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THE EVOLUTION OF BEAUTY

PRUM RO (2017) *The evolution of beauty. How Darwin's forgotten theory of mate choice shapes the animal world — and us*. Doubleday, New York. 448 pp. ISBN: 038-553-72-12. Price: US$ 18.51 (hardcover)

The evolution of beauty is a remarkable book comprising an intriguing interpretation of ornament and armament evolution in animals, humans and non-humans. The author, Richard Prum, is amongst the most influential evolutionary ornithologists since the 1980's and in this book readers can find descriptions of his main contributions to the discipline of animal behaviour. By telling his personal research experiences, Prum builds consistent and controversial arguments supporting the "beauty happens" hypothesis. His book is definitely a passionate narrative of a birdwatcher's perspective, enriched by critical scientific interpretation of natural phenomena. Along his career, Prum developed a particular interest in understanding how social and sexual choices of birds relate to evolution; specifically, how is "the beauty of birds to themselves". In his book, he strongly encourages scientists to consider the subjective experience of desire in animals, which he considers a significant step to develop an accurate scientific account of the natural world. He advocates the reuse of the term "aesthetic evolution" previously proposed by Charles Darwin, as an important process driving the evolution of display traits ("the object of desire") and mating preferences ("the form of desire itself") in animals. In the introductory chapter, Prum criticizes how the lack of consensus and intellectual conflict arising in the scientific community regarding aesthetic evolution have prevented the development of this research area. He argues that the main cause for this disagreement lays on the excessive focus on the adaptive "honest signaling" paradigm, which states that beauty is often related to individual health, vigour and fitness. For him, the adaptive mate choice may exist, but is probably rare in nature.

Prum mentions how the current Neo-Darwinism is not Darwinian at all for dismissing the aesthetic theory and makes a parallel to Darwin's contemporary critic, Alfred Russel Wallace, who was skeptical about animals' advanced sensorial abilities to choose sexual partners and also a defender of the adaptationist interpretation of ornament evolution. In chapter 1, "Darwin's *really* dangerous idea", Prum supports that Darwin's concept of aesthetic evolution by mate choice is really dangerous to Neo-Darwinists, because natural selection should not be the single evolutionary force acting upon species. For him, adaptationists largely tended to avoid alternative interpretation of evolution if not operated by natural selection. He cites names defending controversial thoughts against, such as the biologist St. George Mivart, who defended that females "could never lead to the evolution of something as marvelous complex as the peacock's tail", and the highly influential ornithologist Amotz Zahavi, proponent of the "handicap principle". For Prum, Zahavi's principle is likely to flaw: if the sexual benefit of a signal is directly related to its costs, the signaler will never gain advantage.

Throughout his book, Prum uses birds with extreme ornamentations or complex courtship displays as models to understand the "evolution of beauty" theory. In the "Beauty happens" chapter, Prum describes male displays and ornaments of the Great Argus Pheasant (*Argusianus argus*), such as the optical illusion created by plumage pigmentation artefacts, and conducts readers to the idea that this is "one of the most highly elaborated of any creature on Earth". For him, pheasant females are explicitly highly focused on male displays and should possess a taste for the beauty. In this chapter, Prum also advocates the need for a null hypothesis in sexual selection studies, as applied in other fields of evolutionary biology. For him, contributions made by Ronald Fisher unveiling genetic mechanisms and Russel Lande and Mark Kirkpatrick's evolutionary models of mate choice ("runaway model") provides ground for the appropriate null model. In an uncomplicated text, he explains this evolutionary model and defines

what would be an "arbitrary trait", that is, a trait disconnected from any measure of mate quality.

The book is also an interesting journey into the world of manakins, a fantastic Neotropical bird family, the Pipridae. These species show a wide variety of complex courtship displays and, for him, comprise an appropriate group to illustrate the "beauty happens" hypothesis. Chapter 3, "Manakin dances", is a delightful narrative about these birds, including detailed descriptions of their lek mating system and an understanding of the manakin phylogeny proposed in Prum's PhD thesis. Highlights of this chapter include the Golden-headed Manakin (*Ceratopipra erythrocephala*), the White-bearded Manakin (*Manacus manacus*), the White-throated Manakin (*Corapipo gutturalis*), and the Golden-winged Manakin (*Masius chrysopterus*).

In chapter 4, "Aesthetic innovation and decadence", the author explores the nonvocal communication sounds in manakins as "aesthetic innovations". Incidental sounds, such as wing snaps, should have become preferable to females when combined with males' acrobatic displays in this group. Prum provides an overview of his student Kimberly Bostwick's research investigating wing bone and feather anatomies. A great focus was given to the Club-winged Manakin (*Machaeropterus deliciosus*), the White-bearded Manakin and the White-collared Manakin (*Manacus candei*), which, according to him, "sing with their wings". In this study they found that wing bones have evolved "far from the natural selection for flight efficiency", because they have a solid structure (contrasting to hollow bones of birds). Prum calls this an "evolutionary decadence", because it may decrease survival and fecundity capacities due to mate choice. Later in the chapter, Prum tells readers about his studies on feather evolution and dinosaur plumage coloration defending how an evo-devo approach provided evidences that feathers evolved first for the desire for beauty and only later allowed birds to fly.

