste for beauty" in both sexes, and a competence in manufacturing and decorating in both that are accidental effects, "spandrels,"²¹ of good eyesight, fine eye-hand coordination, and a large brain along with cultural development innovations that allowed for leisure time.

Dutton criticizes the "spandrel" view he ascribes to Stephen Pinker at many points in *The Art Instinct*. But what would have to be the case for the "art instinct" to be a trait that was a target of sexual selection by females in the Environment of Early Adaptation? First, it would have to be the case that some male humans had more artistic talent and more propensity to display it than others in human prehistory. Second, these qualities would have had to be heritable to a significant extent. Third, females would have had to prefer artistic

males as mates for these qualities, not on account of some qualities associated with them. Fourth, the preferences would have had to be effective in determining mating success and the number of offspring.

The satisfaction of the first condition could perhaps be investigated by means of tests on untutored children to see whether some boys had a better sense of form, color, and design or more musicality than others persisting into adulthood and a greater interest in using or showing off their abilities. If this turned out to be the case, an effort could be made to disaggregate artistic talent from other potentially attractive psychological qualities. If the effort was successful, a longitudinal study on successive generations of untutored children could be performed to determine whether artistic talent was heritable. Next, we could investigate, perhaps by means of fictional "dating profiles" with samples of the candidate's "work," whether human females have a preference for more artistic males, other qualities being equal, or even in case their other qualities, including looks, generosity and helpfulness, and analytical abilities, are inferior to those of less artistic males. Fourth, if such a preference turned out to exist, we would need to establish that, in the Environment of Early Adaptation it was likely effective in generating larger families for artistic versus nonartistic men.

It is possible that the positive results could be obtained for artistry and a disposition to show off, for its heritability, and for its attractiveness to women. However, humans do not choose their mates as birds, lizards, fish, and spiders do, and establishing the possible effectiveness of a preference for artistry in the Environment of Early Adaptation presents certain difficulties. In the human case, arranged "monogamous" marriage with exchange of women between groups appears to date back at least 50,000 years²² where, judging by the practices of modern hunter–gatherers, it was based on criteria of kinship, alliance building, and status. Perhaps Pleistocene elders were impressed by artistic abilities, or the principals were and had a strong say in these matters, but the Wallacean impulse to say that such frivolous criteria would not have been likely to be employed or would have been swamped by other criteria of suitability is strong here.²³

The sole piece of evidence that Miller actually presents to support the claim for the evolution

of artistry via sexual selection is that the professional involvement of men in the contemporary artworld is greater than that of women and peaks in the peak sexually competitive years. This is not high quality evidence for an evolutionary process beginning in the late Pleistocene. Further, aesthetic practices get allocated between the sexes and have probably been allocated for a very long time. In hunter-gatherer and nomadic societies, in which artistry consists in the manufacture of garments, rugs and wraps, body art, the decoration of pots and weapons, there is no evidence of male domination of artistry across cultures. This domination only emerges with civilization, professionalization, and the restriction of training and occupations to women. Miller means something very specific by “display”; it does not include setting the table or arranging the furniture or choosing clothing for the family. If males do more artistic displaying in his sense, it is no wonder because public performance to crowds of all sorts is more typically engaged in by men than by women.

In a condition of economic dependency and restrictions, women use aesthetic competence and performance nonprofessionally for forming and maintaining mating relationships. Young Victorian women displayed their drawing, embroidery, piano, and other accomplishments. Nowadays much “traditional” female aesthetic activity, such as picking out birthday cards or decorating the home or cakes, or devoting time and resources to innovating and upgrading clothing, accessories, perfumes, and hairdos, looks like ‘mating mind’ activity intended to attract suitors or to cultivate relationships. If Miller had focused on these phenomena rather than income-producing artistic productions, he would have had to run his argument the other way. The inference would then be that present behavior indicates that in the Pleistocene women were using artistic competence to attract and retain mates and that some were more successful at this than others. Where Dutton’s handicap theory is concerned, female aestheticism in the choice and application of clothing, makeup, accessories, and so on is extremely costly and time-consuming as well.

