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RESEARCH HIGHLIGHT

Is there a hormonal basis for human homosexuality?

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In the August 2011 issue of *Endocrinology*, Dr Balthazart presents a minireview on Hormones and Human Sexual Orientation.[1] As in most scientific papers on this issue, the contribution lacks an operational definition of (human) homosexuality. Personally, I like the definition of John Money.[2] 'Homosexuality is characterized by same-sex contact, either as a genital act or as a long-term sexual/erotic status. A homosexual person is able to fall in love with, and become the pair-bonded sexual/erotic partner of only a person of the same morphological sex'.

Scientists have had problems to make sense of homosexual behavior. In present-day Thailand, some men will say: 'I am not homosexual, I am a man', implying that homosexual men are not men but belong somewhere in the female category of human beings, where else in a binary world of two sexes? The scientific thinking about homosexuality started in the middle of the nineteenth century when the term was coined by Karl-Maria Kertbeny in 1869: 'In addition to the normal sexual urge in men and women, Nature in her sovereign mood has endowed at birth certain male and female individuals with the homosexual urge, thus placing them in a sexual bondage which renders them physically and psychically incapable—even with the best intention—of normal erection. This urge creates in advance a direct horror of the opposite sex, and the victim of this passion finds it impossible to suppress the feeling which individuals of his own sex exercise upon him'[3] (page 637). The German sexologist Magnus Hirschfeld (1868–1935) was convinced that legal protection could only be argued if it became irrefutably clear that homosexuality was inborn and had a biological substrate. Hirschfeld was influenced by the research of the Viennese endocrinologist, Eugen Steinach (1861–1944).[3] Steinach performed transplantations of testes and ovaries in rats and guinea pigs. His research showed that these glands secrete hormones into the bloodstream that influence not only the animals' physical development but also their sexual behavior, responsible for the 'sexualization' of the brain as male or female.

When research tools in biomedicine improved, the principle guiding biomedical research of homosexuality remained faithful to this concept attempting to identify female biological traits in male homosexuals and male biological traits in female homosexuals. Actually, Balthazart follows this paradigm. He posits (the following is a quote, but I have added some clarifications in italics) 'In animals and men, many sexually differentiated characteristics are organized during early life by sex steroids, and one can wonder whether the same mechanism also affects human sexual orientation. First, multiple sexually differentiated behavioral, physiological, or even morphological traits are significantly different *in men and women*, *and in* homosexual and heterosexual populations (*is the latter true?*) Because some of these traits are organized by prenatal steroids, including testosterone, homosexual subjects were, on average, exposed to atypical endocrine conditions during development (*atypical for their genetic/gonadal/genital sex; female-type endocrine conditions in male homosexuals and male-type endocrine conditions in female homosexuals*). Exposure to a high concentration of testosterone during a critical phase of development would lead to a male-typical orientation (attraction to women), whereas a lower embryonic exposure to steroids would lead to a female-typical orientation (attraction to men)'.

1. My own views on the issue have been elaborated in Ref. 4. The principle guiding biomedical research of homosexuality has traditionally been to attribute female biological traits to male homosexuals and male biological traits to female homosexuals. The exaggerated effeminacy (not femininity!) encountered in some homosexuals, but certainly not all, is often a caricature of women's manners. Women rarely find it feminine. There has been not much systematic research whether the sexuality of homosexual men bears a close resemblance to the sexuality of women in all its aspects, but I doubt it. Homosexual men's sexual desires are projected on men, but the only available partners are other homosexual men. How could two homosexual men possibly provide sexual satisfaction to one another if both of them have a female soul and a female sexual repertoire while, at the same time, following the above paradigm, a homosexual man, with his allegedly female sexuality, is desirous of another man with a male soul and a male sexual repertoire and, therefore, by the above definition, not homosexual.
2. Much of the research in Balthazart's article[1] is based on findings in (lower) mammals, with a highly stereotyped sexual behavior of mounting and lordosis. Can this be extrapolated to the human species? In animal experimentation, it is possible to induce in a male animal a largely female sexual repertoire of lordosis and being mounted by a male animal by depriving that animal from exposure to testosterone at the critical period of sexual differentiation of its brain, which comes later in development than the sexual differentiation of the genitalia. To prove the point, these hormonally feminized interact sexually with intact male rats and, indeed, the intact male rat will mount the hormonally manipulated male rat. I have never read experiments

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where two hormonally manipulated male rats are allowed to interact which would be a more faithful representation of the conventional theoretization of human homosexuality.

The human species attributes meanings to sexuality. This is probably best captured in John Money's concept of the lovemap,[5] defined as: 'one's own concept of an idealized lover and idealized erotic and sexual activity in our imagery or actually carried out'. There is more to human sexuality than mounting and lordosis!

3. 'A theory is a good theory if accurately describes a large class of observations on the basis of a model that contains only a few arbitrary elements, and it must make definite predictions about the results of future observations; you can disprove a theory by finding even a single observation that disagrees with the predictions of the theory'.[6] Some clinical syndromes with abnormal prenatal endocrine conditions have been associated with a higher prevalence of homosexuality later in life, but the differences with control subjects are small and there is, not rarely, a forceful attempt to prove the point that androgen exposure of girls predisposes them to become lesbians and a less-than-normal androgen exposure of boys would increase the likelihood of future sexual orientation to men.[7] There are simply too many human homosexuals who do not fit in this paradigm. It is safe to say that the prenatal history of nearly every homosexual person has been unremarkable from the perspective of endocrinology. To state that homosexual subjects were, on average, exposed to atypical endocrine conditions during development, as Balthazart does, seems to me unfounded and biased. Balthazart first proposes a theory of the (prenatal) origins of human homosexuality and then infers that homosexuals fit with that theory, without presenting any evidence that this has been the case. Homosexuals are born from normal pregnancies and do normally not suffer from sexual differentiation disorders. That being so, they miraculously develop a same-sex orientation.
4. In my belief, we need a different scientific approach to the intriguing phenomenon of sexual orientation. Imposing the model of femininity on male heterosexuals and of masculinity on lesbians has not led to new vistas. The road to insight should be walked in the opposite direction, potentially offering exciting views. Let us ask what homosexuals themselves think about their sexual orientation, how they interpret the feelings usually becoming manifest at the time of hormonal puberty that the same sex exerts an enormous fascination much in the way the other sex does in the case of a heterosexual development. Maybe, a painstaking description may lead new insights into the biology of sexual orientation and human homosexuality in particular. I do believe in a biological substrate of sexual orientation since our human existence rooted in our biology but I have no clue what lies at the basis of homosexuality and by the same token heterosexuality. A hormonal basis for homosexuality? Maybe, but the explanations offered in this minireview fail to come to grips with human homosexuality as it is lived.

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