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## Historico-Philosophical Aspects of Mathematisation of Nature in Modern Science

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**Introduction.** The paper deals with the philosophical problems of the mathematisation of nature in modern science.

**Methodology and sources.** The analysis is based on the issues in modern science viewed through the prism of the critique of the mathematisation of nature in phenomenological philosophy.

**Results and discussion.** It is argued that the radical mathematisation of nature devoid of any references to the source of its contingent facticity in humanity, leads to the diminution of humanity and concealment of the primary medium of existence, that is the life world. Phenomenology shows how the life-world can be articulated through contrasting it to "nature" constructed scientifically. It is the analysis of the scientific universe as mental creation that can help to uncover the life-world when "nature" (as scientifically constructed and abstracted from the life-world), is itself subjected to a kind of deconstruction which leads us back to the life-world of the next, so to speak, reflected order.

**Conclusion.** The life-world is articulated under the conditions that there exists a scientific explicability of nature. The life-world as it is articulated in theology does require some alternative explication of nature, but, contrary to science, it never leads to the concealment of the life-world. What is common to these life-worlds is exactly that which cannot be explicated by science, namely the underlying personhood.

**Key words:** history, humanity, mathematisation, nature, persons, phenomenology, philosophy, scientific method.

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## Историко-философские аспекты математизации природы в современной науке

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**Введение.** Рассматриваются историко-философские проблемы математизации природы в современной науке в перспективе феноменологической философии и антропологии.

**Методология и источники.** Анализ математизации естествознания основан на проблемах современной науки рассматриваемых через призму ее критики в феноменологической философии с целью восстановления утерянного источника случайной фактичности науки в человеческой субъективности.

**Результаты и обсуждение.** Обосновывается точка зрения, что радикальная математизация природы, приводящая к потере источника своей фактичности в человеке, ведет и к преуменьшению роли человека в познании природы, и сокрытию исходной среды существования, т. е. жизненного мира. Феноменология показывает, как жизненный мир артикулируется в контрасте с понятием «природы», конституируемым в науке. Анализ научных представлений о вселенной, являясь творением разумной деятельности и будучи деконструированным с помощью методов феноменологии, приводит к переоткрытию жизненного мира, так сказать, второго порядка, находя исходную базу любой научной деятельности в активности человеческого сознания.

**Заключение.** Приводятся аргументы в пользу того, что такая математизация ведет к искажению антропологии и сокрытию исходной экзистенциальной сферы человека, т. е. его жизненного мира. В связи с этим обсуждаются ограничения науки в экспликации смысла реальности. Сама экспликация жизненного мира предполагает возможность научной экспликации природы. Таким образом, в основании самой возможности математизации природы в естествознании, лежит человеческий разум, существующий в условиях парадокса своей телесности и безусловности.

**Ключевые слова:** история, личность, математизация, научный метод, природа, философия, феноменология, человек.

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**Introduction.** It is now a matter of common fashion to speak of the ecological crisis, abuse of nature and horrific scenarios of the human future, based on the presumption that it is human beings who involved themselves into such a state of affairs because of the unending greed and instinctive desire of well-being and indefinite consumption. It is believed that human fallacy is related just to the underestimation of the capacity of Nature to tolerate our interference with its order on the ground of quantity: by reducing pollution and exhaustion of the natural resources one can alleviate the present

state of affairs and to stabilize ecosystem on the planet. However there is a lack of understanding among ecologists, philosophers and religious advocates for the preservation of nature, that nature implies the preservation not only of the outcomes of the physical laws, but the laws themselves. "Preservation" means not a literal ability of humanity to amend or tamper with the physical laws. One speaks of a spiritual understanding that laws of nature are not something with respect to what one can be neglectful and careless, but to treat them in reverence and gratitude for it is due to them that human beings exist. And here any religious sentiments appealing for preservation of humanity in all possible circumstances in order to fulfil its divine destiny seems to be fallacious in a theological sense, for what is implied in this type of arguments is a complete disregard and disrespect of the physical laws which impose limits on the human growth.