Miller sometimes writes as though “creative intelligence,” a more general quality than artistic talent but including it, was the target of sexual selection. The argument that *mentality* was both attractive to females in the Environment of Early Adaptation and effective in bringing about mat-

ing success is not implausible. It would be easier to show that a basket of capabilities—wit, artistry, verbal fluency, insight—are preferred to their absence, are heritable to some extent, are independent of many physical traits, and would have been perceived as good-making features by Pleistocene elders. In that case the sexual selection hypothesis would be a contender for the explanation of the big brain along with hypotheses that invoke other evolutionary mechanisms.²⁴

VI. HUMAN ARTWORLDS

The evolutionary theories of Dutton and Miller focus on the production of art, not the liking for it. But this is backward. Logically, the taste for beauty must precede the appearance of beauty, which then exploits it. Otherwise all display would be for nothing. Beauty is not beauty if it does not trigger the liking and wanting response. And in the human case, taste—the ability to judge and correct one’s own efforts—must arise simultaneously with manufacture and performance because artistry, unlike plumage and coloration, is under voluntary control.

The favored explanation for the “taste for beauty” at present is “sensory bias,” which implies that “the sensory system of any species will be pre-adapted to perceive some not yet evolved stimulus in a particular way” (Burley 1985, 31). “Aesthetic preferences,” Burley and Szymanski claim, “are emergent properties of the central nervous system and sensory systems that originated incidentally, not through active selection on mate preferences” (1998, 793). They have been inherited and not extinguished because they make a contribution to searching for food or building nests or doing other survival- and reproduction-related tasks. Thus, animals contain “reservoirs” of latent preferences that become operational only when some innovation happens along to exploit them.

This explanation illuminates Kant’s notion that the aesthetic attitude is “devoid of all interest” (5:204 §2). Although he conceded that we “linger” over both the beautiful and the “charming” (5:222, §12), where the latter produces a more interested kind of pleasure, Kant distinguished between the good form of a horse, church, palace, man, woman, or child—objects he thought of as being “good for” something (5:230, §16)—and the beauty of the rose or the seashell. In aesthetic experience, it seems, cerebral mechanisms are accidentally

triggered by sensory presentations having in many cases nothing to do with survival and reproduction, yet triggering the liking and wanting responses. What we want from the beautiful object is to *experience* it where “experiencing” can be distinguished from using.²⁵

Recognizing that aesthetic taste precedes production, we can account for the cultural phenomena Miller and Dutton describe without introducing gratuitous hypotheses. Tastes were latently there, and human beings, with all their ingenuity and dexterity, then discovered how to tap into them for personal gratification and social rewards. Chance inventions—the cooking of food, metalworking, horticulture and agriculture, omnivorousness—left these big brained, dexterous people with plenty of time on their hands. Once they had acquired certain technologies and leisure, humans moved on from decorating themselves to decorating pots, weaving, featherwork, metal jewelry, later architecture, tiling, and wall painting. So-called primitive art replicates the building forces of nature in its vegetable and geometrical forms and, where pigments are available, bright coloration.

These patterns and colors create arousal, attention, absorption, and pleasure because they are fitted to the human nervous system, which makes use of an underlying geometry for the interpretation of the visible world. ‘Artisan’ became a special occupational category in ancient urban civilizations, and experimentation and cultural exchange resulted in people happening on new ways to make new things and discovering by trial and error how to unlock responses in human minds that include the aesthetic shivers, feelings of being taken into the work, feelings of transcendence, and loss of the normal sense of self that characterize the experience of fine art.

