

FROM THE BIONIC EYE TO GOOGLE SMART GLASSES SOME PHILOSOPHICAL REFLECTIONS ABOUT BIOTECHNOLOGIES

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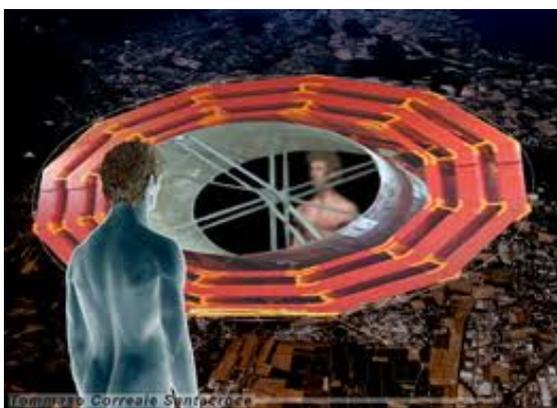
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Abstract

The advanced scientific progress transforms the identity and life of the contemporary individual ranging from the body applied to the built-in technique. In fact, the bionic eye not only can restore the sight of those who have lost it, but it can also overcome the physical limitations of human nature. Wearable computers, neuromorphic artificial visual sensors are the proposals of the new biotechnologies that keep the individual in balance between the ideas of normality or strengthening of the body. But to what extent can we consider ourselves as cyborgs or mere cyberbodies?

Keywords: biotechnologies, cyborg, identity, artificial sensors, human nature



«Maybe we should just be dehumanized to feel the opposite inclination»

(F. Nietzsche, *Menschliches, Allzumenschliches. Ein Buch für freie Geister*)

1. The bionic eye: return to normality or strengthening?

The Italian debate regarding the interaction between human and machine, real and virtual is still limited to traditional topics like abortion, euthanasia and so on. Instead you should go further to consider the most advanced part of scientific progress: bionics and biotechnology.

For example robotics research of recent decades has advanced in different directions: one is that of autonomy, i.e. in developing systems capable of dealing environments not completely structured and known in advance (such as a cell of industrial production, for example) by delegating to the robot the ability to “decide” when unforeseen situations arise. The results are remarkable in this context as evidenced by the success, for example, in the realization of prototype cars that can drive autonomously on normal roads for very long distances or in the development of teams of underwater robots with “cognitive” abilities in navigation and guidance. However, today, we can talk about something that exceeds the figure of the robot, i.e., the cyborg¹, because in our contemporary world, the advanced scientific progress combines the artificial reality with the human and natural, because the technique is embodied in each of us and becomes an extension of the body. It is not only the way in which the artificial element is presented that changes but also the relationship between technology and man². This relationship incorporates in itself an extensive material that it is not a simple supplement of Gehlen instinctual lack, but is the beginning of the transformation of the body and its way of unleashing. The body exists and widens in the world with the artificial dimension. As a result the artificial intelligence seems to coincide with the existence, which becomes the seat where the characteristic feature is the absence of nature as technology rather than simply besiege the outside, has installed itself in our members. So, today, there is a real overcoming of the classical view that the technique would be a supplement to a nature lacking in something, since the artificial, now, coincides with our being naked, with our body, in which continuous technology flows are embodied. The bodies are nothing but open dimensions to contact, exposed to an otherness that radiates up to make the body coincide with technology. It introduces itself as « body given, multiplied, multisexed, multifigured, multizoned, phallic and aphallic,

¹ See P. Bellini, *Il cyborg, una nuova mitologia tecnologica*, in «Pedagogika», anno XIV, n. 4, 2010; A. Caronia, *Il cyborg. Saggio sull'uomo artificiale*, Shake, Milano, 2011

