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Human Nature, Genome and Culture

Ludzka natura, genom i kultura

Abstract: The human nature (understood as the whole of genetically determined behavioral programmes specific to man) and the human culture (or human civilization) defined as the whole of the information which can be transmitted to successive generations without the involvement of genetic transmission both present numerous similarities. They are both the stock of information. They evolved with time, although the evolution of the human genome lasted much longer than the development of human culture (million years in the case of the genome and thousands years in the case of culture). Both the human nature and culture are conservative, but the former is much more conservative than the latter. The velocity of cultural and civilizational changes become greater and greater with time, especially from the beginning of 21st century. Although the negation of some elements of culture and its enrichement with novel elements by successive generations is a stable component of the human history, this process seems too fast in our times. The extreme high difference between the velocity of civilizational changes and changes induced by biological evolution of man creates the serious tensions, which should be overcome by the contemporaneous and future generations. Although the culture must evolve, it cannot become totally rejected or destroyed and replaced by totally novel rules. All the ideas of the „cultural revolution" are not realistic and dangerous.

Keywords: human nature, human genome, human evolution and history, human behavior, human culture.

Before the discussion on the relations between the human nature and human culture, we have to define these terms. Under the term of the **human nature** we understand the whole of the behavioral programmes genetically determined and specific to man, more simply a part of the human genome related with human behavior. However, it seems that a great part of these genes encode rather the possibility to develop the neural junctions under the influence of the proper environmental stimuli [Eagleman 2023].Today knowledge of molecular biology shows that human and animal genomes (especially those of the chimpanzee) are very similar. It means that we share, at least in part, our nature with animals. Similar conclusions result from some studies on animal behaviour. However, the important differences between animals and men can also be indicated, for instance the ability of man to active and passive participation in culture, creation and participation of so-called intesubjective knowledge (see Pawlikowski 2021), extremely large limits of knowledge (concerning the most distant galactics) and the susceptibilty to be open to transcendence. Although the definition proposed above could be acceptable to antropologists, probably it is not easily acceptable by specialists in cultural studies and other representants of humanistic disciplines, because of the philosophical tradition beginning from the antiquity. The ancient, as well as the later philosophers, devoted much attention to the human nature but, obviously, they could not, until the second part of 20th century to refer to genome in their considerations on the human nature. Obviously, I am ready to admit that the idea of human nature, rooted in philosophy and religion, is something larger that the sole genetic determination. It includes also some very old and stable elements of cultural transmission. However, I think that the theologians should not be afraid of the idea that God use DNA as the ink to describe our nature. In turn, under the term **culture**, we understand the whole of the programmes which can be transmitted to successive generations (like in case of the genome), but without the involvement of genetic transmission. The above definition of the human culture might be also claimed as unsatisfactory, On the one hand, the above definition is maximally unequivocal, and, on the other hand it is the widest from the all possible. It may be its weak point that it comprises such different elements like religion, customs, art, science and technology. Paralelly to the ability to create culture, a very important ability appeared: the possibility to act **beyond**, and even **against** genetically programmed rules of behavior (for instance, the ability to act even against the genetically programmed self-preservation instinct). More traditionally, we call this possibility **free will,** or **freedom**. This ability may results with honest acts, like

the voluntary act of Saint Maximilian Kolbe, who offered his own life to save the unknown prisoner of Nazi Concentration Camp from death, and the criminal act of Al-Kaida terrorists, leading to the death of thousands innocent victims of attack against the World Trade Center. Both possibilities have fundamental significance in monotheist religions. Both contradictory decisions were perceived as very important by late philosophers. Especially Immanuel Kant linked the human dignity with the ability to perform moral choices. There are no doubts that the abilities to create and participate in culture, as well as to exceed the nature, have some molecular background in the human genome. In Fukuyama,s essay „The end of Man" [2003] there is an important warning that the attempts of "amelioration" of human genome by biotechnology procedures are extremely dangerous for both human nature and culture. Limits between the human nature, programmed in genes, and human culture is not sharp. For instance, the language belongs to the culture, but the speech is the natural ability, belonging to the genetic deposit of man. Although the identification of the genes involved in these processes is always before us, one of the genes connected with speech function, called FOXP2 has been discovered (Enard et al.2002). Let us also record that the rules of language are also considered to depend on genetic programming (Chomsky,1977). The language stays on the edge of nature and culture; and is a link between them. Although the genes influence human behavior, the reciprocal effects of social situation on the gene replication are also described [Cole, 2009], Thus, the culture is, to some extent, the „prolongation" of the genome. Are we able to compare them, to indicate similarities and differences? Both genome and culture are **stocks of information**. Moreover, this information could be, in both cases, transmitted to successive generations. Here we meet the first important difference: information belonging to the area of culture, can be transmitted also between individuals of the same generation. It is not possible in the case of the genome. The next common trait of the genome and culture is the relative **fidelity of communication**. However, it is absolute neither in the case of the genome nor in the case of culture. In the case of the genome this fidelity is very high; the main probability of the fault of the inclusion of the false base during the replication of DNA was estimated as 1 to 10000 [Biedrzycki 2003]. It speaks in favor on the high conservative character of our genome. A non-professional reader could be astonished that many of our genes can be found not only in animals but also in plants and bacteria. The culture is also conservative to some extent. When we take in our hand the Bible, Iliada or Odysea, we realize that these words were inscribed thousands years earlier. However, the conservatism of culture has

