

THE BIOLOGY of SEXUAL ACTIVITY: Social Monogamy and Sexual Monogamy from a Biological Perspective

I. Monogamy and Promiscuity

Of the 4,000 mammalian species, only a small percentage is monogamous. Elephants mate for life (sexually monogamous) but are not necessarily socially monogamous. Recent research with voles, commonly referred to as field mice, have shed light on a neural influence for sexual and maybe even social monogamy. Most research involving voles and fidelity (used synonymously with "monogamy") confounds sexual monogamy and social monogamy.¹ Social monogamy is characterized by pair bonding (not necessarily sexual) where two individuals share resources, burdens, and tasks. Sexual monogamy is characterized by exclusivity in mating where only those two individuals mate with each other. Social monogamy does not entail sexual monogamy; conversely, sexual monogamy does not entail social monogamy. Monogamy, of some kind, is biologically influenced by V-sub-1a receptor binding sites and the hormones vasopressin, "which affects male reproductive and social behaviors (such as communication, aggression and sexuality) and oxytocin, which is involved in promoting maternal nurturing and sexual receptivity".²

Prairie voles (*Microtus ochrogaster*) are monogamous, whereas the closely related montane voles (*M. montanus*) are promiscuous. Male prairie voles injected with vasopressin increases monogamous pair bonding. Inhibiting the hormone prevents pair bonding. Similar effects were found in female prairie voles injected with oxytocin. However these effects were not found in promiscuous montane voles. Montane voles have fewer receptor sites for these hormones than their prairie vole cousins and the receptor cites

¹ Ophir, A. G., Et. al. 2008. "Social but not genetic monogamy is associated with greater breeding success in prairie voles." *Animal Behaviour* (75); 1143 - 1154.

² Broadfoot, M. V. 2002. "High on Fidelity: What can voles teach us about monogamy?" *American Scientist Online* (May - June): <http://www.americanscientist.org/template/AssetDetail/assetid/14756>. Last viewed 23 May 2008.

are distributed differently in their brains. The receptor sites in monogamous prairie voles are located in the reward sections of the brain that are also implicated in drug (and gambling) addiction. During copulation, vasopressin and oxytocin is released.³ Sexual copulation, in monogamous prairie voles, leads to sexual and social monogamy. Studies where the number of receptor sites in prairie voles were increased (by injecting a virus with the gene for vasopressin receptors) showed that less vasopressin was required to form pair bonds.

Vasopressin and oxytocin are found in both female and male humans; however, the receptor site distributions differ from both prairie and montane voles. Consequentially, one cannot extrapolate from voles to humans regarding sexual and social monogamy/promiscuity. Vasopressin is released in human males during copulation but uptake effects are currently unknown. The evidence from voles does suggest that social and sexual monogamy and promiscuity may have biological influences even in humans.

The divorce rate in America is roughly 41%, and inching *downward*. We need to know to what degree infidelity (sexual promiscuity) is the cause or reason for divorce. Sexual monogamy is rare in the animal kingdom. Monogamy and promiscuity (sexually and socially) may be biologically influenced in humans, but it is a further question, over and above the biological questions *alone*, whether or not one *ought* to be sexually and/or socially monogamous.

³ There is currently no evidence supporting the view that a person can be addicted to sex!!