

Междисциплинарный диалог может начинаться с вопроса: что значит быть рожденным? Институционально в биоэтическом поле проблема рождения человека, прежде всего, рассматривается сквозь призму «*Всеобщей декларации о биоэтике и правах человека*».

Понимание человека в русле традиции христианской биоэтики основывается на признании божественного начала, которое присуще каждому человеку, и эта характеристика не связана жестко с актом физического рождения, поскольку человек является человеком с момента зачатия. Отсюда и отношение христианской биоэтики к ее открытым проблемам: допустимости аборта, границах вспомогательных репродуктивных технологий, экспериментам с человеческим геномом, возможностям планирования рождаемости и применения контрацептивных средств и т.д. Исходя из описанной выше позиции христианской биоэтики, возникает ряд вопросов/дилемм, так или иначе связанных с рождением человека. Если философская антропология, экзистенциализм, социальная философия и этика вопрошают о целостности человека, его возможности родиться для себя и общества, через реализацию ключевых аспектов его сущности; христианской биоэтике достаточно признания факта человеческой богоподобности для заключения об особом статусе человека; и, исходя из этого, о моральности/аморальности тех или иных решений в сферах, о которых говорилось ранее.

Как видим, в рамках философии медицины и биоэтики с проблемой этической оправданности рождения человека связан целый узел не только духовных, но и социальных проблем. Биоэтика не однородна в отношении к описанным проблемам – наиболее очевидное различие наблюдается между религиозной и светской биоэтикой. Ранее мы уже рассматривали проблему статуса человеческого эмбриона, которая наиболее остро ощутима в магистральных направлениях биомедицинских исследований, в рамках которых проводится изучение эмбрионов – разработка новых подходов в контрацепции, более глубокое понимание механизмов и диагностики бесплодия, улучшение лечения бесплодия методом ЭКО, выявление генетических и врожденных патологий с помощью пренатальной диагностики. Возможность таких исследований и требования к ним были изложены в 1997 г. в «Конвенции Совета Европы о защите прав человека и достоинства человеческого существа...». Однако никакие формальные кодексы и другие нормативные акты не способны не только регламентировать, но и выявить все нюансы этического отношения к рождению человека. Рождение человека как высшая ценность является не просто «лакомусовой бумажкой», тестом на этичность, но указывает на сам фундамент этического отношения к человеку.

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## ARTIFICIAL INTELLIGENCE, CYBORGS AND IMMORTALITY: BIOETHICS IN SCIENCE FICTION NOVELS

## ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ, КИБОРГИ И БЕССМЕРТИЕ: БИОЭТИКА В НАУЧНО-ФАНАСТИЧЕСКИХ ПРОИЗВЕДЕНИЯХ

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Rapid development of biotechnologies and their merge with recent developments in the field of Artificial Intelligence (AI) raises many technological, moral, philosophical, ethical, legal, as well as other questions. The rise of such technologies, like cloning or Artificial Intelligence, to name only a few, has faced different, sometimes completely opposite reactions, ranging from very positive and enthusiastic to very hostile ones. At present, there are a lot of relative research going on which try to estimate potential risks and advantages of these developments, as well as bioethical and legal issues involved. Needless to say, that also leading thinkers and leading protagonists of science

fiction show their concern about the latest advances in biotechnologies, AI, their merge and its potential implication for the human species. The present paper analyzes the novels of British science fiction literature *Frankenstein* by Mary Shelley, *Altered Carbon* by Richard Morgan, *Spare* by Michael Smith, *Sirius* and *Odd John* by Olaf Stapledon through the prism of bioethical, moral, philosophical and other issues related to biotechnological sciences and AI.

Быстрое развитие биотехнологий и их слияние с последними разработками в области искусственного интеллекта (далее – ИИ) поднимает множество технологических, моральных, философских, этических, правовых и других вопросов. Развитие таких технологий, как клонирование или искусственный интеллект, столкнулось с различными, иногда диаметрально противоположными реакциями, от позитивных и восторженных до крайне враждебных. В настоящее время проводится множество исследований, пытающихся оценить потенциальные риски и преимущества этих разработок, а также связанные с ними вопросы биоэтики и права. Несомненно, крупные мыслители и писатели научной фантастики также демонстрируют свою озабоченность последними достижениями в области биотехнологий, искусственного интеллекта, их слиянием и потенциальным влиянием на человечество. В данной статье анализируются романы британской научной фантастики: «Франкенштейн» Мэри Шелли, «Измененный углерод» Ричарда Моргана, «Запчасти» Майкла Смита, «Сириус» и «Одд Джон» Олафа Стэплдона – сквозь призму биоэтических, моральных, философских и других вопросов, связанных с биотехнологиями и ИИ.

