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The future of the self-image of the human being in the Age of Transhumanism, Neurotechnology and Global Transition

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ABSTRACT

In the present moment of cultural and political transition, one question seems to become the center of most other societal and civilizational questions: will the basic self-perception of the human being change under the influence of the new "neurotechnologies" and its accompanying ideologies like "Human enhancement" and "Transhumanism"? And if yes, how? Applied consciousness research is currently one-sidedly understood as brain research, and it is carried out mainly by the Natural Sciences under the influence of the "Economic–Technological Complex" and its relatively narrow interests. With its paradigmatic materialism determining the cultural spread of its temporary findings, it is already modifying our imaginary about what a human being is, what its rational self-determination can be, and how a "good society" can work. What is at stake with the change related to the findings of the new "consciousness technologies" is not only the principal socio-philosophical status of the human "self" or "I", but also the related concepts of humanism, open societies, individualism and rationality. Thus, the new neurotechnologies and their "neurophilosophies" are currently in the process of profoundly influencing the very basics of our cultural self-understanding, grown over centuries. This article discusses some of the implications of this development within the greater picture of the current "global mindset change".

1. Introduction: the historical interweave between humanism and modernity

By definition, modernity has conceived itself as a humanistic worldview. From the intuitions of balance expressed in the American Constitution and the French Revolution, to the ultra-liberal "postmodern" societal blueprints of radical diversity, gender emancipation and multicultural freedom, the very concept of open societies has always been built around a core concept of the human being. This concept has changed over time, initially focusing upon a "human measure" mirrored in the self-centered confidence of the "new citizen" of the second half of the 18th century, and eventually becoming the "positive fragmentation" of the actively "de-centered" subject of the post-industrial late 20th century. Despite these changes, modernity has always kept a certain continuity, and a relatively stable center of gravity. Commonly considered as "modern humanism", the concept affirmed "the dignity and worth of all people, based on the ability to determine right and wrong by

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appealing to universal human qualities, particularly rationality... It endorse(d) universal morality based on the commonality of the human condition, suggesting that solutions to human social and cultural problems cannot be parochial" [1]. Rather, solutions must be found within the individual, relying upon her own capabilities of analysis, self-observation, self-critique, and dialectical correction of earlier decisions to forge a new decisional awareness, critical ability and orientation toward the common good.

In other words, modern humanism has invested significant effort in working toward a rational self-awareness of the universal "logos" in its individualized form, stating that the "essence" of the human being must be seen in the unity of the subjective (individual) with the objective (universal) "logos". These two dimensions of "logos" constitute an ontological unity that at its core can be regarded as the "human being". The "human being" is viewed as the only known "place" in the world where both subjectivity and objectivity meet and merge; thus, the human being enjoys a privileged status based on the fact that it is conscious of itself. In this way, every individual must enjoy a "proto-sacred" status of inviolabilty and mutual respect, "untouchable", as a unitary "event" and therefore of value in and of itself.

Because of this basic concept or image of the "essence" of the human being, the core characteristic of the individual for modernity is the unity of the objective and the subjective world as "embodied" in the primary capacity of self-determined rationality. Derivative of this view was an emphasis of the superiority of mind over matter, and of the self-conscious "spirit" over the biological body. "*Materia principium individuationis*" became the primary motto that guided modernity from the 18th to the 20th century. The material world was seen as a tool to be manipulated by the hands of the "logical" mind of a human individual. History or the "world process" [2] itself can be seen as a continuous striving for increased self-consciousness. In this worldview, technological progress and "humanism" are not divided, but form a single identity, and that was described by Hegel and later the Neo-Kantians as "societal morality" or the "ethics" ("Sittlichkeit") of modern rationality [3].

This concept of the "essence" of the human being constituted a cultural and civilizational self-perception that gave rise to paradigms and organizational patterns of social structuring. The "humanistic" self-perception of the human being in classical modernity constituted, to a remarkable extent, a common ground for the very diverse (i.e., partly competing, partly mutual) efforts of emancipation in European-Western culture. It successfully built commonalities capable of bridging the rifts that existed within and between modern movements throughout the last three centuries of development and struggle.

From a current perspective, the "modern" concept of the "essence" of the human being was decisively tied to ideas originating in the Renaissance and antiquarian Greece and Rome. It fostered a self-perception of the human being (and humanity as a whole) that accompanied the development of modernity through the 18th, 19th and 20th centuries that accounted for – if not upheld – all of the inherent contradictions, dialectics, and implicit and explicit oppositions. Ultimately, it can be said that the "humanistic" self-concept of the human being in European-Western Modernity established the groundwork for what has been achieved during the past three centuries in the name of freedom, equality and individualism, and for the representation of societal pluralism and libertarianism.

