

Joan Roughgarden, 'Challenging Darwin's Theory of Sexual Selection.' *Daedalus* 136:2 (2007): 23-36

Whilst evolution and Darwinian natural selection continue to attract criticism or disdain from those with religious views to maintain, it is perhaps less common for evolutionary biologists to mount serious challenges to Darwin's work. However, Stanford biologist Joan Roughgarden has recently put together a sustained critique of Darwin's theory of sexual selection, a key component of modern evolutionary biology. This article constitutes an extension of her controversial 2004 book, *Evolution's Rainbow: Diversity, Gender, and Sexuality in Nature and People*. Her aim is to challenge gender identity, sexual orientation and sexual behaviour in animals, particularly attitudes about sex and gender that were current when Darwin was writing 150 years ago, and are still with us today.

Roughgarden begins by asking whether a biologist may criticise any of Darwin's theories without risking insult, ridicule, anger, and intimidation. Such emotive language immediately suggests that defenders of Darwin do so not intellectually, but by otherwise less savoury means. This allows Roughgarden to cast herself in the role of victim, a theme to which she returns at the end of the article when she addresses criticisms of her thesis and the suggested basis for those criticisms. However, the history of the development of evolutionary ideas suggests that Darwin is not quite the sacred cow she portrays, and one also wonders whether her own sense of victimhood is real (she has more than 30 years of academic publication under her belt), or more of a literary device to elicit our sympathies.

The main focus of the article, though, is Roughgarden's attack on Darwin and his sexual selection theory, a confrontation through which she conflates various different narratives. First, she rebukes Darwin as a Victorian scientific thinker and takes an indignant view of his use of language. Second, she opposes vehemently Darwin's theory of sexual selection. Third, she takes an aggressive stance against the current theory of sexual selection by effectively denouncing the modern theoretical model as fundamentally flawed. She therefore takes her assertion that Darwin was mistaken when he wrote his theory of sexual selection (because his ideas about sexual identity and gender were subjective), and uses this to criticise all subsequent developments in the theory of sexual selection.

To attack Darwin as a thinker, however, one has to consider the social context within which he worked. He must be read as both an historical as well as a scientific text, and therefore be placed within an appropriate historical framework. Darwin lived in a patriarchal Victorian society in which women were actively encouraged to behave in a modest and unassertive way, while men dominated the spheres of law, medicine, education, and commerce. How Darwin chose to write about evolution, and the examples he used, are clearly influenced by this social and cultural world. This does not *a priori* undermine the basic empirical truth of those biological examples or the scientific interpretation of them however. Whilst modern biologists place a different emphasis on male and female roles in reproduction (not least thanks to the evidence gained over the last two decades concerning the near-ubiquity of female multiple mating in animals), we should not uncritically let historical context get in the way of our appreciation of Darwin's insight.

Second, what of Darwin's theory? In *The Origin of Species*, gender stereotypes are firmly in place: Darwin does introduce sexual selection in terms of "a struggle between the males for the possession of the females", or female birds "selecting... males, according to their standard of beauty". However, by 1871 Darwin could assert confidently in *The Descent of Man* that sexual selection "depends on the advantage which certain individuals have over others of the same sex and species solely in respect of reproduction." This concept is akin to modern definitions of sexual selection, and eschews gender roles and stereotypes. Therefore, sexual selection, as envisaged by both Darwin and modern biologists, does not in fact require particular male or female roles. Whilst Roughgarden is justified in addressing gender identity in science and society, there is no rationalization for equating sexual selection with a particular gender construct. This fundamental misunderstanding has led to much criticism from the biology community.

Roughgarden then promotes a theory based upon the concept of cooperation, rather than competition, claiming that males and females reproduce cooperatively through 'animal friendships.' In a discussion of how anthropologist and gender theorist Gayle Rubin's 'sex-gender system' may be applied to the privileging of one gender over another, Roughgarden argues for 'social' rather than sexual selection, suggesting that there is a lack of sexual conflict between animals because they have to combine resources in order to ensure the successful production of offspring. To some extent this is correct; a certain level of cooperation must exist in order for procreation to take place. Although many biologists question her interpretation of how animals typically behave (are 'animal friendships' relevant for most insects, for example?), this part of the article is the most useful, generating predictions about animal behaviour. However, it is also in this section that she fails to separate "sexual selection" from what might have been Darwin's view of gender stereotypes: put simply, modern sexual selection theory is not as myopic as she pretends.

In *The Origin of Species*, Darwin made the humble admission that his research constitutes nothing more than a mere stepping-stone to a higher and more advanced scientific understanding of the natural world. Despite the arguments presented by Roughgarden, these are stepping-stones still worth taking.

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