*Key words:* bioethics, biotechnologies, artificial intelligence, cyborgs, *Altered Carbon*, *Spare*, *Frankenstein*, *Sirius*, *Odd John*, Stapledon, Smith, Morgan, Shelley, Asimov.

*Ключевые слова:* биоэтика, биотехнологии, искусственный интеллект, киборги, «Видоизмененный углерод», «Запчасти», «Франкенштейн», «Сириус», «Странный Джон», Стэплдон, Смит, Морган, Шелли, Азимов.

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Rapid advancement of biotechnologies and their merge with recent developments in the field of Artificial Intelligence (AI) poses many technological, moral, philosophical, ethical, legal, as well as other questions. The rise of such technologies, like cloning or Artificial Intelligence, to name only a few, has faced different, sometimes completely opposite reactions, ranging from very positive and enthusiastic to very hostile ones. At present, there is a lot of relative research going on, which tries to estimate potential risks and advantages of these developments, as well as bioethical and legal issues involved. Needless to say that also leading thinkers and protagonists of science fiction show their concern about the latest advances in biotechnologies, AI, their merge and its potential implication for the human species. The present paper analyzes the novels of British Science fiction literature: *Frankenstein* by Mary Shelley *Altered Carbon* by Richard Morgan, *Spare* by Michael Smith, *Sirius* and *Odd John* by Olaf Stapledon through the prism of bioethical, moral, philosophical and other issues related to biotechnological sciences and AI.

A great number of bioethical issues were raised in one of the first science fiction novels, *Frankenstein, or the Modern Prometheus* (1818) by Mary Shelley. It is often considered to be one of the first science fiction novels, in which the genius of the impressively young eighteen year old female writer sketched the impressively great number of problems to be discussed in the coming centuries by the genre of science fiction. The novel also raises the issue of the responsibility of science and scientists, ethics and morals relative to scientific research. It is one of the first novels to examine the issue of eugenics, a field that was later widely explored by such prominent science fiction writers like the father of science fiction, H.G. Wells, and the philosopher and author Olaf Stapledon. *Frankenstein* is also one of the first novels, which raises the problem of immortality, as well as a moral and ethical problem of the origins of the donated organs.

Due to the embryonic state of the transplantation sciences in the times when *Frankenstein* was written, the problem of compatibility of many human organs put together into one corpus did not emerge in the text. However, nowadays it is a well-known fact that one of the key problems in organ transplantation is the compatibility of a donor organ and a recipient's body. It is rather difficult to obtain a highly compatible organ for transplantation, due to many physiological, ethical, and other restrictions. There are long waiting lists of patients waiting for a suitable organ for transplantation. This situation has created various criminal activities, like body-trafficking, body-snatching, etc. However, even if a highly compatible organ is available, there are still many other problems to face during and after transplantation, like transplant rejection, etc. At present, after transplantation a patient must follow forever the immune system suppressing therapy in order to avoid the rejection of the transplanted organ. Even then, there is no 100% guarantee of the success. Needless to say that a patient, whose immune system is constantly suppressed, is very vulnerable to various diseases, many of them can become fatal since the recipient's body is artificially deprived of its natural defense system.

Many scientists have been trying to solve this problem of the transplant rejection, offering various practical and hypothetical solutions. A great breakthrough in this field was done after the invention of cloning. Cloning of human (and animal) organs for transplantation seems to be a reasonable solution of the problem. However, in some urgent situations the availability of a suitable organ for transplantation is crucial for a patient's life. Hence, some proposed cloning of the whole body of patients, in order to insure that the necessary compatible organ is always available for transplantation. However, this solution immediately raises many legal, ethical, philosophical, physiological issues as far as the clones are concerned. A wide range of these problems is analyzed by Michael Marshall Smith in his novel *Spare*.

The novel describes the factory where the human clones are kept in small closed rooms under ground, until their organs are needed for transplantation. If they survive the surgery, they go back to their room, mutilated. Otherwise, they die if their vital organs are taken away for their rich twins. This business is organized by an insurance company SicurNet, which produces clones for their clients while they are still in the womb of their Mother. For this purpose, some of the fetus cells are extracted to grow a clone.

