

In the Light  
of  
Evolution

*Essays from the Laboratory and Field*

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# Sexual Selection: A Tutorial from the Túngara Frog

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If we survey the animal kingdom we are struck by a spectacular diversity of forms: birds and bats, ants and aardvarks, lions and lamprey. Each has evolved suites of traits that allow it to make a living in a range of environments while dealing with a stunning set of ecological challenges. A closer look, a look within rather than among species, reveals another type of diversity, that between the sexes. In humans the differences can seem so profound that some have suggested in jest that we must be from different planets—“men are from Mars, women are from Venus.”

Darwin suggested that many of these differences between the sexes arise from sexual selection, which is variation in fitness that derives from variation in an individual's ability to acquire mates. Sexual selection can act on both sexes, but the results often seem to be more profound in males. In most species an increase in the number of matings has a greater effect on male mating success than on female mating success since males have more gametes than females. Also, as females invest more in reproduction than males, there are more males who are free to mate at any one time, thus promoting competition among males for access to females.

There are numerous strategies that males employ to gain matings, and they tend to fall into the general categories of competition and mate choice. Males can physically control females directly, they can control access to resources females require, or they can physically dominate and intimidate other males. In such cases selection has resulted in the evolution of males' weapons.

The mating strategy that has received the most attention, however, is mate choice. In numerous species the mating decision is made mostly by the female. Males advertise their wares to attract and seduce females, and females contrast and compare males and then decide on an appropriate partner. This aspect of sexual selection is also an exercise in a fundamental problem of animal communication: how does a sender utilize a signal to manipulate the behavior of the receiver to its own benefit, and how does the receiver respond to the signal to promote its selfish interests? To enhance their attractiveness males have evolved some of the most striking phenotypic traits of the animal kingdom, including dazzling visual displays of butterflies, coral reef fishes, and birds; the sonorous



