Stop calculating: it is about time to start thinking!

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Abstract: The paper is a partly provocative essay edited as a humanitarian study in philosophy of science and social philosophy, reflecting on the practical, "anti-metaphysical" turn taken place since the 20th century and continuing until now. The article advocates that it is about time it to be overcome because it is the main obstacle for the further development of exact and natural sciences including mathematics therefore restoring the unity of philosophy and sciences in the dawn of modern science when the great scientists were philosophers as a necessary condition for their revolutionary achievements, and the physicists were simultaneously mathematicians not less than philosophers and even theologians as Descartes, Newton, Leibnitz were just as their predecessors, Copernicus or Galileo Galilei. The revolution in science accomplished by them needed philosophy since any scientific revolution, then necessarily growing into social, needs philosophy; and if ones wish to prevent social revolutions originating from fundamental scientific discoveries, in turn relying on the close link of sciences and philosophy, they are to cut the link at issue, and just that happened in the 20th centuries therefore implicitly heralding a "brave new world" of eternal normal science without revolutions whether scientific or social. Fukuyama's "end of history" requires an "end of scientific history" as it is an obligatory premise, and separating sciences from philosophy is sufficient for that, though proclaimed quite otherwise: as overcoming metaphysics preventing sciences and substituting them by quasi-sciences. Particularly, that "anti-metaphysical turn" has established for science to obey society absolutely and thoroughly, obviously a condition contradicting the scientific and social revolutions in Modernity featured by the domination of science over society by the mediation of philosophy able to translate all epochal scientific discoveries as social corollaries. A special attention is paid to quantum mechanics, being the frontier of physics in the 20th century, where that anti-metaphysical turn is discernibly concentrated and may be notated by the famous slogan "Shut up and calculate!" regardless of its authorship. Just the revolutionary discoveries in physics, for example those of "dark mass" and "dark energy" or entanglement force now its rejection therefore restoring the unity of philosophy, mathematics and physics, made ever possible the establishment of modern science by its emancipation from religion, and thus and ind final analysis, from society.
Keywords: anti-metaphysical turn in philosophy, demarcation of science to metaphysics, Heidegger, Modernity versus postmodernity, normal science versus scientific revolutions, reasonability versus sociability, science versus society,thinking versus calculation, Wittgenstein,

I LOVE AND HATE: THE HISTORY OF A TOO STORMY LOVE AFFAIR OF SOCIETY AND SCIENCE

Humankind as a biological species is both social and reasonable. The latter feature, unlike the former, is unique, at least as to the specific degree of human intelligence, quite inaccessible even for the higher primates. Language needs both, and it may synthesize them. Nonetheless, human sociality and reason resulting correspondingly into society and science as their higher forms contradict each other often enough so that many scientists seem to be "asocial", and society confesses more or less irrationality necessarily shared by many members of it, as far as they

claim to be social. So, one can coin the metaphor utilized in the title of the section as to the relation of society and science.

Though language synthesizing human sociality and reason is one of the main features of humankind presupposing a basic degree of both as a necessary condition for a human being to be "normal", the further development of them can be described rather as "quantum complementarity" following Niels Bohr who used the term at issue in a much wider and philosophical sense: now particularly visualizable by means of the mentioned "associality of science" versus the "irrationality of society".

So, the degree of mastering both, characterizing language, determines only a basic level for all humans claiming to be normal, but that basic level is quite insufficient for both science and society to function successfully. The degrees of sociality versus scientific results into two hierarchies absolutely independent of each other so that the great scientists rule society extremely rarely as well as vice versa.

Being sufficiently different from each other, even "complementary", their relations are usually conflictful, rivaling, even reaching a proclaimed "war" as, for example, in the Middle Ages when Christianity and its Church as its dominating institution were openly at war with science and sought to overthrow it completely and by force.

However, the great world religions, such as Christianity in particular, rely on a book such as Bible interpretable to contain an ancient "scientific" or rather philosophical "theory" however heralded to be ultimately true by virtue of its "divinity" embodied practically in the activity of a prophet as Muhammad or even a Godman as Jesus. Though language synthesizes sociality and reason into a basic level shared by all "normal people" that level turns out to be quite insufficient in the further development of society needing to unify the worldviews of all its members, for the objective of which religion serves, but that unification is to be accessible to anyone mastering language rather than to an elite whether religious or scientific (even being able to coincide as in the Pythagorean school or the Egyptian priests).

However, that "scientific" or rather philosophical "theory" is created for society, first of all, thus it needs "belief" rather than reason, and even openly contradicting the latter. What "belief" is too difficult for one to say, not to speak for a scientific definition. It is a rather powerful subjective feeling for truth regardless of all empirical or experimental considerations as well as regardless of all logical arguments usually contradicting the subject of belief, but not being able to generate such a powerful psychological feeling. In fact, the capability of belief (and thus creating religion) is at least not less rare than that of creating science, however, it is crucially tolerated and favored by the social order and hierarchy needing an ultimate "theory" to support them and society (what it is) without trying to change it.

Thus summarizing from the present viewpoint of the relation of science and society, religion can be seen to be similar to language as a form able to synthesize human sociality and reason into a text granted to be true by virtue of its "sacrality" and/ or "divine origin". Of course, any scientific theory is also accepted to be true however far not forever, but only during some period of time from its establishment until its change by a newly introduced theory. The reason to be

heralded for truth though temporal is its empirical and experimental confirmations as well as the absence of any (or many enough) facts falsifying it. Of course, any sacral text, for example the Bible, is obviously an absolutely arbitrary fiction if one refers to it as a scientific theory thus needing just only religious belief furthermore shared by many people for centuries and millennia and supported by an immense social institution such as the Church.

