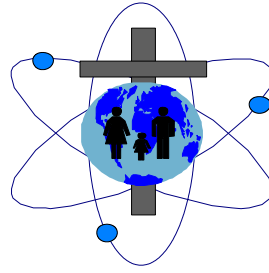


# SOCIETY, RELIGION AND TECHNOLOGY PROJECT

Church of Scotland



## SHOULD WE CLONE ANIMALS?

Despite all the fuss about human cloning it may never happen. Animal cloning is already done in many species, and raises some important ethical issues which we look at here.

### What's the Church doing Here?

Since 1993, the Church of Scotland's Society, Religion and Technology Project (SRT) has examined the ethics of genetic engineering and cloning in animals and plants with an expert working group. This work produced the book "Engineering Genesis", now a standard text on the ethics of GM issues. The group included Professor Ian Wilmut, leader of the Roslin Institute team that created Dolly the cloned sheep. So when Dolly hit the headlines in February 1997, the church was already in a position to offer a balanced and informed view on cloning issues. That May the Church of Scotland General Assembly was one of the first organisations in the world to give a considered official view on animal and human cloning. SRT continues to be engaged in national and international ethical discussions about cloning issues, and has written and broadcast widely. To help shed light on these confused and often misrepresented issues, we've produced 3 information sheets - this one on animal cloning, one on human cloning and one on human embryonic stem cells.

### Is Cloning Animals Simply Wrong?

Cloning occurs naturally in many plants and micro-organisms, and some lower animals, but it does not normally happen in humans and mammals, except for identical twins. Should we respect this biological distinction or celebrate our capacity to override it? It's not a new issue. The first cloned sheep were created in 1979. For creatures that rely on sexual reproduction it is important for a healthy population to maintain good genetic diversity. Cloning such creatures could therefore be seen as a step in the wrong direction. For Christians and many others the very God-given diversity and variety in nature is a cause of praise to its creator, vital for the species, and of pleasure and use to humans. Where God evolves a system of boundless possibilities by diversification, ought humans to select certain functions we think are the best, and simply replicate them? Does cloning animals exceed other ethical limits? In our other cloning sheet we argue why human cloning is ethically unacceptable. One reason is its instrumental effect of predetermining people's genetics. This would not itself be an absolute objection to cloning animals, if we already accept a certain amount of valid human use of animals. As we shall see there are problems of animal harm, but there are also intrinsic issues. As with genetic modification, cloning is a serious intervention which some feel violates the value inherent in the animal. We think a "No, unless .." approach should be taken. Animal cloning should not be done without a *very* good reason. Let's look at some possible cases.

### Cloning to help make Pharmaceuticals in the Milk of GM Farm Animals

The original reason why the Roslin Institute and PPL Therapeutics produced cloned sheep arose from their earlier work to genetically engineer sheep to produce proteins of medical value in their milk. This was one of the least controversial GM applications for the SRT working group and the church. It had clear human benefits and few animal welfare or other concerns, once past the experimental stage. But the modification process was imprecise, long and expensive, and used

many animals. Nuclear transfer cloning provided a technical solution which enabled scientists to produce GM 'founder' animals directly from modified cells with greater certainty and precision, which would then be bred normally. It was used to produce Polly, the first sheep to be both cloned and genetically modified, and various other lines of GM sheep. The Church of Scotland accepted animal cloning in this limited context, aimed at using less animals to address a clear medical need, where cloning was not the main intention, and where natural methods would not work. Since then, however, it has been largely abandoned because many welfare problems arose in the cloned sheep.

### **Dolly, Cloning and Animal Welfare**

Dolly was a sensational sideline to this research. Her creation rewrote the laws of biology because she showed that ordinary (somatic) body cells could be turned back to embryos and made into new offspring, genetically identical to the animal whose cells had been used. Cloning has now been done experimentally, usually with much unjustified hype, in cattle, pigs, goats, mice, rabbits, one cat, horses and even infertile mules, but not so far in dogs, primates or humans. Efficiency is usually very low and with the notable exception of pigs, serious animal welfare problems have generally occurred. These include perinatal and birth problems, oversized offspring and disease susceptibility, but it's not clear if premature ageing occurs. Some scientists think that somatic cell cloning has an inherent problem of incomplete reprogramming of the DNA in the cell nucleus. The UK Farm Animal Welfare Council was clearly right to call for a moratorium on nuclear transfer cloning in commercial agriculture until much more is understood of the causes of these problems.

### **Animal Cloning for Novel Uses?**

Many other uses have been suggested for animal cloning. Cloning gives scientists a tool to do targeted genetic modification. One application has been to try and eliminate genes that lead to the rejection of pig organs that might be used for future transplants to humans. Xenotransplantation is ethically controversial. Cloning pigs for this purpose is only justified if the result would make a substantial improvement to patient survival and quality of life, and if pig virus transmission risks were overcome. Currently this seems doubtful. Cloning pets is misconceived. One would never recreate a loved companion animal, and may make many suffering animals in the process. Even if millionaires provide the money it is a trivialisation of scientific skills. Cloned prime sporting animals like horses or camels seems unjustified because so many other factors could overrule the performance. Conservationists are sceptical of the value of cloning to save rare animals. It would be impractical to create enough numbers to make the difference between survival and extinction, but in less threatened species it might be useful to preserve rare genetic stock for the future.

### **Cloning in Farm Animal Production**

The main applied use of cloning so far has been in farm animal production. Most dairy cattle in the UK are already produced by artificial insemination. Semen from one select bull services numerous cows. Embryo transfer goes a step further. Why not clone prime cattle in a breeding programme, to raise more breeding stock to the highest level of 'genetic merit', or even clone the best beasts for fattening for slaughter? The Church of Scotland takes the view that to clone animals routinely for production is treating animals too instrumentally, given that natural methods of breeding exist. A case might be made if cloning helped spread a genetic modification to combat an animal disease like foot and mouth, but mere commercial production or supermarket efficiency are not enough to justify cloning. Copying the complete genetic blueprint for efficiency's sake carries a factory mass production mentality too far into animal husbandry. Our fellow creatures are more than identical widgets on an assembly line. There are limits on how far we should commodify animals for their functional worth. We may use them, but we also need to remind ourselves that they are God's creatures first, to whom we may not do everything we like. Given the abuses which a commercial drive has led to in some areas of animal production, cloning is normally a place to draw a line.