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THE PARADIGM OF REGENERATIVE BODY: THE ROLE OF REGENERATIVE MEDICINE IN BIOPOWER

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ABSTRACT

The aim of this article is to call attention to the growing importance of biotechnology for power over life and body and to analyze biotechnology as contemporary biopolitical strategy. Thus biotechnology is comprehended as a political technology investing in the body, improving its qualities, prolonging youth and taking care of health and reproduction. In such a sense it can be seen as preserving or protecting life by helping to improve health, enriching the quality of life and enabling active aging. It intensifies techniques of biopolitics and anatomo-politics (detected by Foucault) and implicates specially derived politics, geno-politics and regenerative politics, which demonstrate that there is power over life and body in contemporaneity that far exceeds the extensions of power during the period of biological modernity. The paper is particularly focused on regenerative medicine as the knowledge-technology-power opening a new horizon for biopower.

Key words: biopower, biopolitics, regenerative medicine, tissue engineering, anatomo-politics, regenerative politics

IL PARADIGMA DEL CORPO RIGENERATIVO: L'IMPORTANZA DELLA MEDICINA RIGENERATIVA NEL BIOPOTERE

SINTESI

Lo scopo del presente articolo è di richiamare l'attenzione sulla crescente importanza della biotecnologia per il potere sulla vita e il corpo, nonché di analizzare la biotecnologia come strategia moderna della biopolitica. La biotecnologia è intesa come una tecnologia politica che investe nel corpo, migliorandone le qualità, prolungando la sua giovinezza e prendendosi cura della salute e della riproduzione. In questo senso, la biotecnologia può essere vista come uno strumento per preservare o proteggere la vita, il quale contribuisce a migliorare la salute, arricchire la qualità della vita e a sostenere l'invecchiamento attivo. Intensifica le tecniche utilizzate dalla biopolitica e dall'anatomo-politica (come definita da Foucault) e include politiche derivate, la politica dei geni e la politica di rigenerazione, che dimostrano che il potere che si ha oggi sulla vita e sul corpo supera di gran lunga i limiti dello stesso potere durante il periodo di modernità biologica. L'articolo si focalizza particolarmente sulla medicina rigenerativa, poiché comporta la conoscenza e la tecnologia, in grado di aprire un nuovo orizzonte per il biopotere.

Parole chiave: biopotere, biopolitica, medicina rigenerativa, ingegneria dei tessuti, anatomo-politica, politica di rigenerazione

In his accompanying study to Roberto Esposito's book on Bios, Timothy Campbell noted: "What does the opening to *bíos* as a political category that humanity shares tell us about the other development that so decidedly marks the current biopolitical moment, namely, biotechnology?" and continued with a remark, "indeed, missing is precisely a reflection on the role biotechnology plays for contemporary biopolitics." (Campbell, 2008, xxxiii) The aim of this paper is to call attention to the growing importance of biotechnology for power over life and body and to analyze biotechnology in terms of a contemporary biopolitical strategy. *Thus biotechnology has to be comprehended as a political technology investing in the body, improving its qualities, prolonging youth and taking care of health and reproduction*. In this sense it *preserves or protects life by helping to improve health, enriching the quality of life and enabling active aging*. It intensifies techniques of biopolitics and anatomo-politics (detected by Foucault) and implicates specially derived politics, geno-politics and regenerative politics, which demonstrate that there is power over life and body in contemporaneity, which far exceeds the extensions and technological possibilities of power during the period of biological modernity. The possibilities for technological interventions into areas previously thought of as "natural" are growing and the distinction between natural and technological is becoming increasingly blurred. This marks the beginning of a new chapter of biopower, one that no longer belongs to biological modernity, but rather to biotechnological postmodernity.[1] The importance of biotechnology for biopower has been recently acknowledged in the lively debate on biopolitics: "The patenting of the human genome and the development of artificial intelligence; biotechnology and the harnessing of life's forces for work, trace a new cartography of biopowers. These strategies put in question the forms of life itself." (Lazzarato, 2002, 1) As part of the growing interest in biopolitical issues relating to the development of life sciences, the field of genomics has drawn quite a lot of attention, while on the contrary, the implications of the younger field of regenerative medicine has not yet been comprehensively discussed. The paper is focused particularly on regenerative medicine as the knowledge-technology-power that is opening a new horizon for biopower.

