
HUMAN BODY AND MEDICINE IN THE DIGITAL AGE

ETHICAL ISSUES AND LIMITATIONS

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Abstract

Given the biological nature of human and social development in an increasingly high technology environment related to the digital age that tends to shape and adapt its components to some global conceptual necessities, we considered useful to analyse the process of augmentation of the individual in the medical field with its cyborgization. Regarding the process of simulation and artificial functioning of the body, we shall analyse mostly the cyborg as prosthetic body or implanted with various technological devices, sensory, motor or cognitive, without neglecting the cyborg as a concept. The primary purpose of this theoretical study is to subject to a critical reflection the three types of consequences of the process of simulation and artificial functioning of the body, namely: sociocultural, ethical and biological.

Keywords: technology, medicine, cyborgization, augmentation, ethics

1. Introduction

The fact that cyborg technology, in the near or distance future, will become an integral part of human existence and evolution is no longer just a prerogative in the science-fiction discourse, in the context of the digital age cyborgization being a prevalent topic in the medical sciences and in Philosophy. The interdisciplinary approach allows the cyborgization of the human body to be related, on the one hand, to the practical dimension offered by the usage of high technology in medical science and Biology and, on the other hand, to the conceptual dimension specific to Ethics and anthropological philosophy.

The applications of the cybernetic organism term are varied and numerous, ranging from biomaterial to software networks. In the recent theoretical debates, there are distinguished at least three ontological dimensions of the cyborg: human cyborg, its body being technological added, having prosthetic appliances or implants (mechanic or electronic); the virtual cyborg, its body being integrated in the virtual space by means of digital technology and

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computers; the cyborg as a sociocultural attitude, with a behaviour or life-style according to specific values [1, 2]. The three dimensions of cyborg ontology involve different hypostasis of the human body: the body with implants or prosthesis out of medical reasoning, the body interfaced by computers and the body of which artificial device gives a new identity or affiliation - cultural, social, gender, to its wearer.

2. Human body and medical technology

In the context of high technology society, cyborgs are not limited to humans whose bodies survive or are added implant devices by medical technology, but, finally, all the individuals of the digital era are more or less cyborgs, because the contemporary society is one that provides the "birth of a new subjectivity" [3], and, by biotechnology, leads to cyborging. We perceive reality through various digital channels and our social behaviour is mostly based on information networks: the computer, the phone, in general various applications of digital and advanced technologies. From this point of view, we can speak of a new kind of identity that is configured in the digital age, namely a "cyborg identity" as an "intersubjective entity" [4], shaped by and through advanced technologies. From the perspective of cyborg anthropology, cyborg identity does not express just a denotation for a individual whose thinking, social attitude or way of life are dependent on technology, but also an augmented reality, of human bodies modified by prosthesis or implants [5, 6].

Cyborging is such a concrete proof in understanding of the human perspective in the digital era, in that its various technology devices effectively becomes an extension of the human body. Thus, most times, individuals whose body is prosthetic or implanted with various artificial devices do not refer to them as an object that they own, but rather declare themselves as subjects carriers of these objects, which become thus an own and inalienable element of their self-identity.

Regarding the immersion of the cyborg in the digital era and the recent development of human enhancement technologies [7, 8], contemporary theoretical debates oscillate between two extremes: technophilia, represented mainly by radical position of trans-humanists and technophobia, specific to bio-fundamentalists and to traditional humanist [9]. If the technophile discourse confidently welcomes new technologies, supporting the right of the individual to control his own biological destiny through cyborging, the technophobic discourse virulently criticizes the immersion of biotechnology in recent decades, drawing particular attention to ethical issues, especially those related to genome modification. Both discourses have in common the classic dichotomies taken from the history of philosophical thinking, as self-other, unity-diversity, nature-culture, reality-appearance, divine entity-human, through which the human is put under question, them being replaced with the perspective of the post-humanism. Thus, the technologized human body is correlated with the concepts of a post-biological and post-evolutionistic era, characterized by artificial being,

prosthetic replacement and automatisisation through cybernetic technologies [10]. The body as a sign of individual identity can reconstruct and recompose itself beyond traditional values in a new ontological order, where the difference between natural and artificial, biological and synthetic tends to be questionable.