² See P. Lévy, *L'intelligenza collettiva. Per una antropologia del cyberspazio*, it. trans., Feltrinelli, Milano, 1996

cephalic and acephalic, organized and inorganic»³. The body, therefore, incorporates and adopts a continuous and constant metamorphosis, and man becomes a union between artificial and biological creation, in which nature and culture finally find their meeting point, cancelling each other, in favour of a neighbour as “*téchne*” that is creation, the true art of our world. The whole life is resolved into a set of technical reports and technical conditions which are the matrices of an «*ecotecnia* that creates the world of bodies»⁴. These bodies seem to be totally eradicated from any possibility of absolute and completely immersed in the dynamic flow and a continuous flux in their changing. Transformation, transmutation are the attributes that determine both the way of being or having a body in our contemporary age in which we see the overlap, or rather, the perfect coincidence between technology and nature, body and machine. This fusion between technology and the human body can have a positive and a negative meaning. In the positive meaning, technique is presented as a substantial imitation of natural biological processes and, therefore, as man’s constant desire to stay alive, to get back in life, in his bodily dimension. In this case, the artificial element becomes one with the natural rhythm of the body as it follows each performance mode, every way to perform the natural bodily function. Two distinct forces, natural and artificial, are united not as compensation but as incorporation and embodiment. The technique embodies and becomes itself the body, which escapes the fate, evolving in anti-fate, since man presents himself as being able to choose, to self-produce and regenerate following, however, the map of the natural flow of life. For instance a pacemaker implanted in the body is a machine, which is embodied as it participates in the functions of the body, allowing the heart to normalize its beat, to return to its natural rhythm. A device, therefore, that joins the body, thanks to its biocompatibility. It is compatible with the body, which means that it is a natural element for it. A technique that makes you one with nature in that “*compassion*”, that comes from “*cum patior*”, in that suffering together, in part, on entering into life to become the other. Moreover we can consider the events of 2010 that is the first permanent artificial heart transplant which took place in Rome and the double hand transplant in Monza.

³ J. L. Nancy, *Corpus*, it. trans by A. Moscati, Cronopio, Napoli, 2007, p. 70

⁴ Idem, p. 39



Figure 1: Monza 2010. Double hand transplant

These examples help us to understand how technological development can replace human body parts and save man from his fate. It is a robotic technology inspired by biology and related to biomedical applications. The studies of bio-mechanical and bio-mimetic robotics have led, for example, to the realization of prosthesis arts increasingly sophisticated and effective which may be interfaced with the nervous system of the user. Similar technologies have led to the development of exoskeletons that can help people in their mobility. Then there is the frontier of the neuromorphic technologies (Neuromorphic Engineering and Neuro Informatics) that are involved in the study and realization of artificial systems designed on the basis of studies on human or animal physiology. The results in this context are of great interest not only in terms of basic research, but certainly also for applications that include, for example, the artificial retina, which, hopefully, will one day restore sight to some of the people who are lacking. The neuromorphic visual sensors are born to perform human functions in robots⁵. Gradually these particular devices have been designed to restore sight to the patients who have lost it. In addition to bionic arms and hands, it has been realized the bionic eye.

⁵ See Indiveri, G. and Douglas, R., *Robotic vision: neuromorphic vision sensors*, in «Science», vol. 288

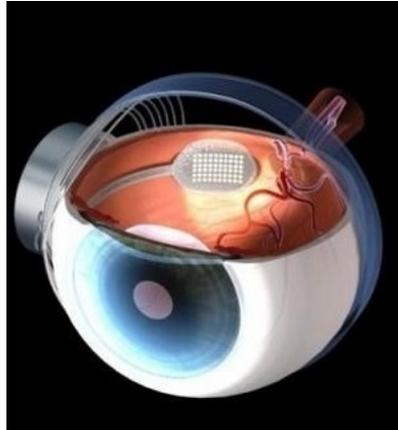


Figure 2 - Bionic eye to defeat blindness

Pigmentosa retinitis (pigmentary retinopathy) or macular degeneration can be healed through the implantation of a microchip capable of stimulating retinal cells and reproduce the function. The bionic eye is not only a visual sensor implanted in the robot to reproduce human life, today neuromorphic engineering allows you to create artificial organs to treat humans. It is a science that can return to the human the lost body functions for this we can say that the bionic eye falls within the concept of a return to normality. A return that is inspired by human nature. Patients with physical deficits, such as unable to see, can improve their lives and restore their shortcomings. This means that biotechnology as the bionic eye are born first of all with the aim to "fix" bodies that are broken, dysfunctional, or worn.

