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Chance and the Frankenstein's syndrome

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rozszerza repertuar naszych prawdziwych zdań o rzeczywistości. Symbole denotujące metaforycznie odnoszą się do swych rzeczywistych referentów, a próbki egzemplifikują pewną realną rzeczywistość umożliwiając nam jej poznanie. Metafora jest więc traktowana w filozofii Goodmana jako coś kognitywnego, a nie jako środek czysto dekoratywny czy też jako jedynie przyczyna poznania. Z tego punktu widzenia należy ją widzieć jako istotnie ważny środek naukotwórczy czy szerzej – wiedzotwórczy.

THE THEORY OF METAPHOR IN NELSON GOODMAN'S PHILOSOPHY

Summary

This article concerns Goodman's solution of the problem of metaphor. The first part presents his positive and negative description of metaphor. According to him, a metaphor is neither ambiguity nor elliptical simile. Applying a familiar label to a new kind of things is only a special form of metaphor. This is not a metaphor as such. A metaphor is defined by Goodman as the change of realm, i. e. as the change of ranges of labels' extension in a schema (sets of labels). The second part of the paper deals with metaphorical denotation and exemplification. They are both regarded by Goodman as being cognitive. They enable many form of rightness. Rightness is something cognitive and something more general than truth. It is applied to verbal and nonverbal symbols in art and in science. Metaphor is present in language and in other kinds of symbols. It can be related to truth and rightness. So – concludes Goodman – metaphor is very important to human knowledge.

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CHANCE AND THE FRANKENSTEIN'S SYNDROME[1]

ABSTRACT

In the act of creation God planned the order and the hierarchic organisation of nature. This order is described in the laws of scien-

[1] Poszerzony tekst referatu wygłoszonego w ramach „Ninth European Conference Science and Theology: *Creating Techno Sapiens?"* w Nijmegen (19-24.03.2002 r).

ce. Accidental events are manifestations of disturbances of this order. By accidental events I mean those, which are unexpected, surprising and unforeseen.

Scientific and technical development, especially in genetic engineering, may lead to certain accidental events and therefore to breaking the natural order. This is because there is no possibility to foresee the consequences of human interference with nature. Accidental, unexpected, unplanned consequences of scientific activity give rise to serious misgivings.

The paper deals with the so-called Frankenstein's Syndrome – fears of possible creation of a human being by some interference with human genotype. The notion of chance will be also considered as crucial to the problem of genetic experiments with human body.

In this context, an interesting question may be posed: did God foresee chance and its consequences in genetic manipulations?

INTRODUCTION

Popular observation of the world of nature confirms that it is ordered and well arranged. Scientists give evidence of this order. The order of the macro-world is deterministic while that of micro-world is indeterministic (probabilistic). Despite the differences in the character of both orders we acknowledge the existence of harmony in nature, harmony, which is described by strictly determined laws. Any perturbations of thereof are explained in terms of accidental phenomena, which appear in an unexpected, surprising and incidental way. This is why any human interference with that harmony stirs up anxiety and fear. Fear of accidental, unplanned and unexpected effects of scientists' activities is especially strong. Scientists themselves are aware of infringement into the basic laws of nature. They realise that it is impossible to anticipate the effects of infringement they undertake.

1. THE FRANKENSTEIN'S SYNDROME

The greatest scientific progress at the turn of the century is being observed within genetic engineering. This is a sphere of investigations where we hope to correct mistakes of nature, but also improve life condition, and sometimes even make dreams come true.

Genetic engineering is a discipline which recently has developed very intensively. Many exciting but also controversial dilemmas ha-

ve grown around it[2]. Representatives of this discipline aim at creating new organisms and parts of them (e. g. cells, tissues). These experiments are carried out in the hope to use their results in medicine[3]. This hope is a hard way to recognise the regularity of human genome and, as a consequence – its pathology. To recognise human genome means to know full information included in DNA which determines how an organism functions. Recognising the genome is also knowing diversity, capability, sickness predisposition, and behaviour of an organism. Studying the human genome has been largely developed and is supposed to be completed in 2005[4]. These studies proved that dispositions to alcoholism, fatness, homosexuality or tumours are genetically conditioned.

