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## CONFERENCE

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Translated by John Bell

### **HUMAN CLONING: POSSIBILITIES AND ETHICAL PROBLEMS\***

**Alfonso Gómez-Lobo**

What is cloning and why should it be so important to us? Do we have to wait for some monstrous results to force us to recognise that this is a path which humanity should never have taken, just like in the case of thalidomide? In these pages Alfonso Gomez-Lobo explains what human cloning is and analyses the different positions which have been proposed for judging it on ethical grounds, including his own. The author warns that the prohibition of reproductive cloning is illusory if it does not prohibit all forms of human cloning, since it will lead inevitably down a slippery slope. Is it possible to stop the process? Maybe yes, as long as there is an international movement which manages to spread the word about the implications of human cloning.

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At this moment in time there is an intense battle under way in the United States and other countries with advanced biotechnology regarding the proposal to clone human beings. In this seminar I should like to do three things. The first is to explain what cloning is all about and why it has acquired the importance and pre-eminence attached to it today. The second is to talk briefly about the councils and commissions on Bioethics which have been set up in the United States to confront the different challenges that have arisen out of this and lastly I should like to present the different positions which have been taken to judge human cloning in ethical terms, concluding with my own.

At the start I should like to clarify two things. One of them is that my field is not biology so my information in the scientific field is second hand, though coming from good sources. The second is that the opinions expressed here are my own and do not necessarily reflect opinions or arguments taken into consideration by the Bioethics Committee of the White House. You can find the official line of the Council on its web page ([www.bioethics.gov](http://www.bioethics.gov)) where the report that the Council made public on July 11<sup>th</sup> 2002 appears.

### **1. What is cloning and why should it be important for us?**

In November 2001 a North American company, Advanced Cell Technology, announced that it had carried out the first attempt to clone a human being and an impressive photograph soon appeared on the cover of the magazine, Scientific American, in January 2002. The news went around the world.

But what is cloning?. A lot of descriptions have already appeared in the different sectors of the media so I shall limit myself to a brief and schematic recap.

The natural way of generating a human being is for an ovum which contains 23 chromosomes to be penetrated by a spermatozoa, another germinating cell, which has another 23 chromosomes. On fusing together these two germinating cells give origin to a zygote, a cell which contains the complete 46 chromosomes. It is these chromosomes which essentially contain the programme that governs the development of the corresponding organism.

Moreover every somatic cell of the organism (as opposed to a germinating cell) contains a nucleus with the whole total of chromosomes

derived in equal parts from the father and the mother. However to clone a human being signifies arriving at the final point of the process, that is the make up of the zygote, through other means. What the scientist does is to take an ovule and extract its genetic material, its 23 chromosomes. The following step consists of taking the nucleus of a somatic cell, i.e. a nucleus with 46 chromosomes, and inserting it directly into the egg. If everything works well, the genetic material that has been thus inserted will reprogram itself and the new cell will begin to divide itself as if it were a naturally created zygote.

Since the genetic information in the somatic cell is the same as that which now governs the new organism, it is to be expected that this will be an almost exact copy of the organism from which the somatic cell was extracted. If Pele was the donor of the somatic cell then the clone should be very similar to Pele.

At this point it is necessary to look at two things. In the first place we cannot talk about identity in the strictest sense of the word. We are not dealing with the same person. Pele and Pelito (to give Pele's clone a name) are two different individuals. As far as sharing the same genetic constitution we can say that they are twins, although twins with a very great difference in years. In the second place, although the genes in the chromosomes contain the programme for organic development in a manner of speaking (i.e. the chromosomes of a rabbit produce a rabbit, human chromosomes would produce a human, not a rabbit etc), it would be an error to make out that there was a strict genetic determinism involved. There are other factors which produce variants within a specific programme. The cytoplasm of the egg always contains genetic material and the surrounding environment, including diet, multiple interactions with other factors etc., produces variations. The similarity between the human being that has been cloned and the human being from whom the chromosomes derive will be very great, but it will not be a total similarity. Pele's clone could dedicate himself to another sport instead of football.

