

MARZENNA ZAORSKA¹

Special Education in the Twenty-Second Century?

Abstract

At present, not only the representatives of the world of science, but also ordinary inhabitants of the Earth follow evolutionary theories with interest. They ask themselves questions such as: Who are we in reality?, How have we developed in the history of humanity?, Have we indeed, as claimed by Charles Darwin, evolved from creatures who physically and intellectually were, colloquially speaking, no match for us?, Where are humanity and the human heading for and what will humans look like in the future?, What will the world be like in a few centuries? At a time when the dispute between the opponents and propagators of the theory of evolution is still hot, many scientists – assuming that evolution indeed takes place – wonder where this evolutionary process will lead us.

Key words

special education, development, transhumanism, cyborgization, posthuman

1. INTRODUCTION

In various historical epochs, humanity, and especially its excellent, outstanding representatives deliberated on what society would look like, what a human being might be like in the near and distant future. Specific theories concerning the development of human civilization have been constructed, including philosophical

¹ Nicolaus Copernicus University in Toruń, Poland.

ones; more or less realistic visions of the existence of humanity with the correlation of the observed social, scientific and technological progress have been designed. Such inclinations appear to be specific to the human species and are a correlate to the ability of abstract thinking and a mere curiosity that translates into the following questions: What will happen next? What are we heading for? What will the future look like? Thus, the question concerning the future of special education is entirely justifiable.

A hypothetically possible and potential, and thus obviously presumptive and even subjective to some extent, answer to the question as to the future of special education, as to its shape in the 22nd century, requires the analysis of the development of special education in the 20th century; it also requires the analysis of contemporary scientific and technological achievements and elucidation on past, historical and current hypotheses, and even on systematized conceptions indicating the further development of humanity in the future.

2. SPECIAL EDUCATION IN THE TWENTIETH CENTURY

The 20th century was an extraordinarily tumultuous historical period; it was the age of much historical turmoil, suffering, genocide, injustice, and death. It was the period of vast losses in the human, material and infrastructural potential. It witnessed the implementation of maleficent conceptions of annihilating the human being in the name of promoting the idea of the superiority of one race or nation over others: the conception that negated universal, humanitarian values and simple humanity. Yet the 20th century was also a period of enormous intellectual, social, political, scientific and technological progress, on a scale not recorded in history thus far. It saw the development in medical prophylaxis and treatment that facilitated combating serious diseases then depopulating different continents during epidemics difficult to control previously; whereas those diseases that could not be controlled were ever more successfully treated. It was the age of *in vitro*, cloning, children born by surrogate mothers; the age of mass communication, globalization, unification of various states in the name of creating supranational communities in order to achieve a social development that would be more transparent, planned and more closely correlated with what civilization needed and with an ever higher quality of life – that is to achieve those aims and values that humanity had pursued for millennia. These values are strongly desired by humans. But looking ahead, contrary to appearances, they can simultaneously diametrically change, if not endanger, the traditional image of humanity that

contemporary man has known; the image in which man has functioned as *Homo sapiens* since his origin.

The 20th century also witnessed the focus on the individual human being, its individual needs, possibilities, right to self-determination, and social and personal autonomy. It saw social involvement in those spheres of life that require assistance and in the lives of people who need support at various stages of their development. This can be proved by perceptible changes in the treatment of weak, distinct, uncommon individuals, i.e., persons deviating from generally assumed standards of what constitutes the norm. This is also evidenced by an evident transformation of social and individual attitudes towards people who, because of their phenotype, psychophysical abilities or behavior, are perceived and recognized as not fully meeting the criteria of relative normality assumed by the more able majority. All these factors contributed to and activated many changes concerning the assistance, education, rehabilitation and therapy offered to people with disabilities and the environments of their everyday existence. The attitude toward the traditional education of people with disabilities was modified; solutions based on segregation were renounced while integrative and inclusive education was promoted. The modification also involved the achievable levels of education due to enabling access to higher education for people with disabilities. Additionally, the transformation embraced the promotion of the right to be employed on the open market and the right to self-fulfillment in personal life, including family and marital life. Greater, more comprehensive and deeper understanding of specific rehabilitative, educational, assistance and legal needs appeared with respect to people with serious physical and / or intellectual defects / disorders.

There appears a question, however, as to future development, considering the desire to achieve the ideal noticeable at the turn of the 20th and 21st centuries – to achieve ideal appearance, ideal physical ability, ideal self-fulfilment, ideal, i.e., maximum quality of life, ideal, i.e., maximally extensive exploitation of one's existence, generally aimed at fulfilling material and existential needs. This is when recognized and acknowledged values become obstacles, when hitherto norms become inhibitive, when *sacrum* hinders and does not keep up with a practical, adaptively desired vision of one's own and social future, and consequently becomes a restraint that, considering what is happening around us, should be rejected.

Already in 1983 the then President of the United States Ronald Reagan suggested that each employer, physician and citizen must admit that the real problem is whether to affirm and protect the sanctity of each life or whether to assume social ethics according to which one human life is deemed valuable and another

is not. Americans as a nation must choose between the sanctity of life ethic and the “quality of life” ethic².

A survey conducted by P. Singer and H. Kuhse in 1983 among pediatricians and obstetricians in the State of Victoria (Australia) revealed that 90% of obstetricians and 83% of pediatricians at least once expressed the opinion that maximum effort to save the life of each disabled child should not be undertaken. Almost all of them indicated that before making the decision to cease activities to save the child’s life at all cost, they would contact the child’s parents. Other empirical studies concerning these issues were conducted by these scientists between 1987 and 1992 in Australia, Canada, Great Britain, and Poland. They demonstrated that while Australian, Canadian and British physicians shared similar views and implemented similar procedures towards children with poor prognosis for survival, Polish pediatricians were much more “conservative.” Almost 98% of respondents in English-speaking countries rejected the idea that all possible effort should be undertaken to save children’s lives irrespective of the circumstances, whereas opinions of Polish pediatricians were divided into fifty-fifty. Similarly, if a decision concerning ceasing treatment was necessary, approximately 90% of Australian, Canadian and British physicians would discuss it with parents and nursing staff, whereas only 8% of Polish physicians would consult with parents and 4% with nursing staff. Different opinions of Polish physicians can be explained by the influence of the Catholic Church propagating the thesis of the fundamental value of human life, irrespective of its quality³.