become much weaker in the last years. The next common treat of the genome and culture is their changeability The changeability of the genome (linked with mutations) is a condition sine qua. non of the biological evolution. The changeability of culture is enormous in comparison with the genome, and it seems that its velocity become greater during the time, especially in the area of technology. The analogies between the genome and culture, as described in this text, are nothing original. They were indicated mainly by many authors recruiting from biological sciences. Richard Dawkins [2000] even proposed the term of **„mem",** as a „unit of imitation", in analogy to „gene" as a unit of heredity. This proposal seems controversial because the structure and mechanism of action of the gene are well known, and, in contrast, the term „mem" lacks precision and is unequivocal. Such different things like ideas, technological procedures, musical hits or shoes fashions are given as examples of mems [Biedrzycki 1998]. The mechanisms of replication of mems are more clear. Their basis is, of course, the language, and further successive discoveries like scripture, printing, radio, television and social media on the internet. Comparing the human genome and human culture, one can see a further important difference. Each of us individually possesses in his cells the whole human genome (of course with some individual differences) but nobody possess the whole content of human culture. The later is „possessed" by us only partially (as subjective knowledge) or commonly, with the whole humanity, as the intersubjective knowledge. (see: Pawlikowski 2023]. Further, as individual subjects, we participate in the human culture only partially, because its content overcomes our individual cognitive possibilities. Nobody of us possess all the human knowledge and skills. Human culture exists in the „over personal" manner, independently from the actual biological existence of their creators. Sokrates, Platon, Arystoteles, Goethe, Mozart, Bach, Beethoven, Chopin or Mickiewicz has not been living for many years, but their works are still the living particles of human culture. The term „noosphere" (sphere of spirit), proposed by Teilhard de Chardin [1964], relating to the whole planet indicates well the area of presence of human culture. Nevertheless, the existence of human culture (like of all stocks of information) is not independent from the material carriers of information. The further similarity of culture with the genetic information exist here. Although the nucleic acids are not involved as carriers of cultural information, the role of their carriers is played by the neuronal structures connected with speech, memory and imitation [the last by so-called „mirror neurones", see: Rizzolati et al.2004]. They are very important especially in the early stages of culture development. Further, the material

carriers of cultural information like scripture, stable pieces of material culture, and, nowadays, digital records play an important role. The destruction of the material carriers may cause the irreversible loss in our culture (for example, the catastrophic fire of the famous library of Alexandria). Both the genome and culture must evolve. The lack of evolution of the genome would result in the non existence of the diversified kingdoms of plants and animals, including the man himself. The lack of evolution of culture would stop us on a very primitive social level. However, if the evolution of the genome happens very slowly (the evolution of the human species has been lasting for several millions of years), the evolution of culture takes place much faster. About the existence of human culture (in the present significance of this word) we have been able to speak approximatively from ten thousand years. It seems a great period of time in comparison with the duration of our lives, but very short in comparison with the lasting of the biological evolution of humanity. The velocity of cultural and civilizational changes becomes faster and faster with time, especially from the beginning of the 21st century. Although the negation of some elements of culture and its enrichement with novel elements by the successive generations is a stable component of the human history, this process seems too fast in our times and goes beyond our individual possibilities of adaptation. The extreme high difference between the velocity of civilizational changes and changes induced by biological evolution of man creates the serious tensions, which should be overcome by the contemporaneous and future generations. Although the culture must evolve, it cannot become totally rejected or destroyed and replaced by totally novel rules. All the ideas of the „cultural revolution" are not realistic and dangerous. The genome exerts significant (and at the same time not conscious) influence on our behavior, which so far has been estimated by us as depending on cultural factors. However, the influence of our genome, although significant, does not determine totally our choices. In normal conditions we are free in majority of our choices. Moreover, we are obliged to make them because our genetic programming is not sufficient to cope with the abundance of our vital situations. From this statement we can conclude, that the development of culture is necessary for the existence of our species. Culture is complementary for nature. However, their contacts are not always conflictless. It could be exemplified by the struggle between the „animal body" and the sphere of spirit, present in iudeo-christian tradition. On the other hand, we can indicate numerous views on the exaggerated „restrictions" of human nature by the manacles of the culture, coming from Jean Jacques Rousseau and his myths of the „good savage" and „tabula rasa", as well as

from Sigmund Freud and his psychoanalysis. Several genetic adaptations allowed us to disperse around the whole planet. For example, without our adaptation to eat meat we would not have been able to survive in the colder climate before the invention of agriculture. The increased pigmentation of skin allowed some of us to survive easily in the regions with high insolation, like Africa. On the other hand, the high pigmentation of skin was not necessary for humans living in nordic areas; on the contrary, the pale skin was in these regions favorable because of higher intensity of local production of vitamin D under influence of ultraviolet radiation. However, these very old adaptations generated some cultural and political antagonisms. The „black–white" antagonism, although generated rather by social and historical but not biological premises, unfortunately remains until now.

The similarities between the genome and culture lead not only to the inter-generational exchange of information, but are both palimpsests. Rejecting part of the genome which was for example just present, for instant, in worms, we will unable to live. The culture is also a palimpsest.The supposition, that we are able to totally destroy „old culture" and perform the „cultural revolution" creating in its place the totally „new" one is a nonsense utopia.

Discussing in this text the connections between the genome and culture, I used the singular number. relating to both. It seems proper in description the genome, but perhaps to simplified in the relation to culture. I am conscious of diversity, complexity and even antagonistic character of culture (rather multiple cultures and civilizations). However, this simplification was needed to focus our considerations on the most important properties of the phenomenon called human culture.

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