So, one can notice that a text whether "sacral" or "scientific" being granted by society to be true assists sociality just as languages does. However, any scientific theory is potentially changeable unlike any human language learned while people have bee still children and thanks to a specific human capability more or less stunted in adults. So, the corresponding language is not more changeable once learnt. Then, one can interpret religious belief to repeat the same feature of language (not to be changeable) as far as it is exceptionally useful for sociality and supporting the unity of society: people can exchange their experience and knowledge being absolutely sure that they will be understood even if their statements would be rejected.

Any scientific theory generates a specialized "language" as to the scientific community though international in general and as such, a "language": it is a "paradigm" (a term and concept coined by Thomas Kuhn and commonly accepted) therefore allowing for scientists in a certain discipline to understood each other very well and to be metaphorically considered as a "tribe" capable of cooperation and division of labor.

However and unfortunately, a scientific theory can be substituted by another by virtue of the fact that the newly introduced is "more true" unlike any natural human language which is not more true than any other, always allowing for an exact enough translation between any two or more languages.

On the contrary, such an analytical translation between two paradigms though referring to the same is more than problematic. The scientists of two paradigms,though in the same discipline, are "at war" just like two tribes disputing the same territory.

Thus, any scientific theory being potentially replaceable is not especially suitable to support sociability and to unite society since it will generate future conflicts and wars by definition (by virtue of its "falsifiability" after Popper, furthermore being inherent for a science to be science).

The society needs the constant language of a certain nationality not to be changeable, so if one promotes a text as a specialized presumably perfected language to unite the society at issue, it is necessary to be unchangeable, i.e. "sacral" or due to its "divine" origin, thus practically guaranteeing its obligatory permanency.

Then, that "love" of society and science is expressed by a gealousy of the former in relation to the latter's "adultery" with new hypotheses and eventual theories able to destroy their "marriage". Society needs a partner not so "amorous" and constantly "flirting and cheating" with new and new conjectures and doctrines. So, religion turns out to be that ideal partner of society, absolutely reliable and supporting the "family", or speaking not figuratively, the social order and hierarchy.

As to science itself, society permanently sends to it signals and messages not to “flirt and cheat”, but to be a “normal science” (another term and concept coined by Thomas Kuhn) thus sharing one single paradigm and generating a sustainable scientific order and hierarchy.

Just those signals and messages originating from society as well as their influence on science are the proper subject of the present study.

II RELIGION, PARADOXICALLY SEEN AS A “CHILD OF THAT LOVE” OF SOCIETY AND SCIENCE

The viewpoint to religion which follows below is valid only in the present context meaning the relation of society and science, and then, any given religion as a “scientific theory” unchangeable for the conservation of social order and hierarchy. Thus and vice versa: all scientific “revolutions” are pregnant with social revolutions, i.e. revolutions in a proper sense, essential transformations of social order and hierarchy by means of a short period of violation and anarchy.

The hidden link between scientific and social revolutions is a postulated condition for the intended approach, however it is more or less a “taboo” for both philosophy of science and social philosophy (respectively, “philosophy of history”) confessing the opposite dogma that science obeys society absolutely thus not being able to cause that crucial change of the latter such as a social revolution. The justification of the revolutionary influence of science on society, and particularly the statement that any scientific revolution calls for a social counterpart, is not a subject of the present section of the study: it is granted in advance, but it will be discussed in detail further.

Meaning it as well as the logical law of “modus tollens”, one can quite reasonably conclude that the most reliable way for the society to conserve its order and hierarchy is to prevent any scientific revolutions, and religion is just what is necessary to “vaccinates” against them, indeed postulating a text just as any scientific theory, however unlike it as unchangeable forever due to its ostensible “divine origin” or “sacrality”.

One may parallelize rather loosely and figuratively with Euclidean geometry, a mathematical and thus scientific theory, nonetheless relying on a (supposedly) “sacral text”, namely Euclid’s “Elements” though modifiable, e.g., by Hilbert only making clearer and more precise its axioms (neglecting Euclid’s proper distinction between more obvious “axioms” and less obvious “postulated” being rather conventional). Sharing the advocated here viewpoint, one can consider it (just as any mathematical theory or first-order logic) as an unchangeable forever, ostensibly “sacral” or pseudo-sacral text referring to a quasi-religious doctrine created or only “written from God’s Voice’s Words” by the “prophet” Euclid. Of course, that interpretation is extraordinary, ridiculous, funny, but absolutely consistent in essence.

Indeed, Euclid’s geometry along with Aristotle's logic were thoroughly confessed and studied by Christian religion and theology as consistent and relevant to Belief. On the contrary, such a great mathematician as Friedrich Gauss did not dare contradict Euclid’s authority as those “heretical” doctrines of János Bolyai or Nicolay Lobachevsky, being enough “barbarians”, and

remote from the “sacral Jerusalem”, i.e. Gauss’s Göttingen for being able to that courage. So, one can quite reasonably conclude that the above “funny” interpretation is serious enough and corresponds to the facts, though not being articulated expressly until now.

Euclid's “Elements” is a mathematical rather than physical paper thus not needing any empirical or experimental confirmations for its theorems. Its relevance and consistency to human experience is concentrated exceptionally and only within its principles (whether “axioms” or “postulates) processed further unambiguously and logically by the rigorous rules of Aristotelian logics, in fact, calculated though according to the laws of logic (respectively logical calculus according to the rules of Boolean algebra) rather than according to those of arithmetic, but the essence of calculation is thoroughly conserved meaning a finite algorithm transforming the input data into the output theorems.

