Why Beauty Matters

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FOR those of us for whom "literary Darwinism," which bases its "scientific" approach to literary criticism on evolutionary psychology, has seemed an intellectual disaster, but who continue to believe that it is important to incorporate science cooperatively into our study of literature; for those who are concerned about how art and literature matter in a world so troubled and dangerous; for those convinced Darwinians who find themselves skeptical about and uneasy with the mechanico-materialist version of Darwinism that Richard Dawkins and Daniel Dennett have made popular; for those who find that the science they credit is yet inadequately attentive to women's perspectives, Richard Prum's *The Evolution of Beauty* offers a potentially marvelous option. A distinguished ornithologist, Prum has undertaken an enormously ambitious project, whose implications run from evolutionary biology to aesthetics. From the perspective of a very unscientific literary guy and a wannabe birder, I slightly distrust my enthusiasm for the book. But Prum's arguments are creatively provocative and brilliantly argued, even when they get rather iffily hypothetical; his ornithological studies are intrinsically fascinating, even to nonbirders, and at the same time they have potentially transformative implications. What he has to say, even if his inferences can and should be challenged, deserves the most serious engagement.

From the perspective of science, Prum's arguments make a strong entry in growing resistance to the dominant paradigm of evolutionary biology (and its virtually exclusive assumption taken over by evolutionary psychology), that all evolutionary change is adaptive, and that it happens algorithmically, without agency, intention, or mind. From the perspective of the humanities, Prum lays the groundwork for a potentially creative and liberating aesthetic theory. From the perspective of interdisciplinary scholarship, he suggests fresh ways for science, the arts, and the humanities to talk creatively to each other. In addition, he reinforces a strong

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feminist program from within the framework of scientific study. Prum's insistence on the importance of history, with all its contingencies, in understanding the way things are now may be old news to humanists, but it has a particularly important resonance within the virtually atemporal mechanico-materialist system that much scientific study prioritizes. The evolutionary history on which Prum sets out is an unusual one. It is not a history of adaptations leading to speciation, but a history of "beauty," an "aesthetic" history. His unusual focus is on *individual* preferences, on desires and pleasures and even intentions. "We need," he says, "to embrace Darwin's *aesthetic* view of life and fully incorporate the possibility of *nonadaptive* arbitrary aesthetic evolution by sexual selection."[1]

Victorianists will recognize that although this is not a book about Victorian culture, the story it tells has Victorian resonances. They should be pleased to note that a fundamental move in Prum's argument is the attempt to replace modern "Darwinism," taken as the fundamental assumption of evolutionary science, with a Darwinism more in keeping with Darwin's complete theory. The book's subtitle, "How Darwin's Theory of Mate Choice Shapes the Animal World," aggressively affirms the centrality of Darwin's idea of sexual selection against the dominant, but only selectively Darwinian, view that natural selection does it all. Prum impressively builds a case, out of Darwin's original formulations of sexual selection, that female aesthetic choice provides a better explanation than the traditional adaptationist one for many evolutionary changes, not least the evolution of humans away from their primate origins.

Into the mechanisms on which all serious biologists agree, Plum inserts the scientifically dubious elements of individual desire and intention; in addition, he makes the case that evolutionary biology now is largely conducted from a male perspective. Without challenging the importance of natural selection, he argues for a shift of perspective that would allow for other evolutionary forces—most particularly, female choice. Reading the book for its wondrous study of birds and its challenge to evolutionary psychology, I was startled to realize that I was reading also a fresh and singularly strong argument for feminism. Prum's work, from the perspective of a scientist, arrives at similar conclusions, working with similar Darwinian ideas, that Elizabeth Grosz develops in a series of important books that courageously and importantly reconnect the biological and material with important cultural projects like feminism, despite the long history of misuse of such material for racist and sexist cultural projects.[2]

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The idea of "the evolution of beauty" might be said to have its beginnings in the late eighteenth century, particularly in the work of Erasmus Darwin, Charles's famous grandfather, but later most fully among the Victorians: first, in Darwin's focus in *The Descent of Man* on "mate choice," and then in the disagreements that followed between Darwin and A. R. Wallace about sexual selection. For Darwin, sexual selection was a hard-earned idea that grew from his deeply felt realization that the extravagances of some natural phenomena required an explanation for which his central theory of natural selection wouldn't work. The intensity of the problem as he experienced it is implied in what he famously wrote to Asa Gray in 1860: "The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick."[3] While Darwin found a nonadaptationist explanation for that feather, Wallace, after years of debate in correspondence with Darwin, did not; and Wallace became a key figure in the scientific rejection of sexual selection that endured well into the twentieth century. Wallace also famously veered off from Darwin by arguing, almost in anticipation of current theories of intelligent design, that the enormous complexity of the human mind and brain (he uses mathematics as an example) is evidence that natural selection could not explain the development of mind. His rejection of sexual selection had longer-term consequences for science.

Today's evolutionary biology—though obviously not accepting Wallace's move to spiritualism and despite its usual designation as "neo-Darwinian"—is on Prum's reading Wallacean rather than Darwinian. In his 1889 book, *Darwinism*, Wallace represents Darwin as insisting that "all the fixed characters of organic beings have been developed under the action of the law of utility."[4] Wallace thinks of himself as Darwinian because his book is, as he puts it in the preface, based on the argument that "*all* [emphasis mine] specific characters are (or once have been) either useful in themselves or correlated with useful characters" (186). But sexual selection doesn't work that way.

