PHILOSOPHICAL PRESUPPOSITIONS
OF PRODUCING AND PATENTING
ORGANIC LIFE

Rafael Capurro

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Introduction

A phenomenological approach to the question of artificially producing and patenting organic life may make more plausible why, on the one hand, this question is possible and legitimate and why, on the other hand, we should not give up the efforts to perceive and draw limits to modern technology. Such limits may appear less arbitrary if they arise from an insight into what seems to be unbalanced as soon as a broader perspective is taken into consideration. Phenomenology is related to empirical research insofar as it intends to clarify conceptual differences on the basis of what appears to make a difference. Its main utility is of the kind to make us aware about what sometimes remain hidden when one perspective is highlighted (1).

The question regarding the production of organic life has roots in Greek philosophy. Plato postulated a division (chorismos) between the physical and the metaphysical, i.e., between the place where sensible objects are located and sensually perceived (topos aisthetos) and the eternal world of ideas (topos noetos). Usually the difference between the Platonic and the Aristotelian conception of this division is characterised by the sense that Plato conceived ideas (idea) as having a higher kind of reality while Aristotle postulated a knowledge process wherein such forms or essences (eidos) were mentally abstracted from natural beings (physei onta). Both conceived the nature of numbers (arithmos) as well as geometrical figures as separate from natural beings (2). In his Physics Aristotle makes a detailed analysis of the nature of numbers and points (3). His thinking on the difference between natural beings (physei onta), points (stigme) and unity (monas) can be summarised as follows:
- Natural beings: are determined by unity (hen), place (topos), and position (thetos)
- Points: are determined by non-place (atopos), position (thetos) and contact (syneches, continuum)
- Unity: is characterised by non-place (atopos) and non-position (athetos)

In other words, there is a removal of points and numbers from natural beings and of their perception. While points and geometrical figures can be sensibly perceived (aisthesis), numbers are only accessible through conceptual reason (logos, nous). This also means that human beings are not only able to perceive in a pre-determined way the natural world, as in the case of all other living beings deprived of reason (alogoi), but also to construct a world of meaning through which we may grasp beings in their being, as well as produce artificial beings on the basis of ideas. Although Aristotle was concerned with the process of abstracting points and numbers from natural beings, his thinking was logos-oriented (4). Greek physis refers to the process of what unveils or generates itself and whose origin (arche) is therefore not within the power of human beings (5). But at the same time there is the mythical and Platonic conception of a divine cosmic builder (demiourgos), a kind of pottery god that produces things in a way similar to the human use of techne, although much more perfect (6). In other words, the Greek concept of physis is twofold. This view of nature changes in Modernity as nature is conceived within the possibility of human mathematical calculation. These kinds of world-view changes are called "paradigmatic" after Thomas S. Kuhn (7). Paradigm shifts are not only of an epistemological but also of an ontological nature. The concept of ontology is now used with regard to the human capacity of world construction on the basis of the awareness of
I. A Phenomenology of Organic Life

Natural beings, including human beings, are generated by a process whose *origin* retreats itself in the very process of its disclosure. Thus it is not possible to get a complete explanation of what naturally comes forth. When considering nature we usually take the evolutionary viewpoint starting from the less complex and looking for the qualitative changes of what is or was already there. The *place* of such processes of natural disclosure is usually called the *world*. Non-living things, a stone for instance, are no less in the world as a stem cell, a dog, a computer, a work of art, a human being or a political party. But at the same time we intuitively grasp that there is a difference concerning the ways things are in the world. Although living organisms in general and human beings in particular are open to the *groundless ground* that gives them their being, in the sense that they are delimited by coming-into-life and going-into-death, they do not relate to it – as far as we know – in the same way. Human beings are aware of this coming-forth and of the groundless ground that generates them. This makes them responsible for their own being in the sense that they must accept that they cannot simply do what they want due to the fact that their will and knowledge are basically finite. To want the impossible was called by the Greek *hybris*. The problem is that we often do not know if, for instance, the consequences of our actions may create an *impossible situation*, i.e., a situation in which our own being is headed for its destruction. It is not only existentially but also logically impossible that a will can will and not will at the same time.