Michel Foucault recognized an important historical shift regarding the relations between politics and life, which he located between the ancient era of the sovereign power and the modern era of *biopower* "when the life of the species is wagered on its own political strategies" (Foucault, 1978, 143). This moment is marked by shift in power relations. "For millennia, man remained what he was for Aristotle: a living animal with the additional capacity for a political existence; modern man is an animal whose politics places his existence as a living being in question." (Foucault, 1978, 143) In order to consider the semantics of the term biopolitics and the relation between life as a "natural" issue and politics, one needs to refer to the ancient Greek (in particular the Aristotelian) lexicon to find the etymological origin in the Gr. term *bíos* (βίος). But the ancient Greeks used two terms to denote life: "*zoē,* which expressed the simple fact of living common to all living beings (animals, men, or gods), and *bios,* which indicated the form or way of living proper to an individual or a group." (Agamben, 1998, 9) The present *zo* means "I am alive, I exist" and the past tense (usually the case with the second past tense) *ebion* (meaning "I lived my life in a specific way") is an ancient form, from which came into existence the later present tense *bioo*. "The past tense 'EBION' and the derivative noun 'BIOS' were constructed in order to indicate a new notion about life, a notion more concrete and specific: i.e., the constant purposive and therefore complete, unchangeable way of life, to live a life, as Aristotle says, in a concrete mental way /…/ 'BIOS is a moral action'." (Bakaoukas, 2009) *Zoe* generally refers to the existence of a living being and *bíos* denotes qualified life. *Bios* is duration of *zoe* and means rational life, thus it cannot be ascribed to animals (Bakaoukas, 2009). In the classical world of the ancient Greeks, simple natural life is excluded from *pólis* ("to speak of a *zoē politikē* of the citizens of Athens would have made no sense") (Agamben, 1998, 9). However, Roberto Esposito relativizes the distinction between the two Greek terms denoting life, because "every life is a form of life and every form refers to life." (Esposito, 2008, 194) He notices an interesting oscillation in the semantics of the Greek lexicon, namely "biopolitics refers, if anything, to the dimension of *zōē*, which is to say to life in its simple biological capacity, more than it does to *bíos*, understood as 'qualified life' or 'form of life', or at least to the line of conjugation along which *bíos* is exposed to *zōē*, naturalizing *bíos* as well." (Esposito, 2008, 14) Furthermore, he problematizes the concept of *zōē* and adds another term to the dualism of *bíos* and *zōē*: "*Zōē* itself can only be defined problematically: what, assuming it is even conceivable, is an absolutely natural life? It's even more the case today, when the human body appears to be increasingly challenged and also literally mediated by technology. Politics penetrates directly into life and life becomes other than itself. Thus, if there is no such thing as a life that is natural that isn't at the same time also technological; if the relation between *bíos* and *zōē* by now requires (or has always required) to include in it a third correlated term,

1 If postmodernity would still be the proper term to use for denoting the era proceeding modernity in economic, social, cultural and thus structural terms, marked with some significant shifts comparing to modernity. However, it is not the aim of this paper to discuss the issues of postmodernity.

technē – then how do we hypothesize an exclusive relationship between politics and life?" (Esposito, 2008, 15)