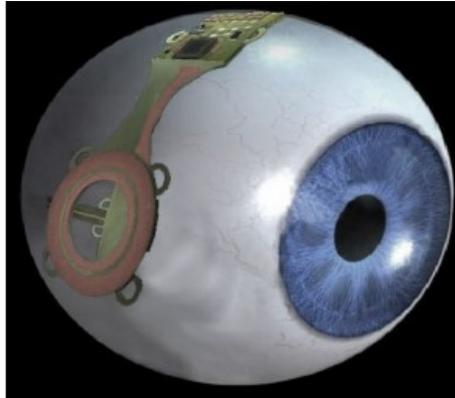


Figure 3: Chip on the retina to recover the perception of light

This particular aspect is very positive because it allows the individual to escape from an inexorable fate. From robots to the implant in the human body, the bionic eye becomes the technology that improves the life of a subject. But, what is the limit of these discoveries?. In fact, there is not only the concept of normalization but also that of empowerment. The most recent discoveries, in fact, change the meaning of bionic: it means not only the opportunity to recover lost functions, but also to overcome the physical limits of human nature. Today, we ask for more to the bionic eye. For example, a recent search of the University of Washington has the objective of achieving contact lenses still untested in humans. These lenses are enriched with LEDs and electronic components able to add some information to images. Wearing, or better, embodying this particular bionic technology, we can have information about the identity of the person. If we meet someone we already know and we do not remember his name, bionic lenses can help us by providing the data we want. If we approach a trip and do not know the directions, our bionic eye can supply it. For this reason we can say that having a bionic eye does not mean simply to recover their lives, but to overcome the same human sight. Bionic does not stop at "repair" the body. In our days, the term bionic goes beyond the human nature. The dream of being cyborg may come true because it is possible to empower our human body⁶. The lenses of the University of Washington have not yet

⁶ Dhoble, K., Nuntalid, N., Indiveri, G. and Kasabov, N., *Online spatiotemporal pattern recognition with evolving spiking neural networks utilising address event representation, rank order, and temporal spike learning*, paper presented at International Joint Conference on Neural Networks, Brisbane, 2012

been tested on humans, but recently we can already use the new Google Glasses. They are called Augmented Reality glasses, which can transmit a data stream.



Figure 4 Glass Project: Google smart glasses

As Iron Man, all of us in the very near future can wear glasses with a computer inside. Anything you need in a smartphone we can find it in the bionic glasses: camera, gps, maps, train schedules, audio, etc. ... This is an interface change that alters our experience with reality. The augmented reality is superimposed on the physical one and the human being becomes something different. The strengthening of artificial sight makes us men of the future. But to what extent can we call ourselves men? To what extent can we still claim to have or to be a body?

4. The bionic man and his body

If acting on the body requires to possess it as a thing that occurs to make a choice, a desire, a taste, it means that through the manipulation of the body, we are not only in the realm of having, but we choose, also, of being. In shaping the body you have, you can model it depending on what you want to be like, that in such a paradigm, it becomes what you want to appear like. Here, the being becomes mere appearance, losing all the ways of true determination and properly speaking, man is not a being but a becoming in perpetual change, since can become all and recreates, as he likes. Thus, in our contemporary world, to have is gobbled up by to become and, consequently, man is