In sum, from the viewpoint of a contemporarily informed history of ideas, a sort of "guiding image" of the human being, closely connected with some image of what a "good life" and a "good society" could be, was always at the center of modernity. It acted to legitimize individual self-empowerment behind the curtains of societal and political events, and it was crucial in both keeping the ideals that were determined to build a "rational civilization" alive – and in keeping those ideals "open" within themselves [4].

In a phrase, *modernity and the self-concept of the human being as "humanistic" were inseparable*. They formed a constitutive unity at the center of the enlightened, progressive open societies in European-Western civilization.

2. The dawn of Transhumanism in "post-mature" modernity

If we accept this to be correct, then it becomes clear that today we are facing an all-encompassing change in the fundamental structure(s) of modernity. This change is yoked to far-reaching shifts in worldviews regarding the "essence" of the human being which is increasingly challenged by information gained from, and applications of new neuro- and biotechnologies. In march 2009, the new US-President Barack Obama programmatically declared his willingness to decisively increase the support for formerly restricted scientific research, including "immersive" biotechnological research [5]. The influence of the endeavors to be expected from this research on the cultural paradigm of the European-Western civilization cannot be underestimated, because their resulting philosophies are already changing the fundamental self-concept of the human being, if not the notion of "beings", more broadly.

On the most basic level, this is due to the fact that the philosophies deriving from the new neurotechnologies are questioning, or more accurately threatening the primacy of traditional humanistic "mind over matter" world views. On the contrary, the new neural sciences, including bio-physical brain research, consciousness studies, and the technologies that enable and/or arise from these endeavors, are asserting that what has been called the self-aware mind is directly and causally derived from the function of the brain as biological entity. The "self" or the "I" become issues of debate and contention, framed within the contexts of the biological, psychological, and social influence. This frames certain humanistic ideas within "folk" constructs, and forces re-consideration of (1) the extent to which "we" think and make decisions *versus* "the brain" thinks and makes decisions, and (2) whether self-aware decisions of an "I" are just the secondary reflection of what has been already decided by biological and physiological necessities that function in an "autopoietic" way, independently of the subject. Thus, much of the previously held "humanistic" world view, including the special status of humans and their "dignity", might need to be re-assessed.

Is contemporary neuroscience, fueled by rapid and robust advances in biotechnology, bringing 300 years of societal humanism to an end? Some observers believe that such progress will portend the demise of confessional religion, "civil" religion and "spirituality" [6], and that open societies will change into a "post-human" stage of yet unknown dimensions [7]. Today, we certainly face the end of "mature modernity", and are currently entering the stage of what we could call, in the absence of a better term, "post-mature modernity".

This word suggests a certain ambiguity; "post-mature" can mean "beyond maturity", suggesting that something is already over-mature, and over-due for change. Yet, at the same time, "post-mature" does not necessarily include "maturity" anymore; instead it could connote a new irrationalism, laden with paradigmatic and societal imbalances of unknown proportions. Given that since the 18th century, there has been little doubt that the future of the open societies and social morality depends upon some "essential" concept of the human being, the question then arises: in light of these new developments, how will the human being conceptualize itself and its society, in the decades to come? At the center of that question, lies an even more crucial inquiry: what will be the future self-image of the human being – and hence, of being human – in the Age of Transhumanism, Neurotechnology, and Global Transition?

It can be assumed that rarely has a question been of more importance in the history (and possible future) of modernity. As it seems, this question addresses a new level of complexity with a "post-mature" modernity poised to transform itself and emerge from its current cocoon. The question of "what is the essence of the human being" becomes a new catechism of our age that increasingly lies at the center of all other fields of action, including politics, economics, technology, science, medicine, culture, psychology, education, and religion. Each and all of these fields are becoming increasingly dependent on this central question – and in many ways, the geno- and neuro-centric approaches (i.e., socio-behavioral genetics, neurogenomics, neuropolitics, neuroeconomics, neurotheology, etc.) within each bespeak the applied issues raised and contested within the reductionist/non-reductionist debates regarding "self", "I" and intentionality and actions in particular enterprises.

To what extent is this the case? To make the potentially epochal turn somewhat clearer, let us take a closer look at a concrete example, and try to understand the meaning of the current mindset change, and the resulting implications.