How did we get to this present situation, this attempt to clone a human being?. It seems to me that there are two decisive events. In 1997 a team of Scottish researchers managed to clone a mammal for the first time, the famous sheep called Dolly. What this showed was that it was possible for the genes of an adult mammal to be reprogrammed, that the clock could be turned back to zero and that this could begin to lead to the development of a new organism, as if the genes had not completed their role in creating a previous one. Moreover, in principle, it would be possible to produce an indefinite number of Dolly clones.

And if a sheep could be cloned successfully, why not other mammals, including human beings?. Up to this moment there have been successful clonings of cows, goats, mice, pigs, cats and rabbits. There have been no successful results, on the other hand, with rats, dogs and monkeys. The rabbits have managed to reproduce themselves via natural sexual activity. This detail is important because it defines a species as a group of individuals which are genetically compatible in such a way that they can be crossed with each other and have progeny. A cloned rabbit, therefore, is a member of the natural species of rabbits. As an analogy we would have to say that if we managed to clone a human being, this individual would be a human being like any other.

The second event which has accelerated interest in the cloning process is the publication in 1998 of the identification and isolation of embryonic trunk cells by two teams of researchers, directed respectively by John Gearhart (John Hopkins University) and James Thomson (University of Wisconsin).

What is a stem cell?. The notion of stem cell is the following. Each cell comes from another and if we think of an embryo, the natural hypothesis follows that all the cells that make up our organism come from a few initial ones. There is no differentiation between them and they have the capacity to generate not only any type of cell but also an entire organism. A cell with these properties is an all faceted one. As larger and larger differentiations are being produced, the cells gradually become more specialised and lose their capacity to become any cell type. At this stage we talk about multifaceted instead of all faceted cells.

Another important discovery is that there are also stem cells in the adult organism, that is to say, cells which do not specialise and which keep on generating cells of one type or another. These haematopoietic trunk cells regenerate certain blood cells (like for example erythrocytes and leucocytes) whilst these are dying. Their function is to repair tissues in the place where their services are required.

However it is also well known that there are illnesses which result in the destruction and loss of certain cells and which affect a large number of people. Among these illnesses the most well known are Alzheimer's, Parkinson', several kidney or heart diseases, diabetes etc. From this came the idea that if it were possible to regenerate cells of the same type to those which had been destroyed, the patients could be cured. So the therapeutic project is to start with the stem cells and induce them to diversify themselves until they come to be beta pancreatic cells capable of producing insulin, for example. These could then be inserted into the pancreatic of a diabetic.

Up to this moment the logical progress of the research is leading to not to cloning but to obtaining embryonic material of the type used by Gearhart and Thomson, i.e. human embryos derived from selected abortions or blastocysts from in vitro fertilisation clinics. In both cases there is a need for “dismantling”, i.e. for destroying the corresponding organism so as to get hold of the required material. The stem cells arrived at in this way will have a genetic constitution resulting from a fusion with the genetic material of their progenitors and will therefore be genetically unique.

On the other hand it is known that the organism has a complex immunological system which tends to attack and eliminate any foreign body. The great challenge for organ transplants is, effectively, how to avoid the transplanted organ from being rejected. There are several drugs available today for neutralising this rejection but almost all of them have problems and side effects. And so the promising idea emerged of an auto transplant, the idea of transplanting tissue from the same patient. I understand that this is what happens when skin from a different part of the patient's body is grafted onto the area where the same patient has suffered burns. In a case like this the organism identifies the grafted tissue as its own and accepts it.

Let us suppose that a procedure has been discovered to differentiate certain cells from trunk cells and that in principle they can be transplanted. How can we be sure that they will not be rejected?. One reply is an obvious one: making sure that they are suitable, i.e. that they have the same genetic make up as the patient. And this can be done by producing an organism cloned from the patient's genes.

This is the basis for so called therapeutic cloning, cloning which the White House Committee has preferred to designate “cloning for bio medical research”. Its justification would be the expectation of curing thousands of people suffering fatal illnesses through the production of genetically compatible cells.