3. DEVELOPMENT OF HUMANITY IN THE LIGHT OF TRANSHUMANISM⁴

It appears that the notion of transhumanism might, treated with some caution, point to the possible directions in the development of the human being and humanity in the context of scientific and technological progress and social development. One of its precursors was a Russian philosopher Nikolai Fyodorov⁵, who advocated

² R. Reagan, *Abortion and the Conscience of the Nation*, “Human Life Review” 1983, No. 2, Vol. IX.

³ P. Singer, *O życiu i śmierci. Upadek etyki tradycyjnej*, Warszawa 1994.

⁴ The major parts of this section were written on the basis of the document: *World Transhumanist Association for the ethical use of technology to extend human capabilities*, published by Nick Bostrom et al. in 1999; www.transhumanism.org: date of access 03.02.2013.

⁵ Nikolai Fyodorov (26.05.1829–15.12.1903) was a Russian philosopher, futurist, a librarian in the Rumyantsev Museum, and innovative pedagogue. A precursor of the notions of “communism”

radical life extension, physical immortality, and resurrection of the dead using scientific methods.

The term “transhumanism” was introduced in 1957 by a well-known English biologist, the founder and first president of UNESCO, Julian Huxley⁶. He understood the notion of “transhuman” as man remaining man, but transcending himself, by realizing new possibilities of and for his human nature⁷. In 1966 a futurist F. M. Esfandiary professed himself a “transhuman” (*transhuman* – shorthand for *transitory human*, “a transitional form of man”) changing his surname into FM-2030. Transhumans, according to this author, are transitional beings between humans and posthumans that adopt the latest technologies, lifestyles and worldviews⁸.

A modern definition of transhumanism was created by philosopher Max More. It is a class of philosophies that seek to guide us towards a posthuman condition. Transhumanism shares many elements of humanism, primarily a respect for reason and science, a commitment to progress, and a valuing of human (or transhuman) existence in this life. Transhumanism differs from humanism in recognizing (and even anticipating) the radical alterations in the nature and possibilities of our lives resulting from various sciences and technologies⁹.

Anders Sandberg describes modern transhumanism as the philosophy that we can and should develop to higher levels, physically, mentally and socially using rational methods¹⁰, whereas Robin Hanson presents it as the idea that new

and “transhumanism,” he advocated modesty and ascetic life. Called “the Moscow Socrates,” he expounded his ideas of the so-called “Philosophy of the common task” (*Filosofia obshchago dela*), understood by the contemporary readers as the concept of globalization. He also authored many philosophical studies published, amongst others, in: N.F. Fiodorow, *Filozofia sprawy ogólnej. Artykuły, myśli i listy Mikołaja Fiodorowicza Fiodorowa*, W.A. Kożewnikowa, N.P. Peterson (ed.), Volume I, Moskwa 1906; Volume II, 1913 (Н.Ф. Фёдоров, *Философия общего дела. Статьи, мысли и письма Николая Федоровича Федорова, изданные под редакцией В.А. Кожевникова и Н.П. Петерсона*. Т. I. Верный. 1906, Т. II. М., 1913); N.F.Fiodorow, *Dzieła zebrane*, Moskwa 1982 (Н.Ф. Фёдоров, *Сочинения*, 1982). This biographical note was written on the basis of: *Kosmizm socjalno-utopijny N.F.Fiodorowa*, M.W. Archipow (ed.), Sankt Petersburg 1996 (М.В. Архипов, *Социально-утопический космизм Н.Ф. Фёдорова*, Санкт Петербург 1996).

⁶ J. Huxley, *New Bottles for New Wine*, London 1957; J.Huxley, *Transhumanism* [in:] *New Bottles for New Wine*, London 1957.

⁷ J. Huxley, *New Bottles...*, op.cit.; J. Huxley, *Transhumanism*, op.cit.

⁸ FM-2030, *Are You a Transhuman?: Monitoring and Stimulating Your Personal Rate of Growth in a Rapidly Changing World*, New York 1989; FM-2030, *Optimism One; The Emerging Radicalism*, Norton 1970.

⁹ Quoted after: A. Heard, *Technology Makes us Optimistic; They Want to Live*, “New York Times”, September 28, 1997.

¹⁰ Quoted after: J. Garreau, *The Next Generation; Biotechnology May Make Superhero Fantasy*

technologies are likely to change the world so much in the next century or two that our descendants will in many ways no longer be deemed “human”¹¹.

Transhumanism is also a movement that affirms improving the human condition by developing technologies improving the human body in order to eliminate aging and to greatly enhance human intellectual, physical (cyborgization) and psychological capacities and the study of the advantages, dangers and ethical matters involved in developing and implementing such technologies¹². Transhumanism, then, represents a new approach to thinking about the future. It is based on the assumption that humanity does not constitute the end of our evolution but rather its beginning¹³.

Transhumanism is also defined as: 1) the study of the ramifications, promises, and potential dangers of using science, technology and other creative measures that will enable us to overcome fundamental human limitations; 2) the intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities¹⁴.

Transhumanists support the latest technologies, including many controversial ones, such as nanotechnology, biotechnology, information technology, and cognitive science, as well as hypothetical future technologies including artificial intelligence, mind uploading and cryonics. Many representatives of transhumanism emphasize that the next half century will bring about significant and radical technological advances, that they are desirable, and that in the future humans can and should become something more than human through the use of innovative technologies such as genetic engineering, molecular nanotechnology, neuropharmacology, improving prostheses, or direct brain-computer interface. Transhumanism also aims at using the worldwide potential of knowledge to improve the condition

a Reality, “Washington Post”, April 26, 2002; A. Sandberg, N. Bostrom, *Whole Brain Emulation: A Roadmap, Technical Report #2008-3*, Future of Humanity Institute, Oxford 2008.