In the middle of the 1970s Michel Foucault, taking as his departure point the ancient Greek comprehension of life and the inclusion of the "natural" life in the political mechanisms (and the previous theories of biopolitics as well), re-posited and redefined the concept of *biopolitics* in a much more complex sense than had been done before.[2] Foucault outlined the difference between *biopolitics* as the politics in the name of life (politics of life) and *biopower* as subjecting life to the authority of politics (politics over life). *Biopower* designates "what brought life and its mechanisms into the realm of explicit calculations and made knowledge-power an agent of transformation of human life." (Foucault, 1978, 143) In other words, biopower means "a number of phenomena that seem to me to be quite significant, namely, the set of mechanisms through which the basic biological features of the human species became the object of a political strategy, of a general strategy of power, or, in other words, how, starting from the eighteenth century, modern Western societies took on board the fundamental biological fact that human beings are a species." (Foucault, 2009, 1) Foucault recognizes the beginning of the age of biopower taking place with the ending of the sovereign power for which "[t]he sovereign exercised the right of life only by exercising his right to kill, or by refraining from killing; he evidenced his power over life only through the death he was capable of requiring. The right which was formulated as the 'power of life and death' was in reality the right to *take* life or *let* live." (Foucault, 1978, 136) In the modern era of biopower, the social body has got the right to ensure, maintain, or develop its life, "the ancient right to *take* life or *let* live was replaced by a power to *foster* life or *disallow* it to the point of death." (Foucault, 1978, 138) If previously it was the sovereign who played the role of the one who must be defended now wars are being waged on behalf of the existence of everyone. Thus it is now the society that must be defended, with entire populations being mobilized for the purpose of wholesale slaughter, with battle tactics proceeding according to the principle that one has to be capable of killing in order to carry on living. Thus the dream of modern powers is genocide. Power is situated and exercised at the level of life, the species, the race, and the large-scale phenomena of population. "But this formidable power of death [demonstrated by the bloody wars since the nineteenth century] /…/ now presents itself as the counterpart of a power that exerts a positive influence on life, that endeavours to administer, optimize, and multiply it, subjecting it to precise controls and comprehensive regulations." (Foucault, 1978, 137)

According to Foucault this power over life has been one of the basic phenomena of the nineteenth century in western society and evolved two basic forms, together constituting two linked developmental poles. The first emerged in the seventeenth and eighteenth century and is a disciplinary technology – Foucault calls it the anatomo-politics of the human body. It was "centered on the body as a machine: its disciplining, the optimization of its capabilities, the extortion of its forces, the parallel increase of its usefulness and its docility, its integration into systems of efficient and economic controls". (Foucault, 1978, 139) The other pole emerged in the middle or the second half of the eighteenth century and "focused on the species body, the body imbued with the mechanics of life and serving as the basis of the biological processes: propagation, births and mortality, the level of health, life expectancy and longevity, with all the conditions that can cause these to vary." (Foucault, 1978, 139) The supervision of these was effected through an entire series of interventions and regulatory controls: this informs the biopolitics of the population. These two technologies directed toward the performances of the body and, with their attention to the processes of life, the highest function of this power over life "was perhaps no longer to kill, but to invest life through and through." (Foucault, 1978, 139) Both politics, anatomo-politics and bio-politics were, according to Foucault, the techniques of power established

2 Roberto Esposito has illuminated a brief genealogy of the concept of biopolitics before and after Foucault (Esposito, 2008, 13–24) and traced the first wave of early discussions in biopolitics from the beginning of the 20th century in Swedish (Rudolph Kjellén, 1905, 1916, 1920), German (Baron Jakob von Uexküll, 1920) and English (Morley Roberts, 1938) thought when it was mostly referred to geopolitics and used an organistic, anthropological and naturalistic approach, where the "naturalization of politics" takes place according to an analogical understanding of the state with its tissues as an organic whole (Kjellén and von Uexküll) and where the comparison between the defensive apparatus of the state and the immunological system was discussed (Roberts). These early approaches show that "a politics constructed directly on bíos always risks violently subjecting bíos to politics." (Esposito, 2008, 19) The second wave of interest (appearing in France in the 1960s) demonstrates the modification by the epochal defeat of Nazi biocracy and the necessity of a semantic reformulation; it is a neohumanistic one, but ultimately it results in a weakening of the specificity of the category, becoming rather a sort of "onto-politics". The third wave took place in the Anglo-Saxon world – and this is the one that is still ongoing. It emerged in the 1960s and was formally introduced in 1973 by International Political Science Association, which opened a research site on biology and politics; and it is marked by the foundation of the Association for Politics and the Life Sciences in 1983. This approach has a naturalistic character – its symptomatic value resides in the direct and insistent reference made to the domain of the natural as a privileged parameter of political determination. Esposito notices a considerable categorical shift with respect to the principal line of modern political philosophy: "While political philosophy presupposes nature as the problem to be resolved (or the obstacle to overcome) through the constitution of the political order, American biopolitics sees in nature the same condition of existence: not only the genetic origin and the primary material, but also the sole controlling reference. Politics is anything but able to dominate nature or make it 'conform' to its ends and so itself emerges 'informed' in such a way as to leave no space for other constructive possibilities." (Esposito, 2008, 22)