If metals had higher melting points than they do, if animals had proved impossible to domesticate, there would not be wealth and poverty, slavery, money, and means of transport other than walking. There would be no fine art. But there probably would have been and would still be clothing, jewelry, face and body painting, and hairdressing as biotic advertisement expressing clan identity as well as mate eligibility. There is a universal human insistence on doing something considered artistic or aesthetically improving—“making it special,” as Ellen Dissanayake (1992, 39–63) says—with hair, face, and body. Tattooing, scar-

ification, jewelry, hairdressing and headgear, genital cutting, to the point of what we consider mutilation, all indicate the human reluctance to leave well enough alone. It would be interesting to learn whether a group of children abandoned on a desert island but provided with the means of survival would discover the arts of personal adornment and develop the same liking for flowers, birds, and shells that Kant thought entirely spontaneous and untutored. Perhaps they might copy nature, as the ancient Epicureans thought, learning weaving from spiders and singing from birds. Andrew Strathearn reports that members of the Melpa tribe of Papua New Guinea contrive their costumes, dances, and songs to imitate the bird of paradise (2013, 304–305).

The concept of the extended phenotype, so illuminating in some respects, can be taken too far. Are skyscrapers and theater tickets—elements of the human extended phenotype—providing protection from the sometimes lethal elements and helping to induce mating behavior? If the underlying capabilities and interests that lead people to make and use these things were not heritable, one might argue, they would not appear in successive generations. They are optional, comes the reply: our species has done and can do without. But under some conditions animals can do without their customary nests, burrows, and dams too. I see no way of drawing a sharp line between the extended phenotype and its contingent products, but for the arguments of Miller and Dutton about sexual selection to work, artistic productions of human beings will need to be more like feathers and less like theater tickets.

To conclude this section, the “art instinct,” if by this term we mean the almost universal motivation to create order, beauty, and other forms of aesthetic significance, certainly exists. That artistic competence as an isolatable trait arose through sexual selection on males is, however, unsubstantiated, and there is reason to doubt that conditions in the Environment of Early Adaptation would have promoted its fixation.

To sum up the argument so far, the theory of sexual selection, together with the hypothesis of sensory bias and its liability to exploitation, can illuminate the concept of beauty. Together they offer the best solution so far proposed to Kant’s riddle of the beautiful in nature. The question remains how we might understand human artistry and its evaluation as related to biotic display and

evaluation more generally if the Miller–Dutton hypothesis is rejected as improbable.

Here is a proposal: as certain human practices and institutions such as the building of dams or the domestication of other species are intention-driven copies of behavior that has been selected for in beavers and ants, so human artistry and evaluation are intention-driven copies of behavior that was selected for in insects, reptiles, birds, and some mammals. By taking this perspective we preserve the valuable concept of a community of producers and evaluators whose production of new traits and acquisition of new tastes explains the appearance, maintenance, and change of art objects.

The institutional artworld that ever since Hegel has been the object of most aesthetic discourse in philosophy represents only a small portion of human artistry. In other fields, it is recognised that adornment and decoration perform important social functions. Human styling could and still can signal class, rank, religious identification (veils, turbans), invulnerability (armor), danger (swords), priestliness, occupation (uniforms), and marital status (rings or bound hair or shaved heads). It can mark ceremonial holidays, as Christmas sweaters do, or just express attitudes to life, as Goth makeup or motorcycle gear may. Large-scale artistry can intimidate as well as excite admiration, as it does in palaces and cathedrals. Whenever and wherever a presentation is meant to arouse, please, and attract, and there is a possibility that it does not in fact do so because of the tastes of the observer, it has been presented for aesthetic judgment.

Evaluators come to human manufactured works biased by their internal wiring, sensory acuity, and emotional dispositions and greatly affected by their previous experience and cultural learning. The concept of ‘beauty’ no longer seems strictly and literally to apply to certain objects of cultural approbation. Duchamp’s fountain, the paintings of Francis Bacon, and some ethnographic art fall into this category. They nevertheless attract and hold the gaze and arouse the desire in collectors to possess them. They tap into emotional and cognitive systems designed for real life, including humor, disgust, horror, and fear. Human-made art is experienced as “transformative” when emotional arousal creates the impression that something of significance is happening and there is something to be learned from these new appearances. The survival value

of the unbeautiful as objects of esteem in the distant future may, however, not be as great as those objects with less culturally specific appeal. If toilets are no longer in use in the twenty-second century, no one except a few historians will find *Fountain* interesting. As in nonhuman aesthetic evolution, which can be rapid, as morphology and preferences in a population shift,²⁶ there is coevolution of observers’ appreciation and producers’ innovations: the taste of critics and purchasers encourages certain forms, and certain innovative forms succeed in getting themselves liked, so that new preferences emerge from latency and spread through the population.