¹¹ R. Hanson, *Today I’m 50*, “Overcoming Bias”, August 28, 2009.

¹² J. Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future*, Cambridge 2004; R. Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, New York 2005.

¹³ E.K. Drexler, Ch. Peterson, G. Pergamit, *Unbounding the Future – The Nanotechnology Revolution*, New York 1991.

¹⁴ R.C.W. Ettinger, *Man into Superman*, Avon 1974; E.K. Drexler, *Engines of Creation: The Coming Era of Nanotechnology*, New York 1986; E.K. Drexler, Ch. Peterson, G. Pergamit, *Unbounding the Future – The Nanotechnology Revolution*, New York 1991.

of humanity as a whole. It applies reason, science and technology for the purposes of reducing poverty, disease, disability, and malnutrition. Many transhumanists actively monitor the development of new technologies and innovative social systems to improve the quality of all life (people, animals, and entire ecosystems), and to ensure social equality in accessing material goods¹⁵.

Transhumanism assumes that there are no supernatural forces that affect or guide humanity. It argues that there exists an ethical imperative for humans to strive for the progress and improvement of their psychophysical condition. If humanity enters a post-Darwinian phase of existence, in which humans control and monitor their own evolution, then accidental mutations will be replaced by rational, moral, ethical and oriented desire to be more perfect. To this end, transhumanists engage in interdisciplinary approaches to understanding possibilities for overcoming biological limitations. They draw on various fields of science, philosophy, economy, history and sociology¹⁶.

Criticism of transhumanism generally assumes two main forms: those objecting to the likelihood of transhumanist goals being achieved (practical criticisms); and those objecting to the ethical and moral principles of transhumanism (ethical criticisms).

Practical criticism:

- geneticist and popular-science writer Steve Jones emphasizes that humanity does not have and will never have technologies anticipated by transhumanists, and that technologies, such as genetic engineering, will never offer such possibilities as are envisaged for them¹⁷;
- sociologist Max Dublin points out many past failed and erroneous predictions of technological progress, and, accordingly, theses of modern futurists will prove similarly inaccurate. He also objects to those ideas advanced by transhumanists that he sees as fanaticism and nihilism, noticing correlations with the Marxist doctrine¹⁸.

Obviously transhumanists disagree with these objections. They argue that, in particular, the very ideas of fanaticism or nihilism are alien to the rationality of this movement, and that almost all technological achievements of the past century had been envisaged by futurists and science fiction writers.

¹⁵ S. Nate, *The Signal and the Noise*, New York 2012, pp. 201–202.

¹⁶ J. Huxley, *Evolutionary Humanism*, New York 1992; J. Huxley, *Transhumanism*, op.cit.

¹⁷ S. Jones, R.D. Martin, D.R. Pilbeam, *The Cambridge Encyclopedia of Human evolution*, Cambridge 1994; S. Jones, *Darwin's Island*, Little Brown 2009.

¹⁸ Quoted after: B.S. Turner, *Classical Sociology*, London 1999.

Moral criticism:

- critics and opponents of transhumanism believe that the most efficient way of improving and developing society is through ethical rather than technological measures. Technological solutions can be only applied in correlation with those of a different nature. Some critics argue that strong advocacy for technological measures might divert attention from social research. Most transhumanists support non-technological changes to society, and most critics of transhumanism support advances in areas such as telecommunications and health care, the difference is often a matter of emphasis in the conducted debates.
- Bill Joy – one of the most significant critics of transhumanism argues that human beings due to achievements of transhumanism would most likely ensure their own extinction; whereas neo-luddites add that humanity has an inherent lack of competence to direct its own evolution and should therefore completely relinquish technological development¹⁹;
- British astronomer Martin Rees²⁰ notices that advanced science and technology bring as much risk of disaster as opportunity for progress. He does not advocate a halt to scientific activity, but calls for tighter security and an end to traditional scientific openness;
- advocates of the precautionary principle, such as the Green movement, also favour slow, careful progress or even a halt in potentially dangerous areas. Some believe that, initially, the collective intelligence of humanity should organize itself to prepare it for the threats from artificial intelligence that lacks human morality²¹.

Transhumanists, arguing against the aforementioned objections, indicate that if suggestions of Joy, Rees, or the Green movement are unrealistic, or even undesirable, then society should undertake conscious actions to bring about fast and safe benefits from new technologies. Francis Fukuyama reasons that transhumanism can in fact be extremely dangerous to the progressive ideals of liberal democracy by fundamentally altering human nature and human equality. He believes that

¹⁹ B. Joy, *Power to the People, from the Code* – Salon.com; quoted after: R. Kurzweil, *Are We Becoming an Endangered Species?*, “Technology and Ethics in the Twenty First Century”, November 20, 2001.

²⁰ M. Rees, *A Scientist’s Warning: How Terror, Error, and Environmental Disaster Threaten Humankind’s Future in This Century – On Earth and Beyond* (UK title: *Our Final Century: Will the Human Race Survive the Twenty-first Century?*), 2003.

²¹ B. Joy, *Why the Future Doesn’t Need Us*; quoted after: B. Goertzel, *Does Humanity Need an AI Nanny*, “H+ Magazine” 2011.

any attempt to change the natural condition of a human being (such as cloning or modification of the human genetic code) is immoral by nature²².

The notions of “transhuman,” “posthuman,” nanotechnology and artificial intelligence are very important to the concept of transhumanism. “Transhuman” refers to “transitory human” that was described by futurist FM-2030; it is a significant step in the evolution that seeks to achieve the status of “posthuman.” Signs of transhumans include: enhancing physical capabilities of the body through prostheses, androgyny, mediated reproduction, and distributed identity. Transhuman is someone who acts actively to become posthuman. He is sufficiently informed to notice radical possibilities and makes plans for the future using every available possibility for self-improvement²³.