It is this type of cloning which is distinguished very sharply by its advocates from the type of cloning known as “reproductive”, cloning to produce a boy or a girl. In this way they can affirm that they are in favour of something whose goal is research and against something whose processes lead to a birth. But opposition to the latter has only been coming together very recently. At the beginning, many people, especially those outside the biomedical field, expressed enthusiasm for the idea of producing people with genetic characteristics especially if it were a particularly pleasant person or a loved one who had died. They also talked about the advantages for an infertile couple who would be able to have a son who was almost

genetically equal to the father or a daughter almost genetically equal to the mother. With this, human cloning moved another step towards the idea of genetic engineering, a step which many considered inexorable. If certain genetic modifications (achieved via diagnosis in vitro) allowed one to choose not only the sex of the offspring but also the colour of its eyes or hair, height, intelligence etc. then why not take a person whose characteristics we value and admire and reproduce that person, completely as it were, via cloning?. This would be the best guarantee that intentionally designing a person would work since there would be no uncertainties regarding partial genetic modifications.

These ideas seem to dwell in the realm of fantasy and in a certain sense they still do, because many of them have not actually been carried out. But Science and Technology are taking giant strides forward. My colleague, Professor Warren Reich, the editor of the famous Encyclopedia of Bioethics, told me that in 1994, when they were preparing the first edition, they completely discarded the notion of including an article about cloning because it seemed like something out of science fiction. In less than three years, with the arrival of Dolly, it was no longer fiction and became a mixture of reality and nightmare.

In fact, if we sharpen our eyesight and try to look at the problem more deeply, I think that we have to recognise that we are facing one of the greatest revolutions in the history of humanity, almost as important or maybe more important than the discovery of nuclear energy. We are facing what another member of the Committee, Francis Fukuyama, has called “our post-human future”.

For the first time it will be possible not only to modify our environment but to decide the make up, in the most intimate detail, of our descendants. We are going to pass from the decline of a natural world to the beginnings of a world totally dominated by technology. Fukuyama thinks that technology can be regulated and that, in certain aspects, this has been done successfully. I do not want to dash any hopes but I do tend to be more pessimistic, especially when I view the world panorama. Where will the intellectual and spiritual resources come from to form the basis for an efficient and obligatory set of rules?. In the light of this question I think it would be salutary to look at the existing regulations and their philosophical basis.

## **2. What has been the reaction in the United States?**

The challenge of the new biotechnology was seen immediately by North American politicians as something of vital importance. The same day

that the cloning of Dolly was announced the then President, Bill Clinton, asked the National Bioethics Advisory Committee, NBAC, to present a report to him within 90 days on recommendations for a Federal policy regarding the cloning of human beings.

In June 1997, the committee issued a report whose central theme is human cloning. Essentially it recommended that a law should be passed which prohibited the cloning of a human being, but that it should be valid for a limited period (from three to five years) and did not prevent “the cloning of lines or sequences from human DNA”. Basically the committee was almost exclusively concerned about the physical risks implicit in the actual process. Apparently if those risks were reduced or eliminated in the future the committee would not oppose human cloning.

The discovery of trunk cells in 1998 also induced Clinton to ask for recommendations from his Bioethics Committee. The report that followed is both complex and detailed since it deals, above all, with the use of Federal funds for research. It recognises that the point of major concern is that of the trunk cells and consequently recommends that only those projects which use cells derived from deceased foetal tissue or from embryos surplus to requirements after fertilisations in vitro should be financed. It rejects financial support for projects which involve the use of embryos, natural or cloned, generated exclusively for research purposes. Clinton accepted these recommendations and issued the corresponding regulations. It was these regulations that Bush modified, allowing the use of Federal funds only for lines of cells already in existence at August 9<sup>th</sup> 2001. Note that there is no Federal legislation regarding human cloning and that, with the exception of those States that have passed local laws, human cloning employing private funding is an activity legally permitted in the USA.