moved away from what is, by his essence, as full of fleeting and fragile appearance⁷. Just the appearance draws strength from the consideration of the body as the wrapper with contingent and accessorial qualities, changing over time and lacking of internal structure. To be and to have take on a relationship of mutual interconnection, relying both on the rejection of the body as a primary branch of life and as the ultimate expression of the generative process of nature. Having a body means, in fact, to reify it, manipulate it according to its own voluntary rational force. Being a body means to build and realize our individuality through attributes that are assigned which characterize the being according to Frommian definition of copula «that is, as grammatical denotation of identity»⁸, quite different from being as essence. To be a body should, therefore, assume the value of an existence, which considers man as having an essence and a very precise and specific nature. That goes beyond that being, meant as copula, arising from the consideration of the body as entity with countless accessories determining the identity of a subject. To exist as a body can assume, therefore, a negative and a positive sense. In the positive meaning “being a body” makes us consider an entire and unique being presupposing a certain sacredness of what we are. In the negative meaning, however, being a body, meant as a determination of the individuality of a man through his physical characteristics, means to join being with having being and consider the body as something through which to appear in the contingency of the human condition. The manipulability of the body, in fact, puts the man in an existence, which, by becoming one with the historical flow, acquires an acute sense abandoning the natural, biological and vital dimension. Just at this temporality of the dimensions of present-past-future, we see the perspectivism of Dilthey, asserting that man, endowed with reason and will, descends into a kind of historical self-production, which determines him as an actor, able to manage the body that he is and has. The man considers himself, therefore, outside of his simple life, in the sphere of what makes him human, i.e., in the existence, a situation in front of the individual’s knowledge of the self but also knowledge of the non-self, making it being that may even be other than himself. The human being changes and becomes a person that makes him by himself. His body, its physical elements seem to insert into a sphere of substantive subordination to their choices, their capacity and ability to change, of mutation and

⁷ See C. Bonvecchio, *Il cavaliere, la morte e il diavolo. Un percorso nella post-modernità*, Sriptaweb, Napoli, 2010, p.

⁸ E. Fromm, *To have or to be?*, Harper & Row, New York, 1976, p. 37

manipulation. The existing body thus becomes the creation of man himself, his real essence, which does not arise from human nature, but from the rationality of human action, giving culture the primacy over nature since existing assumes a central role compared to living. The biological body is, therefore, regarded as a pure substrate on which to exercise their sovereignty, becoming an object-body. But, the action of rational man on his own animality is nothing but the estrangement of man from himself, denying the body as a point of radiation and derivation of existence, deprived of the natural flow of life. Indeed, it seems that the very existence acquires a significant value through the separation from life that, abandoning its natural and organic state of being, assumes human, anthropological, cultural and historical characteristics. Just in the historical self-production man strives to increase his potentiality and self-generation. Self-generation that, in addition to making explicit a complete distrust of modern man against the natural processes, seems to be a mode of elevation and determining the human, which, taking the distances from animality, acquires, increasingly, his own existential characterization, so that the terms *poiesis* and *genesis* have become, by now, inseparable, and their substantial interchangeability has led, inevitably, to a *poiesis naturans*, i.e., toward a complete substitution of human production of natural generation⁹. Man, therefore, becomes an individual, existing being purged from his animality because he can control it, manage it, direct it. And in order to manage the biological life it is necessary to identify the origin of itself, which, in this case, can be nothing but the body from which discloses the most authentic natural meaning of life. Thus, in the technological age, par excellence, the body returns to be the object, the battlefield, and the meeting point, on which the post-modern man challenges himself imposing his beloved voluntary-rational character on those humiliating and "indifferent" biological mechanisms belonging to the body and to the living organism. The technological man, therefore, appears as being infinitely a creator of himself, and able to improve, enhance and self correct the body he has, he is and by which he appears.