during the course (anatomo-politics) and at the end (bio--politics) of the eighteenth century and they were present at every level of the social body and utilized by very diverse institutions such as family, army, schools, police, individual medical practices and the administration of the collective bodies. There was a big difference between the era following the French Revolution in comparison to the ancient age, namely "death was ceasing to torment life so directly. But at the same time the development of the different fields of knowledge concerned with life in general, the improvement of agricultural techniques, and the observations and measures relative to man's life and survival all contributed to this relaxation: a relative control over life averted some of the imminent risks of death." (Foucault, 1978, 142) The new regime tended rather towards supporting the affirmative politics of life and over life: "Power would no longer be dealing simply with legal subjects over whom the ultimate domination was death, but with living being, and the mastery it would be able to exercise over them would have to be applied at the level of life itself; it was the taking charge of life, more than the threat of death, that gave power its access even to the body." (Foucault, 1978, 142–143) The political technologies that ensued, investing the body, health, modes of subsistence and habitation, living conditions, the whole space of existence only proliferated.

Foucault discussed the issues of biopolitics in several of his lectures and papers whereat it is interesting that his first utilization of the term appeared in the 1974's lecture where he emphasized the importance of biopolitics and recognized medicine as a biopolitical strategy: "for capitalist society it is the biopolitical that is important before everything else; the biological, the somatic, the corporeal. The body is a biopolitical reality; medicine is a biopolitical strategy". (Esposito, 2008, 27) The role of medicine and clinics is of great importance to Foucault's discussion on biopower and biopolitics. He conducted a comprehensive research of the birth of the clinic from the middle of the eighteenth to the middle of the nineteenth century. With the coming of the Enlightenment, death was subjected to the clear light of reason and thus became an object and source of knowledge for the philosophical mind. With the inclusion of dissection rooms to the clinics in the middle of the eighteenth century, a new period began for medicine; it turned to the study of physiological phenomena. But there is a paradox involved in basing a diagnosis on an anatomical perception: "A clinic of symptoms seeks the living body of the disease; anatomy provides it only with the corpse." (Foucault, 2003a, 135) Thanks to the organization of the clinic in eighteenth century pathological anatomy, the technique of corpse observation gained the facility to open up a corpse immediately after the occurrence of death. This meant that the period of latency between death and autopsy was reduced and the stages of pathological time and the first stage of cadaveric time became almost coincidental. The effects of organic decomposition were therefore virtually suppressed thus: "Death is now no more than the vertical, absolutely thin line that joins, in dividing them, the series of symptoms and the series of lesions." (Foucault, 2003a, 141)