Posthuman is a descendant of human whose basic capacities so radically exceed those of present humans as to be no longer unambiguously human by our current standards. Physical and mental capabilities of the posthuman will fundamentally exceed the capabilities of any, randomly chosen, contemporary inhabitant of the Earth. Posthumans should be far more intelligent than any current human genius and able to easily memorize various things. Their bodies should be resistant to disease and impervious to aging, thus having unlimited ability, youth, and vigor. Their capacity for feelings, experiencing pleasure, love or beauty should be significantly increased. Posthumans would not feel tired, experience boredom or irritation. According to transhumanists, the range of measures serving to achieve the condition of the posthuman include, among others, molecular nanotechnology, genetic engineering, artificial intelligence (some transhumanists believe that artificial intelligences will be the first posthumans), psychopharmacology, anti-aging therapies, neural interfaces, advanced information management tools, memory enhancing drugs, wearable computers, as well as economic inventions and cognitive techniques²⁴.

Posthumans could be also completely synthetic (that is, based on artificial intelligence), or they could be the result of numerous and cumulative augmentations to biological humans or transhumans. Some posthumans may find it more advantageous for them to jettison their bodies altogether in order to live as information patterns on vast super-fast computer networks. Sometimes it is emphasized that the

²² F.Fukuyama, *Transhumanism*, “Foreign Policy” 2004, No. 144, pp. 42–44.

²³ FM-2030, *Are You a Transhuman?*, op.cit.

²⁴ FM-2030, *Are You a Transhuman?*, op.cit.; F. Heylighen, C. Joslyn, V. Turchin, *A Short Introduction to the Principia Cybernetica Project*, “Journal of Ideas” 1996, No. 2(1), pp. 26–29; J. Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future*, Cambridge 2004.

existence of posthumans is unfathomable. Such creatures could engage in activities and have aspirations that current humans are unable to comprehend²⁵.

Nanotechnology is an anticipated manufacturing technology that will give us thorough and inexpensive control of the structure of matter. It makes it possible to build super-fast computers that would be smaller than a micron cube, cell-repair machines, personal manufacturing and recycling appliances, cheap equipment to colonize space. The key thesis of nanotechnology postulates that any stable structure, possible to be determined chemically, can be constructed in reality. Analyses conducted at the beginning of the 1980s by Eric Drexler made nanotechnology the subject of scientific research and at present it is considered a long-term engineering project²⁶.

Superintelligence is an intellect that has the capacity to radically outperform the best human brains in practically every field, including scientific creativity, general wisdom, and social skills. Sometimes a distinction is made between “weak” and “strong” superintelligence. Weak superintelligence is when a human brain works faster than normally, such as by uploading it to a computer. If the upload’s working rate were a thousand times that of a biological brain, then it would perceive reality as being slowed down by a factor of a thousand. In other words, it would think a thousand times more thoughts in a given time interval than its biological counterpart. Strong superintelligence refers to an intellect that is not only faster than a human brain but also smarter in a qualitative sense. Some people believe that there will exist superintelligences inaccessible to any human, irrespective of how fast his brain would be. As regards software, progress in computational neuroscience will allow us to learn about the architecture of the human brain and the rules governing the thinking and learning processes. The obtained algorithms can be then implemented on computers. Using neuronal networks, we would not need to program superintelligence, because it would learn from experience the same way a human infant does. An alternative approach would be to use genetic algorithms and methods from classical artificial intelligence to create a superintelligence that would bear no close resemblance to a human brain. The arrival of superintelligence will be a blow to philosophical worldviews in which the human being occupies a central position. Factual and practical outcomes will be, however, more significant. Superintelligence may turn out to be the last human

²⁵ R.C.W. Ettinger, *op.cit.*

²⁶ E. Drexler, *The Engines of Creation: The Coming Era of Nanotechnology*, New York 1986; E. Drexler, *Nanosystems*, New York 1992.

invention because superintelligences could themselves manage further scientific development, more effectively than humans. The human species would cease to be the smartest life form in the known universe²⁷.

Many of transhumanist technologies and tendencies are currently the subject of debates, for instance biotechnology and information technology. Many complement each other so that their benefits are transferred to various spheres of human societies. One important factor affecting life expectancy is access to quality medical care. Improvements in provided health services will extend lifespan and research into lifespan extension will further improve it. Efforts on amplifying intelligence have applications in education, rational management, and better communication. Improvements in communication, rational thinking, market exchange and education significantly contribute to peaceful solutions to international conflicts²⁸.

According to transhumanists, the world's population increase is an issue that humanity must face, even if technologies connected with life extension were not to be implemented in reality. Some believe that technology is mainly to be blamed for overpopulation. Analyzing this problem from a different perspective – but for technology, the majority of people living nowadays would actually not exist now, including those who complain about overpopulation. If we stopped using modern methods in agriculture, many people would die of starvation and disease. But for antibiotics and other drugs, but for the possibility of medical intervention, especially during birth, many people's existence would end in infancy or childhood²⁹.

Transhumanists emphasize that an excessively rapid population increase leads to overpopulation, poverty and limits natural resources, becoming a serious problem for humanity. Programs offering contraception and family planning methods should be supported, especially among the poorest where population increase is highest. According to transhumanists, attempts to exert pressure on governments by

²⁷ H. Moravec, *When Will Computer Hardware Match the Human Brain?*, "Journal of Transhumanism" 1998, Vol. 1; N. Bostrom, *How Long Before Superintelligence?*, "International Journal of Futures Studies" 1998, Vol. 2; R. Kurzweil, *The Age of Spiritual Machines*, New York 1999.

²⁸ F.J. Tipler, *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead*, New York 1994.

²⁹ G. Riotta, *No a Ingegneria Genetica Come a Fascismo e Comunismo*, Corriere Della Sera, 10 Ottobre 2005; *Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology, Information Technology and Cognitive Science*, R.M. Bainbridge (ed.), Arlington 2004.

some religious groups in order to block these humanitarian efforts are injudicious and groundless³⁰.

Transhumanists believe that nanotechnology will make it cheaper to colonize space. However, even with the possibility of space colonization, population growth can remain a serious problem. If the speed of light provides a limit on the expansion speed then the amount of resources under human control will grow only insignificantly. Additionally, when average income drops to subsistence levels, population growth slows down, thus making annual birth control indispensable. This does not mean that a population will stop growing, but that this growth will be strictly planned, controlled and selective³¹.

