

Anna Latawiec

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Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

Z ZAGADNIENÍ BIOETYKI I FILOZOFII MEDYCZYNY

ANNA LATAWIEC

Wydział Filozofii Chrześcijańskiej, ATK

PHILOSOPHICAL AND THEOLOGICAL RAMIFICATIONS RESULTING FROM HUMAN EMBRYOS CLONING¹

The issue of human embryos cloning becomes especially important towards mastering the technique of in vitro fertilization and prospects of improving the cloning methods. On the one hand there is well mastered method of obtaining and freezing human embryos, which definitely increases the range of bioethical and theological problems but on the other hand, together with undertaking newer and newer experiments of genetics engineering, the field of vision on the human embryo status changes while discussing. When we assume that the embryo is not a human being we do not take any responsibility for the results of undertaken research. This is why this paper presents the concept of the clone as well as refers to the state of clone research and clone status as a human being. In the light of the above problems we are going to deal with correct and erroneous rights of carrying further experiments on cloning.

Genetics engineering is the most intensive developing discipline for some time now. It is surrounded by many fascinating but also controversial dilemmas². The representatives of this discipline aim at creating new organisms as well as their parts i.e. cells and tissues and

¹ Jest to skrócony tekst referatu wygłoszonego na Międzynarodowej Konferencji ESSAT w Durham (III-IV'98)

² M. Wadman., *Politicians accused of shooting from the hip on human cloning*, Nature 386 (1997) 6621, 98; E. Massood., *Cloning technique „reveals legal loophole”*, Nature 385 (1997) 6619, 757; A. Kahn., *Clone mammals... clone man?* Nature 386 (1997) 6621, 119; P. Ellmer Dewitt, *Cloning: where do we draw the line?* Time 143 (1993) 19, 65-70.

possibility of applying scientific and engineering basics for converting the biological factors in order to obtain such biological structures³. The research aim at full structure cognition and human genome working⁴ as well as mastering the technique of genes transfer⁵ which are regarded to be the most important measures. The experiments are carried on with hope that their results will be used in the field of medicine⁶. That hope is a difficult way of cognition of human genome regularity and in consequence grasping its pathology. In that field a lot of has been already achieved and the measures aimed at full human genome cognition are expected to be finished ca.2005 year⁷.

1. CONCEPT OF A CLONE AND THE TECHNIQUES OF CLONING

The *clone* term derives from Greek: twig, sprig, vine. It has been used to define an identical, as regards genetics, cell offspring or specimen came into being as a result of vegetative or asexual reproduction. Therefore a clone is an organism genetically identical to the mother specimen and its peer, but reproduced in an asexual way. During a vegetative reproduction there is no exchange of genetic information between the two specimen, and this is why the offspring has the same group of genes coding the identical features as the mother organism. Thus the two copies come into being⁸.

The technique of cloning is aimed at obtaining the offspring from the organisms being reproduced in a sexual way. This is a biological technique leading to duplicating of genotype. Therefore cloning is a transplantation of organism nucleus to the ovum of another organism. Such an experiment was carried on for the first time in 1952. From the frog's fertilized ovum a zygote nucleus has been removed (the so called nucleus enucleation) and next from the cell of intestine

³ T. Twardowski, *Społeczne i prawne aspekty biotechnologii*, Łódź 1996, 9.

⁴ *Genome człowieka. Największe wyzwanie współczesnej genetyki i medycyny molekularnej*, pr. zb. red. W. Krzyżosiak, Warszawa 1997 – the item which constitutes very important summarizing of knowledge to the point of human genome, methods of cognition of human genome map as well as organism genomes with a genome similar to the human one.

⁵ K. Gibiński, *Rozmiary problemu*, Nauka (1997)2, 72.

⁶ D. J. Weathrall, *The new genetics and clinical medicine*, Oxford 1985.

⁷ H. L'etang, *Anglo – American Conference on the Impact of Molecular Medicine on Clinical Practice*, Journal Royal Soc. Med. 869 (1993), 187-193.

⁸ K. Tittenbrun, *Etyka klonowania*, Etyka 23 (1988), 133. Por. tez: D. Rovik, *Na obraz i podobieństwo swoje. Klonowanie człowieka*, Warszawa 1983, 55 i 311.

epithelium of another frog the nucleus was taken and put into the ovum deprived of its own nucleus. The zygote that has been obtained in such a way, had a diploid nucleus from the tissue cell of another frog and gave life to the grown-up specimen. Genetically it was equipped identical as a frog that the nucleus was taken from⁹. As long as such experiments are carried on the plants and animals they do not cause any problems of ethics nature. Mainly they are aimed at breeding valuable specimen for a mankind because of some characteristic feature: ex. impressive flowers, fruits, increased meat weight or increased milk quantity. This problem, however, shows different in relation to the experiments connected with cloning the human embryos or human beings as themselves¹⁰. It concerns the possibility of giving life to the units with identical features such as appearance, capabilities or susceptibility. The priest professor T. Ślipko writes: „Supposing disseminating of such practices, the humankind will stand in the face of possibility of populating the world with some groups of people chosen from the point of view the eugenical rules of the society”¹¹.