Tracing the evolution of beauty, Prum shows how it evolves precisely as it was *not* useful, and yet important enough to influence speciation itself. Prum and Darwin insist on inutility as a force in the development of varieties and species. Darwin needed the theory of sexual selection not only to account for the peacock's extravagant plumage, but also to account for racial divergence in a world he thought of as monogenetic: we all descend from the same beings, but each race, he believed, developed distinct aesthetic preferences, preferences not necessarily linked to natural selection and utility. On the one hand, then, almost an aesthetic

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relativist—every race's perception of beauty is distinctive—Darwin was, on the other hand, a Victorian gentleman who was also, from our current perspective, both racist and sexist.

Victorian science shared these tendencies with Darwin and because of them found it impossible to accept Darwin's theory of mate choice because it could not credit the female with as much power as the theory required. But it is hard to claim now that the theory is "forgotten," as the subtitle of Prum's book suggests. R. A. Fisher, with brilliant mathematical ingenuity, made the case for it against scientific consensus, first in 1915 and then in 1930 (it may be beside the point of the science, but Fisher was also outspokenly racist and a supporter of eugenics). Prum notes, however, that Fisher's ideas, which tended to confirm *that* sexual selection works by showing just *how* it works, "would be mostly ignored for the next fifty years" (35). Now, as Prum certainly does acknowledge, "all biologists embrace the fundamental concept of mate choice" (65).

What is controversial and fresh, then, in Prum's argument (aside from the wonderful ornithological studies he describes in the first half of the book) is his "embrace" of what he calls Darwin's aesthetic approach, making "beauty" (and the largely female choice that evokes it) central to evolutionary study, and deploying it as part of what seems a larger argument with important aesthetic and social implications, far from the racist traditions in which the idea was born.

While Prum rightly connects his own perspectives on sexual selection with Darwin's, his embrace of the female role in speciation and evolutionary change takes him a long way, even from the Darwin he is trying to reinstate. Evelleen Richards has convincingly demonstrated that Darwin's willingness, against the grain of his culture, to allow that females had the power of choice and thus to lead to important biological changes was not built on an affirmation of women's strength, but on its reverse.[5] The choice for extravagant inutility is what women do as they follow fashion trends. Silly women simply haven't got the kind of functional intelligence that would encourage them to choose the mate with the best chance of reproduction and survival. Rather, they like fancy ornaments, subject to the whims of fashion. They are too coy and silly to choose the useful. Prum regularly ignores Darwin's ingrained sexism, and makes the inutility of female choice one of the great strengths of the theory: inutility challenges the dominant Darwinian theory of our time, just as Darwin argued against Wallace. In the face of the inutility of female mate choice, contemporary insistence that *all* evolutionary change is adaptive seems to leave too much out.

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Prum insists that Darwin's theory was forgotten in large part because —even against Darwin's own sense of the superiority of males to females—he so strongly focuses on female agency, female desire, female purpose. "We cannot doubt," he writes in *The Descent of Man*, that, though led by instinct," female birds " know what they are about, and consciously exert their mental and bodily powers."[6] When he describes the female's reaction to courting males, he says, "we cannot doubt" but that "the females, supposing that their mental capacity sufficed for the exertion of a choice, could select one out of several males."[7] Darwin lets himself "suppose," and in effect urges that we do as well. His language cedes to the realities he is discovering: "The exertion of some choice on the part of the female seems almost as general a law as the eagerness of the male."[8]

Certainly for the purposes of his argument, Prum's avoidance makes sense. Although Darwin was, in our current terms, Victorianly sexist, his science, as Jim Enderby reminds us, took him where few of his contemporaries were willing to go. The theory of sexual selection gives the female a strong role in evolution, while "several of his contemporaries —such as Alfred Russel Wallace and St George Mivart—rejected Darwin's proposal that female choice could have played any role in evolution because females were so notoriously fickle."[9] Prum finds the same attitude more quietly embedded in modern evolutionary biology, and he contends that "Darwin's idea that the aesthetic evaluations invoked in mate choice among animals constitute an independent evolutionary force in nature is as radical today as it was when he proffered it nearly one hundred fifty years ago" (323).

Part of what encourages trust in Prum's arguments is that he is not scientifically unorthodox when discussing the sheer mechanisms of sexual selection. In *The Blind Watchmaker*, for instance, Dawkins describes those mechanisms, as they produce the extravagances of everything from feathers to vaginal tracts, which become so important to Prum's argument. Dawkins also implicitly rejects the kind of doubts Victorians had about the important role "weak" and "coy" females play in evolutionary development. So, while it is not quite fair to say that Darwin's theory is now "forgotten," it is fair to argue that it has been twisted in un-Darwinian ways as it has been assimilated to natural selection. Wallace had done that one hundred and fifty years ago. "Female preference, says Dawkins, is a genetically influenced variable just like any other" (202).[10] For Prum, however, the most important point is that today's dominant paradigm resists the idea that elaborate ornamentations "are

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merely meaningless, arbitrary (albeit fabulous) results of co-evolutionary fashion" (65). It was unease with the implication that his fickle females were subject to fashion that made Darwin's development of his theory so difficult; Prum, relieved of the cultural pressures of Victorian sexism, finds meaning in female mate choice. Moving from Prum's language to my own, the strict adaptationist approach, which Darwin also rejected, does not allow for art for art's sake: a point I will develop later. It does not contemplate the free play of desire or the power of female self-interest. It does not emphasize sufficiently the possibility that sexual selection can at times win out over natural selection—well, at least up to a point.

Darwin first invokes sexual selection by distinguishing it from natural selection. "It acts," says Darwin, "in a less rigorous manner than natural selection. The latter produces its effects by the life or death at all ages of the more or less successful individuals," while the former "rarely leads to death of the vanquished male." In addition, while for natural selection there is "a limit to the amount of advantageous modification" possible, in sexual selection "there is no definite limit."[11] "Sexual selection," Darwin goes on, "depends on the success of certain individuals over others of the same sex in relation to the propagation of the species; whilst natural selection depends on the success of both sexes, at all ages, in relation to the general conditions of life."[12] Which is simply to say that Darwin imagined sexual selection not as a major footnote to natural selection, but as a process that works independently of it and is yet required for a fully coherent explanation of evolutionary change. Female desire, however arbitrary, can at times win out. "The process of adaptation by natural selection," Prum insists from the start, "is *not* synonymous with evolution itself" (11).