The last milestone before the present Committee is a report from the National Academy of the Sciences published in January 2002 and which does two things. On the one hand it presents convincing proof that reproductive cloning should be rejected, but adds “at present”. The dangers to women who donate ovaries for the generation of boys or girls and the dangers of deformities or deficiencies of any type in the person cloned are so great that it recommends prohibiting this activity “for now”. On the other hand the report also recommends that there should be no prohibition on what it calls “nuclear transplants to produce stemcells” (and, I believe, deliberately omitting the fact that this can only be achieved by first producing a genetically well formed human embryo). The present Committee has issued a report in which the principal characteristic, unlike

others, is a lack of unanimity. We are talking here, maybe, of the first really pluralist Committee, because the others avoided the presence of people who were in favour of better protection for human life. Every one of the seventeen active members supported a permanent ban on reproductive cloning. As far as cloning for research purposes was concerned, 7 voted in favour of allowing it under a system that was strictly regulated and 10 were in favour of a moratorium which would it completely for a period of four years. The interesting thing about this report is that it does not limit itself to the physical damage that be caused by reproductive cloning but also examines the problems of certain less tangible aspects, such as the effects on the family and on society. It also looks at the injustice which is committed by deliberately imposing on someone a genetic constitution chosen by others, depriving them of certain natural rights like the right to biological parents.

This last point is not there by chance as the Committee, pushed its President, Professor Leon Kass, of the University of Chicago, proposed carrying out an ethical investigation, and taking into account a maximum of possible factors, including literary sources.

We are now going to leave the different reports and look at the ethical problems involved.

### **3. Cloning and Ethics**

As I have indicated above, the rejection of cloning to produce a child is almost universal, but almost always a limited time span is added. This time limit is decided by the ethical basis of the rejection. Since the reason for opposing it is only because of the high risk of physical damage to the gestating mother and the cloned offspring, therefore once this risk has diminished the reasons for opposing it no longer exist. To this point it is customary to add that normal gestation is also subject to risks which have not yet been completely eliminated and that therefore you should not have to demand an excessive degree of safety from cloning.

On the other hand the motives for trying reproductive cloning do not appear to hold much water. It is not strictly necessary, given that there is a demographic explosion world wide and that the immense majority of people can reproduce naturally. Not only that, there is a marked tendency everywhere to reduce the number of children. Moreover it can be added that adoption is one way to satisfy the maternal or paternal aspirations for infertile couples. It is possible to adduce more specific motives such as



producing a child with the same genetic make up as a child who has died with the aim of “bringing it back to life” or the same with an older child who is sick, with the idea that the younger one can donate organs or tissue to his brother. The first case is based on the mistake that there would be a strict identity between the cloned individual and its progenitor while the second implies all the problems that arise from the demands of informed consent. Can we presume that the cloned child would agree to donate part of its liver or a kidney?.

The weakness of the motives and the high danger risk seem to me to explain the high degree of unanimity in rejecting reproductive cloning, but these factors are reversed in the case of cloning for biomedical experiment. Before examining this I should like to make a conjecture regarding the form of ethical reflection which underlies the generalised rejection mentioned above.

The ethics that prevail today in the Anglo Saxon world are an unstable amalgam of ethical liberalism and consequentialism. I understand ethical liberalism to mean the position where every action which does not hurt another person is considered to be lawful and by consequentialist the position that maintains that the ethical justification for every action stems exclusively from its consequences. Within this utilitarian version of consequentialism actions are lawful if they lead to the happiness of a greater number of people.

Now, since reproductive cloning would not produce positive consequences for a high number of people, but, on the contrary, probably cause physical damage to those that were cloned (and to their mothers), however small those numbers may be, it is logical that the liberal aspect of the amalgam would come to the fore.

In biomedical cloning, as has been indicated above, these factors are reversed. It has been shouted to the heavens that this type of cloning would lead to the curing of thousands of illnesses which affect millions of people. We are talking here about the greatest good for the greatest number of human beings. For the supposed consequentialists, the inference is clear and irrefutable: not only is this type of cloning ethically lawful, it should also be compulsory.

