Kant's first published work as a revolt against "dead forces" in the natural evolution

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Abstract. In the preface to his *Thoughts on the True Estimation of Living Forces* Kant was unusually bold in stating that now one could be confident enough to disregard Leibniz and Newton as authorities if they impeded acquiring the truth, pointing out that they, too, could be found making mistakes. What force was it that inspired the young Kant to such resolution in his first work dedicated to the common European argument concerning the measure of motion of a physical body? Why did Kant define the motion of "mathematical bodies" as caused by "dead powers" (Leibniz's definition)? Which *praedicabilia*, i.e. which *a priori* disposition of Kant's mind had become a reason for such a confident beginning? And what is the source for Kant's decision to acquire the truth rather than constantly keeping to the beaten track? I attempt to explain the disposition of Kant as a kind of *eidos*-memory and genuine intuition to defend the honour of human reason in its metaphysical mission of organic "vivification" of "dead powers" in opposition to the mechanical systems of his time. In first work Kant shows his amazing intuition regarding the issue of the interaction of mind and physical reality. This question is primarily connected to Kant's appeal for vivification in his attempt at a new theory of "living forces", rejected by his contemporaries. This attempt can be reduced to the disproof of the principle of absolute determinism, which, contrary to Kant, has become the basis of the paradigm of modern natural science. This paradigm in relation to Kant may become the cause of the "unnatural end of all things".

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1 "One light"?

In the Foreword to his first published work, dated by Kant by his twenty-third birthday, i.e. 22 April 1747, Kant, showing an unusual audacity, claims that "one can boldly dare to think nothing of the reputation of Newton and Leibniz, if it should oppose the discovery of truth" (*GSK*, AA 01: 07; Kant, 2012, p. 14), that "it is possible to catch" them "making mistakes" (*GSK*, AA 01: 09; Kant, 2012, p. 16). And "when one has erred a thousand times in a venture, the profit which thereby accrues to the cognition of truth will nonetheless be far more considerable than if one had always remained on well-trodden paths. I am basing myself on

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the following. I have already marked out the path that I shall take […] and nothing shall hinder me from proceeding along it" (*ibid.*).

Already in this declaration of war against "the great masters of our knowledge whom I now have the honor of calling my opponents" (*GSK*, AA 01: 13; Kant, 2012, p. 18) there is something startling and mysterious, which resembles well-known limit situations in Western history. For instance, Luther's words to Emperor Charles at the Reichstag in Worms: "Upon this I insist and cannot do otherwise!" Or Galileo's words before the trial of the Inquisition: "And yet it turns." What kind of force inspires the young Kant to such audacious determination in the Foreword to his first published work on the pan-European dispute about the measure of motion of the physical body? What is happening in the mind of pre-critical Kant, "pure" of the pressure of any authorities? What kind of *predicabilia* (in the *Critique of Pure Reason* the concept of force is defined as *predicabilia* of the category of causality), i.e. what kind of *a priori* disposition of Kant's mind is the reason for such a self-assured start? Perhaps the answer is in the future foreword to the second edition of the *Critique of Pure Reason*: "When Galileo rolled balls of a weight chosen by himself down an inclined plane […] a light dawned on all those who study nature" (*KrV*, B XII; Kant, 1998a, pp. 108-109). "They comprehended that reason has insight only into what it itself produces according to its own design" (*KrV*, B XIII; Kant, 1998a, p. 109), which encouraged the Enlightenment to seek the true path into the future. This path is connected to the main question for all forms of culture (from religion to natural science): What moves? How does it move? Where does it move to? A false answer, according to Kant, threatens to lead to choosing the path which will lead humankind not to "the natural end of all things" (*EAD*, AA 08: 334; Kant, 1996, p. 226), but to the "non natural" (*ibid.*). He warns us about this in his essay "The End of All Things", published in 1794, almost simultaneously with his project of solving the problem of a peaceful future in his *Perpetual Peace*.