Meanwhile, the judgments of the connoisseur class are “better” than those of the average lay person because they are based on a wider class of comparisons, harsher scrutiny, and supported by articulable “reasons.” But the notion that beauty is an objective feature of some objects arises from the conflation or commingling of two valid observations: first, that there is virtually universal liking for some forms of biotic display and certain light and color effects, and, second, that there can be a great deal of convergence in the connoisseur classes. But where fine art is concerned, even experienced critics with articulable reasons on their side can faultlessly disagree.

Both males and females are deliberate producers and evaluators of aesthetically significant objects and arrangements. But in civilization, with the division of labor, the emergence of a special class of trained artists, and an “institutional” human artworld with its competitions, fees, and prizes and devoted connoisseurs, critics, and collectors, the distinction between active presenters and choosy evaluators reappears. In the extreme case of modern gallery art, there is little overlap between the two classes, and the sexual distinction reappears as well, prompting the Dutton–Miller observations and hypotheses, but in fact reflecting no more than the age old exclusion of women in conditions of civilization from the lucrative and honorable professions.

VII. THE PRIORITY OF CULTURE IN HUMAN AESTHETIC EXPERIENCE

In closing, I return to the issue of priority in nature and culture. Although I took issue with Wollheim’s claim that beauty in nature and the explanation of beauty in nature is derivative rather

than the ground of all aesthetic appreciation, evaluation, and explanation, there is something right about it that emerges in the contrast between Sei Shonagon's description of her experience and Alfred Russel Wallace's description of his.

The Lady Shonagon belonged to a court culture that, with an abundance of leisure and no real work, paid meticulous attention to costumes, poetic and epistolary expression, and the exchange of gifts. The phenomenon she describes of a spider web hung with drops of dew is probably not an example of biotic display, though the chrysanthemums she mentions are, and in her word portrait, the spider webs are tattered, the flowers are dripping, the scene itself has a certain elegiac mood and could not qualify as a display that could have been an object of selection. Further, in the absence of considerable practice in adorning, arranging, and judging, the scene would probably not have been noticed or evaluated by a human being. Sei Shonagon is always on the lookout for the visually charming. So is Wallace, although he is responding to a biotic display that was shaped by evolutionary forces. In other contexts having to do with the appreciation of landscape, he appears to draw on his experiences with fine art in responding to nature. In his description of the Malay Archipelago, he evinces his familiarity with other travelogs and illustrations and refers to scenes frequently as "picturesque."²⁷ Even in his description of the dragonfly, the term 'velvet' (other writers on insect coloration are apt to reach for terms like 'jewel-like') imports a term from the "higher" arts.

The experiences and resulting descriptions of beautiful nature in the quoted passages are strongly influenced by existing cultural traditions of making, noticing, and describing and are unthinkable in the absence of such traditions. But it was never my intention to question that. My aim was simply to understand fine art as an especially deliberate and conscious form of display implying coordination between a producer and an evaluator—who in the human case may even be the same organism—that in a wide variety of contexts in the bioworld operates unconsciously but effectively.

CATHERINE WILSON

Department of Philosophy, University of York,
York YO10 5DD, United Kingdom

INTERNET: catherine.wilson@york.ac.uk

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1. Stephen Davies criticizes Ellen Dissanayake (1992): "Dissanayake ditches the greater part of art's artiness and intellectual value. And she becomes vulnerable to the charge she makes against other anthropologists and evolutionary psychologists: that they deal with . . . precursors or ingredients of art and the aesthetic rather than with the developed behaviour" (Davies 2012, 131–132). For a contrary view, see below, Section 6.