Prum focuses primarily on only one of the two major aspects of sexual selection to build his case. The male role is usually the one most attended to, with emphasis on the violent struggle of male against male for possession of the female, and thus the development of weapons like horns and talons. This struggle, Darwin believed, makes of the male a more powerful, an even more intellectually powerful figure than the female, who "coyly" waits to be mastered. But he insists on the difference between the two forms of sexual selection: "In a multitude of cases the males which conquer other males, do not obtain possession of the females, independently of choice on the part of the latter."[13] Prum's book builds on the second aspect, "mate choice," in which the female chooses among males and thus plays the dominant role. Here, the

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male's superior physical powers are not the essential element and often play no role at all in mating.

The nausea Darwin felt at the sight of the peacock's feather was, of course, caused by how impossible he thought it would be to account for it by way of natural selection. Sexual selection became his way of accounting for it. To clarify the problem, let us look briefly at Prum's groundbreaking work on the color of dinosaurs. After studying closely a raptor-like feathered dinosaur (discovered in China in the last century), Prum came to realize that "the evolution of aesthetic plumage ornaments originated not within birds but way back in terrestrial theropod dinosaurs. The dinosaurs co-evolved to be beautiful—beautiful to themselves—long before one exceptional lineage of dinosaurs evolved to become flying birds" (143–44). That little parenthetical "beautiful to themselves" is loaded. Simple as it seems, it makes a major move to undercut the idea that speciation is entirely or even dominantly always the result of the adaptation seized upon by natural selection, or survival of the fittest. Rather, "the evolution of beauty contributed to the evolution of feathers themselves" (144). Not natural selection.

Originating as simple tubes on dinosaurs, feathers evolved with "downy tufts" and eventually into the "planar" forms that make such glorious canvases for color and are familiar to us in birds. Female dinosaurs, demanding beauty in the male, selected for developments in the feather that allowed it to display color. Only later, after beauty had begun doing its job, did feathers save dinosaurs from absolute extinction by turning them into birds. Color first, not flight. Aesthetic pleasure, not utility. The planar feathering that, eventually and luckily for us, developed into feathers that enabled flight was *not* an adaptation *for* flight. The wonderful irony here is that a desire for the beautiful divorced entirely from any useful purpose—what our practical-minded culture is trying to defund—saved dinosaurs from absolute extinction by allowing them to transform into birds.

For evolutionary biologists following in Wallace's tradition, the idea that something other than adaptive fitness drives evolutionary change has been particularly difficult. There is still, apparently, disagreement in the field about whether beauty "means" something other than what it is, and thus can be assimilated to the adaptationist model. Many biologists believe that the beauty of the male, often extravagant and dangerous to the male, "signals"—and "*honestly* signals"—reproductive fitness. The minority, to which Prum belongs, believes that while "adaptive mate choice *can* occur" it "is probably rather rare." These astonishing

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ornaments "are merely meaningless, arbitrary (albeit fabulous) results of co-evolutionary fashion" (65). A poem, a peacock's feather, should not mean, but be. Just as dollar bills have been detached from the "gold standard" for which they were originally promissory notes, Prum explains, beauty was detached from what it honestly signaled. The miser wants the dollar bills and does not worry about Fort Knox. The female wants the color and manages without any motive but her own pleasure to choose.

The same thing can hold for humans. While neo-Darwinist explanations imply that "there *must* be something of greater value in sexual attraction beyond mere sexual attraction" (357)—the theory of "honest signaling"—the evidence is that there is no relationship between body shape and fertility. Prum cites a mathematical study by two biologists that has "documented that cultural mating preferences can create feedback loops that result in the evolutionary elaboration of certain traits that are deemed desirable but have no survival or fecundity value—only aesthetic value" (261). Sexual attraction is sexual attraction—art for art sake, beauty for beauty's sake, pleasure for pleasure's sake.

As Prum neatly puts it, establishing a key phrase for his whole argument, "Beauty Happens." Released from the gold standard, the dollar's value is entirely a matter of agreement, a social construct, and everyone wants it. Released from the utility it theoretically signaled, beauty becomes also a social construct: an agreement of both parties that the prettier the better—according to their lights. The resonance of this idea for aesthetic theory and criticism is strong and clear and remarkably in harmony with much extremely unscientific aesthetic theorizing of recent years.

Prum offers many examples of bird behavior and development that illustrate this sort of nonadaptive exchange. To make its mating "call," for one remarkable instance, the Club-winged Manakin rubs its wing feathers together at a very high frequency, but to produce the sound the wing bones can not be hollow. Yet hollowness seems a condition for bird flight and is characteristic of all other Manakins. The Club-winged fly less well than their cousins because, Prum tells us, their ulnas "are four times wider and three times larger in volume . . .There is nothing else like it in any other bird in the world" (150). But, then, of course, no other birds produce such sexy wing sounds.

The beauty of the Club-winged Manakin's "song" has a *history*. It is a physiological evolution different from that of all the other Manakins, who are otherwise closely related, and it evolved very clearly from mate

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choice, the female's desire for the beautiful. To win mates, this Manakin degenerated in fitness; it evolved "a decrease in overall survival capacity" (152) under the pressure of female desire. The club wings are inherited by both male and female, but so too is the desire for them. This inheritance across both sexes assures a cascade of beauty-oriented changes: from generation to generation females get pickier and pickier; offspring inherit larger and stronger bones to make the music that will satisfy. In the pursuit of pleasure, it all becomes extravagantly useless and a separate species is born. *De gustibus non est disputandum.* Beauty is *not* truth; it signifies "nothing but itself" (322). In this whirling, self-reinforcing, aesthetically inspired dance, the female seeks the sound; the male body shapes itself to the female's pleasure. The evolution of beauty entails a remarkable amount of free play.