As maintained by transhumanists, if someone considers limiting lifespan as a way to control population, nothing prevents active implementations of specific ideas. That is why older people (over 75 years old) should be encouraged to lead an extended, active life. When transhumanists speak about extended lifespan, they mean healthy life. Life in dementia, spent unproductively, without economic benefit for society has no sense³². Transhumanists believe that the human condition has been improved if the conditions of individual humans have been improved. Thus, according to them, every man, individually, is the best judge of what is good for him. Therefore, transhumanists advocate individual freedom, the moral right for those who so wish to use technology to extend their mental and physical capacities and to improve their control over their own lives³³.

From this perspective, an improvement to the human condition offers increased opportunity for individuals to shape themselves and their lives according to their own choices and being aware of the consequences of these choices. As believed by transhumanists, it is important that people make decisions best for themselves. Education, freedom of information, information technology, enhanced intelligence can help in this respect³⁴.

³⁰ G. Wells, *The Fate of Homo Sapiens: An Unemotional Statement of the Things that Are Happening to Him Now, and of the Immediate Possibilities Confronting Him*, London 1939; S. Young, *Designer Evolution: A Transhumanist Manifesto*, New York 2006.

³¹ A.A. Bolonkin, *The Twenty-First Century – The Beginning of Human Immortality*, “Journal Kybernetes” 2004, No. 33(9/10), pp. 535–542.

³² *United Nations. World Population Prospects: The 1998 Revision*, New York 1998.

³³ E. Drexler, *Engines of Creation*, op.cit.; E. Drexler, C. Peterson, G. Pergamit, *Unbounding the Future – The Nanotechnology Revolution*, New York 1991.

³⁴ R. Hanson, *Could Gambling Save Science?*, London 1990.

4. CURRENT SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENTS AND PERSPECTIVES OF THEIR DEVELOPMENT

Current, i.e., currently noticeable, progress in technical and medical sciences furnishes disabled people with many important devices and possibilities, significant for their development and functioning, e.g., cochlear implants, ever better prosthetic limbs, organ transplants, including vision improving corneal transplantation (research on bio-eye orbital implant is under way). These are undisputed achievements of modern times that offer opportunities and real possibilities for normal life to people with various limitations. But more cynical, or more doubtful, people can pose a question whether in such cases we in fact deal with striving for augmenting the human being, “cyborgization,” and first changes of the *Homo sapiens* into *Cyber sapiens*, and so with the actual implementation of the notion of transhumanism.

Moreover, in present scientific deliberations and voiced theses concerning the envisaged future, it is claimed that in a few, or perhaps several, years, medicine will offer parents the possibility of sequencing the child’s genome and evaluating his or her condition on the basis of father’s saliva and mother’s blood sample – before the birth of their offspring. Such experiments are already carried out by scientists, and their accuracy is assessed at 98%. This can mean that when the price of such non-invasive examinations is minimal, they can be commonly available, becoming a specific selective measure, and to put it more bluntly, a measure of the so-called “P eugenics,” i.e., “positive eugenics,” encouraging reproduction by persons having desirable genes³⁵.

Charles Darwin wrote: “With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilised men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to small-pox. Thus the weak members of civilised societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of

³⁵ *Pełna ocena stanu zdrowia człowieka przed jego urodzeniem?*, www.wp.pl, [Access date: 03.02.2013]; Ch. Walter, *Thumbs, Toes, and Tears: And Other Traits That Make Us Human*, Hardcover 2006.

care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly any one is so ignorant as to allow his worst animals to breed.”³⁶

For most navigation tasks, GPS systems, tablets and smart phones are used nowadays. According to scientists, many functions of such devices and their functionality will be transferred to the human eye in the nearest future, probably in the first half of the 21st century. Thus questions such as: How to reach the desired aim in space?; Where is the place which we desire to reach?; How to move efficiently in poor lighting conditions? will no longer be valid because they will be solved by a computer placed in the human eye. This can mean that man will resemble a terminator known at present only from action films. It is anticipated that miniature lenses placed in the eye will make it possible for man to have preternatural vision and a map will be possible to be superimposed on the image in the eye at any moment. Then darkness will no longer be scary or dangerous³⁷.

According to the voiced theses, humans will become superhumans within the nearest decades. There can appear devices that will allow the representatives of *Homo sapiens* to hold their breath for four hours. This can become a fact when scientists put into use respirocytes, i.e., artificial carbon molecules that will emulate one of the functions of blood cells, i.e., oxygen transportation. Such a medical breakthrough can effect significant changes in both military and medical sciences. People suffering from asthma and cardiac diseases will profit from the beneficial impact of respirocytes. According to researches, the implementation of this nanotechnological discovery will allow for respirocytes to store 200 times more oxygen than a natural red blood cell³⁸.

The assumed theses concerning the development of civilization predict an unimaginable progress in medicine as compared to its present condition and hitherto development. The entire sphere of diagnostics and its system will be utterly transformed. In order to evaluate the condition of patients, physicians will monitor small sensors that, having been placed in various parts of the body, will record various functions of the organism. The situation of individuals who are chairbound because of spinal cord injuries will also change radically. In the near future treatment of even the most serious diseases will be possible through

³⁶ K. Darwin, *Dzieła wybrane*, Volume IV: *O pochodzeniu człowieka*, Warszawa 1959, p. 130.

³⁷ *Co? Gdzie? Kiedy? Odpowie komputer w oku*, www.wp.pl, [Access date: 03.02.2013]; Ch. Walter, op.cit.

³⁸ *Na jednym oddechu przez cztery godziny? Staniemy się superludźmi!*, www.wp.pl, [Access date: 03.02.2013]; Ch. Walter, *Thumbs, Toes, and Tears: And Other Traits That Make Us Human*, Hardcover 2006.

implants. Thanks to them, reversing paralysis will not constitute any problem. The most daring visions assume that systems placed in the brain allowing transfer to the virtual world will become commonly used³⁹.

