OPINION

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CLONING: SOMETIMES 'NICE' AND SOMETIMES 'NASTY'?

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Cloning human beings is no longer science fiction. It is only a matter of time before scientists successfully produce cloned human embryos. Accordingly, ethical attitudes among scientists and bioethicists are changing to accommodate the new possibilities. Since the successful introduction of in vitro fertilisation technology in 1978 there has been support[1] for cloning as well as opposition[2] to it. Generally speaking, though, cloning has been seen as something 'far away' and not a subject in need of detailed ethical scrutiny.

Since cloning has now become technologically feasible and within reach, many scientists and philosophers, with one eye on the public's revulsion for it (the so-called 'yuk' factor), have proposed a distinction between 'nice' cloning and 'nasty' cloning. 'Nice' cloning is 'therapeutic cloning'. This is different from 'nasty' cloning, termed 'reproductive cloning', which involves the replication of human individuals who will be born. This distinction serves the purpose of weakening opposition to cloning in principle thereby weakening the resolve of society at large, and politicians in particular, to maintain cloning as a banned activity. After all, to be against anything called 'therapeutic' is akin to being opposed to 'motherhood'!

Establishing a human embryo naturally, or by any of the standard artificial reproductive technologies, involves the fusion of a sperm with an egg. Thus the new organism formed contains genetic information derived from both the sperm and the egg. Cloning is different. Cloning involves the asexual reproduction of a cell or an organism, usually, but not always, with the same nuclear genome (the complete genetic make up) as another cell or organism. That is, the new organism is **not** formed by the fusion of a sperm with an egg.

How is this done? There are a number of different ways (including parthenogenesis and embryo splitting which will not be described here). In principle, the nucleus of an unfertilised egg, which contains genetic information derived from the mother, is removed. The nucleus taken from a somatic cell (a cell from any part of the human body excluding sperm or eggs) or from an embryo is placed inside the newly enucleated egg. This entity now contains all the genetic information needed to form an embryo. This entity is 'tricked' or stimulated into believing it is a fertilised egg and the process of embryonic development begins.

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[1] See for example Walters, William A.W. (1982) Cloning, Ectogenesis, and Hybrids: Things to come?, in *Test-Tube Babies*, Walters, William & Singer, Peter eds., Oxford University Press, Oxford, 110-115, and Walters, William A. W. and Singer, Peter (1982) Conclusions - and Costs, *ibid*., 140-141

[2] Ramsey, P. (1975) *Fabricated Man: The Ethics of Genetic Control*, Yale University Press, New Haven and London, 89

Thus, the enucleated egg may have placed in it the genetic code of the woman who produced the egg, or any other person including her son, daughter, husband, father or mother. This new entity may be placed in a woman's uterus and brought to term as a new baby, a clone or twin of the one cloned.

This is 'reproductive cloning'. Almost *every one* claims to be opposed to that. The Australian Academy of Science (1999), the Australian Health Ethics Committee (1998), and UNESCO (1997) have all opposed reproductive cloning.

But is there cloning which would be acceptable? Well, there is no doubt that the copying or cloning of component parts of human beings, such as cells and DNA, have been carried out for many years. Such cloning does not involve cloning an individual human being, but establishes, for example, cell lines. No one objects to that.

But what some scientists are proposing is that we distinguish 'therapeutic cloning' from 'reproductive cloning', ie the cloning of a human individual. Therapeutic cloning is defined as "medical and scientific applications of cloning technology which do not result in the production of genetically identical fetuses or babies" (Australian Academy of Science, 1999). What does this mean?

It means that it would be all right to clone human beings up to eight weeks from the time when the embryo began its development. In other words, you may make an embryo by cloning techniques provided you do not allow that embryonic human being to develop past eight weeks at which time its life must be terminated.

The distinction between 'therapeutic cloning' and 'reproductive cloning' is, in fact, a definitional sleight of hand. The truth is that in so-called 'therapeutic cloning' you are involved in the reproduction of a new human individual, the human embryo. It is as much reproductive cloning to make such a new embryo as it is to allow that embryo to continue on as a fetus and as a baby. In short, embryonic human beings would be used as a resource on which we could carry out experiments which would destroy the lives of those living human embryos, and from which we could gather information and material which might be used to alleviate the illnesses of other human beings.