The idea of the aesthetic as a social contract is not the only important inference Prum draws from the evolutionary engagement (and contest) of female and male. Along with attraction, mating includes a power struggle, the stronger male trying to impose himself on the less powerful female. In a chapter on duck sex, Prum describes the extraordinary behaviors and physiological changes among males in mating season, all in response to choosy female ducks who are choosy "because they *can* be" (155). This study is one of the few the book discusses that wasn't conducted by Prum and his team, but it dazzlingly confirms his larger arguments. Most interesting for Prum's point, and more distressing for anyone who sentimentalizes ducks, is the behavior of "puddle ducks," the drakes of which regularly rape the females. Prum complains about ornithologists' decision to call bird rape "forced copulation." He wants, rather, to emphasize the "violent, ugly, dangerous, and even deadly" nature of sex among these ducks to make clear that it happens *against the wills* of the females. Recognition of the female perspective here becomes essential. The cost of duck rape is not only direct damage to the female's well-being, but indirect genetic loss: the females *and* the species suffer because successful rape not only lowers the number of available females, but also diminishes the chances the offspring will inherit the traits—the "beauty"—that the females prefer.

Among "puddle ducks," as Prum calls them, the two modes of sexual selection are in contest: the male's combat for power and dominance, the female's desire for the beautiful. To overcome the resistance of the female, the males have developed long penises, sometimes longer than their own bodies. To counter, the female has developed a long sinuous vaginal tract with "thickened, convoluted walls . . . wrapped in a mass

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of fibrous tissue"; "the longer and twistier the penis, the more complex the vaginal tract, full of nooks and crannies" (160). Prum and his team have discovered that though 40 percent of the puddle ducks' sexual relations are coerced, "only 2–5 percent of the young in the nest are sired by a male who is not the chosen partner of the female." The length and the nooks and crannies "are actually incredibly effective at preventing fertilization by force" (172). In the end, the female carries almost exclusively the young of the male of her dreams, the most aesthetically satisfying of her courtiers:

> By being overwhelmingly successful at bottling up the penis during forced intromission, and preventing the vast majority of attempts at forced fertilizations, female ducks have managed to maintain the advantage of this sexual arms race. Even in the face of persistent sexual violence, female ducks have been able to assert and advance their sexual autonomy—their individual freedom to control paternity through their own mate choices. . .female mate choice continues to predominate. . . .Beauty continues to thrive even in the face of persistent violent attempts to subvert the freedom of mate choice that creates it. (174)

Although females cannot "evolve to assert power over others in respect to sexual violence," they can "evolve to assert their own freedom of choice. . . . Males evolve weapons of control . . . females are merely coevolving defenses that create opportunity for choice. It's not a fair fight," Prum concludes; "however, as ducks show, female sexual autonomy can still win" (174). If nothing else, these remarkable stories of bird mating and evolution build a strong case: the grim story of the mindless demands of natural selection for fitness, on matters of life and death, as Darwin notes, must take one step to the side. Natural selection cannot explain it all; room must be made for beauty, and thus for desire and intention and purpose.

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There is yet another way in which current dominant scientific assumptions are simply not adequate to the realities of the natural world. Darwin's theory has been taken to imply that nature provides no "agency" for the enormous evolutionary changes through which it moves across geological time. What happens in evolution happens algorithmically: no mind directs it, no desire impels it. Daniel Dennett argues influentially that "life on Earth has been generated over billions of years in a single branching tree—the Tree of Life—by one algorithmic process or another."[14] And he defines algorithm as working on three fundamental conditions—first, "substrate neutrality," which in effect means that

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what matters is not the particular contingent content of the process, nor the causal powers that may drive them, but a simple logical structure which applies everywhere always. Second, "underlying mindlessness": however designed the outcome might seem to be, it is constructed of a series of steps that, if taken (and even an idiot might be able to take any one of those steps, as in a computer program), will—third—always produce the results, apparently designed or not (51). Algorithms function independently of mind, of conscious direction, or of telos. Although, as Dennett shows, all of this has been subject to much disagreement and uncertainty, Prum writes into an intellectual culture in which the "algorithmic" reading has largely triumphed. He mentions Dennett only once, but in doing so he makes clear what his own program is: "I propose that Darwin's *really* dangerous idea is the concept of aesthetic evolution by mate choice." Implicitly conceding that natural selection works algorithmically, he yet claims that "natural selection can not be the only dynamic at work in evolution" (18). In fact, his view of aesthetic evolution is that it runs precisely counter to the algorithmic. Unhinging sexual selection from reproductive fitness leads Prum to his main point: "the inherently serendipitous and unpredictable nature of aesthetic evolutionary process" (118).

The ornithological studies that I have described are strong evidence that, as Prum claims, birds "act as agents in their own evolution" (10). The conclusion to his startling histories is even more startling, for his language seems almost Lamarckian. He claims, for instance, that the history of the beauty of the Manakin's song is one strong example of how "animals are aesthetic agents who play a role in their own evolution" (324). Prum never mentions Lamarck, and he certainly rejects the Lamarckian notion of the inheritance of acquired characteristics, but his language occasionally resembles Lamarck's, in suggesting that sexual selection reinserts into the evolutionary process the "intention" that Dennett regards as a "skyhook"—it ain't scientific. Darwin's own metaphorical language, as particularly with the very active "Natural Selection," often looks as though it is affirming agency even though he goes to great pains to deny it literally. Lamarck was eliminated from the evolutionary canon in part because he believed in inheritance of acquired characteristics, but largely because this meant that he believed that organisms might "act as agents in their own evolution." This idea of "agency" is subtly (and sotto voce) alive in Prum's argument—as it was in Darwin's—even though Prum would certainly argue that while individuals have intention, the broad transformations toward speciation are not at

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all "intended" by an agent; they result from the normal unintentional developments within population genetics. Samuel Butler, in a long series of anti-Darwinian books, culminating in *Evolution, Old and New*, argued that a theory that eliminates agency is radically flawed. Prum's birds, certainly not acting with teleology in mind, yet act with a purposiveness it is hard to dismiss.