3. A case example: has the human genome project caused an epistemic crisis?

The Human Genome Project (HGP, 1990–2003) has been the largest single investigation of the "natural" (bio-physical) dimensions of the human being in history. It concentrated efforts to explore the "material" basis of human existence, i.e., the role of the gene in the nature of human "identity". Subsequent applications of genetic research in neuroscience, coupled to major advances in computational technology spawned significant developments in consciousness studies, and provided a forum for renewed engagement of philosophy, science, and theology. This almost inevitably narrowed the non-material dimensions of being that were the concerns of traditional and mature modernity, in anticipating implicit or explicit "solutions" to the mind–body problem. The pendulum of progress had swung, and the concatenation of scientific, technological and social forces had (at least theoretically) reduced "humanistic dualism" to a new, bio-physical monism.

This monism is currently influencing the concept and self-perception of the human being and its society much more than is casually perceived. It is altering the bases of our societal consensus, because it is changing the leading cultural paradigm of our epoch. Even if only viewed as scientific and technological enterprises, geno- and neuroscience have become ideological, philosophical and cultural forces writ large, and in this way have become the explicit *epistemic* endeavors of cultural (and perhaps civilizational) value. This is currently evolving within the nuances and depths of contemporary society, and we believe will probably only unfold its full cultural and paradigmatic power in the years to come, after an incubation phase of several decades.

We find it interesting that the epistemic and moral dimension of the HGP had been identified early enough to reserve part of the budget to address ethical, legal, and social issues (ELSI), especially as regards the future (self-image and social fabric) of the human being that might be impacted by genetic research and its applications. Yet, to re-iterate, the rapid progress in technology and genetics have been readily applied to neuroscience, leading to discoveries, inventions, and possibilities (e.g., neuroprosthetics, xenografts of neural tissue, human–machine interfaces for augmented cognition, "designer" neuropsychiatric drugs, human–animal neurochimeras, etc.) that may modify our understanding of consciousness, the "self", non-human (i.e., animal and machine) "others", and the nature of being.

The crucial point is that ethical issues, questions and problems of genetics, biotechnology and neuroscience are no longer "siloed" within each of these disciplines, but have become germane to all. In the light of this, the terms "genethics", "nanoethics", and "neuroethics" might be considered subsets of a larger intellectual domain that seeks to identify and analyze the extant and predicted gaps in knowledge, margins of uncertainty, and ethical, legal and social issues that arise in, and from research at "frontier" areas of science that have the capacity to affect the future of humanity. In many ways, these terms reveal a potentially new worldview which acknowledges that we are facing what Thomas Kuhn called an "epistemic crisis": a time of change based upon a mass-effect of new knowledge.

4. At the boundaries: transhumanistic and post-human trajectories

Obviously, scientific research and the policies that dictate its scope, tenor and uses in the public sphere, do not occur in a social vacuum, and thus, the direction and conduct of both are susceptible to particular socio-cultural and temporal values

and biases. Given that science can never be truly "value-free", it is incumbent upon scientists (and the users of scientific knowledge and enactors of public policy) to recognize this potential for value-ladeness, and respond with self-criticism, self-revision, and self-control.

Many of the ethical, legal and social issues generated by the potential studies, developments and uses of biotechnology do not actually reflect the technology, per se, but rather arise from (1) failure to appropriately regard the boundary conditions at the frontiers of scientific progress and its use, (2) ascription to technology as demiurge; and (3) the commodification of multiple domains of society, and use of technology as a leveraging factor in this market *ethos*. Taken together these factors cumulatively contribute to what Hans Lenk has called "the technological imperative", namely the notion that if we can build it, we will, and if we build it we must use it, and the problems that such thinking and actions incur [8].

At this point, a number of observations can be made with confidence. First, is that the same biotechnological progress that has allowed considerable insight to nature, has also afforded means and capabilities to access (if not manipulate) the natural world. Second, these technologies have afforded scientific advancements that have changed much of the "philosophy of mind" ("Philosophie des Geistes") [9]. Taken together, this may raise questions about the validity of human/non-human differences as distinctions of natural kinds, and generate profound ontological, practical and moral re-assessment of the notion of selves and others. Biotechnologically blended boundaries between the human and non-human (animal and machine) beings prompt ethical concerns about the types and scope of our actions toward, and interactions with nature and non-human others.

Haraway invites us to consider the implications arising from "species in collision" [10], and speculates upon utopian and dystopian possibilities that progressive technological imperatives could foster. Haraway, Fukuyama [11], Clarke [12] warn that the self/other distinction of human/non-human relatedness may be the focus of increasing scrutiny as (1) technology provides means to evaluate degrees of distinction previously maintained by categories of species; (2) science reveals structural and functional similarities of multiple dimensions of physiology (including neural function and capacity) and (3) the synergy of science and technology affords the capability, if not likelihood to create human/non-human chimeras. Given that attributes of self-identification are important for individuals' construct of, and attitudes toward others, it becomes important to consider what effect would 'blending the boundaries' of human/non-human have on these values and behaviors?