Why the interest in getting scientific hands on human embryos? Cloned embryos, at the blastocyst stage, contain **stem cells** in the inner cell mass, or specific **primordial germ cells** located in the early embryo that eventually become sperm and eggs. Recently, human embryonic stem (ES) cells have been isolated from these two sites and maintained in culture to produce self-replicating cell lines using established cell culture techniques.[34]

[3] Thompson, J.A. *et al*., Embryonic stem cell lines derived from human blastocysts. *Science* **282**:1145-1147, 1998.
[4] Shamblott, M. J. *et al*., Derivation of pluripotent stem cells from cultured human primordial germ cells. *Proc. Natl. Acad. Sci. USA* **95**:13726-31, 1998.

Stem cells can also be taken from adult human tissue, such as bone marrow, skin, brain, and gonads. These are not ES cells. The ethical issues involved in taking these other stem cells are not problematic because they do not involve the destruction of human embryos.

Why are stem cells important? Stem cells are precursor cells which have the capacity to develop into more specialised cells. ES cells are cells in the earliest stages of development.

Thus stem cells possess therapeutic potential including the 'manufacture' of various tissues, improved treatment of diseases such as diabetes mellitus, leukemia and genetic disorders, and perhaps, even, the 'manufacture' of human organs, although talk of the latter might well be described as an exercise in science fiction. Nevertheless, the therapeutic possibilities of stem cells in general, and ES cells in particular, are used as the justification for the cloning of human embryos whose destiny will exclude being allowed to develop past eight weeks but will include being used as a scientific and medical resource.

However, the cut off point of eight weeks is arbitrary, just as the renaming of an embryo prior to implantation (14 days) as a 'pre-embryo' was arbitrary. In both cases, the naming of some embryos as 'pre-embryos' and the naming of some reproductive cloning as 'therapeutic cloning', are calculated to manipulate public opinion into thinking that some human beings are not worthy of moral status as human beings and of the protection of the law. The only difference is that the proposed cut-off point for experimenting on human embryos has now advanced from 14 days to 56 days to meet current scientific and medical demands.

If this distinction between 'reproductive cloning' and 'therapeutic cloning' becomes accepted in law, then there is no reason to believe that the two categories will not eventually collapse into one category, 'therapeutic cloning', where clones are either brought nearly to term or to full term in order to more efficiently harvest (for example) their organs for the benefit of adults and other children.

Julian Savulescu, for example, argues that it is morally permissible to produce embryos and fetuses for the sake of providing cells, tissues, or even organs for therapy, followed by the abortion of the embryo or fetus.[5] Savulescu "believes" that clones become persons with rights and interests to be protected only when they have become "self-conscious". Accordingly, the cloned embryo and the cloned fetus have no different a moral status than the somatic cells from which they are derived. On this account, fertilisation of an egg with a sperm is a process without moral significance even though one would not put sperm by itself, or an egg by itself, or a somatic cell by itself into the woman's uterus and expect pregnancy to occur. The embryo then becomes hostage to the "fortune" of Savulescu's philosophical "beliefs" about when it becomes a person.

[5] Savulescu, Julian, Should we clone human beings? Cloning as a source of tissue for transplantation, *Journal of Medical Ethics* 1999;**25**:87-95

Given that this kind of curious philosophical reasoning abounds, especially among , the disciples of Peter Singer, it is easy to see how 'reproductive cloning' would collapse as a category into 'therapeutic cloning'.

Michael Tooley, who belongs to the same genre of those who have "beliefs" about human personhood based upon some remarks of John Locke (who was actually referring to human beings as distinct from animals), has recently claimed that it would be morally permissible to produce "mindless human organisms that are to serve as organ banks for the people who are cloned", and that cloning of fully born persons "is not intrinsically wrong", that "the objections that have been directed against it cannot be sustained, and that "there are a number of reasons why the cloning of persons would be desirable". In the current climate of opinion, though, proceeding to cloning persons immediately would be, says Tooley, "morally problematic".[6]

The fact is that the distinction between 'therapeutic cloning' and 'reproductive cloning' is a distinction without merit which is being advanced to secure, in principle, the ethical acceptability of cloning, and in the end it is a distinction which simply cannot be sustained. Societies will have to decide whether they want to ban reproductive cloning of all human beings (including embryos) or be led along the path which seeks 'therapeutic cloning' as its first goal and then up the garden path to the cloning of human beings to meet the goals and aspirations of those who believe, along with Michael Tooley, that by cloning a) we can produce "happier and healthier individuals", b) we can have access to "more satisfying childrearing" because we can have children with "desired traits" and because we can use our "self-knowledge" to benefit our cloned child, and c) we can have more possibilities available for overcoming infertility, saving lives, and giving homosexuals their own children.[7]

[6] Tooley, Michael (1998) Moral Status of Cloning Humans, in *Human Cloning*, Humber, James M and Almeder, Robert F., eds., Humana Press Inc., Totowa, NJ, 67-101
[7] *Ibid*.