But "for the current generation of biologists," writes Jessica Riskin, "naturalism precludes treating agency as an elemental feature of the natural world, or indeed as anything beyond an irresistibly compelling appearance."[15] Whether Prum's experiments produce "an irresistibly compelling appearance" that is belied by the reality or not is for science ultimately to decide. In any case, Riskin shows, in her magisterial book *The Restless Clock*, that it has been possible to be a pure mechanist and materialist and at the same time a scientist who believes in agency. Thinkers as different as Lamarck, Darwin, Dennett, and Prum are all entirely naturalistic in their studies and arguments; all exclude from their nature studies any action from the "outside"—certainly any divine hand.

The great irony that provides the structure of Riskin's careful and learned study of agency is that removal of agency from nature has its modern foundation not in science but in religion itself—most particularly, natural theology. That famous Paleyan parable of the difference between the watch and the stone effectively turns nature into a machine without agency, and since there is no agency in nature, a God is required to explain its appearance. Dennett's algorithmic reading of nature is his substitute for Paley's god, since agency of some sort is essential to any adequate explanation of nature's functioning. The running watch (interestingly, Paley chooses a machine to make his point) cannot do it simply by virtue of its intrinsic material nature. Ironically, then, Dennett's position is fundamentally a religious one. Except he leaves God out.

Riskin points out that neo-Darwinism developed, particularly in Germany in the late nineteenth century, by making all scientific explanation dependent on a mechanical model, excluding not only any form of spirit, but any sort of internal agency. So Lamarck's explanation of evolutionary development, "according to which living forms developed gradually and contingently driven by their own inner agencies," was rejected. Neo-Darwinians "reject the idea that intrinsic agencies operate in nature" (251), and thus also reject Darwin's endorsement of Lamarck's view "that the 'habits,' 'ways of life,' and circumstances of animals very gradually shaped their organs" (269).

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The problem of agency looms over all naturalistic explanation. So Prum's argument is doing something extraordinary in telling us that mate choice is an "intrinsic agency operating in nature." Yet he is simply building on Darwin's own ideas: "It is impossible to doubt," says Darwin of birds, in a sequence that constantly evokes human language for beauty, "that the females admire the beauty of their male counterparts."[16] "The taste for the beautiful," says Darwin, comfortably using language of intention, and desire, "is not of a special nature in the human mind."[17]

Riskin's book is one major intervention in a developing concern about agency. Being Paleyan without God suggests that something is missing in current scientific explanation, and J. Scott Turner's *Purpose and Desire: What Makes Something "Alive" and Why Modern Darwinism has Failed to Explain It*, directly addresses the problem. He claims that such a position represents a serious "crisis" in biological thought. On the Dennett/Paley model, biology, Turner claims, fails to make its own subject, "life," distinguishable from the inorganic. If "life" is a machine that can be understood in strictly chemical/physical terms, then how does it differ from Paley's stone? Where is the distinction among the sciences? Agreeing that "it seems hard to attribute striving and desire to anything living without getting into *unscientific* ways of thinking," Turner asks, "How do you experiment with desire?"[18] In effect, although I have no idea whether he would accept Turner's analysis, Prum's ornithological studies might be read as just that, "experiments with desire." Mate choice *is* a choice—usually a female choice. It implies, at least anthropomorphically speaking, a desire for the pleasurable—"taste," as Darwin puts it. Prum's female ducks work hard to protect their "taste." Prum does not avoid the implications of the verb "to choose," as Darwin had to do when he was challenged about the metaphorical implications of "selection." For, of course, selecting entails choosing, and choosing entails something that certainly has the appearance of consciousness. Facing just this question of the appearance of agency (calling his language anthropomorphic suggests that the agency his language implies is mere appearance), Darwin responds to criticism of his anthropomorphism by offering in the fifth edition of *The Origin of Species* (1869) a description of natural selection that would satisfy Dennett:

> It has been said that I speak of natural selection as an active power or Deity; but who objects to any author speaking of the attraction of gravity as ruling the movements of the planets? . . . So again it is difficult to avoid personifying

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> the word Nature; but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us.[19]

This is the language of algorithm, certainly central to Dennett's own version of Darwin, and, if irregularly, it is a language Darwin endorses. Here, Darwin urgently, almost angrily, withdraws agency from nature. It is telling that to make this point Darwin uses for clarification "the movement of the planets," in effect equating inorganic and organic nature. This is the Darwin that Prum ignores and Dennett uses. From Turner's point of view, Darwin fails here to distinguish life from nonlife. But Darwin's position in these problems is, as ever, ambiguous. He could not give up on his anthropomorphic metaphor, "natural selection," and the language with which he otherwise describes "her" actions bursts with intention.[20] As Riskin discusses him, Darwin remains somewhere in a limbo between the brute mechanism that relied on a distant god to get things moving, and another naturalist tradition, which saw the energy coming from an engine within.[21]

Prum's history of beauty very persuasively puts at least some agency back into evolutionary development just where Darwin did when he discussed sexual selection. "We now agree," Prum points out that ornament evolves because individuals have the capacity, and the freedom, to choose their mates, and they choose the mates whose ornaments they prefer. In the process of choosing what they like, choosers evolutionarily transform *both* the objects of their desires *and* the form of their own desires. It is a true evolutionary dance between beauty and desire" (65). That "dance" is the basis of the aesthetic theory that Prum is suggesting—beauty is, as it were, a negotiation between the desirer and the object desired; in a feedback loop, desire transforms the object, which in turn reacts on the one who desires. As Darwin says, there is no limit to how beautiful and strange and extravagant these developments might be.