In the late eighteenth century, Xavier Bichat introduced a new paradigm into medical thought, which replaced the former nosology based upon the principle of localization (understanding the illness of the body on the basis of organic proximity) with the principle of isomorphism in tissues being based upon similarity and external adaptation of tissues, life characteristics and functions. Bichat imposed a diagonal reading of the body, carried out according to expanses of anatomical resemblances that "traverse the organs, envelop them, divide them, compose and decompose them, analyse them, and, at the same time, bind them together." (Foucault, 2003a, 129) He also recognized that when the pathological state is prolonged, the first tissues to be affected are those in which nutrition is most active (the mucous membranes) then the effects expand to parenchyma of organs and finally they reach the tendons and aponeuroses. Bichat ascertained that a disease is actually a process that "announces the coming of death". (Foucault, 2003a, 141) Disease as the "proximity of death" is a process that indicates another process that is evolutionary, "the associated, but different process of 'mortification'." (Foucault, 2003a, 141) With this acknowledgment death becomes no longer an instantaneous event but should rather be comprehended as a process. What Bichat actually acknowledged is "the permeability of life by death". (Foucault, 2003a, 142) Foucault locates a shift in the comprehension of life related to the body with Bichat's contribution to pathological anatomy. Particularly significant was Bichat's investigation of the body as a complex of tissues and his comprehension that the analysis of the disease can be carried out only from the point of view of death, "of the death which life, by definition, resists," (Foucault, 2003a, 144) whereas "[t]he morbid is the rarefied form of life, exhausted, working itself into the void of death". (Foucault, 2003a, 171) For Bichat "[d]eath is therefore multiple, and dispersed in time: it is not that absolute, privileged point at which time stops and moves back; like disease itself, it has a teeming presence that analysis may divide into time and space; gradually, here and there, each of the knots breaks, until organic life ceases, at least in its major forms, since long after the death of the individual, minuscule, partial deaths continue to dissociate the islets of life that still subsist." (Foucault, 2003a, 142) Vitalism could only have appeared against the background of "mortalism"; Bichat relativized the concept of death, volatilized it, distributed it throughout life in the form of separate, partial, progressive deaths, deaths that are so slow in occurring that they extend even beyond death itself, but "from this fact he formed an essential structure of medical thought and perception: that to which life is opposed and to which it is exposed; that in relation to which it is living opposition". (Foucault, 2003a,

143–144) Foucault is convinced that the irreducibility of the living to mechanical or chemical elements is of secondary importance in comparison with the fundamental link between life and death.

This shift in the comprehension of death and life in biological modernity was however not accidental. Foucault acknowledges that it was no longer epidemics that were the issue at the end of the eighteenth century, but rather "endemics, or in other words, the form, nature, extension, duration and intensity of the illnesses prevalent in a population." (Foucault, 2003b, 243) These were the illnesses that were difficult to eradicate and that had become the permanent factors which sapped the population's strength, shortened the working week, wasted energy, and cost money (in the sense that they led to a fall in production and because treating them was expensive) – thus these were the phenomena affecting a population. Therefore death becomes no longer something that suddenly swoops down on life as in an epidemic but something permanent, something that slips into life, perpetually gnaws at it, diminishes and weakens it. (Foucault, 2003b, 244) This problem is a biopolitical one and it became an important issue at a time of industrialization (in the early nineteenth century) with the problem of aging, when the individuals fall out of the field of capacity, of activity. Herein lies the significance of medicine for biopower, since biopower "is continuous, scientific, and it is the power to make live." (Foucault, 2003b, 247) The "power is decreasingly the power to take life, and increasingly the right to intervene to make live". (Foucault, 2003b, 248)

Intervention for the aim "to-make-live" has gained tremendous extensions with the rise of biotechnology in the last half of the twentieth century, which additionally results in a focus on technological intervention and thus on the "artificiality" of life. Since even medicine has become a knowledge-technology, a practice of engineering, living organisms can no longer be perceived as self-contained and delimited "natural" bodies but rather as constructs composed of heterogeneous and exchangeable elements (e.g. organs, tissues, DNA). Involvement of technologic manipulation of the body in medicine has only been increasing since the middle of the twentieth century and today biotechnology has become a significant supporting technology for medicine. The questions concerning the "natural foundations" of life and how these can be distinguished from "artificial" forms of life have become topical because of bioscientific discoveries and technological innovations. (Lemke, 2011, 27) The ancient relation between "natural" life and politics as problematized by contemporary philosophy of biopolitics has become complex considering how the political is encompassing sets of problems that were once understood as natural and self-evident facts but which are now open to technological or scientific intervention. Within the area of "technocratic biopolitics," as termed by Thomas Lemke, the growing significance of genetic and reproductive technologies has raised concerns about the regulation and control of scientific progress. The results of biological and medical research and their practical application demonstrates how contingent and fragile the boundary between nature and culture is; but this also results in intensified political and legal efforts to re-establish that boundary. It was deemed necessary to regulate which procedures were acceptable and under what conditions. (Lemke, 2011, 26)