In the history of cloning the very important event was the first successful affected fertilization of mammals. It happened in 1878 (Schenk S.L.). Another important achievement was the first nucleus transplantation from the embryo cells to the frog's ovum (Briggs R., King T.J.) In 1959 at The Warsaw University the research on development possibilities of mouse isolating blastomere were undertaken as well as the method of transmitting the mouse ovum to the fallopian tube of surrogate mother (Tarkowski A.K.)¹². In the same time the rabbits developed from the affected fertilization were born (Chang M.C.). The 90's brought many successful research resulted in clones producing: ex. a mouse after transplantation of nucleus of embryo cells to the sterilized oocyte (Cheong H.T., Takahashi, Y., Kanagava H. – 1992), bulls after nucleus transplantation taken from the 31 – cell embryo to the cow sterilized oocyte (Che-

⁹ K. Klokowski, *Bioetyczne aspekty inżynierii genetycznej*, Warszawa 1995, 24.

¹⁰ The interesting disputes in Internet on cloning are worth to be mentioned. M. in.: D. Prelman, *Amber's scientific time capsules on display in S.F.*, San Francisco Chronicle 1997, 3.03, p. A17; K. Davidson, *To clone or not clone. Process threatens genetic diversity*, San Francisco Examiner 1997, 4.03, p.A1.

¹¹ T. Ślipko, *Granice życia. Dylematy współczesnej bioetyki*, Kraków 1994, 131.

¹² A.K. Tarkowski, *Inżynieria embrionalna – nadzieje i niepokoje*, Problemy (1988)2, 3-4.

sne P., Heyman Y., Peynot N., Renard J.P. – 1993)¹³, Dolly sheep born as a result of combining the ovum of one sheep with the somatic cell of another sheep and born by the third one¹⁴.

The first experiment of human embryos cloning was carried out by J. Hall and R. Stillman in 1993¹⁵. They succeeded in obtaining 48 single cells from the 17 human embryos. The cells were covered with the artificial shield. While breeding the cells used to divide but they at least atrophied. The hope connected with technique of cloning in relation to the mankind are limited to the following possibilities¹⁶: duplication of the single specimen in order to scientific research; cell, organ and specimen cloning in transplantation purposes; cloning of outstanding specimen and duplication of the whole groups of people. In the nature we can find a similar phenomenon and their representatives are called monovular specimen. It is very important to realize their natural origin.

Nowadays a wide range of cloning methods is being applied¹⁷. There are the following among them worth to be mentioned:

a) Blastomere separation – isolation of one blastomere or the group of their in the early embryo stage is done and conditions for further development are provided (ex. place it in the artificial, transparent shield or derived from embryo or oocyte);

b) Embryo fission – embryo, morula or blastocyst dividing is done and the conditions for further development are provided;¹⁸

c) Blastomere combination – a single separated blastomere is survived with a number of others which provide a development to it or the separated group of blastomere is put inside the blastocyst with isolated own embryoblast providing conditions for further development;

¹³ J. Nurkowska, *Na obraz i podobieństwo swoje...*, Wiedza i Życie (1994)2, 17.

¹⁴ L. Wilmut, A.E. Schnieke, L. McWhir, A.J. Kind, K.H.S. Campbell, *Viable Offspring derived from fetal and adult mammalian cells*, Nature vol. 385 (1997)2, 810-813; por. też: M. Fikus, J.Nurkowska, *Sukces w owczej skórze*, Wiedza i Życie 749 (1997)5, 12-18; K.H.S.Campbell, J. McWhir, W.A. Ritchie, I.Wilmut, *Sheep cloned by nuclear transfer from a cultured cell line*, Nature vol. 380 (1996), 64-66.

¹⁵ P. Elmer – Dewitt, *Cloning: Where do we draw the line?*, Time 142 (1993)19, 57-62.

¹⁶ K. Tittenbrun, dz. cyt., 136.

¹⁷ J.A. Modliński, *Biotechnologiczne metody sterowania pozapłciowym rozrodem ssaków*, Biotechnologia (1990)1, 4-13.

¹⁸ B. Nowicki, B. Kosowska, *Genetyka i podstawy hodowli zwierząt*, Warszawa 1995, 178-204.

d) Nucleus transfer – a nucleus of embryo cell is inserted into sterilized cytoplasm or a merger of sterilized cytoplasm with a nucleus and the cytoplasm of another cell.

2. CLONE AS A HUMAN BEING

Let's think now, whether a clone has a right to be a human being. Artificial fertilization, however, violates human being's self-respect. This is the nature that makes a selection of cells capable of fertilization and of sperm cells capable of penetration into selected ovum. The method of artificial fertilization violates this natural selection. If the sperm cells are not capable of fertilization the ovum it means that the reason is in their biological weakness.