Presently, research on the elixir of youth is being carried out on many scientific fields. At the moment it is difficult to state how this aim will be achieved. Yet even now it is prognosticated that before 2122 there will appear the first humans who will live to be 150 without any special activities. Currently, there are more than 300 thousand people alive who are more than one hundred years old⁴⁰.

It has been reported this year that scientists from the Faculty of Non-ferrous Metals at the University of Science and Technology in Cracow created the first artificial neuron in Poland. Even presently, this discovery can improve medical diagnostics. The Polish scientists aimed at investigating processes occurring in photovoltaic cells. In order to achieve that aim a device composed of three layers was built: two polymer layers and one made of cadmium sulfide. During irradiation with short light impulses, the scientists noticed that their device remembered whether the ray had reached it a moment before. Human neurons can remember whether they were excited with light or not, and can correlate the consecutive impulses, thus enhancing the electric signal. This accidental discovery initiated research on the artificial neuron. Natural cells of that type are the basic constructive element of the brain. Thus, this invention can be used to create artificial intelligence. The scientists, however, plan to focus on another application of the artificial neuron – they desire to develop medical diagnostics. By selecting an appropriate composition of the polymers used in the cell, it can be used as a detector of molecules and chemical compounds that are characteristic for various diseases. Consequently, the artificial neuron could detect a disease before its first, serious symptoms appear⁴¹.

The compound that is responsible for these features of the cell is cadmium sulfide. It is cheap and easily obtainable, but also heavily toxic, thus obtaining it must be strictly controlled. Presently, scientists are working on improving the cell's stability, so that it can operate longer than several hours. Next they want to extend the capabilities of the artificial neuron. Now it has only one input, therefore it can recognize only one piece of information. In the future it will resemble those neurons in the brain, so it will process many input signals⁴².

³⁹ *Medycyna XXII wieku*, www.wp.pl, [Access date: 03.02.2013]; Ch. Walter, op.cit.

⁴⁰ *Życie wieczne?*, www.wp.pl, [Access date: 03.02.2013]; Ch. Walter, op.cit.

⁴¹ *Odkrycie naukowców z AGH. Pierwszy w Polsce sztuczny neuron zbudowali naukowcy z Akademii Górniczo-Hutniczej w Krakowie*, Kronika TVP Kraków, 12 February 2013.

⁴² *Homo sapiens wymiera! Co będzie dalej?*, www.wp.pl, [Access date: 09.02.2013]; Ch. Walter, op.cit.

On the basis of the provided examples it can be concluded that at present there are many scenarios concerning the future of humanity. Some people, especially the propagators of transhumanism, believe that we are currently in the intermediary stage of human evolution. Others argue that *Homo sapiens* are on a collision course that will lead humans and humanity to the verge of the abyss. The most drastic theses assume that humans are bound to become extinct. Even presently, many contemporary humans exhibit self-destructive behaviors that, instead of leading to the next step in evolution, can depopulate the streets, and consequently humans will cease to rule the Earth. This is surprising inasmuch that, as scientists notice, information coded in the DNA induce specific species to dominate their own environment.

The gigantic leap of civilization that has occurred over the centuries produces many side effects both for man and his planet. The “vicious circle” effect appears where achievements testifying to the level of development and desires for new, great discoveries are in opposition to man’s primary needs. Consequently, people are ever busier, stressed, devoid of the feeling of safety, lost in norms and values. The results of studies conducted in the United States indicate that contemporary people are at the crossroads – they are unable to deal with stress, which is harmful or even destructive to their health. Therefore, an increasing number of the population struggles with obesity, depression, fits of anger, frustration, neuroses, and anxieties. Many researchers prove that what can annihilate humanity is, ironically, progress made by man. Progress has made the environment populated by modern man more complex, because not all elements of the world designed by humans match each other. Hence, it may happen that one day man can be unable to live in the world that he has created and for which he is responsible⁴³.

Not all scientists, however, believe that the observed changes and dangers, resultant from the lifestyle assumed by man and from the achieved progress, mean that humanity is automatically doomed to annihilation. The noticeable tendencies can lead to the appearance of a new representative of the hominidae. This species can originate from modern man. In the future, it may turn out that there will have occurred a transformation that will doom reasoning man to nonexistence. This can possibly happen the same way as such transformations happened in the past. As specialists notice, the Neanderthals also did not realize that they no longer belonged to *Homo heidelbergensis*⁴⁴.

⁴³ R. Hanson, *Could Gambling Save Science?*, London 1990; E. Drexler, *Engines of Creation*, op.cit.

⁴⁴ Ch. Walter, op.cit.

Chip Walter postulates that the next step in evolution can be a species that could be termed *Cyber sapiens*. Considering the present direction of changes and problems that modern man faces, it can be expected that the new master of the Earth, who will annihilate *Homo sapiens*, will be better adapted socially. New challenges or managing time will cease to be problematic for him. He will adapt to those situations that contemporary humans are unable to deal with. Considering the most abstract scenario, differing radically from the present model, it cannot be ruled out that he will possess capabilities phenomenal from the contemporary science point of view, e.g. bilocation, which is the ability to be located in two different places at the same instant of time, or multiplication, e.g., self-division and functioning in many different forms⁴⁵.

According to assumptions of transhumanism, people in the future will be a combination of biological and mechanical creatures; they will have brains exceedingly faster than that of contemporary man; they will have superlatively higher intellectual potential and will be more creative. It is possible that they will travel across worlds that are inaccessible now; explore the Solar System, and even other, distant galaxies. Further technological progress can also mean the end of mortal man. People of the future will be able to exchange their neurons, utilize their digital variants and so end the epoch in which man was defeated by diseases and subjected to the physical process of aging. Naturally, it can also happen that before these anticipated changes occur, a global catastrophe will take place, making at least some of these visions invalid⁴⁶.

