

CHAPTER 11

Cloning

It is now some years since the first successful attempt to clone a mammal from an adult cell of a single parent (Dolly the sheep, in case you've forgotten) was announced, bringing with it science fiction scenarios of being able to create exact replicas of people.

Much of the debate on cloning is based on a confusion between terms. Cloning originally meant any process that gives rise to genetically identical organisms, such as the splitting of bacteria or amoebae, the budding of plants, the twinning of animals. What developmental biologists now mean when they speak of cloning is transplanting a nucleus from a body cell into an egg cell of another animal. This is the process that produced Dolly. A clone like Dolly is by no means an exact copy of its 'parent'. In the first place, while its nuclear DNA may be identical with that of its 'mother', the mitochondrial DNA is not. Secondly, it has not developed in the same environment in the womb or later after birth.

Environment does make a difference. Quite correctly, in *The Boys from Brazil*, as much effort was put into attempting to create a similar childhood experience as in creating the original Hitler clones. Identical twins are much closer clones than Dolly and her mother; yet they, for all their similarities, have their differences. Even Eng and Chang Bunker, the original Siamese twins, who remained joined at the abdomen all their lives, developed distinctly different personalities. One became morose and alcoholic while the other remained a cheerful teetotaller. Attempts to recreate an individual by cloning appear inevitably doomed.

In plant and animal breeding, this may not matter that much. Dairy breeders aren't too concerned about Daisy's personality, just as long as she produces milk of the maximum quantity and quality. Cloning promises to enable animal breeders to do what plant breeders have been doing for millenia - produce a desired variety by breeding and then propagate it unchanged indefinitely. The problem with this is that it removes the advantage sex gives to a population of having different genotypes, at least one of which is likely to be better able to adapt to a changing environment. In the case of our domestic animals, the biggest threat would be of disease completely wiping out a susceptible population.

Cloning has another aspect which is even more fraught with difficulties and dangers - gene modification. This promises a dramatic escalation in the production of new varieties - including animals containing human genes, whose organs can be used for human transplantation and which can produce human antibodies in their milk. The biggest worry here (beside the danger of unknown viruses lurking in animal organs used for human transplantation) is that, with current techniques, unintended effects of gene modification are all too common and these may not show up until a clone has become widely used.

There remains, also, a major problem with the cloning of adult animals or even advanced embryos. At least with present techniques, some genetic damage is hard to avoid and such animals are unlikely to live out a normal lifespan. Whether this will always be true or if improvements in technique will remove this obstacle remains to be seen. If in fact it does become possible to mimic in normal body cells the same pristine genomic state that seems to prevail in germ cells, we will have done much to conquer aging. It is in such research and in research into such related questions as why some cells become cancerous that the greatest potential benefits of cloning may lie.

Any attempt to permit the attempted replication or replacement of any human being by means of cloning should be strongly resisted as the farce it is. Whether it should be used as a means of allowing couples to have children 'of their own' is, in this age of medical resource rationing, something which should be part of a wider debate.

Finally, cloning does not alter the conclusion that, given the limited and uncertain benefit of eugenic policies, the cost of such policies in loss of personal freedom cannot be justified.