With the turn of the millennium an important shift was taking place within life sciences concerning the comprehension and accession to life and body: from genomics and the computer paradigm of life – the paradigm that was significantly marked by the digital age – towards the paradigm of regeneration, which was from the beginning directly linked to its respective applications in medicine. Today, one of the central aims of medicine is to collaborate with biotechnology in order to be able to composite or regenerate tissues or body parts. This is enabled using tissue engineering technologies. Tissue engineering, particularly stem cell engineering, has presented new hopes over the course of the last decade; but perhaps rather more realistic or less utopian and exaggerated in comparison with the reactions of the life sciences when linked to the promises of genomics.[3] Primarily, tissue engineering emerged as a response to transplantation problems, mainly in association with the response of the immune system, which results in the rejection of allogenic tissues. When engineering and cell cultivation in the laboratory is conducted for transplantation purposes, the technology is called regenerative medicine. Regenerative medicine aims to enforce the body's immanent functions of regeneration. Tissue engineering is a technology of in vitro tissue manipulation, which nowadays mainly uses stem cells in artificially created support systems that are set up for the execution of specific biological functions, particularly for the repair or replacement of parts of a tissue (like skin, cartilage, bone). A stem cell is a non-differentiated cell, which has the ability of self-regeneration, during which two daughter cells are created – the first one is identical to the original but the other one is partially differentiated and more specialised. Somatic stem cells are located throughout the whole adult human being, while embryonic stem cells are found only in the embryo. Stem cells enable several new treatment approaches. Today, the expression "advanced therapy" is well-established in the

3 Herbert Gottweis reviews the reception of life sciences in the last decades of the twentieth century: (1.) the 70s present the phase of hopes and fears, (2.) the 80s the phase of exaggerations and (3.) the 90s the fantasies being overtaken by contradictory realities (Gottweis, 1999).

EU medical legislation (the EU Act (ES) number 1394/2007 of the European parliament and board) which divides advanced therapies into gene therapy, somatic cell therapy and tissue engineering. Advanced therapy uses principles of self-regeneration in tissue injury as well as in treatment of cancer.

Eugene Thacker, one of the first humanists to discuss tissue engineering, points to the introduction of a new conception of body: "Tissue engineering is able to produce a vision of the regenerative body, a body always potentially in excess of itself." (Thacker, 1999, 183) According to Thacker, it is due to the idea of regeneration that the economy of body parts (transplantations, xeno-transplantations) has been replaced with an economy of auto-regeneration (regeneration of tissues from one's own cells), which is cyclic and proliferative (produces a great number of parts = tissues with division of cells). (Thacker, 1999, 182) Options that are thus presented admit the solution of several health problems (degenerative illnesses, cancer etc.), transformation of body and improvement of life quality – even "rejuvenation," which actually means the prolongation of life and the active age of a social subject. Although longevity and active age have both been prolonging since the human species has been able to make improvements in the quality of life (decrease of life and illness threats, variegation of food etc.) and conduct medical interventions, the options now opened with the regenerative body, enabled with biotechnology, are displacing the limit of life beyond the traditionally attained ones. This is now significantly enabled with the working "from within," – or, even better, with the body itself –, instead of manipulating the body and life "from outside," as tended to be performed earlier with the help of mechanical or chemical interventions.

