

Wilful public misunderstanding of genetics

This week's excitement over a report suggesting a genetic basis for homosexuality has been overdone, suggesting that there is a long way to go before public understanding is enlightened.

So after all, there is a gene for male homosexuality! That seems to have been the common reaction to last week's announcement of a genetic linkage between male homosexual behaviour and a polymorphism of the X-chromosome. "We knew it all along," the homophobes have been telling dinner-party audiences. "Those guys (or gays) are *different* from you and me."

The responses of gays themselves have been variable. Some have welcomed the idea that behavioural characteristics with which they are personally content may have been given the status of being inheritable, as are the colour of hair or skin, so that they may claim immunity from the discrimination and ostracism to which gays have been exposed. Others are alarmed that the discovery of a genetic basis for their sexual orientation may quickly be followed by an attempt to get rid of it, perhaps by amniocentesis and abortion, from the population. Absurdly, a member of the British Parliament has even demanded legislation to prevent the use of this knowledge further to discriminate against the gay population. But the general complacency is entirely misplaced, as are the hopes and fears of gays themselves.

This wave of excitement has been generated by a report of a genetic study by Dean H. Hamer and colleagues at the National Cancer Institute. A measured assessment of the research appears on page 288 of this issue. In brief, the DNA of 33 out of 40 pairs of brothers both declaring themselves to be exclusively homosexual in orientation was investigated with a series of previously defined genetic markers spanning the whole length of the X-chromosome.

The upshot is a significant correlation between declared homosexuality and the inheritance of a genetic marker near the end of the long arm of the X-chromosome. Thanks to the high density of markers on the X-chromosome, if there is a gene, it will probably lie within 4 million base-pairs or so of an identifiable marker. That may be a small fraction of the whole human genome, but it is still a huge stretch of DNA to analyse nucleotide by nucleotide.

So is there a gene for homosexuality hidden in that DNA? Properly, the authors of the study raise the question and then properly enter a formidable list of caveats. For example, they emphasise the need for confirmation of their study, evidently conscious of how previous claims of a genetic basis of behavioural traits in people (manic-depressive illness among

Amish people and schizophrenia) proved false. One obvious pitfall in this business is that of building into the choice of a sample of subjects, in this case the pairs of brothers, a bias of some kind. The authors have been careful, but who can tell how careful is careful enough.

It is also possible that the interpretation may be falsified by extraneous influences. What if it is accepted, for example, that it is true what the psychoanalysts say that male homosexuality is in part determined by the influence of an over-loving mother? And what if the gene located at the end of the X-chromosome does not determine male homosexuality, but instead plays a part in telling whether a mother is "over-loving" in the appropriate sense? Then the gene concerned would be strictly irrelevant to the causation of male homosexuality, whose determinants would remain those of nurture rather than nature.

That is not to rubbish an important finding; either way, a genetic determinant of a behavioural trait would have been identified. But it is entirely possible that further investigation will show that the familial incidence of traits for sexual preference is not at all genetically determinate. The data now published would be more informative on that score if they said more about the incidence of the inheritance of the X-linked markers in the general population.

The authors suggest that the frequency of the putative allele linked with male homosexuality is roughly 1 in 50, but that estimate strictly applies only to their sample of brother pairs and the relatives thereof who have volunteered DNA. It could easily be that the frequency of the allele in the general population is much greater, in which case the link between its inheritance and homosexuality will be weakened. Time (and analysis by independent methods) will answer that.

But it is also plain, as the authors say as clearly as they can, that their data do not explain the homosexuality of the seven (out of 40) brother-pairs in whom the putative allele cannot have been inherited in the fashion described. Is their behaviour determined by other genes, or is nurture solely responsible? Just as if somebody had found a gene linked with, say, the inheritable part of IQ, it would be realised that little had been done to improve the education of the young, so the recognition that some part of the spectrum of male homosexuality is genetically determined (which is not certain) does not of itself simplify

the conduct of family life.

That is why it is disconcerting that the treatment by the general press in Britain of what may be an important step forward in the genetics of human behaviour has been so patchy. Most have approached the problem with solemnity, eager to display the responsibility with which a delicate but important issue is being tackled. But only a few have succeeded.

Among the serious British press (the tabloids are something else), for example, the *Sunday Telegraph* filled a whole page last weekend with three articles with headlines **Born to be gay** (reactions from male homosexuals), **A lot of mothers are going to feel guilty** (subtitled "...scepticism mingled with thoughts of Hitler") and **The gene genie comes out fighting**. The same newspaper carried a leading article suggesting "an extraordinary alliance of gay rights activists and the Right to Life lobby" in defence of the wild-type human genome.

Another, the Sunday version of the *Independent*, which gave a page-full factual account of what the new development consists of and what it implies, thought it worthwhile complaining in a leading article, under the heading of **The genetic tyranny**, that the governments "contributing a total of \$2 billion to an attempt to map the entire human genome" have not "given a second's thought" to preventing the misuse of the data that may be gathered.

The worry in all this is neither ethical nor educational, but the tendency of even sober-sided newspapers to overdramatise discoveries only, afterwards, to complain that they have been misled. Even a casual reading of the original article will reveal a commendable list of caveats. Every serious person telephoned by the newspapers has repeated them and others (and often has been reported as having done so). Yet the overall effect is to pass off inference as fact, and to conceal the certainty that if there is a genetic component of male homosexuality, its influence will be much more complicated than the simple picture rehearsed in the past few days.

In Britain, Mr William Waldegrave the science minister says he plans to spend £100,000 on the encouragement of public understanding of science, a cause long since taken up by the Royal Society. Perhaps the most urgent need is for ways of telling a good tale about developments where the story-line is neither black nor white.

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