In the novel, clones are grown in the factory and are kept in the inhuman conditions, since the company wants to reduce costs as much as possible. The clone factory is run by two droids and one human guard. The clones are kept in very small rooms where they virtually stick to each other, they have no clothes, cannot speak, think, or comprehend the world around them. All this is done not only to minimize costs but also to justify the usage of clones for human spare parts, since they are not personalities and not even really human. Michael Smith draws our attention to the injustice of this situation. Is it just to cause sufferings, pain, and degradation of these creatures only because somebody else has enough money to pay for his own clone? Is it just to treat clones with cruelty, cutting their organs away, sexually violating them, saying that they were created exactly for this purpose, hence have no rights? In the novel, the writer raises these, as well as many other burning issues in order to sensitize the audience to the problems related to human cloning, organ transplantation, etc. In of his main ideas is that it is not just to strive for immortality or to solve health problems of some people at the expenses of pain and sufferings of other creatures (clones), which differ from human beings by the complete absence of any education and hence, are reduced to the animal level.

Another important issue raised in the novel is the responsibility of the scientists for the results of their experiments. The writer describes in details horrifying living conditions of clones and their sufferings when their organs are taken away for the insurance company clients. It is worthwhile to observe that also *The Heart of the Dog*, *The Head of Professor Dowell*, *The Andromeda Nebula* focus on this important problem. Also, Michael Smith emphasizes that it is not acceptable for companies and the rich to make profit at the expenses of pain and sufferings of other beings, be it clones, humans, animals, etc.

Up to now we focused on human organ transplantation or cloned organ transplantation. However, these issues are very closely connected to the subject of implantation of artificial organs/body parts to humans leading to the creation of cyborgs, which rises even more ethical and philosophical issues.

Compared to normal humans, people with implanted artificial body parts can be more vulnerable (for example, pace maker users, etc.) or, on the contrary, possess augmented abilities. In the latter case, they can be even considered to be a different species, not even human species anymore. In this case, a problem of peaceful coexistence of species arises, as many writers observe. Up to now, the human history has persuasively demonstrated that different nations, races, etc., cannot coexist peacefully for a long time, to say nothing about peaceful coexistence of humanity with cyborgs, artificial intellect, and other cases of beings with abilities different from or superior to human ones. Coexistence with beings possessing different abilities (as it is the case with cyborgs, AI, etc.) potentially may create many problems. This theme was analyzed from different viewpoints, starting from science fiction writers to philosophers, specialists in bioethics, etc.

As far as the science fiction approach is concerned, suffice it to mention various texts about the invasion of aliens with superior abilities, for example, Martians in *The War of the Worlds* by H. G. Wells, which inspired an unlimited number of sequels. These texts make it obvious that peaceful coexistence of species with different physical, intellectual and technological abilities is hardly possible.

In science fiction novels *Sirius* and *Odd John*, Olaf Stapledon persuasively depicts the dynamics of coexistence of normal humans and beings with augmented abilities. In case of *Sirius*, the dog's fetus was genetically treated; various human hormones were introduced in order to increase the brain potential. As a result of these scientific experiments, a super dog Sirius was born. He was extremely intelligent and creative, was talented in music writing, etc. but he was rejected by most of human beings around him because he was too different. This hostility and antagonism was gradually escalated until people finally killed Sirius. The story of Sirius can be viewed as a metaphor, and as such, can be interpreted in many ways. One of the possible interpretations is that human species is not ready for peaceful coexistence with beings equally intelligent or more intelligent but physically different from them, as it can be the case with cyborgs and any other posthuman bodies, not to speak about AI.

*Odd John* by Olaf Stapledon analyses the situation when the number of beings with augmented intellectual and psychic abilities is considerable and they form a colony of their own. Odd John, the founder of the colony, since his childhood possesses super intellectual abilities and is able to use telepathy. He finds other kids with the same super abilities and brings them to the uninhabited Island, since their peaceful coexistence with normal humans is not possible. But even on the island they are not left in peace because the leading world powers try to force the colony members to join them since they want to use their super abilities. In despair, Odd John and his colony destroy the island and commit suicide. Hence, humanity will either try to use human beings with augmented abilities for their profit, or will try to destroy them. Very often, the war in this case is inevitable.