5. SPECIAL EDUCATION IN THE TWENTY-SECOND CENTURY

In the light of the above deliberations, what answer can be given to the question concerning special education in the 22nd century, if the articulated anticipations will actually be realized? Undoubtedly, the answer is unambiguous and the simplest one. If the existence of the human as we know it is not anticipated, but rather the presence of other, more efficient and faster (both in terms of thinking and acting) representatives of post-Darwinian human evolution, then it can be responsibly and objectively stated that special education will no longer exist. It will simply disappear (perhaps as early as the first half of the 22nd century). And, even if there appears any need for special activities, identified presently as special education, which seems

⁴⁵ Ibidem.

⁴⁶ R. Kurzweil, *The Singularity Is Near*, op.cit.

simply unreal, it can refer only to two basic issues. The first embraces providing support to those individuals with supra-outstanding capabilities, as compared to supra-outstanding – in relation to the contemporary man – future general population. The second refers to the issue of social rehabilitation of those who will not wish to accept future norms, will treat them with reserve, critically, or even object to them for two basic reasons, that is because of their higher or lower intellectual capabilities.

One can analyze a hypothetical way potentially followed by human society and the direction of scientific and technical development that can make special education gradually more needed in some spheres and less, if at all, in other spheres; and then less needed globally, i.e., needed minimally, and finally it will become needless altogether. Two major elements provide the basis for formulating the anticipated possibilities: 1) achievements of technical and medical sciences analyzed in the progressive and historical context and addressed to persons experiencing disabilities and / or disturbed functioning; 2) historical and progressive tendencies concerning the educational system and support for people with disabilities.

Moreover, it can be assumed that such changes will occur according to a specific scheme which can to some extent reflect tendencies on the basis of which these changes appeared and were implemented in the social and civilization context as well as the scientific and technological one.

The first element, in the progressive and historical context, and with reference to medical sciences, is characterized by a purposeful interest in the pathological condition, its sources, i.e., etiology, and therapeutic possibilities. Further, it refers to the interest in investigating the anatomy of the human organism, functions of specific organs, and, alternatively, possible damage to them, as well as therapeutic procedures serving to improve the somatic condition of the human being. Thus, these interests concern medical prophylaxis and specialized therapy utilizing the achievements of science and technology, including organ transplantations and implanting artificial elements, i.e., augmentation. Thanks to successes in medical sciences, the incidence of many diseases, such as scrofula, poliomyelitis, smallpox, cholera or maternal rubella, being a serious source of congenital disabilities, have been already eliminated or significantly limited.

The specific nature of the second element, encompassing the development of technical sciences, also in the progressive and historical context, generally refers to striving for expediting everyday life and improving life quality, and then using technological achievements in the field of medical sciences with the focus on improving human health.

As regards the dilemmas of historical and progressive tendencies in the shaping of the educational system and generally understood social support for people with disabilities, it can be anticipated that, as contemporary scientific achievements indicate (especially in medicine) initially the problem of sensory disabilities (vision impairment, hearing impairment, simultaneous vision, and hearing impairment) and motor disabilities will be eliminated. At this point, it is worth noticing that the first institutions educating people with disabilities in the segregation system were those for deaf and blind students. Similarly, the issue of including disabled students in integrated education began with such students – students with hearing and vision impairments were the first to have appeared in integrated schools. Simultaneously, due to the development of genetic research, the population of individuals with disabilities associated with genetically conditioned syndromes will be eliminated, that is individuals with complex developmental and functional disabilities. Finally, the population of people with intellectual disabilities and serious chronic diseases will be minimized and then eliminated. And at this point it is worth signalling that historically students with intellectual disabilities were the last ones to have been included in the framework of special education. Such students were also the last ones to have been given the possibility (“the green light”) to be educated together with fully able peers. Thus, historical and civilization progress will be exemplified also in the sphere of human disability.

6. CONCLUSIONS

At present, not only the representatives of the world of science, but also ordinary inhabitants of the Earth follow evolutionary theories with interest. They ask themselves questions such as: Who are we in reality?, How have we developed in the history of humanity?, Have we indeed, as claimed by Charles Darwin, evolved from creatures who physically and intellectually were, colloquially speaking, no match for us?, Where are humanity and the human heading for and what will humans look like in the future?, What will the world be like in a few centuries? At a time when the dispute between the opponents and propagators of the theory of evolution is still hot, many scientists – assuming that evolution indeed takes place – wonder where this evolutionary process will lead us⁴⁷.

Presently we can only deliberate over and create more or less credible visions of what the posthuman society will look like in the future, though at the moment

⁴⁷ E. Drexler, *The Engines of Creation*, op.cit.

we have no sufficient information to provide reliable answers to such deliberations. Undoubtedly, the type of society in which posthumans will live depends on the direction taken by the evolution, perhaps from human through transhuman to posthuman. Transhumanists notice various evolutionary paths. Some of them can lead to creating a single posthuman creature and / or the entire posthuman society⁴⁸.

Transhumanists can only guess as to what the relations between human and posthuman can be like, assuming that the posthuman will actually desire to have such relations. Yet, it is very difficult to imagine the way posthumans would lead their ordinary lives. It is obvious that all predictions as to the structure of posthuman society, at the present stage, would be based on contemporary experiences and the desires of humans or transhumans, and so they can have little in common with the posthuman. Undoubtedly, posthumans will construct a new society in which disability will be long gone, a thing from the past⁴⁹.

Many other questions also arise. How will posthumans or superintelligent machines treat humans whose intelligence will not be extended? Will transhuman technologies make us non-human? – though this question can possibly derive from the interpretation of what “human” means. In fact, what we mean is “humanitarian,” since “human” means something that belongs to the human being, has human features, refers to the human being or human species. Transhumans will have different features, changed to eliminate those that are undesirable or destructive. The majority of transhumanists wish to promote human virtues (such as, e.g., kindness, sympathy, empathy), while eradicating the existing flaws⁵⁰, because the value of human life does not stem from the very fact of being a human, but from who we are and how we decide about the course of our existence. And human nature is to desire perfection and to maximally prolong one’s existence, including achieving immortality. From this point of view, in the future, there is no place for disability as we understand it.