To give an example one can refer to a simple observation that in many ways the modern ecological situation is linked to the unlimited population growth and the implied human rights for every human being to have a dignifying life and access to the benefits of the modern capitalistic society. Thus in many ways the ecological problem (in terms of the possible ways of its resolution) is linked to bioethics, namely to the problem of birth-control. Certainly in this conclusion one must not forget that the life of humanity have become a hostage of the scientific progress and the necessity to have as many economic "slaves" for the benefit of society at large. In this sense the appeal to the control of birth in modern Europe, for example, has strong political consequences, perpetuating even more grave instability on the overall population on this planet, resulting in further ecological degradation. However there is one argument which cannot be disregarded either by politicians or religious fundamentalists opposing the birth control: the inexorable physical laws which determine the ultimate boundaries for the amount of human species on this planet. Since every human organism consists of a biological material requiring for its support a certain amount of physical substance, such as oxygen, water, minerals, heat and light support, medicaments etc., the planet Earth can provide a limited amount of its support related to the actual quantity of these ingredients. Contemporary estimate varies between 9 and 16 billion human beings which can be supported on this planet. The excess of this amount will lead to the extinction of human life and the decline of the whole ecological niche. The denial of the restrictions on the possibility of life on this planet according to the physical laws (which sometimes takes place among in religious circles on the premise that one cannot tamper with God's right to give life), is reminiscent of some tendencies of abstracting from physical nature by replacing it by intellectually fabricated constructs which by the nature of their fabrication disregard their authors. This manifests itself with a great force in cosmology, where the constructed picture of the early universe not only does not contain any signs of the physically suitable life, but also no presence of the constituting intellect. Such an inhuman representation of realities in the universe gives a wrong impression of being existentially relevant, but at the same time misleading in terms of insufficient accentuation the fact that the very construction of such theories is possible only under the condition of existence of embodied human being on the planet Earth. The main mechanism of such an inhuman construction of nature is its mathematisation promoted after a famous assertion of Galileo that in order to understand the book of Nature one must read it by using its "letters" that is mathematical symbols.

**Methodology and sources.** *Nature and Mathematics.* When one talks of nature one must not forget that nature as articulated notion originates in humanity. Humanity is related to nature through its embodiment as well as through intentional immanence of its consciousness. Humanity feels nature through its senses and it thinks about it through its intelligence. Thus there

are two poles of nature which are both linked to humanity which mediates between them. Thus the link between sensible experience of nature and its representation in abstract forms and ideas is exercised by humanity. In this sense the mathematisation of nature is a natural consequence of man being a microcosm and mediator between sensible and intelligible. However the mathematisation of nature can have the connotation of something negative and misfortunate – this happens when the mediating function of humanity is forgotten and the link between sensible and intelligible is thought as existing in itself. In this picture the central role of humanity in creation is diminished and its presence in the universe is denigrated to the level of the physical although of a higher level than other inorganic and organic creatures.

It is widely accepted in modern philosophy of science that science does not deal with simple empirical facts. The facts in science are theory-dependent, that is the appearance of novelty in scientific investigation is conditioned by a theory which dictates to an experimenter what aspect of physical phenomenon to observe, and what particular characteristics of the object studied to measure. Nature appears to be a dialogical construct where empirical and theoretical elements interpenetrate each other. Here the question of truth in scientific constructs comes up. What makes all the claims of a physicist true? This is a difficult question for what is clear is that the questions about truth cannot be detached from the context and language of physical theory itself. This implies that the criteria for truth must come out from the structure and logic of physics itself. Thus there are two dimensions in the response to this question. The first one is connected with the scientific methodology of discovering and approving new results. The primary and simplest requirement for some scientific fact to be true is that it must be reproduced in independent experiments, assuming that all experimenters belong to the same continuous space of observers; this assumes that any new result must be articulated in some common language and logic, so that the other observers can have access to it (the experiment must be described as part of common space of observers). In practical terms this means that any result must be independently reviewed and published. The experimental procedure has to be described so clearly that anyone from an independent scientific group could in principle reproduce the results which are announced by a pioneering scientist. This implies in turn that it is possible to repeat an experiment with the given physical system, using an independent equipment, and that numerical results obtained in these parallel experiments should be consistent with the initial ones and with each other. This requirement that the experiment and its results can be reproduced, described in words and communicated to any researcher constitutes the methodology of objectifying the experience encountered by a particular physicist and asserting that there is some *objective reality* which corresponds to this newly discovered phenomenon. The idea of *reality*, as an invariant (intelligible) aspect of different, but similar measurements, which can be represented in the space of observers, drives modern science.