Before Euclid, geometry had been an empirical science similar to physics where the relevant laws were discovered by experiments though much more primitive than today’s ones in quantum mechanics, for example. He accomplished a revolution transforming geometry from an empirical, experimental, and physical science into a mathematical one: what it has become since then and continues to be until now. Its relevance to experience is concentrated in a short tuple of initial statements granted to be obvious (as Euclid's axioms) or not so obvious, but nevertheless conventionally granted (as his postulates) therefore establishing a standard for mathematical theories for millennia.

Newton (following Galilei) revolutionized Aristotle’s qualitative physics introducing too complicated mathematical models more or less conventionally chosen thus not being able to claim for Euclid’s obviousness and needing experiments (such as those introduced by Galilei) to be verified. Compared with Euclid’s list of axioms and postulates, Newton’s principles needed permanent confirmations by experiments therefore being quite insufficient by themselves for the deductive and axiomatic building of his physics if one followed literally Euclid’s testament.

Theology, defined as a science trying to rationalize religious belief by means of studying a specific subject as “God”, can be compared with both mathematics and physics. It seemed to be similar rather to mathematics than to physics, however not being able to suggest an exhaustive list of axioms for describing its subject as Euclid’s geometry or experiments confirming its principles as Newton’s physics did. Nonetheless, theology established a third way for scientific verification, namely by virtue of the universal acceptance of its subject by medieval society due to Christianity as a universal religion and the institution of the Church (including the “Holy Inquisition”). So, though theologians suggested various theories or proved new statements about its subject, their relevance consisted in whether and as far they assisted the social order and hierarchy in the final analysis, and the main criterion for their verification was whether and as far other theologians accepted their conjectures since neither the axiomatic and deductive method of geometry nor the experimental method of physics were applicable within its framework or to its subject.

One can notice that the contemporary social and humanitarian sciences and thus philosophy if it is enumerated among them follow the same model of “social verification” established by

theology though their subjects are quite different from “God” alleged to be studied by theology. Even much more, even natural science and mathematics obey that social verification utilized by theology; and here is how:

Today’s amount of mathematical, physical, chemical, biological papers suggested for being published in scientific journals is huge. A considerable part of them are also absolutely correct in the sense of internal consistency or the correspondence to all facts and experiments in the discipline at issue. So, an additional criterion is crucial for their acceptance: the pier (whether “blind” or not) reviewers’ estimations as well the ultimate opinion of the corresponding editorial board. Of course, that criterion is analogical to the medieval theologians’ one about their treatises and correspondence to Christianity and the Church. Even more so that the scientific journals are rated by their impact factor repeating on the next metalevel the same criterion about “social verification” as in relation to the submitted papers.

One can utilize also Kuhn’s concepts of “paradigm” and “normal science” to describe that mechanism of social verification acting not less in the area of mathematics and natural sciences, though seeming to be improper and inappropriate for them:

Any given paradigm in a certain scientific discipline is a “language” allowing for the corresponding “scientific tribe” to co-operate and divide its members’ labor. If scientists, not speaking that “language of the paradigm in question”, appear regardless of whether they do not know it or suggest a better one (at least in their opinion), those “dissidents” might not be included in the existent “tribal” organization of labor. So, the institution of both peer reviewers and impact factor (in more detail in: *Penchev 2023 December 6*) serve for nobody who does not know or share the paradigm not to be included in the tribal labor since he or she would be only an obstacle or burden.

One might state that a certain paradigm and the corresponding “normal science” originating from it are able to unify sociality and reason as both are two very fruitful human capabilities. However, if the necessity of any scientific revolution appears (for example, after the conditions enumerated by Thomas Kuhn), they contradict each other and start fighting: sociability supports the old one versus reason and the new one. Meaning that last consideration, religion is an ultimate solution of the conflict in favor of the former and thus preventing any revolutions whether proper scientific or social, at that and very important, supposedly “forever”, by means of some prophet and religious leader’s doctrine and the corresponding text heralded to be the corresponding sacral Book such as the Bible or the Quran, etc. One might admit that any religion’s approach of how to support sociality versus reason for the social order and hierarchy to be hopefully and wishfully “eternal” can be “creatively developed further” not establishing for a scientific paradigm to be “sacral” since it would be funny and ridiculous, but by involving relevant institutions such as “peer reviewers” or “impact factor”, etc., which practically exclude the revolutionary change of any scientific discipline (and even, dominating theory), therefore transforming them into religious doctrines, though only effectively, implicitly and secretly.

The impetus originating from society for sustainability is so strong, powerful and imperative that one can observe nowadays, for example starting from the beginning of the 20th century, that

the just mentioned in the previous paragraph pattern for transforming science into an implicit, silent, unadvertised and unannounced “religion”, though only “de facto”, but not “de jure” implies: “no scientific revolutions any more” (in detail: *Penchev 2023 December 6*).

One may interpret and refer to Bruno Latour’s famous essay “We have never been modern”: religion has ever been supported by a hidden justification in one of the main human capabilities, that of sociability. So, if science has been formally and “de jure” recognized during and after the Enlightenment without elucidating those hidden reasons for religion in human nature and thus and not less, overcoming them, science heralded “de jure” tends to be transformed into a kind of religion “de facto”.

III RELIGION AGAINST SCIENCE, BUT THE EMANCIPATION OF SCIENCE AS THE BEGINNING OF MODERNITY

However, the just sketched turn realized nowadays had been preceded by an extremely difficult and painful emancipation of science against religion marked by Giordano Bruno’s pyre as its symbol, on the one hand, and by the French revolution, a social counterpart of it in a sense, on the other hand. One may refer to the corresponding asymmetry of sociability and reasonability among the human population at all. To think and to be reasonable is too difficult for almost all humans due to the huge energy used by the human brain for its activity in the final analysis. That amount is rigidly limited and thus needs a very smart organization of neural links for being utilized maximally effectively. That organization (as a rule and in general, from which a genius might be an exception) can be only a result of a rather prolonged education lasting decades and valid only as to a too narrow and specific area of human activity: so needing the opinions of other specialists in all other areas.