In connection with "one light" (*ein Licht*) in the historical and cultural as well as autobiographical context of the young Kant his above-mentioned determination to follow his own path is explained, at least partially, by the influence of his philosophy teacher Martin Knutzen, who belonged to one of the most important movements in the Enlightenment – physical theology. One of the paradoxes of the history of culture is that the concept, which became fundamental for a whole generation of thinkers during the Enlightenment era, has almost completely disappeared from the memory of its descendants. But without taking the physical-theological impulse into account, it is hardly possible to understand the fundamentals of the natural-scientific revolution of the New Age, which largely determined the hermeneutics of the Enlightenment!

In the context of theoretical ideas of the Enlightenment physical-theological "light" was given much attention in the works of religious and philosophical Protestantism. Thus, Wolfgang Philipp, summarising the works of numerous authors in his "Age of Enlightenment", proves the semantic connection of the root morpheme of the concept of "enlightenment" with the biblical "*claritas claritatum*". The equivalent of the latter in the Hebraic Old Testament is "Kabod" with its original meaning of "radiance of transcendental light" (Philipp, 1963, p. LIII). Philipp's claim that Kant's ideas are undoubtedly rooted in physical theology (*ibid*., p. LXVII) is also confirmed by the fact that some iconic names, representing this direction, are often mentioned in Kant's texts, especially in the texts of the "pre-critical period": along with Newton, these are Thomas Burnet, William Whiston, John Woodward, William Derham, Bernhard Nieuwentyt, and others.

Corporeal reality of the "*kabod* – light" is closest to the concept of "ether", its synonym is "caloric". This concept is used by Kant in his 1755 dissertation *De igne* (*On Fire*), in the work *Physical Monadology* (1756) and up to his latest works, including the unfinished "Transition from the Metaphysical Foundations of Natural Science to Physics". In his treatise *Mathematical Principles of Natural Philosophy* Newton, the adherent of physical theology,

praises God's "*kabod*", and thanks Him for the mathematical perfection of His creation, discovering a new understanding of nature. The cultural and civilisational consequences of this new understanding of nature caused the real turbulence in all the discourses of social systems – from theology to politology.

2 Motion and force

Exactly at that turbulent time Kant's first public work *Thoughts on the True Estimation of Living Forces* appeared. This work is devoted to one of the central problems of the new physics, namely the search for a formula of the measure of motion of a moving body. In the epicentre of this search there were two approaches, suggested by Descartes and Leibniz, two major authorities in early modern philosophy. Based on his theory of constancy of motion in the universe, Descartes proposes the solution F = m*v, i.e. measure of the energy of a moving body is proportional to its mass multiplied by speed.

In 1686 Leibniz's reaction to this solution was published in his "Brief Demonstration of the Memorable Error of Descartes" (*Brevis demonstratio erroris memorabilis Cartesii*). This work emphasises the theological background of the dispute which is highlighted by its author in the long subtitle: Can God as the Creator of the world-system admit the constancy of the total amount of all moving energies in His Creation? Based on Galileo's mathematical law of the acceleration of a free-falling body, Leibniz suggests his solution to the problem – F = m*v2, i.e. the force of a moving body is equal to its mass multiplied by speed squared. Later in 1695 Leibniz in his work "Specimen Dynamicum" draws the distinction between the so called "living" and "dead" forces, which in the modern approach is closest to the distinction between the concepts of kinetic and potential body energy. Kinetic, or Leibniz's "living force", is the body's own energy, which changes its position in space and can be compared to the concept of *causa efficiens*, i.e. Aristotle's efficient cause.

In his first work Kant seeks to solve the problem neither in the purely mechanical and mathematical sense of Descartes and Newton nor in the sense of Leibniz, with whom he engages in a controversy. There is something in his reflections that can be characterised as an attempt to realise the dynamics of his forming cognitive and mental activity[1], which against such great figures as Leibniz and Descartes can immediately cause distrust and rejection of his viewpoint – which is exactly what happened. Briefly, Kant's solution is as follows:

Leibniz's "dead forces" are latent actions without a manifest external actual movement. "Living forces" are manifested in actual movement. For the "dead forces" Descartes' formula is correct, for the "living forces" – Leibniz's. However, in his solution Kant contradicts everybody and everything that was before him: Descartes with his mathematical bodies in the divine geometry of extended substance, Leibniz's principle of the pre-established harmony of a world evolving for the better, involuntarily also the future law of the conservation of energy. The foundation of the latter had already been laid by Leibniz, who studied the transition of mechanical energy into thermal energy during the collision of bodies. This contradiction is expressed in the assertion that only "living forces" have infinite effect in the unity of divine creation. The energy of the "dead force", which manifests itself as the movement of the "mathematical body" under the influence of an external force (i.e. it converts into a time-limited state of a "living force"), disappears as soon as the effect of an