References

Archipow M.W. (ed.), *Kosmizm socjalno-utopijny N.F. Fiodorowa*, Sankt Petersburg 1996 (Архипов М.В., *Социально-утопический космизм Н.Ф. Фёдорова*, Санкт Петербург 1996).

⁴⁸ J. Leslie, *The End of the World: The Ethics and Science of Human Extinction*, April 1996.

⁴⁹ N. Bostrom, *Observational Selection Effects and Probability*, New York 1996.

⁵⁰ J. Leslie, op.cit.

- Bolonkin A.A., *The Twenty-First Century – The Beginning of Human Immortality*, “Journal Kybernetes” 2004, No. 33(9/10).
- Bostrom N., *How Long Before Superintelligence?*, “International Journal of Futures Studies” 1998, Vol. 2.
- Bostrom N., *Observational Selection Effects and Probability*, New York 1996.
- Co? Gdzie? Kiedy? Odpowie komputer w oku*, www.wp.pl, [Access date: 03.02.2013].
- Converging Technologies for Improving Human Performance: Nanotechnology, Biotechnology*, R.M. Bainbridge (ed.), Arlington 2004.
- Darwin K., *Dzieła wybrane*, Volume IV: *O pochodzeniu człowieka*, Warszawa 1959.
- Drexler E., *Engines of Creation: The Coming Era of Nanotechnology*, New York 1986.
- Drexler E., *Nanosystems*, New York 1992.
- Drexler E., Peterson Ch. Pergamit G., *Unbounding The Future – The Nanotechnology Revolution*, New York 1991.
- Ettinger R.C.W., *Man into Superman*, Avon 1974.
- FM-2030, *Are You a Transhuman?: Monitoring and Stimulating Your Personal Rate of Growth in a Rapidly Changing World*, New York 1989.
- FM-2030, *Optimism one; the emerging radicalism*, Norton 1970.
- Fukuyama F., *Transhumanism*, “Foreign Policy” 2004, No. 144.
- Garreau J., *The Next Generation; Biotechnology May Make Superhero Fantasy a Reality*, “Washington Post”, April 26, 2002
- Goertzel B., *Does Humanity Need an AI Nanny*, “H+ Magazine” 2011.
- Hanson R., *Could Gambling Save Science?*, London 1990.
- Hanson R., *Today I’m 50*, “Overcoming Bias”, August 28, 2009.
- Heard A., *Technology Makes us Optimistic; They Want to Live*, “New York Times”, September 28, 1997.
- Heylighen F., Joslyn C., Turchin V., *A Short Introduction to the Principia Cybernetica Project*, “Journal of Ideas” 1996, No. 2(1).
- Homo sapiens wymiera! Co będzie dalej?*, www.wp.pl, [Access date: 09.02.2013].
- Hughes J., *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future*, Cambridge 2004.
- Huxley J., *Evolutionary Humanism*, New York 1992.
- Huxley J., *New Bottles for New Wine*, London 1957.
- Huxley J., *Transhumanism* [in:] *New Bottles for New Wine*, London 1957.
- Internet sources:
- Jones S., *Darwin’s Island*, Brown 2009.
- Jones S., Martin R.D., Pilbeam D.R., *The Cambridge Encyclopedia of Human evolution*, Cambridge 1994.
- Kurzweil R., *Are We Becoming an Endangered Species?*, Technology and Ethics in the Twenty First Century, November 20, 2001.
- Kurzweil R., *The Age of Spiritual Machines*, New York 1999.
- Kurzweil R., *The Singularity Is Near: When Humans Transcend Biology*, New York 2005.
- Leslie J., *The End of the World: The Ethics and Science of Human Extinction*, London–New York 1996.

- Medycyna XXII wieku*, www.wp.pl, [Access date: 03.02.2013].
- Moravec H., *When Will Computer Hardware Match the Human Brain?*, "Journal of Transhumanism" 1998, Vol. 1.
- Na jednym oddechu przez cztery godziny? Staniemy się superludźmi!*, www.wp.pl, [Access date: 03.02.2013].
- Nate S., *The Signal and the Noise*, New York 2012.
- Odkrycie naukowców z AGH. Pierwszy w Polsce sztuczny neuron zbudowali naukowcy z Akademii Górniczo-Hutniczej w Krakowie*, "Kronika" TVP Kraków, 12 February 2013.
- Pełna ocena stanu zdrowia człowieka przed jego urodzeniem?*, www.wp.pl, [Access date: 03.02.2013].
- Reagan R., *Abortion and the Conscience of the Nation*, "Human Life Review" 1983, No. 2, Vol. IX.
- Rees M., *A Scientist's Warning: How Terror, Error, and Environmental Disaster Threaten Humankind's Future in This Century – On Earth and Beyond* (UK title: *Our Final Century: Will the Human Race Survive the Twenty-first Century?*), 2003.
- Riotta G., *No a Ingegneria Genetica Come a Fascismo e Comunismo*, Corriere Della Sera, 10 Ottobre 2005.
- Sandberg A., Bostrom N., *Whole Brain Emulation: A Roadmap*, Oxford 2008.
- Singer P., *O życiu i śmierci. Upadek etyki tradycyjnej*, Warszawa 1994.
- Tipler F.J., *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead*, New York 1994.
- Turner A.S., *Classical sociology*, London 1999.
- United Nations. World Population Prospects: The 1998 Revision*, New York 1998.
- Walter Ch., *Thumbs, Toes, and Tears: And Other Traits That Make Us Human*, Hardcover 2006.
- Wells G., *The Fate of Homo Sapiens: An Unemotional Statement of the Things that Are Happening to Him Now, and of the Immediate Possibilities Confronting Him*, London 1939.
- World Transhumanist Association for the ethical use of technology to extend human capabilities*, Nick Bostrom et al., 1999, www.transhumanism.org, [Access date: 03.02.2013].
- Young S., *Designer Evolution: A Transhumanist Manifesto*, New York 2006.
- Życie wieczne?*, www.wp.pl, [Access date: 03.02.2013].