It could also be claimed that the function of stem cells in an organism testifies to a very important function in the body, which is vitalization; thus, with the acknowledgement of this function of the stem cells, the recognition of the process of mortification in the body with illness (by Bichat) obtains a supplementary recognition with an opposing process, which is a process of "vivification". This is the process that testifies about life as the one opposing death as noticed by Foucault. The process of vivification with stem cells used to defy the natural process of mortification in the organism provides the assurance of a constant resistance to threats of illnesses and thus death. The regenerative capacity has been explored in nearly all tissues, and several factors have been proven to play a role in auto regenerative processes in which proliferation and differentiation are the fundamental processes that assure auto regeneration. This issue could be linked to the notion of immunity as the ability to preserve and protect life, which is the focus of the contemporary debate on biopolitics. For nearly two thousand years, immunity has served almost exclusively political and juridical ends (a legal concept invented in ancient Rome) and it was only in the 1880s and 1890s that biomedicine acknowledged a new vital function, "immunity-as-defence". (Cohen, 2009) With biotechnological support of body's internal force and strength, the discourse about immunity has only intensified. Regenerative medicine as an intervention technology optimizing the body is in the process of presenting a new vision of the body – a self-improving body, which is a self-excessive body. Foucault already analysed one level of the technological intervention in life, combining the regulatory technology of life and the disciplinary technology of the body and used the example of the death of Franco, who was kept alive after he died, to present the meeting of the two systems of power: that of sovereignty over death, and that of the regularization of life. Foucault remarked: "And thanks to a power that is not simply scientific prowess, but the actual exercise of the political biopower established in the eighteenth century, we have become so good at keeping people alive that we've succeeded in keeping them alive when, in biological terms, they should have been dead long ago." (Foucault, 2003b, 248) Today, however, the technological possibilities to regulate life and discipline the body reach far beyond the abilities of his time. Thanks to the attainments of regenerative medicine the power-to-make-live is now coming to exceed the limits of the "natural" life and body, much more than was enabled by the institutionalization of medicine. The biological concepts of life and body need to be transposed; they are now both significantly intermediated by technology. Ultimately the idea of regeneration of the body is generating a utopian vision of immortal active life and body enabled with a reinforced constant process of vitalization victoriously defeating the natural process of mortification.

With the transformation of medical knowledge and technical possibilities there is another shift taking place, albeit very slowly, which is related to the one described above – it is a shift from a mechanical paradigm to the paradigm of the (self-)regenerative body. The function of self-regeneration ought to be recognized as the essential function of the body and life, which already itself opposes the Cartesian notion of the objective body and thus the essence of modern medical thought, but which even has its especially explicit functional derivation in the potential of advanced therapy with stem cells. The modern medicine and biology operated with a concept of an organism as composed of mechanical parts – the human body was thus understood in terms of a kind of complex machinery, corresponding to the Cartesian causal comprehension of the body, in detection of local defects and offering of directed treatments. In accordance with this, medical treatment was conducted on the basis of elimination or exchange of the damaged parts. In aesthetic surgery, the body was as well transformed mechanically, with direct plastic interventions in the body and with insertions using artificial materials. Recent acknowledgements demonstrate that such methods are obsolete because col-

laterally the healthy parts of an organism are damaged. Advanced therapy, on the contrary, suggests the use of body's own material, which should be implanted to improve the quality of body's immanent ability to regenerate itself. Advanced therapy thus no longer suggests mechanical or chemical repair of the body, but develops options of stimulating the self-regenerative body. It is no longer appropriate to speak of anatomo-clinical medicine as Foucault was referring to the eighteenth and especially nineteenth century medicine. Since the second half of the twentieth century medicine has been significantly altered with biotechnological support. Biotechnology, combining biology with technology, has been established as a techno-science or knowledge-technology. In our era, when engineering is highly advocated, even medicine, supported by biotechnology, has become engineering.