[1] This is what already occupied Leibniz, who referred to the unconscious as "little perceptions", although he emphasised their working effect. Kant addresses this topic directly in his "Inquiry Concerning the Distinctness of the Principles of Natural Theology and Morality", where, introducing the term "dark ideas" (*dunkle Vorstellungen*), he writes that those people who do not set value on them pass by the great mystery of nature.

external force (e.g. the force which, with its "dead force", caused the movement of a body lying motionless on the plane) ceases. Kant tries to explain his statement by introducing in § 115 the distinction between mathematical and natural bodies[2] as well as the laws related to them!

3 The will to vivification

What is happening? What is Kant trying to explain? After all, he knows well the Cartesian theory of two substances, Newton's mechanics, Leibniz's monadology, the works of many contemporary scientists – Jacob Hermann, Johann Bernoulli, Peter van Musschenbrook and the others mentioned in his work. In my opinion, Kant shows something that truly amazes, especially nowadays: he shows a youthful intuition regarding the danger of false theories of motion, which may obtain legitimation in natural science, using the possibilities of the idolised mathematical method which was already deified in the systems of Descartes, Newton and Leibniz. One gets the impression that the principle of sufficient reason, embedded in these systems on the basis of theological arguments, does not seem sufficient enough to Kant – this is reflected in his interpretation of the "dead forces". In the eyes of the future creator of the philosophy of critical idealism the "dignity of the human" and his reason in the ontological responsibility for the world is lacking in these systems. In § 125 Kant writes: "Having been expelled from mathematics, living forces are admitted into nature. Neither great thinker, neither Leibniz nor Descartes, can really be faulted for the error […]. To reconcile reason with itself, which is embodied differently in astute men, and to find the truth, which is never wholly missed by reason's thoroughness, even when such men are in direct contradiction with one another, means, in a sense, to defend the honor of human reason" (*GSK*, AA 01: 149; Kant, 2012, p. 128).

In his first audacious work Kant shows the living will to overcome both Leibniz's idea of a pantheistic control in the mechanism of monadic collectives, consisting in the scattered, contactless "Selves" "with no windows", and deistic mechanics, which threatens to turn not only nature and the human being but also public policy into soulless machines.

It should be emphasised that Kant's physical-theological attitude differs both from Newton's and from Knutzen's, Kant's teacher, who gave him the fundamentals of physical theology and Newton's mechanics. Knutzen set the goal of connecting Newton's physics to the fundamentals of "school metaphysics" focused on the doctrines of C. Wolff and Leibniz. With this in mind he introduced into Leibniz's thesis of the harmony of a world pre-established by God (which however excludes the material interaction of monads separated from each other), a compromise theory in order to solve the problem of necessity and randomness. This was the theory of the so called *influxus physicus*,[3] i.e. the principle of the invisible physical interweaving of monads and their natural interaction with each other (Irrlitz, 2002, p. 74). This has some resemblance with Aristotle's "dark entelechy".[4] So everything in the world is preformed physically as well as theoretically and cognitively! And what about the "honor of human reason", which Kant tries to protect in §125?

His attempt at a new law of "living forces" in §124 is the demonstration (as an alternative to the authorities) of the dynamics of future critical idealism on the basis of the "salvation of reason" and, only through this, the "salvation of phenomena". In §123 of his work Kant

[2] *Cf.* "For every body which derives motion from without is soulless, but that which has its motion within itself has a soul" (Plato, 1999, p. 471 (245e-246a)).
[3] This theory is influenced by the ideal of Leibniz's mathematical logic and his work on the calculus of infinitesimals.
[4] Kant mentions it in §1: "It was believed that Aristotle's obscure entelechy is the secret of the actions of bodies" (*GSK*, AA 01: 17; Kant, 2012, p. 22).

