The ethics of cloning

In our January 1998 issue, we carried an essay on the discussion on cloning.

Eustace J de Souza comments

Drs. Manu Kothari and Lopa Mehta have done us a service in warning against unfounded fears from genetic adventurism.(1) Still, without jumping on the bandwagon, a discussion on the ethics of cloning is not misplaced.

Ethical codes are established guidelines accepted by groups of professionals to ensure correct professional behaviour. They are not remote from, or devoid of, moral considerations. No professional can accept as ethical that which for him is immoral, even though the law of the land may consider it legal.

The authors have indicated that the ethical bandwagon would make more sense if geneticists and ethicists were to bear in mind some fundamental principles that govern the field of genetics.(1) One could not agree more heartily. Too often, we have ethicists opining without expert knowledge of the precise genetic modalities involved. On the other hand, we have expert scientists enthusiastically concerned only with the "goods" involved in the results of their work, irrespective of the morality or ethics of means. Science cannot and should not operate in a total moral vacuum. Nor can the ethics of scientific achievement be live and useful in the absence of a social and scientific environment.

The mechanisms

In most animal experimentation - and Dolly is a case in question - every researcher must be wary of extrapolating from animal experiment to what would happen in the human. Nowhere is this more applicable than in reproductive biology. Human reproductive physiology is in many ways unique. There is no other parallel in the animal kingdom. Yet in the sphere of genetics, which is so integral to that aspect of reproductive transfer from generation to generation, the mechanisms of genetic molecular biology are the same.

What is true of the corn cob, or Drosophila Melanogaster (the Brazilian fruit fly), is also true of man. The "one gene-one enzyme peptide" phenomenon in terms of consequences of molecular biology operates in exactly the same fashion as in the fungal experiments of Beadle and Tatum or as they are in the understanding of the consequences of Phenylketonuria (2).

So the cloning of Dolly should make us aware and alive to ethical concerns and ethical value for human curiosity or cupidity will inevitably transfer this technology to the species.

Who calls the tune?

Drs. Kothari and Mehta have indicated that we have underplayed the role of cytoplasm in "cell swapping" (1). Shettles has called our attention to how the sperm, once it crosses the zona pellucida, "sets up a violent vibration within the egg cytoplasm". The sperm presence stimulates the final maturation of the egg which, in the midst of all this turbulence, expels excess nuclear material in the form of a "polar body" (3). One could even go further and accept Lejeune's contention that it is the breach of the zona pellucida that throws the switch to start the mechanism in this area of reproductive biology (4). Still, the contention that the "cytoplasm calls the tune and the nucleus merely follows it" is not so incontrovertible.

Certainly, if the cytoplasm (1,3) or the zona pellucida (4) calls the tune, it is the diploid chromosomal coils of the "mini cassette" which in Lejeune's picturesque language provides the lyrics in this "Symphony of Life" (5).

One has no quarrel with "Dolly's avowed refusal to be called a member of a clone or to be cloned". Dolly may have no say in the matter - it is we who assign her that decision-making capacity. While man is the only animal with the capacity to decide, no one can deny her absolute uniqueness. But this applies only if we redistill and redefine our definition of a clone.

Need for definite definitions

The authors have done well to call our attention to a need for definitiveness of definitions. They have rightly implied that even two nuclei - taken from one being and transplanted into two separate ovaries, even if from one animal, will not result in beings of absolute identificality. We cannot take environment for granted or neglect to account for its role in the making of uniqueness.

It is the old story of nature (in this case nuclear genetic code) versus nurture, resulting in the final individual as we can now identify him (phenotype). Identical twins, even conjoined like "Siamese twins", will show differences of characters that we may call genetic. The thumbprints can show a "mirror image" difference.

Of "nature and nurture" we cannot ignore the one, however much we may be enamored of the other.