Consequently, thinking is so extremely difficult, though exceptionally valuable and useful, that humankind practically does not think yet (just as Heidegger stated), but not because all humans would not wish to think, on the contrary, we passionately want, however we cannot or do not manage to do this.

The result of that necessity of thinking so difficult for all humans is the confidence of the authorities who supposedly already found the solutions, on the one hand, or the endeavor to the ultimate doctrine (particularly, scientific theory), on the other hand, and the conservation of the social order and hierarchy, also implying the former two, on the “third hand”. So, religion, including Christianity, satisfies absolutely those three demands originating from the above interpretation of Heidegger’s statement that “We don not yet think” or after paraphrasing Latour’s title as “We have never thought ". “Unfortunately”, religion is completely discredited in the field of science, so science tries to fulfill those three “social criteria” without any assistance of religion by means of its own institution relevant to the wishfully “eternal” period of normal science, during which any revolutions whether scientific or social have been prevented in definition. That organization includes the already mentioned “peer reviewers”, “impact factor”, the funding of science “by society”, after which society demands for science to obey its order and hierarchy without any scientific revolutions “pregnant” with their social counterparts.

So, another reading of the history and emancipation of science from religion is also possible and even more relevant to today's actual relation of science and society, reasonability and sociability, when Christianity (or any other religion) is not appropriate any more. The well-known fighting of science against religion for its independence can be now interpreted as a historical form of the permanent "war" of reasonability against sociability (for example, realized during the Enlightenment) so that it is now considerable as the same "war" of science against … its own institution being closely linked to all other social institutions, hierarchies, and order in the final analysis. Said loosely and figuratively, science needs new and still newer hypotheses and theories according to its nature to be inherently "revolutionary" contradicting society, in turn needing just the opposite following its own, not less inherent nature.

So, the parallels can be continued once the Church (in the proper sense during the Enlightenment) is now seen to be represented by the institution of science versus "science by itself". Both "peer reviewers" and "impact factor" act as a kind of "social censorship" preventing those conjectures which are potentially revolutionary (analogical to Copernicus's heliocentric system, Galilei's astronomy relied on observations by the newly introduced by him "telescope", Giordano Bruno's speculative ideas, etc.), but nowadays both "velvety" and much more effectively if science is identified with its institution in an obvious, excluding any doubt way unlike religion supplied with its own hierarchy being absolutely external to science.

So, the social censorship over science is now accomplished as if by the science itself since the corresponding scientific hierarchy is enumerated among and within science itself ostensibly cared for scientificity and fighting against "quasi-sciences", "pseudo-sciences", "para-sciences", etc., which exist really, but as which also any revolutionary conjectures are granted to be for conserving the corresponding paradigm and normal science. Meaning the sustainability of the Church itself to the revolutionary influence of science, one might predict that the contemporary scientific hierarchy would survive after the social aftermath of scientific "earthquake": however, unlike the proper social, non-scientific and "prophan" order and hierarchy.

Furthermore, one might notice that the change of the "celestial order" after the Copernican instantaneous, revolutionary transition (from the earth to the sun as the center) suggested an analogical, sudden "switch" onto another social order (respectively, hierarchy). Nonetheless, the order and hierarchy whatever they would be, were "conserved" as another, "righter" and more correct choice in comparison with the traditional ones among the same general class of all possible social orders and hierarchies.

On the contrary, if ontomathematics[1] would be established, the corresponding social transition would be qualitatively different suggesting the "empty" class of all possible social orders and hierachies rather than any "righter", "truer" social order and hierarchy as after the former historically realized cases of social revolutions such as the French one (which is the most eloquent example). A "liquid" state of society where there do not exist any constant hierarchies, though they are not absolutely excluded however being ephemeral, provisional, occasional, temporal, permanently changeable, rather being comparable with the contemporary "social media" where any post or one's account are potentially able to generate a hierarchy of its "followers", after which all posts or accounts might be ordered according their degree of influence, with an "elite of influencers". Obviously, to be an influencer is quite different from being a "boss", whom an hierarchy though partial and only in a certain relation obeys in definition.

The speed of transferring information is crucial for the transition of a historically given society from its constantly ordered and hierarchized "crystal phase" into a "liquid" one. The traditional "non-Internet" society relies on the much slower transmission of information, though its corresponding vehicles and carriers became faster and faster. Nonetheless, only the Internet allowed for the qualitative jump for its literally instantaneous retranslation all over the world furthermore including the prevailing enough part of humankind as real authors of content and therefore being able to be potential "influencers".

Physically considered, the cast of information (however only "classical" rather than "quantum") is anyway limited by the fundamental constant of the velocity of light in a vacuum, which is actually momentary as for any human being. However, an actually timeless transfer of quantum information is already experimentally established nowadays, furthermore ruling the universe in fact by means of quantum correlations being inherently nonlocal. At least as a conjecture, one might admit even one "more informational", figuratively speaking, "gaseous state of society" where quantum rather than classical information is exchanged.