deduces the thesis that "dead forces" can rise to "the state in which the force of the body is not yet living but nonetheless progressing to being alive" (*GSK*, AA 01: 146; Kant, 2012, p. 126). Kant names this "coming-to-life or vivification" (*ibid.*)! This thesis was naturally rejected together with his thesis of the complete disappearance of the energy of "dead forces" after the external force stops affecting a moving body. However it should be acknowledged that Kant's scientific criticism is based on his attempt to prove wrong the principle of absolute determinism, which is laid down in the paradigm of modern natural science, the principle which, according to Kant, often verges on eschatological fatalism. Is there an alternative to this? Kant's answer is *freedom*! The answer, only outlined in his audacious thesis on vivification, is developed in the systematics of his critical period. In his first work Kant shows, although unconsciously, the true courage to confront deterministic fatalism. Karl Vorländer (1974, p. 26) in his book on Kant mentions that in the hard years of his evolution he used to repeat: "I strive to subdue things to myself, not myself to things." To *myself* means to the moral law in *myself*!

It is quite obvious that Kant's solution on the energy of motion is connected to the metaphysical approach, including the concept of force based on the interaction of the soul and natural corporeality. In the mechanistic model of the world this approach is not recognised as relevant, and therefore Kant's solution was strongly rejected. Tough experience for a young author! However, as the historical development after Kant shows, he still remains a "living force" for the school of life. In §131 Kant, pointing to his thesis of the vivification of forces, suggests considering his theory as "the framework of a new dynamics" (*GSK*, AA 01: 152; Kant, 2012, p. 132). Will humankind, both through me and through every other person, be able to accept Kant's moral law as a "the framework of a new dynamics", as the only law of freedom in ourselves? Or will we finally destroy it?

4 Kant's "come back"?

In spite of the moral rigorism of Kant's philosophy, which in my opinion was the result of the physical-theological approach of his system, the very evolution of this system and its "Tantalus results" (*cf*. Schadel, 1998, p. 25) still remain a serious reason not only for the saving of philosophy, which many philosophers doubt (*cf*. Marquard, 1958, pp. 41-51), but also for the correction of the modern dynamic paradigm of natural science. The latter is highly important today, since in the modern discourse of fundamental science the dynamic paradigm, according to which the acts of knowledge and observation do not influence the nature of reality, is augmented by the informational paradigm, which suggests that any activity, including a cognitive one, not only influences physical reality, but also participates in its forming. In fundamental physics the problem of the interaction of dynamics and information is primarily connected "to the 'informational contact' of a quantum object with a classical nonequilibrium environment, for example, with a piece of equipment", which leads to its decoherence (Kadomtsev, 1997, pp. 346-347). Scientists have long discovered what was the main reason for late Kant's "pain of Tantalus", who, in the letter to Garve dated 21 September 1798, writes about a "gap" in his system, which does not allow him "to resolve the scandal of ostensible contradiction of reason with itself" (*Br*, AA 12: 258; Kant, 1999, p. 552). David Chalmers formulates this gap in a quite Kantian sense in his book *The Conscious Mind*: "Physical theory only characterizes its basic entities relationally, in terms of their causal and other relations to other entities. […] The picture of the physical world that this yields is that of a giant causal flux, but the picture tells us nothing about what all this causation relates. […] Intuitively, it is more reasonable to suppose that the basic entities that all this causation relates have some internal nature of their own, some *intrinsic* properties, so that the world has some substance to it. […] There is only one class of intrinsic, nonrelational property with which we have any direct familiarity, and that is the class of phenomenal

properties. It is natural to speculate that there may be some relation or even overlap between the uncharacterized intrinsic properties of physical entities, and the familiar intrinsic properties of experience" (Chalmers, 1996, p. 153).