Many people, especially North American scientists, stop here and manifest their full support for an activity which promises a new future for humanity, a future which they imagine to be clean and without the burden of illnesses which are becoming more and more frequent among old people.

But what happened with the “*primum non nocere*” (above all do not cause harm”) Hippocratic tradition, emphasised, as we saw, by the liberal

ethic?. If we create a human clone only to destroy it later on, isn't that maybe causing harm?. And doesn't such harm place an obstacle in the way of the consequentialists justifications and neutralise them?. Faced with this objection there are drastic difference of opinions that depend on the solution which is offered to what has been called the problem of the "moral status (or condition" of a human embryo. Personally I am not in favour of this expression and would prefer to use a more traditional term, like the Kantian term "dignity" (Wurde), but I have had to learn to debate in public, using words that are currently in fashion.

The Committee to which I belong has defined the notion of moral status as "the position which a being or entity has in relation to other individuals or moral agencies. To possess moral status is to be an entity in relation to which human beings, as moral agencies, have or can have moral obligations". A stone in my garden, for example, has no moral status and I have no obligation to protect it from the harshness of the weather but I do have an obligation towards my younger grandson and it would be immoral of me to leave him exposed to the snow and the cold.

The philosophical challenge consists of identifying one or more properties that justify the assignation of moral status to something. How do we define that something so that our behaviour in relation to "it" has ethical implications?.

At present there are usually two types of answer to this question.

(a) One of them maintains that the defining characteristic for possessing moral status is an elemental form of conscience which can experience pleasure and pain or which, generically speaking, has sensibility. The key question is whether a being suffers or not. One consequence of this is that the superior animals gain moral status and the proponents of this position also maintain that certain animals are in fact people.

(b) The second reply consists of enumerating a list of capabilities or capacities which include sensibility but which is not limited to that and that alone. According to this interpretation, the characteristic of beings with moral status is that of having the capability to have conscience experiences like feeling pleasure and pain (sensibility), to be able to experience happiness, sadness, indignation etc (emotion), to understand and resolve problems of a certain complexity (reason), to be able to communicate through some type of language articulated via an indefinite number of contents (possession of language), to have an understanding of themselves as individuals and members of different social groups and finally to have the capacity to control their own actions in the light of ethical principles (to be a moral agent).

It is not too difficult to see that the second interpretation coincides with the traditional notion of humanity as defined through reason or the possession of logos. It is also worth mentioning that those capabilities that have been set down are found first of all in a normal adult of the human species. The first interpretation, on the other hand, is a novel one and probably lacks philosophical progenitors prior to Bentham.

How do these criteria for recognising moral status operate within the discussion about human cloning?. I am now going to set out the three positions that have been expressed and defended in public debate, pointing out that they are not just limited to the problem of cloning but can be extended to cover the whole field of the experimental use of human embryos, whether cloned or not.

1. There are those who argue that a human embryo completely lacks any moral status. For those who offer characteristic (a) as an argument, to have sensibility an organism needs to have at least a central nervous system and a central organ for receiving information which makes it conscious. Since a human embryo does not possess these types of organs, it therefore follows that it cannot have moral status. For characteristic (b) the argument proceeds a fortiori. If an embryo does not possess sensibility, it is therefore even further away from possessing the capacity necessary to exercise superior functions like thinking, communicating and doing things.

From this position it follows logically that a human embryo can be used in research and carelessly destroyed. What is curious is that many of advocates of this position resist coming to that conclusion and opt for a system of rules and regulations which allow “abuses to be avoided” without there being a clear definition specifying what would constitute an abuse to an entity to which, in principle, no respect is owed. I think that this bewilderment has partly led to a second position.

2. A human embryo has an intermediate moral status between things and people. In this position it is more frequent to find people who offer up the (b) characterisation. The argument is more or less as follows: an embryo does not possess the capacity to exercise those superior functions which characterise persons, but does possess the potential which could lead to this capacity. The formula more frequently used is that “an embryo is potentially a person”. This potential (which won’t make it a person) is what confers an intermediate status on it.