These few remarks on the *condition humaine* give us a hint concerning the specificity of our being-in-the-world. Instead of being to a great extent bound to our own as well as to other natural beings, we are in a position that allows us to grasp what comes forth as what it is and to be able to behave according to it or not. In other words, we are open to a field of possibilities before we explicitly address things as this or that. If we use the term *world* not as synonym for the planet earth but for this very specific kind of *free relationship* that allows us to weave a network of relations between ourselves (and our selves!) as well as between the things surrounding us or produced by us, we may find it plausible to call, as Heidegger does, the way human beings are as "world-forming" ("weltbildend"), while animals are "world-poor" ("weltarm"), and a stone is "worldless" ("weltlos") (9).

"World-poor" means, on the one hand, that we can shift into the world of animals but not vice versa. This asymmetric relationship makes the difference with regard to our being with other human beings with whom we originally share a *meaningful world*. We can make this kind of assertion about animal life only *ex negativo*. But, on the other hand, "world-poor" does not mean, as Heidegger remarks, "that life ("Leben") with regard to human existence ("Dasein") is of a poorer quality or a lower level. Rather is life a field with an own richness of openness that probably the human world does not know about." (10) Heidegger describes this peculiar openness of animal life as a *drive* ("Trieb") – usually we call it *instinct* – to loose inhibition and remain basically in a dazed state ("Benommenheit"). In other words, animals and more generally, organisms are primarily characterized neither by a multiplicity of parts or organs (Greek *organon* = instrument) nor of *isolated* drives, but by the *unity* of a "ring-like" structure (11). "World-poor" means that organisms do have an openness but that this openness is *not* of the kind of human world-openness. "Poor" means this "not having" a world on the basis of having their own kind of
dazed ring-like openness.

According to Heidegger, this (by no means exhaustive) concept of organic life says more about ourselves than about organic life itself as it is basically negative, starting from our own way of being. Thus he makes a distinction between an indifferent "not-having a world" and a qualitative assertion about "being world-poor." Organisms "lacking a world" is a "negative" assertion that can only be made with regard to a philosophical "positive" pre-view of human life as being-in-the-world (12). To be (in) such a "world-poor" disclosure also means that non-human animal life lacks the possibility of a relationship with what makes its coming-into-existence as a "des-inhibition within a ring-structure" possible, although this process may provoke a "basic shutting" ("wesenhafte Erschütterung") (13).

An organism is not merely constituted by the sum of its cells but by a specific kind of unity that is different from the unity of an instrument ("Zeug") or of a machine ("Maschine"). In other words, Heidegger critizises a pure mechanistic conception of organic life. An instrument is related to its possible use within a whole network of relationships ("Bewandtniszganzheit"), i.e., on the basis of a plan. A machine is an instrument whose structure is a sequence of autonomous movements (14). An instrument refers to a capacity ("Fertigkeit"), an organ to a capability ("Fähigkeit"). Eyes are, consequently, not just instruments installed in the heads of animals. They belong to an organism in the sense that they are generated by the capability of an organism. An instrument may acquire a capacity, an organism as "the being-capable-of' provides itself with organs" (15). The capability of an organ concerns its "usability" ("Diensthaftigkeit") in contrast to the "utility" ("Dienlichkeit") of an instrument. An organism produces itself and its organs on its own. It guides or lives by itself and regenerates itself within certain limits. There is nothing like a drive to hammer in a hammer. An instrument as well as a machine are produced by a human inventor, they need operating instructions for their use and they cannot repair themselves (16).

This is not a plea for Aristotelian entelechy or for vitalist philosophy. It is just a phenomenological insight into the difference between natural genesis and technological production. The priority of the capability in relation to organs has been recently discovered with regard to stem cells (17). Finally Heidegger points to the difference between organs and instruments not only with regard to the place and the way of their generation or production but also with regard to time: "In the case of organs it is indeed not indifferent how long they exist and when they are generated." (18) They do not relate to the living time of a particular organism, but to their life-time capability.