In his book Chalmers, in a significant way, returns to the crossroads not only of Kant's, but of the entire Enlightenment's ideological evolution, while implicating the physical-theoretical basis of this crossroads, outlined in Kant's first work. The main issue of this basis concerns the "difference between mathematical and natural bodies, and of the laws concerning both" (*GSK*, AA 01: 140; Kant, 2012, p. 121). In a remarkable parallel to Goedel's theorem on the incompleteness of formalised mathematics (see Uspensky, 2011, pp. 35-75), Kant in §114, entitled "How that law, which has been found false in mathematics, can be present in nature", writes: "This endeavor will surprise most of my readers, for it seems to imply that mathematics is not without deceptions, and that we would now start challenging its verdict" (*GSK*, AA 01: 139; Kant, 2012, p. 121). The young Kant appeals against this verdict of mathematics, which became the basis of the scientific paradigm of modern civilisation, in the name of saving the "honour of human reason" and its status of "living force", the energy of which, according to the physical-theological theory, is the numinous reality of "*kabod*-light", neglected by future philosophy. This reality suggests the avoidance of what Gerd Irlitz called "the amputation of mundus intelligibilis" (Irrlitz, 2002, p. 75). Roger Penrose (2000, p. 183) writes: "Would one still want to call a world-view "physics-based" if it contains elements of protomentality at a basic level? This is a matter of terminology, but it is one that I am reasonably happy with for the moment at least."

The crossroads that Kant associates in his work with the names of Newton, who, together with Galileo, became the founder of the mathematisation of the truth of the physical world, and Leibniz with his belief in the law of continuity, is actualised in the light of the works of many famous scientists, including Wilhelm Pauli, Roger Penrose, John Searle, Erwin Schrödinger and others. Furthermore, this crossroads is not an attack on mathematics, which is undoubtedly typical for Kant himself, especially in his so-called "critical period". It rather corresponds to what A.N. Parshin, reflecting on Goedel's incompleteness theorem, states. Parshin (2000, p. 30) believes that "Gödel's theorem shows not just the limitedness of logical means, it speaks of some fundamental, deep property of thinking and, perhaps, life in general. If we want to understand something in a person's way of thinking, then this is possible not in spite of, but thanks to it". When the young Kant points out the danger of closing off the access of "living forces" to nature after "having been expelled from mathematics" (*GSK*, AA 01: 149; Kant, 2012, p. 128), he actually notes that the human consciousness, which has revealed 45 orders of the universe on the basis of mathematics, cannot be reduced only to the "metaphysics of the corporal nature", which led to the victory of the mathematisation of natural science. Developing this idea in the "Tantalus pain" between physical theology and ethical theology (see Kant's letter to Garve dated 21 September 1798: *Br*, AA 12: 256-258; Kant, 1999, pp. 551-553), Kant connected consciousness (first of all, in the "power of ideas" of reason) with teleology, not available to mathematics. For the correct understanding of this teleology, it is important to distinguish between nature and matter, which, in my opinion, Kant does rather unconsciously in his work *Metaphysical Foundations of Natural Science*. Here Kant's thought is based on the assumption that science becomes first of all the science of absolutely self-identical, all-pervading and generally "ideal" matter, which can be mathematised. However the physical-theological impulse, associated with Kant's opinion in his first work on the possibility that "having been expelled from mathematics, living forces are admitted into nature" (*GSK*, AA 01: 149; Kant, 2012, p. 128), later manifests itself in the thesis of the teleological causality of the human and, accordingly, of his responsibility for moral ontology, including nature. In the paragraph "On the Final End of the Existence of a World" of his *Critique of the Power of Judgement* Kant writes: "Now if things in the world, as dependent beings as far as their existence is concerned, need a supreme cause acting in

accordance with ends, then the human being is the final end of creation; for without him the chain of ends subordinated to one another would not be completely grounded; and only in the human being, although in him only as a subject of morality, is unconditional legislation with regard to ends to be found, which therefore makes him alone capable of being a final end, to which the whole of nature is teleologically subordinated" (*KU*, AA 05: 435-436; Kant, 2000, pp. 302-303).

That is why the question of the vivification of the "dead forces" of "mathematical bodies" in Kant's first work turns out to be further developed into the issue of a human as a "natural body", being responsible for the "natural" or "non natural" end of all things. And "thus proper natural science presupposes metaphysics of nature" (*MAN*, AA 04: 469; Kant, 2004, p. 5), which ultimately appears as "metaphysics of morals": "Since the universality of law in accordance with which effects take place constitutes what is properly called nature in the most general sense (as regards its form) – that is, the existence of things in so far as it is determined in accordance with universal laws – the universal imperative of duty can also go as follows: act as if the maxim of your action were to become by your will a universal law of nature" (*GMS*, AA 04: 421; Kant, 1998b, p. 31).

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