This method is a great chance for parents ineffectively awaiting their offspring. The extrasomatic fertilization, however, evokes a number of controversies not only of ethics nature but also of medical one¹⁹. First of all we mean modification of the method of injections single spermatid (the spherical cells which are the precursors of the sperm cells that are still unable to move and being obtained from the sperm cell or from the infertile human's testicle biopsy) to the ovum cytoplasm. This method used to be called „the rape on the ovum” and this is why this method must ensure to be safe for the fetus. There is a suspicion that the method of injection causes a higher percentage of congenital faults connected with the X chromosome and it may also cause the human's sterility transmission carried on next generations. The French statistics report that, up-to May 1995, 13500 operations of this kind were carried on and from that number 6065 embryos were obtained. To the uterus 4030 embryos were injected. The 21% of injections gave the pregnancy. The Belgian and Dutch research follow that 5 anomalies of sexual chromosomes have been found at 15 babies born thanks to the method applied. Therefore such a method is an act of God's manipulation, which eliminates natural sperm cell's tendencies for competition and thus the danger of sterility transmission may appear as well as genetic congenital faults in cases when the male sterility is caused through the faults included inside the chromosomes.

We cannot forget that the human being adopts the natural selection of healthy ovum and healthy sperm cells while applying this method.

¹⁹ Opr. K.O. *Kontrowersje dotyczące sztucznego zapłodnienia*, *Medycyna na świecie*, 3 (1996)2, 74.

Unfortunately the human being happens to be fallible and he is unable to estimate the right of applying the method. Moreover, the human being decides which of the fertilized ovum will be further developed inside the mother's uterus and which of them will be destroyed. Therefore the human being makes an attempt to take over God's part while creating another human being. This fact seems to abuse technique an science. The human being is the only one to be enabled to participate in God's life by cognition and love. He was created to this end and constitutes a basic right of his dignity. This is God who gives life to the human being and because the human being is created at God's resemblance, receives a dignity which means that he is not something but he is someone. He receives capability of self-recognizing, self-control as well as he is able to give himself to the others and form a community. He is appointed to the alliance with his Creator and to give Him faith and love that cannot be given by anyone else. The human being created at God's resemblance is, by the way, a physical and spiritual creature. Human's body participates in the dignity of „God's image”. Human's body is livened up thanks to the spiritual soul.²⁰ The human being with the whole body and soul, assembles parts of the material world²¹.

3. FOR AND AGAINST?

Genetic engineering has already mastered the technique of artificial fertilization, embryos freezing, cloning and genes transfer. We regard a man as a human being from the date of conception. It means that any manipulations of his genome violate his personality. In the date of birth any man has a strictly determined genetic information. Interference into reproductive genome is not only the interference into given, particular creature but also into the whole *Homo sapiens species*.

Both the artificial fertilization and cloning tests conduct for treating a man like a subject. This is another man who decides about the embryo status. Moreover, a mastered technique of embryo freezing and gene transfer, enables human to decide about the next generation's genome in the future.

In the case of cloning we must realize a danger of implantation and possibility of further genetic faults conducting to the biological chaos such as genetic changeability, balance disturbances among populations as well as the possibility of micro - organisms and parasites develop-

²⁰ *Katechizm Kościoła Katolickiego*, Poznań 1994, 91-93.

²¹ Sobór Watykański II, konst. *Gaudium et spes*, 14.

ment staying out of our control. The evident threat resulting from cloning is a complete sex determination. In effect the a number of male and female creatures may be shaken²² and it means a serious interference into environmental state.

Summarizing, we have to confirm that the question on existing a border of undertaken manipulations as well as clones' status and their influence on the environment is contended inside the three spheres of genetic engineering research. They are: human genome cognition, gene transfer and cloning²³. Genetic manipulations may threaten the environmental functioning as well as integrity and health. Disturbing of the genes functioning through genetic experiments may cause unexpected surprises. The transferred gene may destroy and/or change the functioning of recipient's organism. This risk increases while transferring more than one gene. There is also a risk of unexpected rousing of the own genes activity or their inhibition.

Moreover, the three discussed spheres of genetic engineering measures may contribute to implementation of Frankenstein's syndrome what may conduct to the human extermination.

If it is true that the nature eliminates weak cells by itself, so a man has no right to make such a selection.

If it is true that fertilization is an act of God, so there is a risk to transfer infertility and genetic faults.

If it is true that human embryo cloning conduct for treating man like a subject, so even good purposes such as transplantation will not justify this kind of activity.

If it is true that a man, at the moment of conception, receives a unique genetic information, so any manipulations of his genome change his personality.

If it is true that a man is a human being from the moment of conception, so it is not allowed to treat him like a subject.

If it is true that a human clone should have a human being's status, so any genetic experiments carried on him should be forbidden.

If it is true that cloning upsets ecological balance and conducts to environmental variety decreasing, so we are imminent of ecological extermination.

²² K. Tittenbrun, *Etyka klonowania*, *Etyka* 23 (1988), 138.

²³ We should mention the appearance of an interesting book: L. Kordylewski, *Problemy bioetyki*, Kraków 1996 – it is a collection of general and detailed questions on fast developing bioethics. These questions have been left without any answer. They suggest a discussion on many important problems.