Recognising human genome will enable to dispose of a number of genetic defects and also restrain some natural biological processes such as ageing or dying. For example, recently discovered gene FoxM1B appears not only in liver cells but also in cells of other tissues. This discovery may, one day, contribute to elaborating a gene therapy which will enable to substitute old cells with new ones quickly. In this way, we would be able to „rejuvenate" old and malfunctioning organs.

The next sphere of genetic engineering is DNA and cells cloning. With regard to organisms that proliferate in a sexual way, cloning is considered a way of asexual proliferation. Organisms that come into being are genetically identical with the parent cell. The first experiments included plants and, in turn, animals. In the 90s, a number of research programs were crowned with the birth of a clone. The famous Dolly sheep has come into being as a result of junction of one sheep's egg cell with other sheep's somatic cell, and born by third sheep[5]. Today we know that the cells of her body are

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[2] Cf. M. Wadman, *Politicians accused of shoting from the hip on human cloning*, Nature (1997) vol. 386, 98; E. Massood, *Cloning technique «reveals legal loophole»*, Nature (1997) vol. 385, 757; A. Kahn, *Clone mammals... clone man?*, Nature (1997) vol. 386, 119; P. Elmer-Dewitt, *Cloning: where do we draw the line?*, Time 143(1993)19, 65-70.

[3] See D.J. Weathrall, *The new genetics and clinical medicine*, Oxford 1985.

[4] H. Letang, *Anglo-American Conference on the Impact of Molecular Medicine on Clinical Practice*, Journal Royal Soc. Med. (1993) 869, 187-193.

[5] I. Wilmut, A.E. Schnieke, J. McWhir, A.J. Kind, K.H.S. Campbell, *Viable offspring derived from fetal and adult mammalian cells*, Nature (1997) vol. 385, 810-813; K.H.S. Campbell, J. McWhir, W.A. Ritchie, I. Wilmut, *Sheep cloned by nuclear transfer from a cultured cell line*, Nature (1996) vol. 380, 64-66.

six years older than herself because Dolly was cloned of a six year-old sheep. Scientists suppose that premature ageing is the cause of her arthritis.

Today, experiments with cloning include also human embryos. These stir up many anxieties and emotions especially in the prospect of successful *in vitro* fertilisations, freezing of embryos, organ transplantation, etc.

The first experiment with human embryo cloning was undertaken in 1993 by J. Hall and R. Stilmann[6]. They succeeded to obtain 48 single cells out of 17 human embryos that were than covered with artificial shield. These cells sectioned while breeding but finally died. Hopes of cloning technique with regard to humans include capability of making copies of individuals for scientific reasons; cloning of tissues, organs and individuals as a base for transplantation; cloning outstanding individuals and whole groups of people.

An obvious threat of cloning is complete sex determination. This may upset the balance of sex representatives. If it is true that cloning completely determines sex of an individual, so a danger of perturbations within natural balance of individuals appears. If it is true that behaviour is genetically based and genes responsible for behaviour may be located, so properly worked out method of genetic modification of organisms enables to change natural behaviour, and in this way – impoverish the influence of environment.

Danger resulting from using the cloning technique is, first of all, uncontrolled „production" of genetically identical individuals, sex imbalance, and – owing to the known techniques of *in vitro* fertilisation and fertilised cells freezing – coming into being any organisms of a chosen phenotype and genotype, any time.

Genetic engineers hope that their technique will enable them to correct the 'mistakes' of nature. Experiments in the genetic engineering focus on improving phenotype values: high growth, containment of proper protein, etc., but they obviously influence the genotype and therefore lead to the change of the forms of behaviour. Research carried out on one of the species of flies let us discover genes which control sexual behaviour. If so, we can change natural forms of behaviour when interfering with individual's genome.

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[6] P. Elmer-Dewitt, *Cloning: where do we draw the line?*, 57-62.

Another success of genetic engineering is artificial fertilisation. This technique lets us overcome the barrier of genetic weakness of sperm or egg cell. A number of methods was developed, however, each of them is unsafe to some extend. One of such threats is a possibility to transfer a genetic defect when using ICSI method. However, researchers supervised by Ken McElreavey of Pasteur Institute in Paris found out that microdeletions of *Y* chromosome might be a symptom of serious defects that throughout ICSI methods could be transferred to the offspring. Loss of *Y* chromosome in some offspring cells may lead to undergrowth of sexual organs. This happens with girls with the Turner syndrome as they suffer from perturbations of sexual chromosomes on the cell level. Usually female cells include two sexual chromosomes of *X*. However, some girls with the Turner syndrome miss one of them. It was found that approximately 40% had one *X* chromosome enclosed with genetic material of *Y* chromosome. Children with the Turner syndrome undergo perturbations during pubescence and their sexual organs remain undeveloped.