In current medical technology, the cyborging of the individual may follow two distinct directions: the analytical augmentation and the prosthetic augmentation. The analytical augmentation allows the surpass of clinical and anamnestic limits through the interference of technology, offering new possibilities for diagnosis, with increased sensitivity and specificity degrees, especially in the field of imaging methods, as echography, endoscopy, CT, MRI, PET, SPECT, scintigraphy, audiometry. The second direction is the prosthetic augmentation, which allows supplementation of deficits of the individual by prosthesis and implants through the interference of technology. These are artificial devices used to correct deficiencies (congenital, pathological, post-traumatic, senile), partially refilling the lost or damaged functions of an organ or used in aesthetic purposes (plastic surgery) or, more recently, used to improve the structure or functionality of some organs [11].

Thus, in Medicine, there are two types of technological cyborging of the body: restorative (reparative) and of enhancement (augmentation). The first type of technology is applied for the restoration of various organs or limbs, but without enhancing or increasing their functions, while enhancing technologies are aimed to optimize those functions or to obtain new functions [12]. In general, prosthesis and implants are mechanical, optical or electronic devices operating artificially, for example, cardiac stimulators, hearing aids, insulin pump, contact lenses, crystalline lens, etc. Recent research in Biotechnology and Nanotechnology have enabled the manufacture of bionic implants, simulating through multiple feedback circuits more appropriate original functioning of the affected organ, such as bionic retinal implants, myoelectric prosthesis, cochlear implant [13].

Current medical research is trying to manufacture prosthesis that can amplify or complete the functions of a healthy organ. Also, attempts to produce functional neurocognitive prosthesis on the basis of the encephalic-computer interface model and opposed to the neuro-motor prosthesis, should be able to simulate the function of neurons in order to enhance certain cognitive processes, such as attention, memory, language and motivation. Such prosthesis may be useful in treating conditions such as autism, Alzheimer's disease, sequelae after traumatic or vascular injuries of the brain. The problem of implants is represented by the self, which, if the integration process will incorporate in a certain degree the prosthesis, through immunity will try sooner or later eliminate it, considering it as a allograft [14].

3. Discussion - consequences of the human body cyborgization

Although the technological achievements in the field of medical sciences are truly remarkable, the changes brought by the proliferating of high

technologies are still regarded with mistrust and suspicion. Some theoretical perspectives protest against the technological immersion and new scientific discoveries in the field of Genetics, Nanotechnology and Robotics in everyday life, drawing attention to problems of the link between technology, economics and politics [15, 16]. Moreover, they claim that in the post-industrial society things can take an unexpected turn, the body can become an object of experiment in hand of various corporations. Beyond this kind of speculations, the cultural and social history proves that individual deviations in the evolution of the society were only temporarily. It is a paradox that, despite the criticism, the majority of individuals in concrete urgent situations, appealed, appeal and will appeal to any type of technology that could preserve their existence, could alleviate the suffering or would enhance comfort in their state of pathology. This aspect is closely related to the axiological principle of the highly technologicalized society, consisting in the desire for improvement and socio-economic well-being, including in terms of Medicine and individual and public health.

In reference to the ideas mentioned above, we can distinguish three types of consequences of cyborging of the human body, namely: sociocultural, ethical and biological consequences.

From a sociocultural perspective, it is raised the question of identity and social inclusion of individuals whose body was augmented by prosthetics or implants to correct a physical, functional or psychological abnormality. What individual would prefer marginalization instead of social inclusion and what wouldn't he do for this? The identity of the individual, including the body identity, is shaped through various social practices, and, thus by the assimilation patterns imposed by society. Anthropological studies have shown that the body representation plays a crucial role in defining individual identity [17, 18] and in the formation and development of a positive self-image; since primitive societies, physically different people, by disease, birth defects and scars, for example, tending to be persecuted, isolated or marginalized by those considered in accordance with the standards of the respective society. However, the otherness, including the physical one, leads to alienation, estrangement and social marginalization, which can affect the self-image of the individual and his need to belong to a group.