2. All references to Kant's *Critique of Judgment* will be to volume 5 and page number(s) and section number of the Akademie Ausgabe (Kant 1900–), for example (5:265, §29). Translations will follow Kant (1987).

3. Paul Valéry (1977; originally published 1936).

4. This list compiled by Moore (1998, 201).

5. See Moore (1998).

6. See Jennions and Petrie (1997).

7. See Schilthuizen (2003).

8. Though Darwin cited several instances of "tamed or domestic birds, belonging to distinct species, which have become absolutely fascinated with each other" and gone on to breed (1879 [2004], 466).

9. "Combined with previous results, our findings indicate that the peacock's train (1) is not the universal target of female choice, (2) shows small variance among males across populations and (3) based on current physiological knowledge, does not appear to reliably reflect the male condition" (Takahashi et al. 2008, 1209). See also Hagelin and Ligon (2001). But see note 16: preferences may exist without being effective.

10. The debate and its influence are extensively analyzed by Cronin (1991, 113–243).

11. Darwin wrote in a letter of August 31, 1877, to Wallace on his chapter, "By the way, I doubt whether the term voluntary in relation to sexual selection ought to be employed: when a man is fascinated by a pretty girl it can hardly be called voluntary, and I suppose that female animals are charmed or excited in nearly the same manner by the gaudy males" (Marchant 1916, 1:299).

12. Quoted by Davis (1911, 420). Davis's indignant editorial in the *Humanitarian Review* quotes Wallace from an article written for the *World Magazine*.

13. For example, Zahavi (1975), and Hamilton and Zuk (1982).

14. See Morrow and Pitcher (2003).

15. This possibility—for the human case—is frequently explored in literature. For example, the case of Burgo Fitzgerald and Lady Glencora in Anthony Trollope's *Can You Forgive Her?* Female susceptibility to impecunious, irresponsible, but exceedingly handsome "rakes" is a stock historical as well as a literary theme.

16. Female frogs prefer deep-voiced male frogs, but their preferences are not effective; higher voiced frogs inter-cept them and succeed as well in mating. See Ryan and Keddy-Hector (1992, 5) and Ryan (1990, 159–60).

17. As Prum notes, the "aesthetics of nature" typically does not distinguish between the abiotic beauties such as that of a starry night or certain land forms and biotic beauty (2012, 814–815).

18. See Botero and Rubenstein (2012).
19. People and other animals may be both choosy and needy; mating implies costs and risks as well as rewards.
20. See Wilson (2015).
21. See Gould and Leuwontin (1979).
22. See Walker et al. (2011).
23. Somewhere between 1% and 50% of offspring, depending on social policing and the internalization of norms, are the products of adulterous relationships. These might be supposed to occur on the basis of spontaneous likings unaffected by social concerns. But there are many ways in which humans can please each other besides their artistic talent.
24. Alternative explanations for the evolution of large brains and complex cognition and ingenuity that are more widely accepted include Kaplan et al. (2000), Dunbar (1992), and Sol (2009) emphasizing sociability and behavioral flexibility in changing environments, and Hawkes et al.'s (1998)

“grandmother hypothesis,” according to which there was selection for post-fertility longevity, requiring redundant brain tissue.

25. Some evolutionary aestheticians by contrast relate aesthetic liking to immediate survival- and reproduction-related concerns: clearly we like, and like to make pictures of, lakes, open landscapes, beautiful women and men, ripe fruit, and grazing livestock. The analysis of the sublime introduces survival-related concerns: “bold, overhanging and, as it were, threatening rocks, ... volcanoes, ... hurricanes” (Kant 5:261, §28). The artist exploits our fear of “real things” to give us an aesthetic experience in a condition of safety.

26. See Botero and Rubenstein (2012).

27. “This was my first view of an active volcano, but pictures and panoramas have so impressed such things on one’s mind, that when we at length behold them they seem nothing extraordinary” (Wallace [1877] 2007, 316).