Some women with the Turner syndrome were found to have two *X*-chromosomes while one of them had genetic defects. Other cases show that some body cells can have natural set of *X*-chromosomes while others cannot. Research show perturbations of foetus' sexual chromosomes resulting from the loss of *Y* chromosome. The risk is estimated approximately as 10 in every 1600 cases.

If it is true that each human being receives unique genetic information from the moment of conception, so any manipulations with his genome change his personality.

The possibilities, outlined above, of the interference in the human genome give grounds for anxiety and fear about human's future, which has been labelled the Frankenstein's syndrome. Genetic interference is possible from the moment of conception. Thus, we can make a human to come into being any time, and soon we will be able to influence his sex, look, manipulate his genes responsible for behaviour, preferences, ageing process, etc. Thus, we will soon try to shape a human being according to our needs. However, it is worth to remember the role of chance in such interferences, the role of unexpected evens. Realising that our knowledge about the mechanisms and effects of genetic manipulations is certainly far from complete, makes our fears even greater.

2. CHANCE IN THE CONTEXT OF GENETIC ENGINEERING

Chance (or *accident*) is understood in various ways. For instance, it may be defined as: (1) An event occurring in a chain of other events, but not belonging to that chain; (2) An event which is a result of mutually independent casual chains (which occurrence in the same time is accidental); (3) An event occurring simultaneously with another event but without any causal relationship between the two; (4) A result which is out of proportion with its cause („small" causes, „big" results); (5) An event which cannot be predicted with the use of known laws of science; (6) coincidence. However, the most popular approach to the problem of chance defines it simply as an unexpected event, though not unexpectable[7]. The intuition itself suggests that as a result of genetic manipulations it may appear accidental events, because not all mechanisms and effects of genetic interference are known. Man cannot anticipate all effects of his activities. Moreover, some effects may appear many years later due to the compensation of various factors invoking some accidental events.

Chance may be treated doubly: as relative or absolute[8]. The first kind of chance is an event without reason in a given frame of reference. The absolute chance is an event without reason in the whole material world. Especially interesting are accidental mutations (relative chance) because their reason lies outside of a biological system. It lies in chemical or biochemical systems. However it has to be stressed that a chance is an event which is unexpected but not unexpectable. Thus, we should ask the question not of the probability of such mutations but of probability of

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[7] J. Beatty, *Chance and natural selection*, Phil. Sci. 51(1984)2, 183-211; Ch. Brich, *Chance, necessity and purpose*, in: F. J. Ayala, Th. Dobzhansky (eds.), *Studies in the philosophy of biology*, London 1974, 225-239; M. Bunge, *Causality, chance and law*, Amer. Sci. 49(1961)4, 432-448; P. G. de Gennes, *Chance and necessity*, Diogenes 100(1977), 197-217; S. L. Jaki, *Zufall oder Realit (t*, Phil. Nat. (1982)19, 498-518; H. E. Kyburg, *Chance*, J. Phil. Log. (1976)5, 355-393; B. Rensh, *I Drei heterogene Bedeutungen des Begriffs «Zufall»*, Phil. Nat. 18(1981)2-3, 197-208; L. D. Roberts, *Indeterminism, chance and responsibility*, Ratio (1971)13, 195-199; J. S. Wicken, *Chance, necessity and purpose: toward a philosophy of evolution*, J. Rel. Sci. 16(1981)4, 303-322.

[8] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* [The problem of evolutionary determinism. A biophilosophical study], Gdańsk 1990, 140.

conditions invoking them, because these conditions increase the possibility of mutation.

Therefore, if we acknowledge that the reasons of accidental events exist, despite they are out of the system of relevance, that means they are known to us.

The more complex problem seems to be the case of an absolute chance. Because if we do not know the source of an event, such an event remains unexplainable.