The supporters of this line of thinking maintain that it now makes sense to distinguish between legitimate use and abuse. What would constitute abuse would be the manipulation and destruction of human embryos for frivolous reasons or for the carrying out of lightweight research

by incompetent scientists. It would also be an abuse to buy and sell human embryos but not to take them apart for stem cells. And who decides if the use is legal or illegal?. If the model still in force in the UK and proposed by the 1984 Warnock Committee is followed, it would be necessary to create a regulating body or commission which would decide, case by case, if a project is justifiable or not. I do not need to call your attention to the nightmare scenario that would follow the naming of a committee whose members would basically have powers over life and death.

In my opinion, the greatest difficulty about the position we are discussing here is that there does not seem to be any adequate way to define what an intermediate moral status is. The reason is the following. The general consensus of opinion is that the basic obligation which a moral status generates is that of not causing harm to the entity which has it and maximum harm is caused, without a doubt, by its destruction. This can be answered by a consequentialist argument: if there is a valuable conclusion to the destruction, such as the benefit to thousands of people, then it is justifiable: but then there is no difference between something which possesses moral status and something which does not, since the same meaning of the notion of moral status is that of declaring unjustified the reduction of one that has it to the status of a mere instrument. Use and abuse would have the same practical effect and therefore the distinction would fail to have importance.

At bottom, the notion of an intermediate moral status is unsustainable because of that same relationship between life and death. We are talking about realities that are mutually exclusive and without any space for an intermediate position. Either we respect the life of a determined organism or not, but we cannot half respect it as we cannot half destroy it. In part (and only in part) considerations of this type lead us to a third position.

3. A human embryo has a moral status equal to that of an adult person. If this is true, then ethical liberalism has taken priority over the idea of consequentiality and would have to declare that the deliberate destruction of human embryos is ethically unjustifiable because it causes harm to others.

But is it true?. To show this, it better to begin by neutralising the arguments offered by the advocates of the first two positions.

The first position, as we recall, identified one or two properties on which the assignment of moral status was based and which then decided if an embryo had them or not. This argument would be perfectly valid if there were no continuity between an embryo and an adult. If an elephant has

certain characteristics (such as ivory tusks) which make it valuable and a rat does not, it therefore follows that the rat is not as valuable. But a rat and an elephant are not related in the same way as an embryo and an adult. To be a rat and an elephant is to be two different things while to be an embryo and an adult is not. They are different stages of the same organism. To maintain that an embryo does not possess in any way the properties that it will possess later on is to deny the elemental fact that these organisms do not replace one another but develop.

The second position takes charge of this objection and replies by stating that an embryo potentially has the properties that an adult will have, but that potential possession is not the same as an actual one.

Only when it fully possesses the key properties will the obligation to respect it exist. This is analogous, they say, to the case of an individual who could potentially be president of his country. While he is not elected and assumes the presidency he does not enjoy the prerogatives of the job.

This analogy confuses the notion of possibility with that of biological potentiality, however. It is possible that a Chilean citizen gets to be President of Chile, but there is nothing in his physical make up which would lead directly to the Presidency. The DNA of an organism, on the other hand, is not a mere possibility. It is a programme that has been well structured and which, allowing for no external impediments, will let an organism develop into being an adult of its species. Biological potentiality is not a mere possibility but an internal motor which is already functioning and which is therefore already being used.

Things become intuitively clearer if we think that a human organism which develops does not transform itself into anything else but changes without ceasing to belong to its natural species. We are not looking at the rat and the elephant. The life of an adult is the same as the life of the embryo. The potentiality which is being used is the exercise of superior functions but this is not a radical innovation. It is simply what should happen given the genetic programme present from the beginning.

The decisive question is therefore – when does a human being begin to be a human being?. At what point does this happen?. Obviously answer will have considerable impact on the three positions described above, since the valuations which each one talk about are not independent from what they consider to be valuable. On the other hand the congruency between both is not perfect since it is possible to deny the value of an organism which is admitted to be human or confer a value on an organism which is considered to be the precursor of a human being.