Consequently and summarizing, one can introduce the concept of religion as well as the fight of science against religion in a much more generalized sense relevant to the present context, furthermore allowing for sociability and reasonability as two fundamental human capabilities to be unified as two essentially different degrees of the same: and thus religion and science in the

[1] Ontomathematics can be considered as a conservative generalization of "ontology" such that both physics and mathematics are within that the newly interpreted and thus introduced "physical and mathematical ontology". Then, all considerations about "physics and ontology (metaphysics)" or "mathematics and ontology (metaphysics)" though the Cartesian abyss granted by Modernity being postulated also in them in advance, are now, however implicitly, relevant to "ontomathematics" including "society" also in its frameworks (e.g., Healey 2020; Langenhove 2020; McIntosh 2020; Okamura, Nishijo 2020; Playford 2020; Esfeld 2017; 2014; 2004; Esfeld, Lazarovici, Lam, Hubert 2017; Nikitenko, Mesyats, Rozhkova 2017; Deacon, Cashman 2016; Tabaczek 2016; Cordovil 2015; Tallant 2015; Tau 2015; Beraldo, Chan, Bundy 2013; Egg 2013; Gaifman 2012; Perminov 2012; Morrison 2012; Howard, Fraas, Bueno, Castellani, Crosi, French, Krause 2011; Stern 2011; Kuhlmann 2010; Strauss 2010; Cole 2009; Domski 2009; McDermid 2008; Maudlin 2007; Brunschvicg 2006; Dorato 2006; Waal 2005; Stewart 2004; Fisher 2003; Pohnolkinghorne 2003; Crook, Gillett 2001; Zalta 2000; Dutton 1999; Muntersbjorn 1999; Torretti 1997; Bradley 1996; Knorr-Cetina 1995; Redhead 1995; Campbell 1994; Trusted 1991; Tymoczko 1991; Poidevin 1990; Singleton 1989; 1987; Fidelman 1987; Menzel 1987; Resnik 1985; Clarke 1979; Wilson 1977; Skyrms 1976; Bergmann 1961; Commoner 1958; Born 1956.

final analysis. Sociability and reasonability, though being standardly understood absolutely, i.e. as properties, are now to be defined *relatively* where sociability "cools down", "freezes" society or any historically given society therefore resultatively assisting for the conservation of the existent social order and hierarchy. On the contrary, reasonability endeavors to "heat" it, thus destroying any "crystallized" order and hierarchy, particularly allowing for a certain society to pass from one to another of its "allotrope", "crystal" forms so that both of them are "crystal", but the corresponding orders and hierarchies differ from each other absolutely (or figuratively, their "crystal lattices").

IV THE REASONS FOR THE "ANTI-METAPHYSICAL TURN" IN THE 20TH CENTURY, INCLUDING INTERPRETED IN RELATION TO QUANTUM MECHANICS

In the last paragraph above, the link between a scientific revolution (though in a meaning partially generalized to the original one introduced by Thomas Kuhn) and a real, proper social revolution (for which the French one is a typical example) is simply postulated. Anyway, it needs a look, though cursorily, at and within the real mechanism, by which that axiomatic link is actually realized, and more especially, to a certain part of it, by means of philosophy, being able in definition to suggest a general worldview valid for both science and society simultaneously. Thus and particularly philosophy is able to transfer and translate that newly created understanding of the world by a certain scientific revolution, to the corresponding society and calling for its revolutionary change.

Philosophy inherently unifies society and science, thus implicitly suggesting for itself to refer to an inseparable subject, that of "socio-nature". The philosophy of the "Enlightenment" preceding the French revolution can elucidate essentially the mechanism for translating scientific conclusions into a social revolutionary "language". Then, society should and had to be "enlightened" by science (contradicting religion) by mediation of philosophy. Meaning the sketched above unification of religion and science as different qualitative degrees of the same, the philosophy of the Enlightenment preferred reasonability, reason, and science instead of sociability, sociality, and religion. The Enlightenment also can be considered in a generalized sense: as increasing the speed of information between the members and groups of the society, after which today's Internet revolution or the predicted above revolution due to the exchange of quantum information (by some "Quantum Internet" unlike the real Internet able to transfer only classical information) can be reckoned to be contemporary forms of the "Enlightenment". Indeed, the 18th century's original Enlightenment also meant the information acquired by science to be transferred and thus to "enlighten" all the French people who, already "enlightened", started the Revolution. Of course, the transfer of information at issue, from science to society, lasted more than a century since the channels of its transfer and mastering by people were extremely slower in comparison to that supplied by the Internet and the contemporary highly educated people.

As well as vice versa: if one wishes to prevent the revolutionary social corollaries implied by any scientific revolution, furthermore being minimally sufficient and thus maximally painless, is to stop the transfer inherently accomplished by philosophy if its subject is defined to be

"socio-nature". For example, philosophy can be stigmatized to be that a-scientific or anti-scientific metaphysics (as for example, after Wittgenstein or Popper, etc). Philosophy is almost interpreted to be even a form of religion, which would be merely ridiculous, applied to the inherently atheistic philosophy of the Enlightenment.

From the viewpoint of the present study, that philosophy alleged to be anti-metaphysical and not less, though rather paradoxically, "anti-philosophical" was directed to conserve society from any revolutionary influence originating from science by means of destroying the "bridge" between them: what philosophy is and has always been. Consequently, that anti-metaphysical turn by the 20th century's philosophy is to be titled rather "Counter-Enlightenment" according to its essence. In fact, the influence of that anti-metaphysical "Counter-Enlightenment" is historically restricted until the Internet revolution having realized and continuing to accomplish a new Enlightenment, now initiated by science by means of technology rather than by philosophy as during the 18th century's original Enlightenment.

One may conclude that society has tried to prevent its own revolutionary change, learnt the lesson taught by history, of how the French revolution could happen by the mediation of the philosophy of the Enlightenment. However, the new Enlightenment is anyway unavoidable, and if its pathway through philosophy has been stopped, it finds another one, originating directly from science and by means of technology, namely the Internet. Both Enlightenments, the original and new one, are caused by the natural advance of humankind and can be only slowed and postponed rather than prevented by society endeavoring to conserve its structure, order and hierarchy.