At present, there is a building body of interpretative patterns or "founded assumptions" from neuroscience to support that cognitive processes and capabilities may be relatively similar in humans and certain non-human species. This has fortified the philosophical claim that we cannot know what it is like to be 'an other' (human or otherwise), and therefore should be cautious (if not adopt some formal, precautionary principle) in our actions and treatments. It may be that differences (in important domains of structure, function, and being) are simply a matter of degree, and in this way, are in fact little more than arbitrary. Might this extend beyond the organic, to the synthetic?

And even if these are, at the present moment, only speculative assumptions or heuristic ideas, what of the possibilities that may arise in what Fukuyama has posed as our post-human future? If we heed Haraway's projection that technology will dissolve the biological boundaries between humans and non-humans either by allowing some insight into consciousness, or by creating new and novel human/non-human chimeric organisms [10], then we must ask: (1) what meaning do self/other, human/non-human distinctions have, and (2) how will and should we respond to the self/other binary? In many ways, this raises the Socratic question of where are we coming from and where are we going, and directs this inquiry on scientific, social, and spiritual levels.

A biotechnologically enabled trans- or post-human future might optimistically lead to what Michel [13] has termed "...blurred boundaries... with natural entities... constructed in terms of mutuality with nature and other organisms". Hawkins [14] believes that such fluid identities "... might help us find better ways of living within ecosystems... that respectfully acknowledge our continuity... with other inhabitants". Of course, it is possible that dissolution of human/non-human borders may be important in developing and sustaining a more meaningful ecological communitarianism, which would support and enable what Kalof [15] sees as "new... forms of shared survival".

Yet, each of these claims is based upon an idealized assumption that biotechnology will not only dissolve borders of distinction, but will also dispel relational asymmetries between human and non-human selves and others. Anna Petersen [16] envisions this to be a "...radical alternative to the individualism of dominant Western anthropology", adding that such "...a relational view of selfhood provides strong philosophical basis for reducing consumption, species extinction....and other damaging practices".

But will it? Lest we be lured into the naturalistic fallacy, it is vital to remember that biotechnological applications will be enacted and engaged within a socio-cultural milieu and in the framework of a guiding ideology or "overall lead paradigm"; and if the appeal to appreciate the past and present so as to realistically consider the future is to be used as a Socratic object lesson, then how wise is it to believe that the biotechnological trajectory will confer distinctly different values from those that currently dominate (technological) societies? In other words, while we can posit (or hope) that biotechnology *ought* to give rise to a broadened worldview, it would be wise to heed the reality of *what is*, and ask whether technological innovations and developments have significant purchase to alter such social trends and tendencies.

In this regard it is noteworthy that many futuristic prognoses about technology have been criticized for misestimating the effect of social constructs and values, and the durability of the market system that has given rise to, and has been advanced by technology. Initial industrial incentives for time-efficiency were intended to ease the human condition, and in many ways, this has been the case, as Ayn Rand has most vociferously noted [17]. However, the pervasiveness of the market has wed

technologic time- and cost-efficiency to end-goals of (1) increasing economic gains and (2) minimal loss of fiscal, physical and temporal resources. In these ways, the market-model has come to define much of the use of technology according to an ethic of profit. Far too often, the market-model mindset, business ethic and ethos dictate what and how technologies are studied, developed, marketed, and utilized. These market forces can be both economically and politically driven, and as a result, the value of research to define the various benefits, burdens and harms of biotechnologies is lessened. This can (1) "sidestep" the discriminative, intellectual integrity of science, (2) advance particular scientific findings and agendas, (3) subvert knowledge, and thereby (4) compromise, if not denigrate the humanitarian and fiduciary aspects of science.

5. BioSoMa, *homo faber* and the new biotechnological imperatives

In light of this, we believe that it is critical to re-define Lenk's notion of the "technologic imperative" so as not to merely develop and use technology, but to understand how such technology works, and how it could best be used to achieve social good. Rather than becoming bound by the inherent tendency for progress, which in the post-industrial age translates into technophilism, this new imperative must acknowledge and comport with a rational understanding of how our biology gives rise to, and is affected by the intersecting artifacts of society and machination – what is referred to as BioSoMa by Buglariello [18], so as to heed Arendt's [19] invocation that we embrace our strivings as *homo faber* – master of our work to provide a stable world in which humanity (in its intellectual and moral virtue) can develop and thrive, rather than being enslaved by labor and its artifacts, as *animal laborans* – distinguished by its non-reflective (if not financially driven) character. For Arendt the economic priorities of the post-industrial age and the new technocracies have oppugned the pursuit of higher ends as proper moral and practical concerns.

