

Rice William R., Urban Friberg and Sergey Gavrilets. Homosexuality via canalized sexual development: A testing protocol for a new epigenetic model. *Bioessays Journal*. 2013; (35)764-770.

Introduction

Homosexuality (HS) is commonly assumed to be rare in nature but this perception appears to be an artifact associated with an historical reluctance to publish socially and religiously controversial information. For example, consider the early 20th century naturalist George Murray Levick who recorded the following observation in his field notes while observing Adélie's penguins in Antarctica " *Here on one occasion I saw what I took to be a cock copulating with a hen. When he had finished, however, and got off, and the act was again performed with their positions reversed, the original "hen" climbing on to the back of the original cock, whereupon the nature of their proceedings was disclosed.*" ... Levick was so taken aback by these "socially inappropriate" behaviors that he hid them in his notebook by recording them in code with Greek letters. He also decided against publishing them except in the relatively obscure expedition's reports – where they were rejected for publication. Circumventing this type of reporting bias, several books have been written in the last 15 years in which the authors searched the published literature for observations-- usually mentioned as an aside in an unrelated context--describing homosexual behavior in nature. Many hundreds of such examples were found across a broad spectrum of species. For instance, homosexual behavior has been recorded in 93 species of birds. Representative examples include a 14% incidence of female-female nesting pairs of Western Gulls in California and this value is 31% for Laysan albatrosses on the island of Oahu. Male-male pairs occur at a rate of 5-6% in Australian black swans, and in grayling geese 15% of males only participated in male-male pair bonds over their lifetime, while 37% were bisexual. Even species as familiar as barnyard sheep have about 8% strictly homosexual males – yet almost no one except sheep breeders is aware of this fact, presumably because it has been socially inappropriate to mention it. (Rice et. al. 2013, 764-765)

HS appears to be relatively common in humans. For example, one well designed study of a large sample of twins in Australia, that convincingly guaranteed anonymity, found an incidence of HS of 8% in both sexes -- when measured as a Kinsey score of same-sex partner preference >0 . HS is not a dichotomous alternative to heterosexuality in that there is an empirically verified continuum between exclusive attraction to same-sex and opposite-sex sexual partners.... (Rice et. al. 2013, 765)

Neurophysiological studies have documented physical differences between homosexuals and heterosexuals. (Rice et. al. 2013, 765)

(....) Conclusion

Historical, social and religious norms have interfered with a full appreciation of the scope and diversity of the homosexual phenotype in nature, as well as research into its biological underpinnings. Recently, however, our understanding of the neurobiology of the homosexual phenotype has rapidly expanded. Non-molecular pedigree and twin studies initially led to the conclusion that genetic polymorphisms accounted for much of the variation in sexual orientation observed within human populations. However, more recent molecular genetic data provide only limited support for this interpretation. Epigenetics provides a feasible alternative to genetic polymorphism(s) as the biological foundation of HS (and in general, gonad-trait discordances that have a familial association) and a detailed epigenetic model has recently been proposed. Current advances in stem cell technology and the ability to perform genome-wide epigenetic profiles on these cells provide a unique opportunity to test models of epigenetic-based HS. (Rice et. al. 2013, 769)