*

The extent of Prum's daring becomes yet more overt when he notes that "in surprising ways . . .the evolutionary hypotheses I've outlined are strongly consistent with, and supportive of, contemporary gender theory" (318), and then asks, "Who could have imagined that evolutionary biology and queer theory could be on the same page about anything?" (319). Prum's argument that "aesthetic evolution has great explanatory power" (236) stretches across his science into large cultural issues, where his work might be taken as a strong, scientifically argued counterforce to

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evolutionary psychology, as it is now practiced, and as evidence on fundamental issues with which the humanities and social sciences are regularly engaged.

The best way to see what's wrong with literary Darwinism is to see what's wrong with the science that sustains it (although Jonathan Kramnick, working from the opposite direction, does a very strong job on it, and one that all literary scholars can profit from reading.)[22] Although he claims that much of his own work might be thought of as "evolutionary psychology," since it concerns itself with the will and desires of animals in mate choice, Prum laments that today's evolutionary psychology "has a profound, constitutive, often fanatical commitment to the universal efficacy of adaptation by natural selection" (227). As readers of literary Darwinist criticism well know, "there is never any doubt what the conclusion of any evolutionary psychology [or therefore, I would add, literary Darwinist] study will be" (227). Total adaptationism implies that all art, all culture, must be understood in terms of utility.

The negative force of Prum's arguments, against the bad science of evolutionary psychology, as he sees it, and against its founding thesis, the universality of adaptation for fitness, seems to me very powerful. But as it extends from birds to the human, Prum's book becomes more problematic. No doubt his arguments are vulnerable, and one important review has already suggested that his claims—or at least the inferences he makes from his studies—are excessive: "The experience of seeing evidence of your favorite theory everywhere is prevalent among scientists," the reviewer half mockingly complains.[23] But by the time we arrive at the chapter called "Human Beauty Happens Too," Prum has, from my point of view, earned the right to what he confesses are only "speculations" that need to be "tested and analyzed" before they can be dismissed.

Once again, the argument begins with a rejection of neo-Darwinist orientations: the "dominant view of hominin evolution as an interplay between male-male competition and adaptive, ecological natural selection is insufficient to explain the key innovations that have occurred in the evolution of human cognitive, social, and cultural complexity" (299). That view, Prum claims, has diverted attention from the real problems, which can best be recognized through an evolutionary history that attempts to account for our separation from our primate cousins. His alternative view is that "women's pursuit of pleasure is at the very heart of the evolution of human beauty and sexuality" (just as, he has forcefully shown, female choice is at the very heart of much bird beauty and sexuality). The aesthetic history for which he is asking takes "pleasure as the

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central, organizing force in mate choice, and mate choice as a major dynamic in evolutionary change" (284), and as the primary force separating us from our primate cousins.

That case, which Prum made about birds, he tests out again about women. We cultural studies types have long been used to thinking about the "male gaze," which turns women into objects. Prum argues that evolutionary psychology, even in its psychological experiments, reifies "the male gaze as an adaptation," and has thus enshrined sexist bias in human evolutionary biology and notably failed to explain the mate preferences of the other half of the species" (241). Attending to that other half, Prum rereads our break with other primates and everything from the unusual anatomy and large size of the penis (in comparison with other primates) to cultural variations in physiognomy and perceptions of beauty, and to the abundance of sexual practices, including homosexuality. So that, as with birds, the inutility of the aesthetic and the aesthetic drive accounts for a great deal in species development.

"What is it that you women want?" is a famous grumpy male response to feminism. Prum builds much of his argument in answering that question and offers a hypothetical but strongly explanatory account of our split with primates. Simian social organization tends to inhibit change, since, for the most part, primates establish groups with a macho leader who prohibits other males from having sex with any females, and who will often kill the young who have been sired by a former leader. "Viewed through the lens of human biology," Prum tells us, "the average male baboon, gorilla, or chimpanzee is an infanticidal maniac" (289). Males in these primate organizations leave the young to their mothers, who expend enormous energy on them, and then often find that energy wasted by male violence. As primates, we lowered the degree of violence that sustained a community: "The evolutionary mechanism for lowered male aggression, cooperative social temperament, and social intelligence . . .proceeded not by natural selection but by *aesthetic sexual selection* through female mate choice. (292)"

The efforts in evolutionary biology to regard "beauty" as an honest signal of fitness once again makes beauty "mean" something. But human beauty "means" fitness no more than bird beauty does. Both males and females—unlike most primates and other animals—make "mate choices." Sexual behavior across cultures varies as wildly as languages and customs, and the "big challenge is to understand how our biological history and our cultural history interact to create the various expressions of human sexuality" (233). Prum notes that human males,

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unlike most primates who "pursue *every* sexual liaison available to them," are quite picky, in part because men make much larger "parental investments" in their offspring than other primate males do. The neo-Darwinist explanation of feminine beauty is that ample breasts and hips are not only beautiful but also biologically right for reproduction; yet, as Prum points out, primate breasts only become prominent in breeding season. The permanent breasts of human females can be explained in the same ways as the peacock's feathers, and long, crooked vaginal tracts, and club wings: so, too, the larger penises of human males (primates have very small ones, and so much for horny King Kong). All, in Prum's theory, are effects of aesthetic agency in mate choice.