One might further stare at the main tenets of that Counter-Enlightenment against philosophy claimed to be metaphysical, not-scientific, even a new, prophan and secularized form of religion. Section VI is intended for demonstrating that nonlocality and thus even the physical and experimental theory of quantum information, at least that part of it, which is out of classical quantum mechanics, is a "metaphysical speculation" after whether Wittgenstein or Popper since both would interpret nonlocality as metaphysics. Even classical quantum mechanics as far as it is inherently probabilistic and thus not satisfying the criterion of absolutely repeatability confessed by classical physics and natural science is to be enumerated out of the "facts", utilizing "meaningless language games", or beyond the "demarcation line" between science and metaphysics[2], or in other words, not within the proper domain of science.

[2] Popper's conception of "demarcation line" and especially, its applicability is discussed in many papers (e.g., Bellolio 2020; Fernandez-Beanato 2020; Keren 2018; Shaposhnikova, Shipovalova 2018; Pennock 2011; Turgut 2011; Yen 2010; Zangwill 2010; Grünbaum 2008; 1979; 1977; Zeeuw 2007; Gruender 2001; Raman 2001; Condit 1996; Mayo 1996; Taylor 1996; Blitz 1991; Fuller 1985; Hirst, Woolley 1985; Yearley 1985; Gieryn 1983; Weingartner, Sugden 1982; Kohak 1974.

V THE ALLEGED, BUT DREAMED ENDS OF BOTH HISTORY AND SCIENTIFIC HISTORY: THE WHISHFUL, BUT IMPOSSIBLE ULTIMATE VICTORY OF SOCIETY OVER SCIENCE

One can consider a generalized viewpoint so that all proper social revolutions, on the one hand, and those more or less figuratively named by Thomas Kuhn to be “revolutions”, though “scientific”, on the other hand, are able anyway to be unified. The objective for being involved that viewpoint is the following. The starting point is Fucuyama's “end of history”, a term rather borrowed by him from Hegel who introduced his “dialectical synthesis” both ontologically and in a philosophical and historical way also in relation to the Prussian monarchy ostensibly preventing any possible future social revolutions since it was claimed to embody the synthesis at issue. That was an absolutely wrong statement which was many times refuted in the 20th century, during which a few terrible social cataclysms took place in both Germany (including Prussia literally meant by Hegel) and the world at all.

Nonetheless, Fukuyama suggested another embodiment of that “ultimate synthesis” borrowed from Hegel, regardless of its categorical rejection by the course of history mentioned above as if Hegel’s idea is correct, but it should be related to the world after 1989 rather than to the Prussian monarchy. The epoch of social revolutions symbolized by the French revolution and its total bloody terror had ended since it can be characterized as Hegel’s philosophical and historical “antithesis” to the preceding centuries and millennia granted to be the corresponding “thesis”. So, all the historical time after 1989 was alleged to be that ultimate synthesis without social revolutions, but marked only by the permanent progress of humankind and civilization. Even a quite superficial look at the history after 1989 is absolutely sufficient to reject that ostensible synthesis of permanent advance, including in Fukuyama’s newly introduced “second edition”.

However, the core for involving the generalized viewpoint to both social and “scientific” revolutions consist in the translation of Fukuyama’s “end of history” in post-Heggelian manner to Thomas Kuhn’s “scientific revolutions” therefore coining the conjecture of an “end of scientific history”, a supposedly “eternal” period of “normal science”, furthermore specified to be a “dystopia” requiring for science to be “socially responsible”, thus avoiding its own “revolutions”, but further “pregnant” with real social revolutions marked by a period of anarchy and violation (including as a direct corollary from the former): an additional idea sketched above. That approach is discussed in much more detail in another paper (*Penchev 2023 December 6*) where it is also justified by a series of arguments.

This section of the present study means only to demonstrate that it can be interpreted to be an ultimate victory of society over science, respectively, of sociability over reasonability, however not less impossible than its original version whether in Hegel’s or Fukuyama’s edition. The ultimate victory of either of both sociability and reasonability is nonsense since they are different forms (or even, degrees) of the same and then: they can be considered as distinguishable only quantitatively where sociability means a “colder state of society” unlike reasonability as a “hotter one” according to the “parameter of exchange of information” as it is suggested above.

One can further consider in more detail an alleged “end of scientific history” following Fukuyama’s pattern only now applied to Thomas Kuhn’s “normal science” during which no “scientific revolution” happens or even might at all take place. If the objective is science to be “cooled” to a degree of “social responsibility”, neither “frozen” nor too “hot”, but in a “pleasant temperature” state not threatening society by the “boiling” of a social revolution.

If society is the “lord”, and science is the “servant” since science serves society rather than vice versa, just science ought to obey society rather than vice versa: however just that is the case during any scientific revolution and especially if it is so essential to cause a social revolution sooner or later. Of course, the opposite “extreme” of a quite not developing, “frozen” science is also unwanted just as a “servant fallen in coma”. The best case is that of an absolutely healthy and active servant who, however, knows where the relevant social place is, thus not trying in any way to become another master or even to transform society into a servant forcing it to obey science just as during a social revolution being a corollary from its scientific counterpart.

If the just sketched purpose and intention for how science to be hold in a “cool state of social responsibility” would be translated into the language of Kuhn’s “The structure of scientific revolutions”, this would mean a prolonged (figuratively said, “eternal”) period of “normal science”, during which there are no scientific revolutions in definition thus preventing they to cause eventually social revolutions. So, the immediate task is to be prolonged the period of normal science as longer as possible:

Then, one is to distinguish the reasons for favoring the period of normal science to be prolonged from the opposite ones, shortening it and calling for scientific and social revolutions in fact. Obviously, the former would be the socially useful ones and thus wishful unlike the latter both “harmful” and “dangerous” at least as to the existent social order and hierarchy. Once, they have been distinctively subdivided into those two groups, what is absolutely sufficient is the former to be encouraged in every way, and respectively, the latter to be suppressed as much as possible. If society does so, science would be “forever” (i.e. as long as this is practically possible) in the socially responsible “normal state” of a “servant” of the society.