Granted, *homo faber* also produces the artifactual – creating a world distinct from nature by shaping and transforming it according to the needs, desires, and plans of humans. But it is the intellectual recognition of artifacts as the product of labor, and the moral regard that is focused both upon the activities and artifacts, that upholds the construct of *homo prudentia* – engaging the practical wisdom to use such tools and knowledge in ways that are "good".

To be sure, the work of biotechnology is no longer dictated solely by necessity, but rather is directed by inquisitiveness and desire, and thus can be governed by human intentions and motivations. But for Arendt and others, the self-reflective and self-deterministic capability of *homo faber* is endangered by the tide of the socio-political.

In this way, we are at risk of being overwhelmed – both individually and communally – by the speed, and potential uses and/or misuses of technological advances and scientific information. Indeed, Arendt asks on what basis will we be able to evaluate and judge those things that we produce (or which evolve) at the trans-, and post-human frontier that might be unprecedented, or incredible, and which defy our established understandings and experiences. Toward this end, Arendt suggests a form of Kantian "reflective judgment" [19] which we believe could be operationalized within our call for a process of periodic reflective pause during which some governance and (re-)direction of technological imperatives may be formulated. Such reflective judgment acknowledges the asymmetrical relationships we have with others, and attempts to proceed from this perspective – appreciating what is shared and not shared – and in so doing seeks to move away from an egocentric concern for our own interests. While seemingly ideal, we pose the question of whether this perspective will not only be possible, but will become obligatory as biotechnology provides greater insight and access to the consciousness of others. For Arendt, this 'representative thinking' occurred through the use of imagination as a hermeneutic tool with which we could "...think with an enlarged mentality ...that one trains...to go visiting" [20]. Indeed, it may be that the very biotechnology that leads us to the frontiers of trans-, or post-humanity will provide the tangible tools to enable a "pan-psychical" mentality, visit other consciousnesses, and gain access to the exigencies of other selves. The constitutive cultural paradox inherent to this mid- to long-term perspective is that the technological and (anti-essentialist) trans- or post-human worldview could unwillingly pave the way for a new "spirituality" – even if this "spirituality" (1) is unintentionally being generated from a fundamental ambivalence of unknown dimensions and depth, and (2) might stand on anthropologically, socially and individually insecure ground.

6. The need for dialogue and inclusion in contemporary "Paradigm Work"

To assume that access to the mentalities of any/all "selves and others" will be a basis for instantiating a homogeneous social milieu once again fails to account for the durability of market influences upon social stratification and polyglot values. The challenges are to recognize the impact and limits of the market in, and upon the scope and influence of socio-cultural values, and integrate these factors into a meaningful appraisal, and reflective governance of the potential future effects of biotechnology. Toward these ends, we call for a proactive acknowledgement of BioSoMa that is conjoined to an understanding of our history, who we are, and the projections of who/what we want to become in the future.

We seek to ground studies and pursuits of neuroscience, genetics and nanotechnology in the premise that reducing the human to the merely biological prevents us from taking into account the rich psycho-socio-cultural and spiritual (i.e., introspective) tapestry of human experience [21] and interpretation of the natural environments in which humanity is nested. Thus, while mathematical trends in the growth and applications of technology, and statistical inference regarding the correlation of one event to another are perhaps useful in futurological forecasting, they remain insufficient for any realistic prediction, as the effects and influence of social values and tendencies, as well as the experiences of introspection and

consciousness, must be figured into the calculus, even if these are often difficult – if not impossible – to "scientifically" determine from within the limits of conventional modern science.

As Latour has noted [22], science (alone) does not provide answers, but only extends the horizon of uncertainties. The goal therefore is to more fully appreciate the possible trajectories that lead to these horizons, and to practically and ethically assess the limits and limitations of our actions at the margins of uncertainty. Such a complete account necessitates integrating philosophical, anthropological, sociological and theological (i.e., religious as well as "spiritual") perspectives with those of (geno-, nano-, and neuro-) science, to more fully elucidate the basis of our experiences, cultures, beliefs, and being, and afford better perspective on the possibilities of the future.