Everywhere, Prum argues for (and produces evidence for) the irrationality of aesthetic evolution, the free wild arbitrariness of mate choice, and of the beautiful. He insists—consistent with Riskin's representation of the history of naturalist thought—that neo-Darwinist thinking represents the world as entirely "rational," functioning always in the direction of adaptation, meaning. Prum reinserts irrationality into evolutionary history by not taking beauty as a signal, certainly not a signal of fitness, by reinserting agency and taking seriously will and desire. He claims that recognizing the irrationality allows for a better understanding of evolution historically and of current cultural practices as well.

On this account, mate choice, both male and female, has produced the human species out of the world of primates, largely by satisfying female desires and female needs. Prum reexamines neo-Darwinist explanations of human qualities in a wide range of areas, everywhere from penis size, to female orgasm, to "decrease in the difference in body mass between the sexes," to reduction of the size of male canine teeth, to male investment in the young. Each of these changes satisfies what seem like female needs and desires (the question of whether penis size and scrotum are particularly attractive to women, as Prum suggests, I leave open). Humans "make more substantial reproductive investments. . . .resources, time, and energy to the protection, care, feeding and socialization of their offspring" (255). All of these suggest a widespread diminishment of male aggression in the human split from primates. They also seem to be nonadaptive even as they satisfy female needs and desires. Again, orgasmic female pleasure seems a particularly human trait.

Prum's attempt to show how the most apparently nonadaptive phenomena can be understood better through the "Beauty Happens" theory, leads him to the chapter, "The Queering of *Homo Sapiens*," on homosexuality. The phenomenon has the same status within the theory

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of natural selection as the peacock feather that upset Darwin: How could it possibly be related to reproductive success and fitness? Sexual behavior, Prum points out, need not be understood in terms of sexual identity. That idea is not even two hundred years old, and sexuality is sexuality in whatever form it might take. "Diversity of sexual practices is a profoundly human characteristic that must be accounted for," says Prum, but homosexuality is not a "conundrum" (304). The wild freedom of sexual practices among humans (again, distinguishing us from other primates) has always included sexual activity with no effect on reproduction. This is yet another instance in which aesthetic evolution is not connected to adaptiveness. It becomes a conundrum only if one is committed to the total adaptationist theory.

Consistent with its approach to all evolutionary phenomena, neo-Darwinism attempts to transform the phenomenon into an adaptive one and has thus come up with the "helpful uncle" theory. The nonproducing male contributes in the long run to overall fitness by helping busy moms and dads raise their children. Prum's speculation—very much a speculation—is, however, this: homosexuality "might have evolved through female mate choice as a mechanism to advance female sexual autonomy and to reduce sexual conflict over fertilization and parental care. According to the aesthetic hypothesis, the existence of same-sex behavior in humans is another evolutionary response to the persistent primate problem of sexual coercion" (307). Once again, female choice, female interest, becomes the explanatory hypothesis. Granted, the evidence is thin, maybe no better than the "helpful uncle" theory, but it is at least not (yet) contradicted by the evidence and it entirely normalizes a phenomenon that has historically been taken as an anomaly and would otherwise be taken as a "conundrum"—at best.

But then one last big question, one that Prum himself recognizes. If it is the case that "female sexual autonomy played a critical role in the evolution of human sexuality and reproduction," if it was "a critical factor in the evolution of humanity itself," why are women in human culture so consistently made secondary? Why is violence against women almost a norm of human cultures? Why in 2018 is a "#metoo" campaign even necessary? The fact seems strong evidence against the triumphal female-oriented aesthetic history Prum has outlined. But Prum has an explanation, one that further opens the way to cultural and gender studies. First, males too have evolved in that other mode of sexual selection, and have "evolved mechanisms to advance their capacity for sexual coercion and violence" (351). Given male physical strength, in the struggle

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between male and female "it is not a fair fight." Second, and here is another point at which Prum's speculative science emerges on the same page as gender studies and feminism: "Subsequent evolution of human culture has resulted in the emergence of new *cultural mechanisms* of sexual conflict. . . .cultural ideologies of male power, sexual domination, and social hierarchy—that is, patriarchy—developed to *reassert* male control over fertilization, reproduction and parental investment as countermeasures to the evolutionary expansion of female sexual autonomy. The biological war is now being conducted through the mechanisms of culture" (351). What matters most here is the expulsion from the discussion of the idea that the current state of male domination is somehow a biologically implanted, evolutionary necessity, against which no cultural resistance, like the current "#metoo" movement, can ultimately have any power. Prum believes that there remains the possibility of women "fully consolidating the previous evolutionary gains in sexual autonomy" (352).

Prum's book is so heartening not because he has conclusively made his case. The speculative nature of so much of his large conclusion leaves much in doubt. There is, in addition, always the danger that he, like the eugenicists he attacks, is biologizing cultural phenomena, a practice with an unpleasant Victorian and post-Victorian history. But one cannot *not* take biology into account in this very material world. And Prum has made a fascinating and forceful case for the idea that it is possible to find other and more fully satisfying explanations of current biological and cultural phenomena, and that serious scientific investigation, freed from the full adaptationist dogma, is not doomed to the same predictable conclusions that evolutionary psychology had been imposing on us. Perhaps pie in the sky. But the aesthetic evolutionary history that Prum lays out through his startling and wonderful chapters on bird life, followed by his strong speculations on the causes of the human split from primates, makes sense. It is certainly a workable hypothesis. To this lay critic, it is refreshingly plausible. I hope it is right.