Continuing the previously formulated idea, the question of the authenticity of the decision criterion on body augmentation appears. It is an independent choice of the individual, of personal choice or of a choice due to sociocultural context? In general, people, especially those with various forms of physical disability, use the prostheses and implants in order to adjust or improve the functioning of affected organs, but also to better integrate into society. If the individual needs society the society also needs individuals, and individuals must conform to social structures and norms, which can generate, beyond the medical need and functional efficiency of the prosthesis or implant, the need for inclusion in social structures and groups. On the other hand, corporal changes exclusively of an aesthetic nature have as substrate the achievement of a pattern

of physical beauty. This pattern is set on a biological substrate, genetically transmitted, but configured on the current sociocultural needs. The impossibility in achieving this pattern can lead to social and personal frustrations, which somatised subsequently, can degenerate in urgent need of augmentation and body reshaping.

However, there are social groups protesting against prosthetic devices, saying they would lead to the denial of individual identity. For example, Deaf Culture advocates for asserting an identity of his population category, believing that any kind of cochlear implant device is actually a way of levelling the hearing impaired people, a way for them to be as similar as possible with the rest of society and thus easily integrated [19]. The argument formulated by them is that society manifests intolerant towards people with this type of disability. If the crippled body does not integrate into society, then the crippled body must be rectified and not the society. Socialization, both in the form of macro-socialization or micro-socialization, with the primary meaning of belonging to groups or to communities, is a sufficient element in determining the non-interference of technology in biological level.

Another important socioeconomic consequence targets world overpopulation, a natural phenomenon, which in the presence of a precarious balance between resources and needs, is pushing society to create as many productive individuals, competitive physically and mentally, even if it implicates an initial effort of augmentation. Thus, in the context of the post-industrialism, the sociocultural and economic environments push the individual to, or determine his cyborging, of course as long as the overall balance is positive. Therefore, in the medical field has emerged the concept of 'cost-efficiency' in the application of diagnostic and therapeutic protocols.

Regarding the ethical consequences, we underline that transhumanism supports the idea of a cyborg society that promotes equality and freedom using biotechnology. If a person has the ability to change his body, including abilities, weight, sex and racial characteristics, this would reduce persecution and social exclusion related to body [20], thus occurring a better coexistence with others. Technological innovations and scientific research related to the digital age have led to a radical transformation of society, new conditions requiring increasingly more rules and ethical restrictions both in the medical field and at the level of society as a whole. Augmented individual has an additional responsibility that requires continuous care for the medical device that he is wearing [21]. This responsibility is reflected on the others, the family and close friends, with or without their consent. This is true for any new technological device: upon entering into society, will inevitably affect the whole system, even if only some use it.

Specialized medical advice and efficient communication between medical staff and patient are imperative factors in terms of the ethical justification of choices. In this regard, the act of medical communication must be clear and complete, to facilitate the exchange of ideas, to provide accurate information in an appropriate manner, also to improve the motivation of the individual so that

the decision regarding augmentation is made in a timely manner. In order for the criterion of the decision on body augmentation not to be a constraint and not to be accepted without discernment, from the aspect of ethical responsibility of the medical staff [22-24] it is imperative that the individual be informed about the applied medical procedures and about the health benefits, also regarding the likelihood of manifestation of the possible risks, of the negative effects and of the unpredictable elements that may occur. In this way, the ethical context is created so that the individual's decision regarding the augmentation of the body would be exercised freely, unconditionally and completely informed.

It is important to point out that there are some social groups that vehemently deny prosthesis or the implant of the body, saying that the law allows implants in children's bodies, but without the child's competence to make a decision [20]. Thereby, Deaf Culture, that we have mentioned above, believes that the medical community treats them as a "broken ear that with a child attached" [25]. Insofar as, in principle, from an ethical point of view, the choice presupposes a free and personal decision, how can the individuals take control of their own destiny biologically and socially? Such a process of cyborging of human beings occurs in the first years of his life, whether the individual does or does not accept it. Subsequently, it is possible for the individual to have an ambiguous identity, in other words to not recognize the membership at any culture.