However, such a broad scope of reflection will also need to be balanced, as different fields of inquiry view these questions and issues through rather different lenses. The assumptions, orientations, and limitations that each area of expertise brings to the discussion must be made explicit so that each and all can participate as equal members in the discourse. In this way, no one perspective can assert any particular dominance over the others. Thus, while inquiries into the nature of being and the issues that arise from this perspective are often ascribed to the "most scientifically valid approach", it remains equally important to weigh any evidence on its overall value relative to what makes information "best" for science, healthcare, public policy, law, society, religion, and human self-understanding and self-determination.

We believe that the pursuit of such thorough and balanced reflection can be called, in one word, "ethics". Ethics, under the conditions of the present "trans-human(ist)" cultural and civilization transition will no longer remain a pre-determined worldview, but will be defined as the search for balance and inclusion. In other words, in the framework of the current "global mindset change" (see Rakesh Kapoor and Jennifer Gidley in this special issue), ethics develops from a qualitative attitude in the field of action (action theory) toward a combined qualitative–quantitative attitude in the field of systemic interaction (systems' theory).

The fact that we may have to revise the way we approach and enact ethics does not infer that scientific research and technological development should be suspended until some over-arching philosophical understanding or socio-ethical consensus have been reached. On the contrary, we feel that any such call for abatement of scientific and biotechnological advancement would be counter-intuitive, counter-productive, and hence un-realistic. Instead, we maintain that this proposed process of reflection, discourse, and dialectic must be an ongoing and sustained process that encourages self-evaluation, self-criticism, and self-revision of the ideas and applications themselves. This compels a broadening perspective that acknowledges and responds to the strengths and limitations of extant knowledge, and more clearly defines the nature of flourishing, good, and responsible conduct – both toward humanity and other species, as well.

But we must ask whether this, in the form of the never-ending, continuously constitutive "humanistic" self-inquiry and self-critique of the rational mind, is a return of the "humanistic" self in ontologically negative forms and manners. We cannot deny that it could be, and that humanism will be resuscitated in ways that we have not foreseen (or anticipated) thus far. If this is the case, we opine that the "new humanism" will be explicitly vested to the quality and process of inquiry, rather than some extrinsic and arbitrary definitions of "identity" and "the good" [23,24].

If the pathway forward is through inquiry, then it is necessary to integrate scientific efforts with trans-disciplinary discourse that aims to (1) shape ethical conduct in research, practice and social domains, and (2) ensure and direct applications of scientific developments toward realizing and sustaining the public good. Such tasks are not simple, and to address them requires an open exchange of ideas among groups of scholars from the sciences and humanities to provide insight to the philosophical premises, ethical issues, and pragmatic realities that dictate social change.

7. The three monisms of our epoch and the twofold perspective

As we have attempted to illustrate, the transition to a trans-, or post-humanistic condition of modernity entails an immensely complex cultural change, ridden with deep contradictions and ambivalence. In reviewing the principal mindset change involved with this transition, it is important to note that it is shaped by the paradigmatic tensions between three cognitive monisms. These monisms sustain public discourses or cultural rationalities which at present, are rarely able to engage in meaningful dialogue, but rather compete with each other for intellectual hegemony, without noticing the relative legitimacy that each possess. All three monisms attempt "true" interpretation of science, and all three seek to provide "human culture" with a new anthropology that will chart the course to the "next stage" of humanism. With this claim, all three influence our self-concept as human beings in a one-sided way. We posit that the more the monisms conflict, the greater the risk that each may become an isolated ideology. These three monisms are:

(1) *Materialistic objectivism* is based upon the assertion that the "essence" of the human being is its material substrate, and that everything else, including consciousness and the "I", are causal derivates.
(2) *Transcendental objectivism*. In opposition to the monism brought forward by the followers of a new "natural paradigm", there is a renaissance of pre-modern and pre-humanistic theories regarding the essence of the human being as a "purely immaterial" or "spiritual" being.
(3) *Empirical subjectivism*. A third monism is dedicated to the experiential primacy of subjective consciousness. The argument is that every materialistic assertion of fact is ontologically dependent on an active stream of self-aware consciousness (or an "I") that creates the concepts of "self"-hood.

In the larger view, one could assert that in general most of the "postmodern" paradigms (including those of the social sciences and the humanities) follow empirical subjectivism, whereas most of the natural sciences (including empirical psychology) follow materialistic objectivism. Most of the confessional religions, including some domains of modern enlightened theology (which are of critical importance to the public discussion about the origin and the wishful future of the human being) tend to follow some form of transcendental objectivism. The schisms and dissonances that exist between these monisms and their respective sciences remain one of the most powerful driving forces within, as well as one of the most obvious symptoms that encumber, the current "global mindset change".