The second dimension of scientific methodology, which provides further substantiation for the objectivity and hence “reality” of newly obtained results, comes from the much more sophisticated demand, namely that there is some mathematical structure which corresponds to the fact which has been found in experiment and can be fitted into some mathematically arranged theory. Here the idea of stability of experiential patterns of physics plays a central role, in order, as was expressed by Einstein [1, p. 291], to order the sense data in some stable and logical patterns. A similar view was expressed by Max Born who linked it to the problem of how to obtain objective and common knowledge from the subjective experience of a physicist [2, p. 168–169]. Born points out that the new physics of the 20<sup>th</sup> century made a fundamental breakthrough in this direction, by dropping off

any direct attempts to co-relate its models with some visualised mechanical images, as was done since Newton's times. Classical mechanics with its differential equations played a role of a mediator between any experimental fact and theoretical construction. New physics somehow released human thought from this necessity and allowed one to seek directly for a mathematical structure corresponding to a phenomenon, without any attempt to make this structure expressible in an ordinary language and in images easily accessible to the human mind. However, the issue of interpretation of abstract mathematical ideas in physics becomes vital in order to avoid the danger of building a mathematical model of something which, like a Kantian thing-in-itself, will never turn to us by its sensible and macroscopic, accessible and comprehensible side, that is, something which can never be interpreted and expressed in terms of simple perceptions and simple language. The aim of science is to serve human beings who are positioned in the living world of sense-impressions and everyday-language relations, so that, if its mathematical structure loses its contact with the everyday world of living humanity, scientific view of nature becomes effectively an "idol" of reality which can preoccupy human consciousness on the level of imagination while detaching it from the existential conditions of its functioning. The important aspect of mathematics in physical theories and in general understanding of science is its role as a universal language which allows physicists to communicate with each other and also to communicate the content of their theories to engineers and non-specialists [3]. However, it is reasonable to demand that the balance between sensible reality and abstractions from it in scientific theories must be maintained.

The presence of a deeply developed mathematical theory becomes vital for those branches of physical science which deal with structural elements which are not immediately observable and accessible (for example microscopic elementary particles, or some details of the past evolution of the universe). In this case theory claims that the ontological status of these entities is inferred from the stable and rationally consistent mathematical pattern, which is usually considered as representing reality itself. In a way, to say that something is real is equivalent to say that this something can be described mathematically. Mathematics becomes a kind of magic which, being uncovered by a creative mind, brings into existence new realities, which are, in spite of being purely mental creations, are objectified as if they acquire an *ontological* status.

In light of this mathematical view of true reality as devoid of transience and emergence it is claimed sometimes that science deals with a world independent of human history and human intervention. This is an ideal which science has the right to long for. It is, however, hardly to be achieved, for science itself is a human enterprise and its concepts are a-priori laden with the non-impartiality of the human presence in nature. In spite of this science still attempts to catch a glimpse of 'eternity' (as non-temporality) through a mathematical pattern of the world. The appeal to mathematics is usually considered as a safe escape from the contingency of appearances in the empirical realm to the world of logical stability and impartiality. The possibility of this is associated with the common belief (the natural attitude) that the reality of nature is independent of man's existence, can be grasped via mathematical forms and it does not matter that a phenomenon was not known before the form has been discovered. The mathematical pattern which describes it, does exist in itself, and that is why the participation of human reason in the unfolding of physical reality as mathematical has an extremely passive character, it has nothing to do with the discovery of reality.

In spite of all that has been said, the mathematical description of nature itself is closely connected with human intelligence. For, even if one accepts that the universality of mathematical laws is closely linked to the intelligibility of the universe, the latter is only accessible to, and

articulated by, intelligent human beings. Even if mathematical laws and the patterns of beauty of the world are hidden in the realm of non-transient Platonic forms, one needs human intelligence in order to make these laws and patterns to be explicitly present in the physical universe. H. Poincaré emphatically advocated this view in his “The value of Science”.

“Does the harmony the human intelligence thinks it discovers in nature, exist *outside of this* [human] *intelligence*? No beyond doubt, a reality completely independent of the mind which conceives it, sees or feels it, is an impossibility. A world as exterior as that, even if it existed, would for us be forever inaccessible. But what we call objective reality is, in the last analysis, what is common to many thinking beings, and could be common to all; this common part, as we shall see, can only be the harmony expressed in mathematical laws” [4, p. 6].