The capability to be "world-poor" is a condition of possibility for the generation of organic life. This is, a fortiori, the case of a "world-forming" being. We are indebted, in other words, to the world-openness itself for being the kind of beings capable of corresponding to it. Our organs are therefore not just of the same kind, as they are embedded within another kind of capability that Heidegger calls "behaviour" ("Verhalten") in contrast to animal "dazed state" ("Benommenheit"). At the same time there is not a fundamental division between being human and other non-human organic life as far as we are also inserted in the "ring-like" structure of "living nature" "which holds us as captive in a very specific way." (19) This is also the reason why we are able to behave ecologically (or not), i.e., to develop a kind of thinking that allows us to correspond to the capabilities of natural beings. If we are free to do this, it is because we are able to co-respond to the call of the world-openness or indeterminacy itself which is indeed a finite call as we are aware of our natality and mortality. In other words, a phenomenological approach is both transparent.
II. Technology within a Phenomenological Context

The computer is not just a technical device among others but a kind of pervading and fuzzy framework that influences not only our scientific methods, but also our everyday life. Being human is becoming more and more a matter of being online. As scientists we live also in a digital environment in the sense that we use the computer as a basic device through which we grasp and transform our research objects. We believe we understand these objects when we examine them not just with regard to their mathematical calculability but also with regard to their digitability. What is, is potentially digital. Esse est computari. This does not mean necessarily that non-digital objects become digital ones, but that the way we look at them, i.e., the way we cast their being is based on digital technology. The origin of today's digital casting of being goes back, as I have shown, to the Greek conception of numbers and points as separated or abstracted (chorismos) from natural beings (physei onta). The peculiarity of digital information technology is the information of numbers and points in the electromagnetic medium (20). This means that when we project natural beings within the digital horizon we displace and may even replace them by points and numbers that we inscribe or programme in the digital medium, the computer. There is a difference between digital ontology and digital metaphysics. From a metaphysical point of view, the real is the digital and vice versa. Digital ontology concerns our understanding of being. We believe that we understand something in its being when we are able to project or pro-gram it digitally. Digital ontology is not the only possibility of grasping beings in their being, but it is, I believe, the dominating view today.

If we take the view of the object from its possibility of being-digital and programmable, the properties of the object and consequently of the subject are reduced to numbers and points within the electromagnetic medium. Some results are, for instance, genetic data banks or the idea of reprogramming adult stem cells. But the issue is more basic. It concerns a paradigm shift within biology insofar as the concept of genetic information becomes a leading one. I call this view of nature a postal paradigm – which is related to a science of messages or angeletics – since it is based on the idea of (non-human) messengers passing-by different kinds of codes. Indeed the whole organism is viewed as processing the genetic code. This means in some way a dissolution of the modern subject at least as far as they may conceive themselves as a product – and not any more as an a priori condition – of their own genetic and digital techne (21). It seems as if post-modern subjectivity is looking for a solution of this dilemma.

This is indeed a legitimate perspective but it is not the only one, and indeed it can lead to disregard for other perspectives or a looking at them from this viewpoint alone. It is our choice to challenge the dominance of an ontological perspective particularly when it becomes a dominating one. This is not just because other legitimate perspectives may not be perceived or may even be considered as illegitimate, but also because the very fact of our openness to indeterminacy as such – what in the modern tradition was called human freedom – may not be seen as our unique way of being. This challenge of an ontological perspective may lead to radical changes in the way we design our individual and social life. Examples of such changes of ontological perspectives and of their practical consequences are for instance the shift from a metaphysical and theological conception of being into a mathematics-based conception of nature in modernity or the influence of dialectical materialism in the last two centuries. The predominance of an ontological perspective does not mean that every scientist or even every individual actually shares it.
Newton's conception of nature was highly influential for centuries although only a few people understood his theory. The influence of an ontological paradigm is more of a general atmosphere that pervades a whole culture or epoch.