Can we prescind so as to gain better perspective of these monisms, both individually and together as force(s) affecting social change? In order to effectively appreciate the profoundly, self-referential enigma of human consciousness [25], it will be necessary to build a more dialogical and dialectic paradigm. Such an "inclusive" paradigm must:

(1) attempt to integrate the material (materialistic objectivism), transcendental (transcendental objectivism), and the introspective approach (empirical subjectivism), with acknowledgment of strengths and limitations of each of their different methodologies of inquiry for studying and validating the existence of their respective dimensions;
(2) recognize the principal value of all three monisms, but must add borders of legitimacy to each; none of these monisms can or should claim hegemony, because none can effectively account for all aspects and dimensions of consciousness and ontology.
(3) synergize the potential of each monism to mutually complement and thus enrich each other, without crossing the borderlines of competences.

We believe that in order to achieve this balanced paradigm, co-terminal development in two intellectual and practical domains will be necessary: (1) defense of *societal paradigmatic pluralism* (subjective *or* objective), and (2) the search for a new, *multidimensional and structured cognitive monism* of paradoxical and inclusive shapes (subjective *and* objective).

In sum, we opine that it will be the *synchronic combination* of the defence of societal pluralism, coupled to the search for a new cognitive monism, even if it implicitly entails a differentiated complementarity, that can bring these paradigmatic tensions toward some resolution. It is, in the end, a "double strategy" that combines dialectic with inclusion.

8. Conclusion and outlook: toward a more inclusive cultural paradigm?

What conclusions can we draw from our reflections?

First, we believe that a global mindset change is occurring at the interface between technology and society; *second*, this change is based, at least in part upon attempts to re-define the "essence" of the human being; *third*, this re-definition of the human being constitutes the end of traditional humanism, as we know it; and *fourth*, the three aforementioned monisms compete with each other, but this tension has not been wholly productive to date in generating a paradigm for cooperation or alignment.

Perhaps the most durable question that will arise from this potential mindset change is whether a re-defined ontological construct of humanity based upon the work of genetics, biotechnology and neuroscience can be the first stage of a new more inclusive, experiential and empirical humanism of the future. If so, this transformation could result in the enlargement of our understanding of what it means to be "human", and what this could mean for our societal and cultural self-concepts.

As we have tried to show, such a "new" humanism rising from the ashes of the "old" is only possible if we invest our energies into a more inclusive cognitive and cultural paradigm. We believe that the task ahead is to unify the three monisms of our time, and this is can only be accomplished if we recognize that all three must be regarded as viable in principle, but as uni-lateral contributions to the enigma of being. By considering each and all as valid, and restricting the three monism to their respective "boundaries of legitimacy"(Juergen Habermas), we may have purchase to enable a new, cognitively resonant, yet socially diverse cultural paradigm.

We think that at very least, there is room for some hope. In the end, it is our obligation to use neuro-, geno- and nanoscientific information prudently, and take responsibility for our intentions and actions. Irrespective of the mechanisms and activities of the brain, we argue for a role for the self-conscious mind, in sustaining our capacities as *homo faber* and *homo prudentia*. What else could make sense? What else would correspond to our implicit and explicit convictions, ontological reality and experience? Will we reductively look to "the brain" as the source of decisions regarding what we are, and of how we should live – or are these decisions at the disposal of our rational, self-conscious, self-critical, and embodied "I"'s?

Answering these questions on a purely experiential basis, it is inevitable for the reader to discover that the basic principles of "humanism" are still alive, not because they are posed as ideological necessities, but simply because they are given realities that can be verified by the very act of reading and understanding these lines here and now. In these terms, the very act of reading these lines and asking these questions is a form of "humanism" at work. As a direct, yet at the same time immensely complex act of self-consciousness, it affirms the validity of the ontologically real "I", and substantiates both the subjective self and its material substrates. What else could be the origin of more hope than this?

Questioning the future implies an ontological status "I": only this being is able to experientially know its past, feel its present, and question its own future. The very act of wondering about the future of the human being and "being human" is an affirmation of the role of human consciousness, as well as that of "the brain". As long as we maintain the value of the subjective "I", and do not subordinate the importance of the subjective self in the process of engaging technology,

understanding brain function, and of moving toward some semblance of the "trans-human", then options of interpretation, decision, and action will remain. Perhaps this is how we must define the rebirth of humanism.

So in conclusion, it may be that we cannot escape the return of humanism, in our time, in our future, and in our doing, simply because there is always a self-conscious "I" that is the origin, and the end of all our questions, perceptions, and desires. It is this recognition of the conscious "I", and the regard for "self" and other selves that it imparts that is a source of hope as we stand before the unknown possibilities of a "trans-" or "post-human" future [26].