Thus even mathematics, taken as an absolute intellectual frame of reference for the universality of scientific experience and as a tool for approaching nature points again to the presence of human consciousness which integrates in itself the truth of these universals and makes them articulated in incarnate, mathematical language, formulas and images.

However, it is important to point out that the articulation of nature through mathematics leaves some questions unanswered. In particular, even if the reality of the world is articulated in terms of intelligible patterns, the issue of the meaning and ultimate origin of thus posited reality, that is its facticity, is still to be addressed. Here a possible explanation leads us not only beyond the physical world, but also beyond the mathematical realm itself for implicitly the question about the facticity of the human mediation between sensible and intelligible is raised, that is the question about facticity of humanity as incarnate intentional immanence. According to Hermann Weyl: “Thus the mere positing of the external world does not really explain what is meant to explain, the question of reality of the world mingles inseparably with the question of the reason for its lawful mathematical harmony. The latter clearly points in another direction of *transcendancy* than that of a *transcendental* world; towards the origin rather than product. Thus the ultimate answer lies beyond all knowledge, in God alone...” [5, p. 116].

**Results and discussion.** *Mathematisation of Nature and the Human Condition.* The problem with the mathematisation of nature is not so simple, when it is affirmed that mental constructs are substituted for existential realities. One understands that in some branches of physics, such as cosmology for example, most of theories can never be directly verified by means of their correspondence to the empirically and existentially given. The “objectivity” of the ideal constructs in this case is established rather through the appeal to coherence of explanation, which does not require that this explanation is correlated with any empirical reality on the grounds of the principle of correspondence. “Objectivity” follows in this case not from empirical verification but from intellectual convention. Thus some physical realities become mathematically constructed by convention with no reference whatsoever to the immediate existential world. The problem, however is not in these mental conventions as such, but in their limiting and degrading effect on the intellectual capacity of human beings, when they start to influence human perception of the world to such an extent that it corrodes the human reality by denying existence of those aspects of the world which cannot be mathematised (for example human feelings, love empathy emotions, relations etc.) Contemporary mathematicians themselves are conscious about this: “As we mathematise the world, we proceed to lose or to throw away those parts of the world that cannot be mathematised. What is not mathematised seems not to exist, even never to have existed” [6, p. 98].

In the tendency to express all aspect of existence by using formulae, equations and statistical tables (not only in the physical picture of the world, but even in some aspects of sociology and social psychology), the existential dimension of nature as the extension of human incarnate existence is thrown into oblivion so that the mystery of life and death, the mystery of beginning of a particular incarnate existent, as not being able to be mathematised and thus transcending mathematical description does not fit into the definition of the natural and objective. The primary existential events of life are usually discarded by contemporary science causing a great distortion to the human image, for human beings, being pronounced as mere physical and biological artefacts of nature, are reduced to self-enclosed and self-sufficient para-empirical and unaccountable embodiments of the soul which, in its extreme discursive capacity (although being a gift of human freedom), abstracts itself from the source of its life and then considers itself as an almighty power of asserting laws for itself and for the outward nature.

The problem with the mathematisation of nature is not simply philosophical and intellectual. If this would be so all complications linked to the mathematical perception of the world could be left just to those ambitious individuals who imagine themselves as enclosed in the world-machine which is driven by some “iron” inviolable laws. However, because in contemporary society mathematics in everyday life imposes implicitly certain constraints in our appropriation of reality and affects our freedom, it becomes an active ruling power, so that the problem of mathematisation acquires some social and cultural flavour. Mathematics orientates humanity towards realities which it selects thus influencing and promoting certain faculties of thinking and perception which ultimately affect human nature and what idea humanity has about itself.

Mathematics with its sharp differentiation of things in terms of numerals can be abused in social implications and can “become a source of evil even if it confers benefits” [6, p. 282]. Mathematics can diminish human person not only in a global sense by subjecting it to mathematised nature, but while implanting in human mind mathematical perception, human being themselves can be valued and judged in terms of sheer numbers: this lead to the dehumanisation of the individual. Here it is important not only to blame people who recklessly apply mathematics to all aspect of life and thus commit consciously a certain offence against the idea of humanity as it is understood in philosophy and theology, but to realise that while engaging in rationality based in mathematics, we are doomed to commit a certain dehumanisation of the persons because of the intrinsic logic and conditions of application of mathematics. Contemporary era of computers and all sorts of digital applications makes it absolutely clear: “Whenever we use computerisation to proceed from formulae and algorithms to policy and to actions affecting humans, we stand open to good and to evil on a massive scale. *What is not often pointed out is that this dehumanisation is intrinsic to the fundamental intellectual processes that are inherent in mathematics*” [6, p. 283]. The development of mathematics thus extends human embodiment of reality in a very specific incorporeal sense: this extension effectively changes human subjectivity, which, in the long run, can change the very human nature and thus threaten the basics of the human condition.