When we think we have a body, we come to the individual appropriation of it and, when we think of being a body, we do nothing but opening the doors to political reappropriation of our body because through it a process of individualization is triggered. Even being a body, is determined,

⁹ See A. Pessina, *Libertà e tecnologia: annotazioni teoretiche*, in F. Botturi, *Soggetto e libertà nella condizione post-moderna*, Vita e Pensiero, Milano, 2003

now, through a mechanism of individualization and subjectivation. An example, in this sense, is the case with the Nazi experience, through which it was found empirically not a policy of the body, but a policy on life, on the bodies, i.e., a thanatopolitics, which, in our contemporary world, is present every day in those cases in which human life is conceived outside of man himself, legitimizing the rational-voluntary domain on the animal-biological one. Moreover, we could easily argue that totalitarianism and liberalism assume a common denominator, namely, the mastery of man over his animal nature, in that, if for Nazism man is his own body, and only it, for Liberalism, from Locke, man has and owns his own body - and therefore he can use it, transform it, sell it as a domestic slave. Thus, the conceptual categories of liberalism overturn the Nazi perspective, transferring the ownership of the body from State to individual¹⁰. This means that, when we think we have a body, we come to the individual appropriation of it and, when we think of being a body we do nothing but opening the doors to political reappropriation of our body, because this conditions starts a process of individualization and it ceases to be a natural essence of man.

5. Cyborgs or cyberbodies

The advanced scientific progress thus opens the way to several reflections. The bionic eye and the resulting increased reality really enhance the human being? When you go beyond the “repair” and the recovery of the natural capabilities of the human body what really happens? Are we becoming more free individuals or increasingly subject to a technological control and consumerism of our body? In fact, the cyborg is the combination of the utopian vision of the post-human creation and the figure of a person driven by the desire of control and appropriation. The cyborg is the emblem of the becoming, of the possibility of a continuous change. But who leads us to change and to modify our bodies? Is it a real need or just a desire? Perhaps today’s desires can be realized more easily. However, the process to enhance ourselves follows accurate market policies.

Multinational corporations, in fact, become the promoters of the innovations that we can wear or embody. The figure of the cyborg, in fact, is considered as a body capable of consuming and being consumed. It consumes because constantly conforms to the standards generated and required by the market and it is consumed because it offers the market a chance to integrate on the human body

¹⁰ See Z. Bauman, *Living on Borrowed Time: Conversations with Citlali Roviroso – Madrazo*, Polity Press, Cambridge, 2012

objects of desire. The advanced scientific progress, in fact, not only provides the possibility of post-human images generated by a perfect blend between technology and nature, but also intertwine relationships with flows of consumption. The consumption technology and the modern information age help to create a body that continues to be a privileged object of control and power. This means that there is a strong ambivalence. The body of the contemporary individual is suspended between the power and strengthening of its functions, and the subjection to a power capable of acting on the life of each of us. The autonomy and the ability to choose what we want for our body join the subjection of a power that follows -first of all- the logic of the market. The opening of physicality to all possible metamorphosis of today, proposes as an essential element a body that produces and consumes. It is necessary to ask ourselves, in fact, the extent to which the mix of technology and the body is able to create cyborg bodies, or stop at simple cyberbodies¹¹, given that while the cyborg bodies refer to the emancipatory and imaginative qualities, the cyberbodies are "high-tech bodies" which follow the laws of the market¹². In fact, the figure of the cyborg as posthuman figure able to return lost bodily functions, begins to disintegrate. Today, professional medical interventions are not only aimed to cure certain diseases, but they are demanded by consumers. The need is replacing the desire. The contemporary individual incorporates technological elements to align with the news suggested by the global market. For this reason we can speak of cyberbodies: bodies subject to market and consumer culture¹³.

¹¹ M. Farci, *Lo sguardo tecnologico. Il postumano e la cultura dei consumi*, FrancoAngeli, Milano, 2012

¹² D. Devoss, *Rereading cyborg women: the visual rhetoric of images of the cyborg on the world wide web*, in idem, p. 82

¹³ See Z. Bauman, *Consuming life*, it. trans. by M. Cupellaro, Laterza, Roma-Bari, 2010



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