The beginning of a human life has been the object of a vigorous controversy which goes back more than two millenia from when Aristotle wrote his amazing treatise on embryology, "De Generatione Animalium". In the debate there is a mixture of metaphysical doctrine, physical speculation, biological observations (both real and imagined) and many ideological elements. This is not the moment to dive headfirst into this passionate debate and so I shall limit myself to a couple of observations which will allow us to go back to our original theme, human cloning.

From the discovery of the female egg (von Baer 1827) and the phenomenon of the fusion of the two gametes, with the consequent emergence of an organism with new and irreducible properties to those of its two predecessors, it became almost inevitable to conclude that the final point of the fusion or syngamy marked the very probable point where a human organism begins. If this is correct, then this would be the point in time in which a space-time continuum exists under a specific concept which characterises the identity of material objects. The embryo stage would be exactly that: a stage in a being that, while passing through other stages, would remain the same.

This implication has been rejected in two ways. The first, the less subtle in my opinion, is the one which insists that an organism must have organs that are already developed and which allow the activation of superior functions for it to be included under the specific concept mentioned above. Given the lack of empirical evidence to identify a moment when it can be said an organ has begun to fully function, taking into consideration, for example its nervous system and brain, it is not strange that there are enormous differences of opinion among the advocates of the above as to the point in time when human life actually begins. There are a range of opinions which go from the first term of pregnancy to children that are just born.

The more subtle position which has been most frequently invoked in discussions on cloning is the one which maintains that the fusion of the nuclei effectively marks an undeniable milestone but that this is only the beginning of a process which ends with its implantation in the uterus and the consequent differentiation of functions inside the embryo itself. Since the publication of the Warnock Committee's report it has been said that the process lasts for 14 days, but as this figure is somewhat belated (it would coincide better with the appearance of the "primitive streak") there are those who have adjusted the estimate to more or less 6 days, which would correspond to a point nearer to the period of time required for the implantation. It is obvious that this would allow the dismantling of cloned blastocysts without being accused of destroying a human being.

There are two arguments which support this position. One is the high percentage of losses in fertile eggs which do manage to implant themselves. I have heard very different figures here which go from less than 50% to more than 80% and I am not in a position to judge these statistics. I am also not in the position to judge if it is true that these losses are precisely due to malformations or errors in genetic replication which means that, strictly speaking, we are not about organisms which are human ones. Philosophically I can only say that the fact that there are losses tells us nothing about the nature of this class of organisms. There have also been high incidences infantile mortality in the past which does not let us infer things about those same infants.

The other important argument is the one that maintains there is no individuality before implantation, and individuality is a requisite for being able to talk about a human being. The morula and the blastocyst would be only a "load of cells" indifferently capable of converting each one of themselves into a complete organism as the phenomenon of monocygotic twins can testify. There is also the possibility that two embryos can combine and turn out to be a genetically made up or "mosaic" type organism.

The debate around this point has been intense. Philosophically it can be said that it is a logical fallacy to infer that something which is potentially multiple cannot actually be something which is one. Every gardener knows that certain plants, for example, can divide themselves and generate others but this does not mean that before dividing themselves they lack unity. Totipotent cells would be able to generate other organisms but while this is not happening (as occurs in more than 99% of cases) it is not a reason to deny the unity of the organism itself.

On the other hand a stronger argument comes from empirical observations which show that the multiplication of cells that proceed directly from the zygote are a long way from being a mere agglomeration without unity. An article in the July number of the English magazine "Nature" talks of recent research showing that in the embryos of mammals the cell differentiation and specialisation together with the organisation of the whole group begins within 24 hours after nuclear fusion. I do not have the competence required to go into details but if these observations are only minimally correct, they are sufficient to reject the idea that a human blastocyst is only a load of cells. In fact if it were, we would not understand the position and the function of the stem cells in relation to those which form the outside membrane. A blastocyst has the unity and the individuality that corresponds to a young organism. Each one of us, with our actual

individuality is in a space-time and biological continuum with the blastocyst that we were many years ago.