Introducing clones and genetically modified organisms into the environment decreases the variety of forms which threatens human's survival. Genetically modified organisms may prove a danger to natural ones. They mature earlier, are stronger and thus better accommodated, therefore they squeeze out those normal ones and make them extinct. Genetic manipulations within an ordered system may threaten its functioning, integrity and health. Disruption of the context of the functioning of genes throughout genetic experiments may give us a surprise. The transferred gene may destroy and/or change functioning of the organism of the recipient. This risk even increases when transferring more than one gene. There is also a risk of an unexpected activation or an inhibition of the activity of the organism's own genes.

A danger of unexpectable mutations, behaviours, etc. may also appear. It is commonly known that not only predominating genes but also recessive ones are a part of the genome. They are genes which may become active sometimes in distant next generations.

Cloning includes a danger of small harms, which can appear after a couple of years. The argument of the „blind alley" is often raised during discussions on cloning: the change of environmental conditions will cause the extermination of clones, so vegetative reproduction of human beings is unacceptable. This would be correct if all humanity gave up sexual reproduction in favour of cloning. It is also often assumed that clone reproduction excludes mutation. But this is true to some extent only. Spontaneous mutations may appear within any conditions which means – in any cell, even in such of which nucleus will be placed into an egg cell cytoplasm. Then, such a mutation may become hereditary and will initiate a group of clones with different features. Moreover, as long as environment stays unchanged, the clones benefit from their ge-

nome. The change of environment threatens their existence. This results from disappearance of recombination or mutation processes, which are the base of hereditary changeability of the organisms.

3. DID GOD FORESEE CHANCE?

Trying to answer that question we should assume that God is an almighty Being with unlimited intelligence and wisdom. This is why He knows all events, even those very distant in time. This, of course, cannot be attributed to a human being. This is why no human can anticipate unexpected chances.

If it is true that the environment affects living beings, e. g. by activating recessive genes, so we cannot anticipate all effects of cloning and genetic modifications.

If it is true that artificial fertilisation is accidental (random) in character, so human interference into this sphere increases the risk of infertility and genetic defects.

It seems to be clear that God not only foresaw chance but also knows consequences of all actions which man performs within genetic engineering. Moreover, the example of Dolly sheep may show that nature was so carefully organized that it is able to defend itself against any interference into its order.

The appearance of accidental events (mutations, defects) must entail the awareness of the loss of control over human activity. Activity that violates the ordered environmental system must release some defensive mechanics of the environment. The examples mentioned above seem to prove it. A clone gets older more quickly than its natural counterpart. It is biologically weaker, and therefore it is more quickly eliminated from the environment. Artificial fertilisation causes illnesses to be transferred to the offspring in such cases, when nature defends itself by not allowing to fertilise in a natural way as it eliminates weak sperm and weak egg cells. Man's interference helps to defeat this natural weakness.

The above examples may show that God foresaw not only chance but also defensive mechanisms of the environment. These mechanisms (e. g. quicker ageing of clones or infertility caused by weakness of handicapped sperm cells) show not only God's almightiness but confirm that He foresaw the appearance

of accidental events. Harmony within the environment is a sign of extraordinary logic and consequence. The violation of it entails defined effects. However, it seems that accidental events, mentioned above, invoked by human interference are of relative character. This means that their causes, being out of biological system, not always can be scientifically explained or even understandable for a human being.

The above examples show us that nature not always takes up a dialogue with a human being and reveals all its secrets. Thus, nature teaches man humility.

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NATURAL THEOLOGY OF DESCARTES AND MODERN SECULARISM

It is noticeable that in the realm of faith and of religious practice an important change is under way at the present time. Within the Western culture religion is more and more only one of many walks of social life and not, as it was in the past, a widespread and influential factor determining the social order. Many people, especially within the science circles, seem to be impenetrable against religious problems. Until not so far ago a challenge against faith and religion took often the shape of open atheism. Nowadays, this shape is also under change. It seems as though atheism was converting itself into secularism which emerged, quite clearly, already in the XVIth century.

At present secularism is taken to mean a philosophy of life manifesting itself both in natural sciences and in politics, philosophy, morality and arts by accepting man, his mind, his liberty, his earthly plans as the only term of reference with there excluded every religious prospect. Under secularism, man is totally concerned with himself; he not only places himself at the center of every interest but also claims to be a principle and reason for the whole reality. Secularism is a form of naturalism excluding every reference to