Closely connected to the idea of organ transplantation (and in particular, head transplantation) is the concept of the individual's life experience back up on the implanted microchip that can be transplanted to another body. This concept is explored by Richard Morgan in *Altered Carbon*. The novel analyzes this concept from the point of view of various disciplines, hence, it can be considered an intersectional, interdisciplinary study of the concept.

The *novum* in the novel is the possibility to store individual life experiences on the microchip implanted in one's body. If the body is damaged, the microchip can be transplanted to another human body, a 'sleeve'. This *novum* embraces several concepts: artificial organ transplantation and hence, creation of a cyborg, hypothetical possibility of eternal life through innumerable re-implantation of the microchip, and many others. The author raises many issues related to these concepts: ethical, philosophical, medical, psychological, legal, etc. On one hand, the long cherished dream of the humankind about the eternal life became realistic; after the death of the body all personal memories (read: the core of personality) can be extracted on the chip and brought again to life in another body, this process can be repeated to infinity. On the other hand, this almost utopian idea creates a dark dystopian reality: there are not enough suitable bodies for everyone and that causes criminal, illegal phenomena like murder, body snatching, etc. Also, like any other transplantation, this operation of re-sleeving causes side effects, it influences negatively the consciousness, causes memories interferences and other mental problems. There are already enough mental problems and diseases, which invalidates a normal human body. In case of such chip implantation, the recipient body comes into conflict with the implanted chip, producing various mental disorders. The metaphor of the chip transplantation can stand also for other similar ideas like brain/head transplantation to a human body, brain/head transplantation to artificial body, download of all the vital information from a dead human body to artificial body, etc.

In the novel, Richard Morgan tries to sensitize the readers to the idea that this kind of transplantation of the vital information (actually, the core of personality), though seems to be an ideal solution to live forever, in reality creates many grave problems due to the serious flaws of human nature like greediness (for power and money), aggression, etc.

In *Altered Carbon*, Richard Morgan employs the idea that it is possible to combine the microchip with all the individual's vital data saved and the new brain and body. Hence, a new body is guided and coordinated by its brain and an implanted chip. This idea can be viewed as an intermediate point on the way to fully artificial intelligence, substituting a human brain, commanding either an artificial body or a human one. However, this idea is not new, since artificial thought-capable beings have populated literary fiction for centuries, starting from Greek myths. Interestingly enough, some scholars of AI consider Frankenstein's Creature to be one of the first examples of AI (McCorduck, 2004: 5-6)

Indeed, the idea of an entity endowed with artificial intelligence can be traced back to Greek mythology (McCorduck et al., 1977:952). Suffice it to mention Hephaestus, the god of metallurgy, invention and technology, who created Talos, a giant automaton made of bronze and destined to protect Europa in Crete from pirates and invaders. This automaton had humanlike features, like blood vessels and human qualities such as emotions and judgements. It is worthwhile to emphasize that Greek mythology tried to explore the connection between man and nature, and human desire to manipulate and control the world. The myths about the creation of artificial beings with human intellect also posed fundamental ethical questions about what it meant to be human and whether intelligent technological creations could be considered human if they displayed humanlike characteristics.

Another milestone work of science fiction, which greatly influenced the development of AI is the collection of short science-fiction stories in *I, Robot* by Isaac Asimov (1950). The writer depicts the development of humanlike robot, which possessed a form of artificial intelligence. Asimov makes a very important proposal that intelligent robots must be programmed with human morals, ethics and empathy, which he embodies in *Three Laws of Robotics* that still continue to have a great influence in discussions concerning AI development and research (Madgwick Phil). However, it wasn't really until World War II that scientists started using the new technologies which allowed them to take the first steps towards making Artificial Intelligence a physical reality (McCorduck, 1977: 951-954). In 1950, Alan Turing's theory of computation suggested that a machine, by shuffling symbols such as 0 and 1, could simulate reasoning and deduction. Along with concurrent discoveries in neurobiology, information theory and cybernetics, psychology and language, researchers started to consider the possibility of building an electronic brain that could enable a humanlike being to think and speak like a real human. (Turing, 1950: 442). With this objective in mind, Alan M. Turing wanted to answer the question "Can machines think?" (Turing, 1950: 433-436), using the "Interaction game" that consisted in computer mediated communication between a person, unaware of who the interlocutors were, a programmed computer and another person. Turing's proposal was that if a human could not distinguish between responses of a machine and those of a human, it could be considered intelligent (Turing, 1950: 454).