Another major issue is the control of authority and the protection of the right of privacy, which is the intrusion of the medical system on the individual. Because of medical techniques, the individual's body is viewed in its intimacy, becoming completely transparent [19], in addition, the individual is constantly supervised and monitored by the medical services, except that personal biological data, may be used for scientific purpose or for teaching. Medical legal processes subject the individual to a full explanation of the medical act and its implications, requesting personal or family agreement on the use of data, act to which he can subscribe or not.

Although Medical bioethics is monitored by laws prohibiting modification in the genome or body integrity meaning non-pathological mutilation, the replacement of organs or functions with prostheses or implants are not prohibited by law. However, even in developed countries there are insufficient funds allocated for augmentation, or do not cover all areas of requirement of the various groups, so recently, they started to be increasingly frequent clandestine operations, often disrespecting the law of body integrity unanimously accepted at the medical level.

The augmentation of the body in order to improve physiological functions (breast augmentation, erectile devices, sex change), despite the risks or complications that may arise, helps the carrier individual to identify with a particular model or a particular body type. However, although helping to redefine the identity or gender of the individual, it is possible to develop a dependence, conscious or not, to the prosthesis or implant itself. This dependence on technology is best illustrated by the attitude of the individual

with prosthesis when, for one reason or another, is bound to withdraw, even transitory, the implant.

Concerning the biological consequences, transhumanism, based on certain assumptions of cyborg anthropology and Biotechnology achievements, argues that the use of certain advanced technologies could improve human biological evolution [26, 27]. Application of high technology would allow cloning control, modifying the human genome in order to remove disease, finding genes that determine diseases, physical vulnerability or intelligence, and reduce infirmity, illness and, as a result, biological inequalities. Moreover, high technology would allow the human race to overcome the initial biological model and by that certain limitations and disabilities like illness, immunity, aging, intelligence can be improved [28]. It would be a post-Darwinian phase of the human race, in which the individual would have control over evolution, cyborging body having a greater capacity for adaptation than the human body.

If we accept that human evolution in the biosphere is considered to be an irreversible process, the consequences of overcoming the initial biological model raise several issues with profoundly ethical significance: Who would not want to become a cyborg? Who does not need a cyborg? When is the right time to resort to cyborgization? Is cyborgization a step forwards? Is this step for the individual, for society or for the species? It is even claimed that prosthesis divides the human biological essence [2] producing technological fragmentation and reassembly of the body; prosthesis is an artificial part, a cyber-part with an operating system different from the processes of the organic body, which produces an imbalance in the organic system. Regarding the digitalization of the human body, medicine is given with an extraordinary opportunity in diagnostics, allowing the detection of pathological changes in a high percentage. This aspect is passed on the physician, which, disposing of this extra-option, is neglecting and ultimately attenuates the clinical sense so necessary in establishing pathologies in statistically nonconforming lesion patterns.

From the perspective of prosthetic replacement of morphological and functional deficits, even congenital, post-pathological, post-traumatic or senile, the cyborging of the individual represents a huge step forward in terms of comfort, self-esteem and integration or reintegration in its proper sociocultural locus and even in the biological one, as long as he and his contacts (family, friends, etc.) do not completely forget the infirmity. The removing through cyborging of congenital or developmental deficiencies with genomic substrate, beyond the reported benefits, is only an ideal, as, according to Mendelian principles of inheritance, they will perpetuate in future generations.

4. Conclusion

The process of cyborgization of the human body in the medical field, considered from the perspective of augmentation and implant technology, in addition to the remarkable health benefits, involves a series of sociocultural, ethical and biological consequences. When we speak of cyborging, we actually

speak of sensory, motor, or cognitive prosthetic, no matter how powerful, of the individual, and its evolution is exclusively through a biological process and not digitally, regardless of the developmental stage of the species anagenetic or cladogenetic. If evolution is based on variability and natural selection, the presence of an additional possibility in completion of biological deficiency develops a so-called ‘theft syndrome’ that deceives the self augmented body, tending toward a unanimous variability, socioculturally modelled and to a selection process which will perpetuate genetic flaws that determined the necessity of the prosthesis. As long as the cyborg will not be integrated into the genomic information and will not be replicate as a phenotype, no matter how much we will support it, the species will not recognize it, remaining a sociocultural model of biological perfection.

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