I would like to suggest a phenomenological view of this technological paradigm within other dimensions by considering:

- Natural beings, i.e., what comes forth out of what unveils itself (physis) disclosing "worldless," "world-poor" and "world-building" beings
- Human beings, i.e., natural beings capable of building a world and co-responding to the world-openness that constitute their own being as coming-into-the-world (natality) and going-into-death (mortality)
- Technology, i.e., human knowledge (techne) on how to produce artificial things including the possibility of transforming natural ones
- The Divine, i.e., a dimension beyond human natality and mortality, nature and technology
- The world-openness, i.e., the (finite) place where the other dimensions unveil themselves

We may consider the predominance of, for instance, the dimension of the Divine or of nature (physis) in Antiquity and the Middle Ages, or the humanistic view since Modernity. But this is not a plea for any kind of philosophy of history based on such a paradigm shift. Instead, we may look at the different possibilities of projecting every perspective within the horizon of one of them leading to, respectively, naturalism, humanism, technocracy – or, in the case of information technology, cyber-gnosis – and religious fundamentalism. The world-openness itself as the finite space-time of our existence that allows us to criticize such one-sided perspectives not by negating one or all of them – what we could call nihilism – but by considering and respecting them in their own way of being. In other words, this phenomenological view is not a view, as it may prima facie look like, of the whole of reality, i.e., it is not a metaphysical view, but just a relative view of the tensions between nature, humanity, technology and the Divine.

I believe that such a relative view is only possible if we let the middle of these four dimensions, i.e., the world-openness itself, as a finite openness, i.e., without filling it with any one of the other dimensions. The philosophical tradition of modernity has called this finite dimension freedom and human dignity. Within this phenomenological context such concepts are not based on a religious or metaphysical basis but on our being able to correspond to the world-openness that constitutes our lives. Within this perspective human beings cannot be treated just as objects not primarily because they are subjects, but because they are given as this world-openness itself which is the condition of possibility for the encounter of an object and a subject.

With today's predominant digital ontology – in case my perception of this phenomenon is correct – we have to do with a perception of nature, including our own being, that has its roots not only in Greek chorismos-thinking about the nature of numbers and points and their abstraction from natural beings (physei onta), but also in the modern conception of human being as a subject capable of constituting (empirical) objects as its epistemological objectum proprium, i.e., as the basic structure that determines our knowledge and its
The process of producing artificial beings was called by Aristotle poiesis and the knowledge how to produce them techne. Aristotle made also a difference between poiesis and praxis, i.e., between the process of producing artificial beings and the process of human action whose finality remains within the acting person. The specific kind of knowledge corresponding to praxis was called by Aristotle phronesis which can be translated as prudential or ethical thinking in the sense that human action is not concerned with what is necessary or absolute but with what is possible within the realm of what is supposed to be the best for human existence as a whole (ta anthropina, eu zen) (22). Aristotle makes a difference between the kind of technical reflection with regard to the possibilities of human action (techne ethike) and the customs or rules that actually constitute the moral life (ethos). To know the good is not the same as to be good, which is indeed the final purpose of ethics as a reflection on morality (23).

With Descartes' ego cogito and Kant's transcendental subject, modernity makes a turn with regard to Greek and Medieval ontology. According to Kant, the conditions of possibility of experience are at the same time conditions of possibility of the objects of experience (24). Kant himself draws a theoretical and a practical limit to modern subjectivity. The conditions of possibility of experience are not "the" but just "conditions of possibility" of the objects of experience. There is a balance between the conception of what is given – a vague remembrance of Greek physis – and the active part of the human subject. This corresponds to the difference between an original intelligence ("intellectus archetypus") and a derivative one ("intellectus ectypus") (25). The second limit concerns the practical dimension. While the utilitarian and naturalistic view aims at balancing objects and their properties with regard to the well-being of the subject, Kant postulates a measure that is indeed inside the subject but at the same time beyond a person's will. A person's moral (and mortal) destiny is therefore coupled with an imperative that categorically states that their being is not identical with their empirical nature ("homo phaenomenon") but has a specific dignity ("Würde") or an "internal value" ("innerer Wert") and not just a price ("Preis") as far they, as homo noumenon, are part of a transcendent (not just transcendental) community ("Reich der Zwecke") (26). In other words, the concept and the reality of being human is twofold, according to Kant. There are traces of this Kantian dualism for instance in the German Constitution (27).