References

[1] Compact Oxford English Dictionary: Humanism, Oxford University Press, 2007.
[2] G.W.F. Hegel, Phenomenology of Spirit (1807). Translated by A.V. Miller. New York 1998.
[3] G.W.F. Hegel, Phenomenology of Spirit (1807). Translated by A.V. Miller. New York 1998; E.v. Hartmann: The Philosophy of the Unconscious. Rostock and Berlin 1869.
[4] K. Popper, The Open Society and its Enemies, Routledge, 1945 (reprint 2006).
[5] B. Obama, Remarks at the Signing of the Executive Order and Presidential Memorandum Altering the Rules on Stem Cell Research, The Washington Post, 2009 March.
[6] M. Urban, Warum der Mensch glaubt. Von der Suche nach dem Sinn,(Why the Human Being Believes. The Search for Meaning), Piper, Berlin, 2007.
[7] K. Warwick, I, Cyborg. University of Illinois Press, IL, USA, 2004.
K. Warwick, The matrix—our future? in: C. Grau (Ed.), Philosophers Explore the Matrix, Oxford University Press, New York, USA, 2005, pp. 198–207.
[8] H. Lenk, Technokratie als Ideologie. Sozialphilosophische Beitrage zu einem Politischen Dilemma, Kohlhammer, Stuttgart, 1973.
[9] G.W.F. Hegel, Phenomenology of Spirit (1807). Translated by A.V. Miller. New York 1998.;
J. Searle, The Mystery of Consciousness, New York Review Books, 1990.
J. Searle, The Rediscovery of the Mind, MIT Press, Cambridge, USA, 1992.
[10] D. Haraway, When Species Meet, University of Minnesota Press, Minneapolis, 2007.
[11] F. Fukuyama, Our Posthuman Future: Consequences of the Biotechnology Revolution, Farrar, Straus and Giroux, New York, 2002.
[12] B. Clarke, Posthuman Metamorphosis: Narrative and Systems, Fordham University Press, New York, 2008.
[13] S. Michel, Golden eagles and the environmental politics of care, in: J. Wolch, J. Emel (Eds.), Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands, Verso, New York, 1998, pp. 162–183.
[14] R.Z. Hawkins, Ecofeminism and Nonhumans: Continuity, Difference, Dualism, and Domination, vol. 13, Hypatia, 1998, pp. 158–197.
[15] L. Kalof, The human self and the animal other, in: S.D. Clayton, S. Opotow (Eds.), Identity and the Natural Environment: The Psychological Significance of Nature, MIT Press, Cambridge, MA, USA, 2003.
[16] A.L. Peterson, Being Human: Ethics, Environment, and Our Place in the World, University of California Press, Berkeley, USA, 2001.
[17] A. Rand, Philosophy—who needs it? Signet (1984).
[18] G. Buglariello, Biology, society and machines, American Scientist 86 (3) (1998) 230–232.
[19] H. Arendt, Human Condition, University of Chicago Press, Chicago, USA, 1958.
[20] H. Arendt, Human Condition, University of Chicago Press, Chicago, USA, 1958, p. 33.
[21] J. Gidley, The Evolution of Consciousness as a Planetary Imperative: An Integration of Integral Views. In: Integral Review 5/2007, http://www.scribd.com/doc/7797506/Gidley-Evolution-of-Consciousness-as-Planetary-Imperative-5-2007.
[22] B. Latour, Pandora's Hope: Essays on the Reality of Science Studies, Harvard University Press, Cambridge, USA, 1999.
[23] R. Benedikter, Italienische Technikphilosophie für das 21. Jahrhundert,(Italian Philosophy of Technology for the 21st Century. Series Problemata 145), Frommann Holzboog Verlag, Stuttgart, 2002.
[24] Cf. R. Benedikter, Wer ist der "rettende Gott"? Das Doppelantlitz der Technik am Beginn des 21. Jahrhunderts (Who is the "Future God"? The Constitutive Ambivalence of Technology at the Beginning of the 21st Century). In: Kulturzeitschrift "Die Drei", 72. Jahrgang, Heft 8-9/2002, Frankfurt am Main 2002, pp. 53–74.
[25] C. McGinn, Consciousness and Its Objects, Oxford University Press, NY, USA, 2004.
[26] R. Benedikter, Global Systemic Shift. The "Three Ends" of our Epoch and their Perspective in the Interplay between the four system spheres Economics, Politics, Culture and Religion. A 2007 Lecture at the Future of Humanity Institute, Oxford University: http://www.fhi.ox.ac.uk/events/roland%20benedikter%20abstract.pdf.