Foucault analysed the emerging institutionalization of medicine in the context of normalizing society, when power took possession of life or at least took life under its care in the course of nineteenth century; at the time when "medicine becomes a political intervention-technique with specific power-effects. Medicine is a power--knowledge that can be applied to both the body and the population, both the organism and biological processes; and it will therefore have both disciplinary effects and regulatory effects." (Foucault, 2003b, 252) The role medicine gained for biopower has only been intensified with the emergence of biotechnology, which instantly became the supporting technology of what Foucault called the anatomo-politics of the human body or what we in this case prefer to call the regenerative-politics of the human body. Regenerative medicine in particular is focused on the performances of the body: it is optimizing its capabilities, concentrating its forces, increasing its utilities. Additionally, biotechnology has become the supporting technology of the biopolitics of the population. Regenerative medicine is used to manage life processes, particularly with regard to improving levels of health, life expectancy and longevity. Regenerative medicine must therefore be acknowledged as one of the leading technologies of contemporary biopower. The political role of regenerative medicine is crucial in slowing down the process of aging, assuring the quality of life, active aging and instant regeneration. Last but not least, all these motifs are represented in popular culture. The cultural tendency towards youth and the need to form one's own aesthetics of the body according to the prevailing cultural standards and as a means of exhibiting the healthy and fit condition of the body is continuing to grow. In this regard, regenerative medicine is presenting novel options and promising solutions for sustainable corrections of the body. Regenerative medicine certainly contributes not only to the politics of the body but also to the politics of life. Regenerative medicine, supporting biomedicine, significantly consolidates the power to make live, established within the emerging normalizing society and analysed by Foucault. At present, the power-to-make-live more than ever testifies that life and death are not natural or immediate phenomena, which would fall outside the field of power, but are decisively subjected to the mechanisms, techniques, and technologies of power.

PARADIGMA REGENERATIVNEGA TELESA: VLOGA REGENERATIVNE MEDICINE V BIOOBLASTI

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POVZETEK

Namen tega prispevka je usmeriti pozornost na pomen biotehnologije za oblast nad življenjem in telesom ter jo analizirati kot sodobno biopolitično strategijo. Biotehnologija je tako razumljena kot politična tehnologija, ki vlaga v telo, izboljšuje njegove kvalitete, podaljšuje mladost, skrbi za zdravje in reprodukcijo. V takšnem smislu ohranja oziroma varuje življenje s tem, da izboljšuje zdravje, bogati kvaliteto življenja in omogoča aktivno staranje. Krepi tehnike biopolitike in anatomopolitike (ki jih je zaznal Foucault) in implicira posebno izpeljane politike, genopolitike in regenerativne politike, ki dokazujejo, da v sodobnosti obstaja oblast nad življenjem in telesom, ki daleč presega razširitve in tehnološke možnosti oblasti iz biološke modernosti. Avtorica izhaja iz raziskovanja biooblasti, ki ga je opravil ključni raziskovalec teme, Michel Foucault v sedemdesetih letih dvajsetega stoletja. V tem smislu je zlasti pomembna njegova analiza anatomsko-klinične medicine, ki jo je prepoznal kot biopolitično strategijo, ki je bila na delu v normalizacijski družbi v osemnajstem in še posebej v devetnajstem stoletju, ko je oblast prevzela posest nad življenjem. Medicina kot vednost-oblast je politična intervencijska tehnika, ki jo lahko prenesemo tako

na telo kot na populacijo, tako na organizem kot na biološke procese, zato ima tako disciplinske kot regulacijske učinke. Avtorica trdi, da je oblast delati živo, ki jo je opazil Foucault, še vedno na delu, tokrat je ključno podprta z biotehnologijo in kot taka pridobiva nove dimenzije oblasti nad življenjem. S širitvijo tehnoloških intervencij v polje »naravnega« in zabrisovanjem razlike med naravnim in tehnološkim, pojavom in vpojitvijo biotehnologije v področje telesa in populacije se pričenja novo poglavje biooblasti, ki prej pripada biotehnološki postmodernosti. Tkivni inženiring je tehnologija in vitro manipulacije s tkivi, ki danes uporablja predvsem matične celice v umetno ustvarjenih podpornih sistemih, ki so vzpostavljeni za izpeljavo določenih bioloških funkcij. Zaradi inženiringa in gojenja celic v laboratoriju za namene presadite se je uveljavil izraz regenerativna medicina. Regenerativna medicina si prizadeva okrepiti telesu lastne regenerativne funkcije. Prispevek je osredotočen zlasti na regenerativno medicino kot vednost-tehnologijo-oblast, ki odpira nov horizont biooblasti.

Ključne besede: biooblast, biopolitika, regenerativna medicina, tkivno inženirstvo, anatomopolitike, regenerativne politike

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