We are indeed able to co-respond and therefore to be responsible with regard to nature, the Divine, technology and to our own (natural) being. Considering ourselves through technology, i.e., through the intellectual process of producing objects, we become (and became!) subjects. Considering ourselves with regard to nature, we become (and became!) natural products. Considering ourselves with regard to the Divine we become (and became!) God's creatures. But, indeed, we may thus overview the very fact of our own existence (vita humana) as a life-span of open possibilities that makes of us finite world-builders and therefore responsible for our lives. Neither the world nor the other dimensions are just the product of our productive knowledge (techne). To treat them just as such is unethical because to will this would mean the destruction of what comes forth from itself, which includes our own being as natural beings. In Kantian terms, this is something we cannot will because in this case the will would destroy its own conditions of possibility (28). To will the impossible is, in other words, hybris. The project of Modernity is not of the kind that it may provide by itself a kind of "orientation knowledge" beyond instrumentality (29).
III. Legitimacy and Limits of Producing and Patenting Organic Life

The constitution of the *modern subject* makes possible that invented objective *properties* or methods for producing natural or artificial objects may also become private *property* of the subject. The copyright and the patent system are, in other words, modern systems. We look at nature, including our own, within the horizon of technology and today digital technology in particular. In order for an invention, a method or a product, to be protected by a patent with regard to its possible commercial exploitation, the inventor must create a difference with regard to what is *naturally* there, i.e., to a discovery. Other criteria concern the novelty of the invention as well as its industrial application. In other words, inventions concern the artificial.

According to Negrotti (30), the artificial is not the opposite of the natural but of *anything* that is considered an *original* and with regard to which changes in its structure and/or substance are undertaken. Such an original can be, for instance, a technical device, a living organism, or a natural organ. In this last case we can artificially transform its capabilities into capacities of an instrument. And we look correspondingly at its utility instead of its usability. We can, on the one hand, interfere in a natural process in medicine, agriculture, forestry, cattle breeding... having nature as the horizon of our action. But we also can, on the other hand, consider natural processes within a technological context.

What is ethically *problematic* about this technological transformation and dislocation of organic life in general and about the question of patenting it in particular? I use the word *problematic* in the Kantian sense. According to Kant *problematic concepts* are those whose object we cannot know about. For the kind of questions arising from them there is no solution (*"Lösung"*), but only a dissolution (*"Auflösung"*) of the problem, i.e., a basic distinction like the one between the empirical and the transcendental (31). There are two problematic concepts related to the question of the artificial production of organic life:

1. Non-human natural organisms and organs as artificial products
2. The human body and human organs as artificial products.

The idea of a natural being as an artificial product is indeed a problematic one insofar as we have no possibility of artificially producing natural beings *as such*. We can just transform in a more or less radical manner natural organisms or their organs, creating artificial ones or, of course, to produce all kind of artificial products, similar or not to natural ones. In other words, the concept of an artificially produced natural product is an oxymoron. The reason for this is that neither are human beings the original producers of natural organisms nor can we get, consequently, a knowledge (*techne*) about their *own* origin. To paraphrase Heraclitus's famous aphorism, nature constantly retreats into itself in the very moment of its space-time disclosure (32). A "dissolution" of the antinomy between the natural and the artificial or between nature and human *techne* on the basis of a radical dualism between both spheres is itself problematic insofar as the real and clear boundaries become blurred in some cases and transparent in other. In other words, it may be difficult to see the difference that makes a difference between the artificial and the natural. Thus, the dissolution of the antinomy remains often a conceptual one without *fundamentum in re*. 
The transformation of natural organisms may also concern the process of isolating them from their natural space-time context. The transformed product as well as the methods for its transformation and dislocation can be object of a patent. How far will these transformations distort, for better or for worse, natural balances? What are the consequences concerning our sensibility for natural organisms and processes? Both questions are the core of ecological arguments. How far may patents on artificially transformed natural organisms or parts of them create new incentives for industry or increase tensions and inequity between rich and poor? There are no overall answers to these questions.