Whether or not the larger case holds up, however, the "Beauty Happens" theory provokes fresh thinking, not only about scientific method and perspective, not only about cultural phenomena in general, but specifically about art. It suggests a world that has evolved virtually on the principle of "art for art's sake." Free arbitrary pursuit of the beautiful to its wildest possible extravagances may be recognized as no mere self-indulgence after all, but as a condition of change and growth, a prod to creativity and the new. If Prum is right, we humanists might infer

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that the "beauty" we study—often with a sense of guilt for devoting such energy to art rather than to the harsh realities of the world that science and social science and the daily newspaper constantly reveal to us—is not a diversion from harsh reality but is integral to it and evolving as the world evolves. Making huge inferences from Prum's already large ones, beginning with recognition that beauty is not marginal but central to evolutionary history and life itself, we can feel reassured of the significance of the humanities and in our own professional engagement with the beautiful, though it gets us no degrees in business and economics, and may seem a long way from the immanent moral and humanitarian crises that confront everyone, everywhere, every day.

Prum's theory of art as the coevolutionary development of fundamentally arbitrary likings and attractions—perceiver affecting perceived, perceived affecting perceiver—is a useful tool for understanding (and valuing) cultural difference. It foregrounds individual free-ranging "taste," explains not by reduction to algorithm but by affirming individual, contingently provoked desire. Despite science's long, honorable, necessary commitment to an objectivity and factuality that excludes purpose, will, and intention, evolutionary history, on Prum's account, can only be fully understood if it allows for the power of pleasure and includes the history of beauty.

Theorists, critics, scholars, feeling the pressures of the need to mean and to matter, to be useful in some way in relation to the most pressing concerns of culture and society, often wonder (usually privately) whether it makes sense spending one's life criticizing novels and poetry while the world is burning. (Among us Victorianists, one senses this feeling in the recent manifesto and activities of the V21 group.) Some richer sense of the importance of what is not "useful" might help. It is, on Prum's account, just in individual desire, in the disregard of the merely useful, that sexual selection directs change to new forms of beauty and of life.

Prum is working now on a whole theory of aesthetics, one that makes any defined universal elements in art chimerical. In an essay strictly about aesthetics, Prum argues that "beauty is not dependent on meaning to exist."[24] Art is always in process, always a matter of desire (unhinged from "meaning" and "utility"—though any work of art may itself be meaningful and useful in some way). Its variations are limited only by the range of possible human desires. Here, heuristically, is Prum's summary point: "Once we understand that all art is the result of a coevolutionary historical process between audience and artist—a coevolutionary dance between display and desire, expression and taste—

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we must expand our conception of what art is and can be. . . . Being an artwork means being the product of a historical process of aesthetic coevolution. In other words, *art is a form of communication that coevolves with its own evaluation*."[25] Like Club-winged Manakins mating.

So Prum takes his ornithology to quite daring hypotheses that it will well repay literary scholars to consider. But I want to conclude by daring a bit too, with an analogy: Darwin's *Origin* is also pervasively hypothetical. The strategy was not so much to prove that evolution by natural selection happened as to demonstrate that the hypothesis that it did happen, and largely by means of natural selection, fits better what we certainly know about nature than any other hypothesis out there. Darwin knew he couldn't prove it in 1859, but he wanted minimally to show that his explanation of evolution fit the existing facts better than the dominant one he was trying to displace. The *Origin* too laid out its hypotheses as a plan, a framework for future investigation: "I look with confidence to the future, to young and rising naturalists, who will be able to view both sides of the question with impartiality."[26] "In the distant future," Darwin wishfully affirms, "I see open fields for far more important researches."[27] I make no claim that Prum's work has Darwin's power or significance. As I write, I think of endless objections and questions and doubts. But *The Evolution of Beauty* has something of the ambition of the *Origin*, something of its beauty and factual density, and much of its hypothetical argumentative structure. Like the *Origin*, it is based on dazzling and important field work, making large claims that run against the grain of the day's dominant scientific paradigm. Like the *Origin*, those inferences have implications that resonate through a wide variety of fields of study. Like the *Origin*, it still must be taken as a heuristic, a provocation to further work. Prum chose this popular mode of expounding his large argument just because he wanted to cultivate the field for those "young and rising naturalists" who might enter their advanced work more disposed to look at evolution from the perspective of "Beauty Happens." I am myself ready to be unconvinced, but not before Prum's arguments are shown to be inconsistent with what's out there in nature and with what my own experience has taught me that literature does.

Notes

1. Prum, *The Evolution of Beauty*, 238. All subsequent references to this edition are noted parenthetically within the text.

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2. Pearl Brilmeyer has called my attention to the important work of Elizabeth Grosz, which anticipates much of Prum's argument, emphasizing in particular the distinction between natural selection and sexual selection: *Becoming Undone*. See particularly the chapter "Art and the Animal." And see also *The Nick of Time*.
3. *The Correspondence of Charles Darwin*, 8:140.
4. Wallace, *Darwinism*, 188.
5. Richards, *Darwin and the Making*, chapter 8.
6. Darwin, *Descent*, 2:258.
7. Darwin, 2:259.
8. Darwin, 2:273.
9. Endersby, "Darwin on Generation," 89.
10. Dawkins, *Watchmaker*, 202.
11. Darwin, *Descent*, 2:278.
12. Darwin, 2:398.
13. Darwin, 2:263.
14. Dennett, *Darwin's Dangerous Idea*, 51.
15. Riskin, *The Restless Clock*, 368.
16. Darwin, 1:63.
17. Darwin, 1:64.
18. Turner, *Purpose and Desire*.
19. Darwin, *Origin*, 93.
20. See my discussion of this issue in *Darwin the Writer*. For a fuller discussion, see Richards, "Darwin's Theory of Natural Selection and its Moral Purpose," 64.
21. Riskin, *The Restless Clock*, 248.
22. Kramnick, "Against Literary Darwinism."
23. Flannery, "Objectifying Male Birds."
24. Prum, "Coevolutionary Aesthetics," 829.
25. Prum, *Evolution of Beauty*, 336.
26. Darwin, *Origin*, 482.
27. Darwin, *Origin*, 488.

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