Consequently, the present study is to try describing both groups of factors, and then, discussing whether or as far our real contemporary society supports the former, but prevents the latter therefore holding science in the bounds of a “cool” and “pleasant” temperature which is “socially responsible”. Obviously, that “socially responsible objective” would be respectively “scientifically irresponsible” since science and society, reasonability and sociability have been in advance unified as both “cool” and “hot” states of the same just because what is “cooler” is less “hot” as well as vice versa. What the conservation of social order and hierarchy slows down is the scientific progress and advancements so that the latter is admissible only in that degree not threatening the former.

However, the scientific progress during the last centuries tends to accelerate by itself, even exponentially, which is hardly consistent with even permanently perfected social order and hierarchy being in definition more or less “solid”. In other words, science by itself tends to transform society in a relevant liquid, even gaseous state, which can be analogically called

“scientifically responsible” (though consequently, “socially irresponsible”. One is to emphasize: society endeavors science to be “socially responsible”, but not less and oppositely, science wishes and tends for society to be “scientifically responsible”. If one embodies that endeavor for science to be kept in check by virtue of the intended actions of some very highly developed alien civilization, the plot of the serial “The problem of the Three Bodies” would be the result.

So, one may discuss it (whether in its original Chinese version or its US cover) just from the above hinted viewpoint as an artistic visualization thus well known all over the world therefore facilitating the popular explanation of the thesis advocated here. “Exteriorization” is usual for humankind’s way of thinking: it consists in the representation of whatever being within it as something opposed to it, especially in the case of any internal conflict where its other side (or Hegel’s “antithesis”) is granted to be ostensibly “external”, “transcendent”, “fremd”, or “alien” as in those serials. That exteriorization originates from the human individuals’ psychological protection against the internal conflict threatening the integrity of the psyche, where the internal conflict is prevented by situating its other, latter side to be ostensibly external therefore identifying oneself with its one, former side.

Meaning that peculiarity of human mind, one can easily suggest that the civilization alleged to be alien and interested in preventing the too fast scientific progress of humankind in fundamental physics is the human society itself in fact, only exteriorized by virtue of the just mentioned psychological mechanism. So, the real conflict between science and society being internal and even inherent for humankind is picturesquely mapped by the opposition of some (too) highly developed alien civilization for the real society and its influence on science.

As a result: “there does not exist physics” since any particle in any human experiments in the area of fundamental physics is “in fact” an alien supercomputer behaving as a human being gifted by “free will” thus able to be unpredictable or to “create miracles” from the viewpoint of classical physics (including classical quantum mechanics rather than only special and general relativity as usual). Thus, the repeatability and even objectivity necessary for any research in physics is canceled by the alleged aliens’ conscious intention but not touching applied sciences where particles (not being the aliens’ supercomputers) behave “normally”, according to the real physical laws (which, however, are inaccessible to humankind because of the ill-intended aliens’ will created for that objective the supercomputers at issue).

One can easily distinguish that the alleged alien civilization reaches the same result to which the real human society endeavors: to “cool” science not to call revolution, though initially scientific, but then possibly transforming into social ones, but protecting the useful function of science to serve to society by means of all applied sciences such as “nano-science”, for example. That observation confirms the conjecture that the “aliens” (of course, only in the serials) in fact exteriorize the real human society and its conflict with science.

Though the own viewpoint of humankind is identified with science in both original serial and its cover, the victory belongs to the aliens’ civilization “cooled” science to a “pleasant” “safe temperature” not threatening their dominance; but in fact: the real dominance of society over science so the latter to serve timidly to the former not calling for fundamental scientific

revolutions then eventually transforming into proper social ones, restricting itself only to its "socially responsible" function for discoveries in applied sciences and technologies. So, both serials "cram" the wishful "socially responsible" conclusion for science to obey society in two quite different (at least, at first glance or according to common sense's prejudice) state ideologies: the communist one of Chinese People's Republic and the ostensibly individualistic one of the United States of America. Indeed, both need science to obey society though for different reasons and due to quite different historical and even civilization traditions.

Still one observation on the serials is directly relevant to the present context and refers to the electrons' free will noticed for the first time by Einstein in his famous and frequently cited letter (1926) to Max Born[3]. The "free will theorems" (Conway, Kochen 2006; 2009), called so by their authors, can be considered to be a confirmation of Einstein's conjecture regardless of its negative emotional background that the electrons should really possess "free will" if the experimenters (who are human beings) have that and as a corollary from a few statements in quantum mechanics and special relativity. So, one might extrapolate those "free will theorems" to the plot of the "3 body problem" to be a hyperbole of the former by means of the suggestion about all elementary particles experimented by people to be the ill-intentional aliens' supercomputers programmed to behave fundamentally randomly and arbitrarily as this is described in the serials.

Quantum mechanics introducing the separable complex Hilbert space as its basic formalism has managed to resolve the problem (pictorially described by Einstein as the "terrible" conclusion that the electrons should possess free will not less than all human beings and then, rigorously deduced by Conway and Kochen) as a sequence from the unification of the continuous (even smooth in fact) description of the macroscopic apparatus obeying the laws of classical mechanics, on the one hand, and the measured quantum entity, the quantity of physical action of which is discrete and commensurable with the Planck constant, on the other hand. That unification forced by quantum mechanics, in order to be an objective experimental science along with all other physical disciplines, needs probability (density or not) distributions as only possible links between the discrete quantum entity "by itself" and its smooth description "for us" by the measurement of the apparatus.

