DO MEN, in essence, marry their mothers, and women their fathers? And do they also choose mates by smell in a way that is likely to result in healthy offspring? These are both old hypotheses and both have been tested by studies published this week. Only one of them, however, seems to hold up.

Janek Lobmaier of the University of Bern, in Switzerland, and his colleagues, looked at the question of smell. Their work appears in the *Proceedings of the Royal Society*. Lisa DeBruine of the University of Glasgow, in Britain, and her colleagues looked, in a paper posted to *bioRxiv*, an online database, at eye colour—specifically,
whether the eyes of someone’s lover match those of a pertinent parent.

Dr Lobmaier and his team were testing the idea that people literally sniff out partners with appropriate major histocompatibility complex (MHC) genes. Individuals with more diverse sets of MHC genes have stronger immune systems. Mates with different MHC genes are thus likely to have healthier offspring. MHC genes also affect body odour, so it is no surprise that many species of animal choose, on the basis of odour, mates with dissimilar MHC genes.

Whether people follow suit, though, is unclear. Experiments have produced equivocal results. So, to nail things down, Dr Lobmaier recruited 42 female odour donors and 94 male odour raters, all of whom gave blood samples that he analysed
to determine which versions of six different MHC genes they possessed. Every man was asked to rate the smell of eight women, collected on a cotton pad held overnight in the armpit of the woman in question. Crucially, which had not been the case in previous work, these samples were all collected at the point in the volunteers’ menstrual cycles when their fertility was at its peak. Four of the eight were from women with similar MHCs to the man doing the sniffing, and four were from women with dissimilar MHCs.

Dr DeBruine’s experiment, meanwhile, involved 150 men and 150 women, half of whom in each case had long-term lovers of the same sex. She asked participants their own eye colour, that of their lover and that of their parents. She then sorted these colours, for statistical convenience, into two groups: light (hazel, green, blue-green, blue and grey) and dark (black, dark brown and light brown). Her aim was to test three conflicting hypotheses: that people are attracted to mates similar to themselves; that daughters genetically inherit preferences from mothers, and sons from fathers (so they will prefer the eye colour of the other parent); or that preferences are learned by imprinting on a parent.

For heterosexuals, however, the outcome of the second and third hypotheses would be the same. It was by including gay men and women in her sample that Dr DeBruine thought she might be able to distinguish between them. A gay son, she hypothesised, would imprint on his father, and a gay daughter on her mother.

And so it proved. When she crunched the numbers, she found that gay men and straight women were both twice as likely as chance would predict to have a lover with a similar eye colour to their father’s. Likewise, straight men and gay women were two and a half times as likely as chance to have lovers of a similar eye-colour to their mother’s. Though eye-colour is but one of many features that may attract romantic interest, in its particular case, that attraction seems likely to be imprinted.

As to Dr Lobmaier, he found that, though the men in his study expressed strong likes and dislikes concerning the odours he asked them to smell, these bore no relation to the MHCs of the women involved. On that hypothesis, then, it is back to the drawing board.