They become even more crucial with regard to the question about the artificial production and patenting of the human body and its organs. The idea of producing artificially a human body is, even more than in the general case of natural organisms, a problematic concept. Nevertheless the concept of cyborg has a strong influence – beyond science fiction (33). The body is the primordial medium of our being-in-the-world. We can only in a derivative way take a distance from it and make it an object of research within, for instance, the digital casting, isolating it from the original being-in-the-world-with-others or life-world. This isolation is the precondition for its commercialization, as in the case of slavery. Human will cannot universalize this maxim without implying its own dissolution. A purely objective view of the human body oversees the way in which humans as "world-builders" bodily share with others the space-time openness of a common world.

The instrumental view of human organs is one of the most controversial points in the present bio-ethical debate. This concerns, for instance, the question of organ transplantation and recently the question of the production and use of human embryos for different purposes other than natural ones. Human embryos are our natural origin and they are embedded within our social and sexual life. They deserve a special care and respect particularly in case we make differences between the kind of being we are in the different stages of our coming-into-the-world. This question concerns time: "when is a human being a human being?" and space: "what kind of being are we in the different places of our coming-in-the-world?" We may artificially interfere at different stages of this process and isolate, change, use and even destroy what nature brings forth. Of course, nature itself produces and destroys fertilized eggs, and it would be an impossible moral and legal obligation to take care of any naturally produced and destroyed embryo on the basis of the idea that it deserves our absolute care before nature discards it.

This reasoning ad absurdum is not an argument in favour or against any kind of use or misuse of human life at this early stage, as for instance through different artificial forms of preventing its further development. Following the Thomistic distinction between actio humana and actio hominis, i.e., between human action as governed (or not) by reason and free will (34), we can make a difference between vita humana (Greek bios) and vita hominis (Greek zoe) The question about the process of becoming a reasonable and free being, i.e., a being co-responding to the world-openness, is related, from a Thomistic point of view, to the idea of anima intellectiva as forma corporis (35), and implies that the embryo as vita hominis has the potential of vita humana. Why shouldn't we produce and use human embryos for other purposes than the natural ones? Because we would contradict our own (potential) being. The capability of a human embryo to become a human being makes the specific difference to a view that transforms the embryo into an instrument with specific capacities and looks at the utility of stem cells for the growing organism from the point view of their instrumental usability.
But let us consider the case of so-called supernumerary embryos from IVF (in-vitro fertilisation) – which is, indeed, an artificial dislocation of the embryo – and their use as a source for pluripotent stem cells. It is an open question, how far adult stem cells can be reprogrammed in order to develop a similar range of potentialities as embryonic stem cells. The idea of reprogramming cells is a sign of the influence of the information paradigm in biology and, more generally, of our view of nature within the background of digital ontology. The methods for artificially breeding stem cells as well as the artificially modified cells (and cell lines) themselves can be objects of patent claims but the indirect instrumentalisation and commercialisation of the embryo is existentially and therefore ethically questionable not only from a preformistic but also from an epigenetic position. Healing expectations may provide a, in Kantian terms, problematic support for research and therapeutic use of stem cell lines from embryonic origin (36). Problematic means that we should not give up the tension between (human) nature and technology allowing any kind of instrumentalisation, privatisation and commercialization of the human body and its artificially (re-)produced organs. In other words, we should be cautious. Prudentia is a virtue that may advise us in a given situation to weaken technological visions (and nightmares) for whatever purposes, supporting, instead, natural processes or vice versa.

Conclusion

Why should we respect nature in a technological civilization? Basically, because it is. This is not a naturalistic fallacy but a recognition of one basic dimension of what appears in the world-openness. It is for us, natural beings, not possible not to respect nature without paying for this with our own dissolution. This is something we cannot will. This argument is neither metaphysical nor religious. It is a weak argument. It allows to recognize us at the same time as co-responding primarily to the world-openness in which, or, better, as which we appear. We are this given world-openness itself between natality and mortality. This finite response allows us to be responsible with regard to what may appear either coming out from itself – as in the case of nature, including our own natural being, or the Divine – as well as to what we artificially produce and change (poiesis) on the basis of our knowledge (techne) of what we believe to be the case, our ontological castings.