Here we experience a meeting with a paradox: mathematics is capable of dehumanising and depersonalising humanity, but still it is the mental creation of humanity. One can see that mathematics, while being a tool for describing nature, if placed in the context of human existence leads to the fundamental question of its own foundation. Indeed, let us formulate the mystery of human existence in a mathematical fashion as a theorem, which requires for its proof to satisfy both necessary and sufficient conditions. One agrees that the physico-biological conditions of human

existence can be expressed in scientific and mathematical terms: for example, anthropic arguments in cosmology which set the numerical boundaries on physical constants which are necessary for biological existence in the universe. But the very actualisation of human intersubjective consciousness which is the ultimate manifestation of the genuine sense of humanity as different in comparison with the animal world, represents a mystery in terms of nature, for the qualitative change in the so called evolution which, according to some optimists, can lead to the creation of intelligence, is of an unbridgeable magnitude, such that physical causation and biological determinism cannot cope with it. This implies that the sufficient conditions for human intelligence to come into being do not follow from the natural and their incommensurability with the necessary conditions can be measured through the fact that the whole chain of changes in the outward nature can be integrated in one simple grasp of human consciousness: in fact, the very fact that mathematics exists and can be used by humanity in order to articulate nature can hardly be explained on the grounds of the natural evolution taken in itself. This entails in turn that the mathematics, by proclaiming that the ultimate sense of things is in thus mathematized nature, contradicts the obvious fact that mathematics is, by its essence, a derivative quality of human life which forms a useful tool for shaping the outward impressions about the world, but which in no way represents the foundation of existence. In simpler words, the foundation of mathematics itself is not in mathematics. Here we have an indication of transcendence which requires one to look at mathematics and the mathematisation of nature as derivative activities, originating from the very fact of human beings present in the world. But human existence, while it can have manifestations through knowledge and its mathematical mode, does not exhaust the very fact and mystery of this incarnate existence. Mathematics attempts to mathematize human being. But by so doing it contradicts itself, because it attempts to mathematize its own origin. Even if this were possible, mathematics can explain only the mathematical. All other aspects of the incarnate existence, which are not projected into the frame of mathematical mind are removed as unimportant and, in a way, “non-existent”. The human reality, however, is more far reaching and immense than any particular reduced form of its discursive image. And this is the reason why sufficient conditions for the existence of human beings transcend the natural and mathematical.

The mathematisation of humanity thus means not only a complete disregard of the individual modes of human existence, that is its personal qualities, but also a complete distortion of the perception of the human position with respect to the environment, society and culture. Through mastering “his own nature”, that is mathematised nature as a project which is yet to be accomplished, man takes over the control of his own life and fate by relying on mathematics implemented in technology. Husserl compares human beings, as being capable of ruling their own affairs indefinitely (because of their feeling of omnipotence founded in rationalism), to God seen as “infinitely distant man” [7, p. 66]. If man is capable of unfolding the sense of the universe through mathematisation, which is treated by us as the only valuable and worthy mode of existence, one can say that man mathematised himself. But, being, in a theological sense, the image of God, man also and mathematised God, by reducing God to the principle of the ultimate rationality of the universe which can in principle be revealed through the rigorous mathematical mode of the discursive mind. Since the real world disappears in the scientific “project” of human affairs, becoming thus an artificial object, human beings themselves become functions of the artificially constructed nature, being inevitably deprived of genuine understanding of the meaning of nature and the human place with respect to it. Ontology of man experiences therefore a terrible distortion which deprives man of the historical dimension which is linked to the conditions of embodiment.