To come back to a definition pf 'clone', which shall be that which is held for the rest of this response, we would accept that of Dorland's Medical Dictionary (6):

"Clone: (Gr. Klon) 1. The genetically identical progeny produced by natural or artificial asexual reproduction of a single organism. cell or gene. e.g. plant cuttings, a cell culture descended from a single cell or genes reproduced by recombinant DNA - technology.

"2. To establish or produce such a line of progeny."

The statement that there is a "genetic *idee fixee* that homozygous twins share a common genotype is belied, by the

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fact..." (1), calls for a response.

Homozygosity implies similar alleles (7). Thus homozygous (twins) implies: produced by similar or near identical alleles.

This would account for the "fact that such twins are more discordant than concordant" (1). "Homozygous twins" in this context, even if derived from a single zygote, could be the result of the fact that there has been a somatic chromosomal aberration, i.e. a deletion, non-dysjunction or aneuploidy, early in embryonic cleavage(8). There is even a report of monozygotic twins where one is normal and the other Down's syndrome(8).

On the other hand monozygotic twins develop into offspring with identical genetic characters.(2,8,9). This vital difference is so important that before we can label twins as monozygotic they must be shown to share a reasonably large number of disparate genetic characters.

Individual uniqueness and, in the human, the absolute uniqueness of the species *homo sapiens*, is vital. This quite in consonance with the authors' quotation: "A pendulum moving in two planes never exhibits the same orbit. Each swing of this chaotic oscillator is unique."

With regard to man - a being of the species Homo Sapiens - the moral and ethical implications become immediate and mandatory. The human being is endowed with fundamental and inalienable rights, not at the disposal and whim of another of the same species.

Question of indentification

In the matter of molecular behavioural activity, there has to be the question of substance-substrate activity where spatiality comes into play Thus two identical spheres of the identical weight of the purest elemental gold are not really identical in an absolute sense. They occupy two different locations in space. So too, no two atoms of the same element can be said to be absolutely identical. No two electrons move in the same orbit. One cannot ignore the spatial relationship in molecular biology.

In matters concerning the dignity and value of each member of the species Homo Sapiens, there is cruciual need for moral and ethical considerations. Man is a unique creation and no one has a right to "tinker" with the essential nature of the life or life process of any member of the species Homo Sapiens. Concetti, an eminent theologian, in an interview (Avvenire) at the Vatican has even gone to the extent of calling attempts at human cloning a serious sin (10).

The Vatican too, has issued an authoritative document that condemns all attempts at interfering with the inestimable value and dignity of human life, and life process (11).

Call to awareness

Of course, not all will agree with this view, some even calling it narrow and fundamentalist, but at least there is a serious call to awareness of possible assaults on the species Homo Sapiens. Nevertheless, we can be sure that once the technology is perfected, either human curiosity or cupidity will tempt someone to cross this "ethical" barrier. If in fact we are warned that the move in this direction is already under way. After all, did not "in vitro human fertilisation" occur in spite of a "scientific moratorium"? What price, then, for a ban on national funding for human cloning experiments?

Drs. Kothari and Mehta are to be congratulated for bringing a note of scientific and philosophic solace in the otherwise bleak and frightening scenario of Huns and Hitlers peering out of the pages of not so fictional literature (1).

They rely on the hope that "Nature's inscrutable wisdom insists on the Darwinian `Descent with variation'".

They have indicated that "The LTI (Left Thumb Impression) of Christ is eternal in the sense that it guided all human beings that preceded Him, were contemporary to Him, and have followed Him"(1).

One would like to recall that this is reminiscent of Teilhard de Chardin (12) who sees that "man" - struggling in the web of evolution, and having moved from "Biosphere" to "Noosphere", might by his own volition, opt for a self-destructive course. Yet, he too strikes a note of optimism when he sees that the Cosmic Christ, who provides the "inner consciousness of matter", will tilt the scale away from the Darwinian descent to an ascent in order to reach a higher and better evolutionary level.

Then like Manu and Lopa, we too, can hope that the "Brave New World will remain restricted to the book that Huxley wrote" (1).

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