

## **Girl Power**

Oct 21st 2004

From *The Economist* (print edition)

### **Single mothers are more likely to have daughters**

All over the world, more boys are born than girls. Evolutionary biologists believe that this is because boys (and, indeed, males in general) are more likely to die at a given age than are their female contemporaries. The imbalance at birth thus means that the sex ratio balances at the age when people are reproducing. But for decades there has been a puzzling trend in the boy:girl ratio. In Britain, as well as in the United States and Canada, the proportion of boys being born is dropping. No one knows why, although it has been suggested, somewhat controversially, that the trend is due to chemical pollutants that are mimicking the effects of sex hormones.

And yet there is another recent trend that may have something to do with it. During the same period, the proportion of single mothers has been increasing. The reasons for this are less puzzling, but as the Italian nominee to the European commission, Rocco Buttiglione, found out this week when he apparently suggested that single mothers were not very good as parents, it is no less controversial. The question is, could the two trends be linked? Can household arrangements affect the human sex ratio?

According to Karen Norberg, of the National Bureau of Economic Research in Cambridge, Massachusetts, they can. In a review of data from almost 60,000 American families, Dr Norberg found that the chance of a woman giving birth to a boy rather than a girl is higher if she has been living with a man before the child was conceived. To be specific, for parents who were living together, boys were born 51.5% of the time, while when the parents were not cohabiting only 49.9% of births were male. This difference may seem small, but statistically it is highly significant, which suggests it is the result of evolution. Dr Norberg's paper was published this week in the *Proceedings of the Royal Society*.

Actually, as with so much else in biology, Charles Darwin got there first. In "The Descent of Man", he referred to studies showing that among children born out of wedlock there were more girls than boys. Dr Norberg's work reinforces the point, and also shows that it is not formal marriage, but actual cohabitation, that is the decisive factor. What neither Darwin's nor Dr Norberg's work shows, though, is why.

### **Sons and lovers**

There are some clues. In work on other mammals, researchers have found an association between hormones, the frequency of copulation, and the sex of the offspring. In other words, there is a way the body might "know" if it is cohabiting with someone by the amount of sex it is getting, since copulation changes the levels of various hormones. It is also known that a woman's hormonal motivation to have sex is highest on the day of ovulation, and that sex on that day is more likely to result in a girl. Couples who live apart, and therefore probably have intercourse less often, may be more likely to do so when the motivation is highest—resulting in a girl.

This chain of reasoning, though, provides only what workers in the field call a proximate cause. What is needed for a complete explanation is an ultimate-evolutionary-cause.

It is easy to speculate. Perhaps same-sex children are easier for a lone parent to rear. Perhaps parents pass on different kinds of benefits to same-sex offspring and opposite-sex offspring. Perhaps a father helps his son to learn sex-specific skills, as in bird songs. Perhaps boys are simply more costly to raise than girls, and would thus overtax the resources of a lone parent. However, a more controversial possibility is that - in a Darwinian sense only - Mr Buttiglione is right that two parents are sometimes better than one.

It is well established, in both humans and other species, that successful males have lots of offspring, while unsuccessful ones have few or none. Females, by contrast, show a smaller range of reproductive output, with most having some offspring, but none having as many as the most successful males. The upshot is that it makes evolutionary sense to have sons when circumstances favour them becoming big, strong, clever and handsome (and therefore attractive to women), but when they do not, it is better for a woman to have daughters, most of whom will find a mate even in tough times. That way, a woman will maximise the number of grandchildren she has. In the case of humans, circumstances favouring the raising of strong, healthy children could include having two parents around, since humans are unusual among mammals in that fathers are often involved in parental care.

Of course, even if this evolutionary explanation of Dr Norberg's result does turn out to be correct, it probably does not carry any lessons for the modern world. Such biological patterns would have been established hundreds of thousands-or possibly millions-of years ago. Bringing up children alone in a rich, industrialised society is a rather different proposition from bringing them up in a hunter-gatherer band, and there is no reason to suppose they would be at a disadvantage now. Except, perhaps, that with a surplus of women around, it will be even harder than it is today for a girl to find a suitable husband when she grows up.