

Chapter 2

Why Sex?

Biologically, sex could appear an enormous disadvantage. Asexual reproduction can certainly produce progeny at a much faster rate than sex. Surely this is a competitive advantage? At times, it can be: a bacterium that can divide every twenty minutes may well outcompete another that takes two hours to do the same thing; insects reproducing parthenogenetically (virgin birth) can take advantage of favorable circumstances and foil attempts by other species (including man) to curb their population.

But even bacteria find it necessary to have sex. Insects that reproduce parthenogenetically still have sex from time to time.

Why should an organism that is coping very well with its environment, even seemingly perfectly adapted to it, risk not creating the perfect copies of itself that asexual reproduction provides?

The first part of the answer to this question is that the environment is never as stable as it may seem; changes are always occurring—by the organism's own activities, if for no other reason. While random mutations provide some variation in asexual populations, they can never produce the wide range of possibilities that sex, with its blending of inheritance from two parents, provides. The ability to evolve at speed confers an enormous advantage on sexual creatures.

Again, sex, with the almost limitless variations it produces, is largely what allows us to stay just ahead of pathogenic bacteria in their attempts to completely subjugate us. On some occasions, it is also what allows bacteria to defend themselves against our counter-attack—e.g., with some antibiotics.

The second part of the answer to the question is somewhat less obvious and has become fully realized only in recent years. It is the other side of the coin to the above. Most genetic changes are, in fact, not advantageous. The process of splitting and recombination of chromosomes that occurs during sexual reproduction masks many of these undesirable changes.

The fact is, too, that asexual reproduction cannot indefinitely produce perfect copies of an organism; errors inevitably creep in. The sexual process provides a means of repairing these errors.

More than this, it provides a means of rejuvenating the organism. Cells, like babies, are born young. The great majority of our cells continue dividing asexually throughout our lives. In the process, their chromosomes become increasingly less able to initiate and direct the process. In particular, a part known as the telomere shortens with each division. Sex restores the telomere to the correct length.

There is sex, and then there is sex. Sex in bacteria is a very rudimentary process. One can really only tell a male cell from a female cell because the male is, by definition, the donor. Why have more complex organisms developed such striking differences between the sexes - at all levels?

The answer to this is simply - because it works. Organisms with specialized sperm and ova are more likely to reproduce successfully than those with largely undifferentiated sexes. Again, this is for two reasons. The first is that a single male can service a large number of females. The second is that the competition between a myriad of sperm for the

honor of fertilizing a single egg ensures a survival of the fittest.

This specialization of the basic sex cells is mirrored in sexual behavior. Females producing large, nutritious gametes (eggs) are choosy about their mates and nurture their offspring. Males that manufacture multiple, mobile sperm try to distribute them as widely as possible and natural selection favored males who mated frequently. Whether or not this justifies certain traditional stereotypes of male and female roles is a controversial topic I may discuss at another time.

What is certain is that sexual selection is an important factor in evolution. In most animals, members of one sex compete more intensely for mates than members of the other sex, and show a greater development of secondary sexual characteristics. It is usually the males that compete and the females that do the choosing, but this is by no means universal. An important factor is the ratio of males that are ready to mate to females that are ready to mate. This is closely related to the potential rates of reproduction that individual males and females can achieve. Though there is a lot of variation, females often prefer to mate with the most flamboyant males, but they also tend to copy the selection of older females.

Human mate selection, while immensely more complex, doesn't seem all that different. The basic mechanism is that both males and females choose partners who are as good as they feel capable of getting. For females, the main criterion is achievement, economic success and prestige—or at least the potential for these. Dr David Buss, in his book *The Evolution of Desire*, reports that 'universally, women are attracted to somewhat older, well-dressed men because those attributes are clues to resources and status'. He also says that a man who is lean and muscular has enormous appeal for a woman and that the first thing she looks at is his butt. Powerful, resource-laden, handsome men have more sexual partners simply because they are the female ideal, but faithfulness and nurturing also enter the equation when a woman is looking for a permanent mate. For males, the situation is rather more complex but depends primarily on the currently accepted view of the ideal female within his society (which often reflects such marks of youth, health and childbearing ability as smooth skin, lustrous hair, full lips, a waist roughly two-thirds the size of the hips and white teeth) and his estimation of his ability to capture the ideal.

One possible danger of the tendency to imitate an older woman's choice could lie in a woman selecting a mate just like Dad. In our mobile society, this might be okay; the chance of the mate selected being closely genetically related is probably remote. In more fixed societies, mechanisms often exist to prevent this. In some societies and races, however, whether due to physical or social isolation or warped ideas of maintaining racial purity, the majority of unions are between closely related couples. The evils of such inbreeding are legendary and often immediately apparent to an outsider. The ability of sex to mask and neutralize harmful mutations depends largely on non-related matings, and the way to minimize genetic defects is to encourage unions between couples as little related as possible.

However, there is a proviso to this: the mating must be between individuals closely enough related to produce fertile offspring. In magpies, it has been found that the female tends to select mates with calls very similar to, but not identical with, the father's. This goes a fair way towards ensuring the necessary balance between genetic closeness and genetic difference. The process is, of course, immensely more complex in humans

but there are clues to a broadly similar process occurring, so that we have a certain bias toward selecting mates similar to, but somewhat different from, our parents.

As is becoming more and more apparent, sex and our evolutionary history have conspired to ensure that all humans are related—and far more closely than most of us would realize. The Bible story is not quite right—Eve came out of Africa a long time before she met up with Adam in the Middle East—but, at least on our mothers' side, we are all ultimately derived from the same ancestors. This makes the study of different populations and societies a legitimate means of sorting out the differing contributions of heredity and environment to human behavior, including sexual behavior.

Despite his frequent unscientific ramblings and misguided conclusions, Freud was certainly right about one thing—sex pervades all our lives, whether white or black, saint or sinner. It determines our behavior in numerous ways and profoundly affects our everyday moods. It may be overstating the case to say, as has been said, that a man's bad moods invariably result from either too little sex or too much sex, but sexual satisfaction or the lack of it does have an enormous bearing on how humans feel about themselves and the world. There are few experiences in the world that compare with drifting off to sleep in the arms of a lover after a satisfying sexual encounter.

Crudely speaking, we are so obsessed with sex because it feels so good and it feels good because, over evolutionary time, the animals that liked having sex created more offspring than the animals that didn't.