**Conclusion.** In conclusion we would like to stress that in no way do we imply diminishing the value of contemporary science. There is no doubt that without science human civilisation could not function in its present state. The tragedy of this is that the scientific progress of the last centuries made the human race a hostage of its own achievements. This is exactly what happens if humanity loses control of its own destiny in a spiritual sense. It is exactly what happens if the greatness of all being is narrowly squeezed in the ambitious intentions of the human reason, which sees this being only along the lines of its technological and social success. And this is the reason why human activity with its greed for exploration and utilisation of the resources of the world should look at its own achievements from outside, from the perspective of existence as such. There is something in human life which cannot be described scientifically but which has an infinite value for human beings as persons. Science is good but it is not sufficient in order to understand what it means to be a human person. The warmth of human relationship and the transmission of grace through generations make humanity unique and special among other types of “existence”, which are described scientifically as existences of impersonal, that is effectively “non-living”, bodies. The exploration of the world of persons which underlies the realm of scientific experience can thus complement science in articulating the genuine place of human beings in the world.

*From Mathematisation of Nature to the World of Persons.* Phenomenological philosophy in the style of Husserl linked the rise of Platonic tendencies in scientific discourse with the name of Galileo. However the name of Galileo was used only to label that scientific trend which developed in the 17<sup>th</sup> century [8, p.45–67]. This trend, which is essential for modern science, can be characterised by the view that there is a fundamental split between the world as presented to human beings in their perceptual experience and everyday life, and the world as uncovered through scientific method and mathematical structure. But this, as is not difficult to see, implies Platonism in the sense of ancient Greek philosophy which made a clear-cut distinction between the world of *doxa* (opinion) and *episteme* (knowledge), as two modes of cognition which correspond to different realms and different truth. For Galileo and for those who followed him this meant that the true knowledge of things must correspond to the ideal of *episteme*. Husserl in his analysis of the genesis of Galilean physics shows how the mathematisation of nature was performed and what was its result [7, p. 23–59], [8, p. 45–67], [9, p. 395–401], [10, p. 338–351]. He points out that geometry exemplified an ideal of *episteme* for Galilean physics; it was considered as a standard of knowledge and therefore science, if it wants to achieve the true knowledge of things, should follow the ideal of geometry and mathematics. But this, according to Gurwitsch, implied that Galilean Physics is essentially Platonic in structure, for its Platonism “appears in the distinction between the perceptual appearance of nature and its true, that is its mathematical structure” [11, p. 51–52].

However, if one does not take the claim about the Platonism of modern science at face value, one realises that “nature”, which science aims at through idealization and mathematisation, is not something a-priori given to human observers and thinkers, but something which is constructed and evolving towards an indefinite *telos* of the human spirit. “Nature”, thus constructed, while being essentially an intentional correlate of human subjectivity becomes exteriorised as a Platonic or Kantian ideal [ibid, p. 46] which is subject to accomplishment in a historical movement of scientific research because mathematics as human science is far from being static and accomplished, and its advance creates more and more space for physicists to invade the realm of the yet unknown (although, perhaps, intelligible and invisible). In other words there must be made a distinction between nature as it appears in primary perceptual experience and nature-for-

physicists (that is “nature”), which is a mental accomplishment, as an ideal limit of convergent sequences of “images of nature” which are constructed by physicists in the course of history. One can then understand the historical process of science as sequence of scientific paradigms, as a process of an ever-unfolding representation of the mathematical universe, the process which, being human and hence unique in its factual givenness, makes all paradigms united as belonging to one and same unique sequence, pertaining to the *telos* of the human spirit.

When we mentioned that the construct of “nature” represents an ideal, which can only be accomplished in the whole of the historical process, we assumed this view as a philosophical hypothesis which asserts some hidden teleology in the development of the overall human spirit. Thus the progress of mathematisation of nature has meaning of one particular tendency of the human spirit under which scientific knowledge and technology advance. This ultimately brings us back to the general idea that scientific knowledge manifests a particular mode of human presence in the universe. Thus the mathematical universe, as a human achievement, represents characteristically the fragmentation of the primary existential link between humanity and the world, considered through a particular discursive function of the human intellect which is based on abstraction and idealisation. “Nature” in the thus understood scientific sense, being a particular human accomplishment, does not exhaust the totality of reality. On the one hand the constructed “nature” is exteriorised by human subjectivity and is intended as being devoid of its inward existence in the hypostasis of human beings, on the other hand the same “nature”, as *being constructed*, still entails some traces of its hypostatic origin.