Nowadays, a broad definition of Artificial Intelligence could be as follows: Artificial intelligence is a branch of computer science that refers to the programmed capability of machines to mimic cognitive functions that are associated with the human brain, such as learning and problem solving. (Russell and Norvig, 2010: 60-61).

Another definition of AI describes it as "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation." (Kaplan and Haenlein, 2019: 2).

These types of systems can learn from the surrounding world by using deep learning - an algorithmic approach that drawn inspiration from the stratified neural networks that make up the human brain's architecture (Bassett and Gazzaniga, 2011: 200-209). The artificial neural networks- layers of mathematically simulated neurons by the way interconnected layers of neurons fire in a brain - allow the system to learn by comparing itself to the desired output and altering the strengths of the connections between its internal neurons to reinforce connections that seemed to have been successful, as it learns to make sense of new information (Russell and Norvig, 2010: 5-28). Big data can be defined as collections containing enormous amounts of data that are recorded, processed and shared.



To process data, identify patterns and make predictions for specific issues, Artificial Intelligence systems are trained accordingly with algorithms - which are basically sets of instructions that tell a computerized system how to handle data. The results can be interpreted as models that provide insights into the activity under analysis (Russell and Norvig, 2010: 34-46).

The Artificial Intelligence field is primarily based on the field of computer science, information engineering, mathematics, but the research has extended to include humanities, psychology, linguistics, philosophy, and many other fields. This allowed AI research to extend from robotics and manipulation of objects to a more abstract reasoning, knowledge representation, planning, learning, natural language processing and perception. (Kurzweil, 2005: 34, 160).

At present, Artificial Intelligence is used in numerous fields of human activities; it is employed in all five sectors of economy. It can be also very useful in education (Second Language Acquisition, SLA studies, Translation Studies, Math, Sciences, test correction, teaching interactive platforms, etc.). AI is a very powerful instrument capable of solving various complicated problems. However, as any powerful instrument, (laser, nuclear energy, etc.) it must be used with prudence. In the wrong hands (obsessed with thirst for power and money, aggression, etc.) it can do more harm than good. Hypothetically, Artificial Intelligence has a potential to become a real threat to humanity, if it gets out of control or out of order (as many of the works of science fiction warn us).

Also, implantation of artificial organs, body parts or Artificial Intelligence into human body (cyborgs) can also augment body abilities and this extra force can be used by money and power thirsty individuals to reach their goals, intimidating or killing other people, until their targets are reached.

The present paper analyzed the novels of British Science fiction literature: *The Heart of the Dog* by Mikhail Bulgakov, *The Head of Professor Dowell* by Alexander Belyaev, *Andromeda Nebula* by Ivan Yefremov, *Frankenstein* by Mary Shelley *Altered Carbon* by Richard Morgan, *Spares* by Michael Smith, *Sirius* and *Odd John* by Olaf Stapledon through the prism of ethical, moral and philosophical issues related to biotechnological sciences and Artificial Intelligence. The research aimed at demonstrating that already at the early stage of development of biomedical sciences and AI, these science fiction writers posed many important moral, philosophical, ethical, and legal questions related to the progress of biotechnologies and Artificial Intelligence, which are only now being widely discussed in the society.

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## ИНФОРМАЦИОННЫЕ СИСТЕМЫ И НАНОТЕХНОЛОГИИ В МЕДИЦИНЕ И ЗДРАВООХРАНЕНИИ И БИОЭТИЧЕСКИЕ АСПЕКТЫ ИХ ВНЕДРЕНИЯ

### INFORMATION SYSTEMS AND NANOTECHNOLOGIES IN MEDICINE AND PUBLIC HEALTH AND BIOETHIC ASPECTS OF THEIR IMPLEMENTATION

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Сегодня информационные системы и нанотехнологии широко распространены, и сфера их применения продолжает расширяться. В то же время непредсказуемость последствий применения многих новейших нанотехнологий, особенно в биомедицине, предполагает тщательную предварительную оценку рисков обратного, негативного их воздействия. Оно направлено на защиту экологии человека, охрану здоровья и жизни людей. Защита прав и достоинств человека в связи с применением современных достижений науки и техники в биологии и медицине, что особенно актуально сегодня, послужит делу защиты людей от негативных последствий современных технологий.

Today information systems and nanotechnologies are widespread and their scope continues to expand. The unpredictability of the consequences of using many of the newest nanotechnologies, especially in biomedicine,