To generate a human embryo by cloning and then take it apart before 6 days (or 14 according to others) have passed has serious ethical implications, equivalent to those that follow the destruction of human lives in other stages of their life cycles.

Not all the members of the White House's Bioethics Committee accepted this conclusion. There was an important minority which recommended that cloning for biomedical research be legally permitted, as long as it was subject to regulations. The biotec industry for its part has mounted a costly publicity campaign which hardly makes mention of ethical considerations (or contracts experts in bioethics who say what the industry wants them to say) with the aim of convincing public opinion that the government represents a threat to the free use of a promising technology.

Let us suppose for one moment that the North American senate accepts the recommendation that cloning for research purposes be allowed together with a ban on reproductive cloning. What is in store for us in the future?.

In the first place there will be a race to see who will be the first to patent the procedures and the results of the techniques for cloning and then to invest in the businesses which have acquired the patents. As everything will on an individual basis (i.e. the beta cells for Mr. X will come from the embryo cloned from Mr. X) there will be major propaganda efforts directed at people with the highest incomes. If a millionaire from Arizona can give \$3.7 million US dollars to the Technical University of Texas (Texas A & M) so that they can clone a cat (his cat?), according to section A3 of the Washington Post of July 27<sup>th</sup> 2002, then how much would he be prepared to invest in his own health?. Since cloning is actually a very inefficient system, a market for feminine eggs would very rapidly appear, eggs which would be treated with high doses of hormones and other dangers that would probably affect primarily those women from low income groups who would submit to the corresponding surgical procedures with the aim of making some money.

Once the cloned embryos exist in quantities relatively large enough to be able to experiment on them with different methods of cell differentiation, what is to stop them being kept alive for more than 6 or 14 days?. Why not go even further and keep them alive until the cell differentiation which leads to the type of cell that they are trying to produce occurs naturally?. Is it realistic to think that scientists are going to put the brakes on their own impetus especially since the limitation on days means nothing to the majority of them and is regarded as a mere inconvenience imposed, as they are used to saying, "by religious fanatics"?.



Since a cloned embryo one generated by fusion in vitro are morphologically the same, what is there to stop the cloned one being implanted in the uterus, in spite of the formal prohibition on reproductive cloning?. The character of the law would seem to be rather strange as its violation would not only permit the destruction of a human life but make it compulsory. Would it therefore be better not to prohibit reproductive cloning?. Moreover, there are those who have announced, in the name of reproductive freedom, that they will present a legal suit against any law which prohibits this way of reproduction, claiming that it to be unconstitutional.

To sum up, the people that talk about a slippery slope are probably right. First will be the production of clones and their being taken apart within 14 days, then this will be extended so as to get better differentiation, after this, perhaps, implantation up to the formation and extraction of organs and finally the birth of the first human beings to be cloned. And all along the way there will be humans who will be victims of serious injustices, stripped of their fundamental human properties, of their physical integrity and their life. And if they manage to survive they would have been the object of an extreme manipulation of their constitution and having had imposed on them a genetic identity deliberately determined by people who have transformed them into something manufactured, into a mere object. The submission of a human being to the will of another would have reached its cusp.

Is it possible to stop this process?. Maybe if there was an international movement which managed to spread the word about the implications of human cloning, showing how illusory the ban on reproductive cloning is if it fails to ban all types of cloning. But there would also have to be a conversion to the value of human life per se, a conversion which is not yet on the horizon. The whole basic idea of the value of human life has been challenged by the so called "quality of life" and that is the idea which is most widespread today.

Maybe you can remember the case of thalidomide, a remedy to treat certain feelings of discomfort that pregnant women feel and which was approved in Europe in the 60's. Only after hundreds of children were born without arms or with severe deformities did the European countries recognise their error. I fear that the same thing could occur with cloning. That there would have to be several cases with truly monstrous results before we wake up and recognise that this is a road which humanity should not take.

On the other hand, my hope is that one or the other alternative roads, for example the use of adult stem cells or treatments based on a better understanding of the human genome could begin to replace the present obsession for cloning human beings.

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