Chapters 5 and 6 introduce an interesting history about females' role on the evolution of other aberrant sexual traits in birds: the complex genital structure in ducks and the extraordinary courting arenas of bowerbirds. "Make way for duck sex" is definitely an exciting (and shocking) journey inside the sexual life of ducks, which includes descriptions of sexual coercion, forced copulations, spiral vaginas in females and penises in males (absent in 97% of birds). Acknowledging the perseverance of a postdoc in his lab, Patricia Brennan, Prum tells readers about his study along with her in waterfowls describing anatomical variations in female genitals to prevent forced fertilizations. "Beauty *from* the beast" also draws a reasoning that female bowerbirds evolved strategies to maintain their freedom of choice besides coercive males, resulting in a process he named "aesthetic remodeling".

Female sexual autonomy then becomes explicit in the next chapters, with examples ranging from birds to humans. In chapter 7, "Bromance before romance", female autonomy grounds an alternative hypothesis for lek evolution, contrasting with the widely accepted hypotheses that reproductive dominance hierarchy is driven by males. The central point is that female preference in these systems should be biased towards socially cooperative instead of competitive and coercive males.

Chapter 8 onwards focuses on a certainly outstanding subject for most readers: evolution of human sexual behaviour. Prum provides what he called a "speculative" but testable hypothesis on human aesthetic evolution. His arguments are based on sexual behaviour characteristics we share with apes, our closest relatives (gorillas, chimpanzees and bonobos). Interestingly, he often emphasizes the importance of considering the interaction of human biology and cultural history for understanding sexuality, as well as varying cultural beauty norms in different ethnic groups, geographical regions or different temporal existence on Earth. In chapter 8, "Human beauty happens too", he argues that the "beauty happens" hypothesis may operate in humans since several human sexual traits (like hairy regions, wide hips and permanent breast tissue in women) are probably arbitrary (i.e., have no relationship with quality even though may indicate social benefits). Also, women pursuit of sexual pleasure ("orgasm") is a mechanism for the evolution of human beauty and sexuality, a reasoning he explains in chapter 9, "Pleasure happens". Interestingly, earlier in the book Prum makes a parallel between the evolution of such sci-

entific thoughts which started to flourish while women were politically organized in Europe and United States to protest for equal rights, sexual freedom and access to birth control.

Chapter 10, "Lysistrata effect", includes an analogy between human sexuality evolution and an ancient Athens's comic play where women sexual behaviour was decisive to the outcome of a war. Prum advocates that a specific process is similarly acting upon humans, the "aesthetic deweaponization" (i.e., a pressure for the reduction of male armaments imposed by females). "The queering of *Homo sapiens*" is another "highly speculative" but intriguing evolutionary hypothesis of human same-sex sexual behaviour proposed by the author. In parallel to previous chapters, he proposes that homosexuality had evolved as a female strategy to advance sexual autonomy and it reduces sexual conflict over fertilization and parental care. Female same-sex behaviour may have helped females to strengthen new female–female social alliances and male same-sex behaviour evolved as an extension of "aesthetic remodeling" to remodel their social behaviour by diminishing their "ferocity".

The last chapter, "The aesthetic view of life", provides a discussion on how this perspective can benefit science, human culture and their relationship. To Prum, this field has achieved few progress because we are too concerned with anthropomorphisms and ignore subjective experiences of animals, especially those related to sexual pleasure. His discussion about the effects of our eugenic roots and patriarchy is definitely appealing, and something that many may expect to receive more attention in the future. Interestingly, Prum is an apologist to feminism and, in several instances, remind readers that this movement is an ideology of "freedom of choice" and not an ideology of power, as patriarchy systems stigmatize it. By the end, he also makes an interesting parallel to human art, stating that there must be a coevolution between art and the aesthetic preference of the audience. *The evolution of beauty* is certainly a worth-reading book and is expected to bring new insights to science and our society.

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Hornero 33(2):138–141, 2018

LA INVESTIGACIÓN ORNITOLÓGICA Y LAS COLECCIONES DE AVES

WEBSTER MS (ed) (2017) *The extended specimen. Emerging frontiers in collections-based ornithological research.* Studies in Avian Biology N° 50. CRC Press, Boca Raton. 240 pp. ISBN: 978-1-4987-2915-4. Precio: US$ 145 (d)

Este libro es "raro" en su temática y celebro eso, ya que una obra de estas características no es común. Trata sobre colecciones, particularmente sobre colecciones de aves, y esto es poco frecuente porque colectar está mal visto. No se pueden matar aves. ¿No se pueden matar aves? Las colecciones se nutren de aves muertas, aves colectadas para ese fin, almacenadas en depósitos y custodiadas por instituciones (museos, institutos de investigación, universidades) que permitirán su estudio. En estas colecciones se realizará un sinnúmero de estudios llevados a cabo por investigadores, docentes, tesistas, alumnos y también serán la consulta obligada de dibujantes y autores de guías de campo, entre otros. Las colecciones brindan un significativo aporte al conocimiento de la biología de los organismos y la información que de ellas se desprende ayudará con seguridad a la conservación de las aves.