“Nature” as mental accomplishment (where the non-egocentric intentionality prevails), that is as idealised and mathematised reality, represents an attempt to discard all hypostatic features which are intrinsically present in the mode of its existence. However, in spite of the success of the naturalising tendencies of scientific discourse in depersonalising reality in its outward objectivistic impression, a person, the human hypostasis, is still present behind the mathematical structure, and the transcendental phenomenological analysis allows one to reveal this presence behind all shades imposed by that discursive thinking which shapes the impression of the scientific universe. In all its attempts to “naturalise” the universe, that is, to make it detached and independent from human subjectivity, scientific discourse cannot dismiss or eliminate human persons in the same way as incarnate consciousness cannot eliminate itself unless it destroys the conditions of incarnation.

If, according to modern science, nature is a mathematical manifold whose concept is subject to further advance and accomplishment one wonders whether this course of constructing “nature” is based upon something primary in the being of man. Since the mathematically constructed “nature” is the product of human intentional activity, it is reasonable to conjecture that that which is linked to the immediate living condition in the world serves as the foundation for all scientific activity and consequent thematisations of the world. This media of primary human indwelling was termed, since Husserl, the “life-world.” Husserl in his *Crisis of the European Sciences* where he gave a historical outlook of the genesis of contemporary science, argued that if this science is to be explained and justified, one should not forget about the realm of being which forms the fundament of meaning for the natural sciences. For, according to him, the mathematically constructed world, which basically deals with intelligible realities, was substituted for “the only real world, the one that is actually given through perception, that is ever-experienced and experienceable - our everyday life-world” [7, p. 48–49]. Husserl made a clear distinction between *nature*, as the media of human immediate indwelling, which is intuited pre-scientifically, and “nature” as constructed through the mental creation. And the purpose of scientific idealisations which were supposed to

serve the objectives formulated in the life-world has been forgotten so that the substitution of mathematised nature for the life-world was promptly passed onto the physics of all succeeding generations, including contemporary physics [7, pp. 48–49]. While the method of mathematics should serve only as a tool in elucidating nature in its relationship to the life-world, nature started to be treated as a mathematical manifold, concealing thus its genuine underlying structure, that is the living world of immediate experience. The manifestation of this concealment consists in the assertion of modern science that not only is nature mathematical, but that any knowledge and interpretation of nature is possible only through mathematics.

**Conclusion.** For the purposes of our research, the primary problem is how to uncover the forgotten life-world which is always present in scientific insights. Phenomenology shows how the life-world can be articulated through contrasting it to “nature” constructed scientifically. It is the analysis of the scientific universe as mental creation that can help to uncover the life-world when “nature” (as scientifically constructed and abstracted from the life-world), is itself subjected to a kind of deconstruction which leads us back to the life-world of the next, so to speak, reflected order. It turns out to be that scientific method provides us exactly with the tools of articulating the life world by means of apophatic discernment of the scientifically constructed nature (as the otherness of all the scientific) as its ultimate foundation. Paradoxically it is by the way of abstraction from the reality of the living condition that this condition is articulated back through deconstruction of scientifically aimed accomplishment in the idea of nature. Through this deconstruction scientific theories exemplify themselves as structures of human subjectivity, giving thus examples of how human consciousness works and how the structures of this consciousness are reflected in the models of “nature”. Here one must not forget that technology, which provides technical devices employed in observations and measurements, effectively constitutes bodily extensions of the subject of knowledge, that is an ongoing embodiment in nature of humanity’s intention, which affect either transiently or permanently human subjectivity in general, and, as a result, itself manifests indirectly the emergent structures of human subjectivity [12]. It is clear that in such a deconstruction of scientific “nature”, the life-world will be articulated under the conditions that there exists a scientific explicability of nature as well as an access to the life world through a certain apophatic move from thus articulated “nature”. In contrast to this, the life-world as it is articulated in theology does require some theological explication of nature, but, contrary to science, it never leads to the concealment of the life-world. What is common to these life-worlds is exactly that which cannot be explicated by science, namely the underlying personhood. To conclude, one quotes a passage from M. Merleau-Ponty in which he points to what science forgets about while drawing the grandeur picture of the world: “Scientific thinking, a thinking which looks on from above, and thinks of the object-in-general, must return to ‘there is’ which precedes it; to the site, the soil of the sensible and humanly modified world such as it is in our lives and for our bodies – not that possible body which we may legitimately think of as an information machine but this actual body which I call mine, this sentinel standing quietly at the command of my words and acts...” [13, p. 122–123].

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