Today we may take a one-sided technocratic perspective without paying attention to a specificity of human existence (vita humana) which is indeed its unique plasticity. Anima quodammodo omnia (37). From our co-response to finitude arises not only a calm but even a cool view of our present and future experiments with ourselves. Human beings are not only homo faber but also homo faber sui ipsius as the theologian Karl Rahner wrote with regard to what at that time (1965) was just in its beginning, namely self-manipulation in the "factory buildings" ("Werkhalle") of biology, biochemistry and genetics, medicine and psychology, sociology and political science (38). According to Rahner the root of self-manipulation is freedom. If until now we manipulated ourselves and our selves mainly in a moral and theoretical way, we start now transforming ourselves as a historical and physical being. We are not only culturally but also bodily open beings. Beyond the moralistic position which says we should not do everything we can, and the pessimist who doubts we would follow any reasonable advice, Rahner suggests: humans should do what they can – because it would be absurd to will the impossible. This is indeed a Kantian argumentation. The consequence is, on the one hand, that we may create a situation with irreversible and irreparable consequences. Rahner criticizes, on the other hand, resignation in view of death and human finitude. Self-manipulation arises within the given frontiers of natality and mortality, i.e., within dimensions beyond manipulation. They point
to the question concerning the Divine.

Notes

1. My approach has an explicit debt to Heidegger's existential phenomenology as well as to its application in the Swiss school of "Daseinsanalyse:" See particularly Medard Boss Grundriss der Medizin und der Psychologie (Bern: Huber 1975). See also the contributions in the journal "Daseinsanalyse" now: International Federation for Daseinsanalyse (IFDA) (Ed.): Yearbook for phenomenological anthropology and psychotherapy (ISSN 0254-6221).

2. The origin of numbers, particularly of the 0, goes back to India. See Bartel L. van der Waerden, Geometry and Algebra in Ancient Civilizations (Berlin: Springer 1983).

3. See for instance Aristotle Physics (V, 3), Categories (ch. 6), and Metaphysics (V, 13). The following analysis is based on Martin Heidegger, Plato: Sophistes, GA 19 (Frankfurt a.M.: Klostermann 1992). For more details see my Beiträge zu einer digitalen Ontologie.

4. This is less the case of Plato's "arithmological" ordering of beings following Pythagorean philosophy. See Jacob Klein Greek Mathematical Thought and The Origin of Algebra (New York: Dover Publications, 1968; orig. Griechische Logistik und die Entstehung der Algebra, Berlin 1934).


8. See Martin Heidegger, Sein und Zeit (Tübingen: Mohr 1976, 13th ed.)


10. Ibid., 371-372.


13. Heidegger refers to the Judeo-Christian views about the "anxious longing of the creation" (Rom 8:19) and Book Esra, Heidegger. *Die Grundbegriffe*, 396.


15. Ibid., 324.

16. Ibid., 324-325.

17. Ibid., 327. Heidegger points to living beings without a fixed structure, particularly protoplasm, where organs are produced and destroyed according to a previous capability.

18. Ibid., 328.

19. Ibid., 403.


22. *Phronesis* is thus a *techne sui generis* as far as it is in some way concerned with human action as a product but this product is in fact the well-being or good life of the actor him/herself (*eu zen*). See Rafael Capurro, "Techne und Ethik. Platons techno-theologische Begründung der Ethik im Dialog "Charmides" und die aristotelische Kritik,," *Concordia* 20 (19919: 2-20.


27. Article 1 of the German Constitution which states the inviolability of human dignity
("Die Würde des Menschen ist unantastbar") is implicitly based in Kantian philosophy, the Judeo-Christian tradition and the historical experience of the Holocaust.

28. Kant, *Grundlegung zur Metaphysik der Sitten*, BA 52: "Der kategorische Imperativ ist also nur ein einziger, und zwar dieser: HANDLE NUR NACH DERJENIGEN MAXIME, DURCH DIE DU ZUGLEICH WOLLEN KANNST, DAß SIE EIN ALLGEMEINES GESETZ WERDE."


34. See Thomas Aquinas, *Summa theologiae* (Rome: Editio Leonina, 1923), 1-2, q. 1, a.1, c.

35. S.th. 1, q. 76, a. 1, a. 3., and a. 4.


37. S.th. 1, q. 80, a. 1, c. See also Aristotle, *De anima* 431 b 21: "he psyché ta onta pos esti panta."


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