The "wave functions" of all possible quantum states are the characteristic functions of the corresponding probability (density or not) distributions from the proper mathematical viewpoint noticed by Max Born for the first time and often called his "probabilistic interpretation of quantum mechanics", but rejected by Einstein himself coining the sardonic metaphor of "God plays dice" as nonsense. The serials only substitute the figure of "God plays dice" by another and more contemporary one: that of the aliens' supercomputers, but both mean the same "probabilistic behavior" of all quantum entities once they have been measured by microscopic apparatuses.

However, the serials share a "socially responsible" viewpoint opposite to that of Einstein himself, believing in science thus blaming quantum mechanics to give up its classical ideals or at least to be "incomplete", so that an alleged future "actually complete quantum mechanics" would

[3] Born 1969.

restore them absolutely. On the contrary, the serials granted today's certainness that quantum mechanics is really complete, and the "probabilistic quantum behavior" is real and inherent, but nonetheless they explain what Einstein called the "electron's free will", so awful that he "would be better to be a shoemaker or croupier than a physicist"[4] again classically, by means of the aliens' free will though ill-intended to humankind (thus oppositely to Einstein who did not believe God to be ill-intended).

However, that ill-intended free will is interpreted otherwise in the present study: as the only exteriorized real free will of the society endeavoring for science to serve, not calling for scientific and then, social revolutions. The real interests of science and society are partly opposed to each other so that the former is linked to the maximal fast advance of humankind's cognition, and the latter tends rather to limit it and not no destroy the social order and hierarchy.

VI TWO CASE STUDIES OF THAT ANTI-METAPHYSICAL TURN IN PHILOSOPHY ITSELF: WITTGENSTEIN AND POPPER

Furthermore, one can discuss the anti-metaphysical turn in the 20th century's philosophy by means of Wittgenstein's criticism[5] to metaphysics as well as by that of Popper[6]. The intention of the present section is to demonstrate that both influential authors' ideas prevent really the

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[4] Born (1969).

[5] Wittgenstein's philosophical heredity is huge, but two consecutive constraints (to anti-metaphysics and to its criticism in the framework of the present context) allows for the references to be reduced to a reasonable amount (e.g, Goncharenko 2019; Grimmel, Hellmann 2019; Mion 2019; Hutto, Satne 2018; Lampert 2018; Montibeller 2016; Plourde 2016; Zalabardo 2015; Connelly 2014; Dawson, 2014; Garavaso 2013: 1988; Heinämaa 2012; Egan 2011; Hacking 2011; Penco 2010; Berto 2009; Mulhall 2009; Cahill 2008; Putnam 2008; Steiner 2008; 2001; 2000; Zhang 2008; Zhang, Chen, Zhang 2008; Awode, Carus 2007; McGhee 2007; Floyd, Putnam 2006; 2001; Kuusela 2005; Westphal 2005; Bays 2004; Dwyer 2004: Plant 2004; Stevens 2004; Caruana 2003; Norris 2003; Rodych 2003; 2003a; 2002; 1999; Seron 2003; Kjaergaard 2002; Smith 2002; Floyd 2001; 1991; Harré 2001; Medina 2001; Pârvu 2001; Sayward 2001; Steuer 2001; Joseph 2000; 1998; Hochberg 2000; Soulez 2000; Stiers, 2000; Jacquette 1999; McGinn 1999; Costelloe 1998; Goodman 1998; 1986; Jost, Gustafson 1998; Kindi 1998; Minar 1998; Gillett 1997; Glebe‐Møller 1997; Proudfoot 1997; Putnam, Conant 1997; Sullivan 1995; Wahl 1995; McDonough 1994; 1992; Proudfoot, Copeland 1994; Ruffino 1994; Levett 1993; Carmesin 1992; Marcotte 1992; McDowell 1992; Gerrard 1991; Gonzalez 1991; Hao 1991; 1984; Stern 1991; Singer 1990; Trigg 1990; Lear 1989; Moser 1989; Neumaier 1989; Lokhorst 1988; Marion 1988; Sokuler 1988; Tully 1988; Altmann 1987; Cook 1985; Holiday 1985; Moore 1985; Tymoczko 1984; Weinert 1983; Klemke 1981; Reeder 1980; Rubinstein 1979; Taylor 1978; Chihara 1977; Hughes 1977; Miller 1977; Pears 1977; Wrigley 1977; Burr 1976; Bloor 1973; Mounce 1973; Schwyzer 1973; Dummett 1959; Kreisel 1958; Peursen 1959; Ambrose 1955;

[6] Popper's philosophical worldview is enough commented. A few of only those closer to the present context are: Del Santo 2019; Goncharenko 2019; Belinsky 2018; Borghini 2015; Smit 2015; Tambolo 2015; Ribeiro 2014; Albinus 2013; Rowbottom 2013; 2011; Corkett 2009; Grünbaum 2008; 1979: 1977: Rieppel 2008; Díez 2007; Klein, Herskovitz 2007; McLaughlin 2007; Stamos 2007; Qureshi 2004; Rodych 2003a; Plaga 2000; Koertge 1997; 1972; Stokes 1997; Kurz 1996; Mayo 1996; Newton-Smith 1995; O'Connor 1995; Redhead 1995a; Worrall 1995; Jammer 1991; Miller 1991; Popper 1989; 1957; 1952; 1950; Schmid 1988; Derksen 1985; Irzik 1985; Yearley 1985; Krips 1984; Creed 1983; 1979; Rudd 1983; Klemke 1981; Settle 1979; Bhattacharya 1978; Krige 1978; Wettersten 1978; Kelly 1977; Lefevre 1974; Churchland 1975; Lloyd 1967; Kirk 1960;

transfer of an eventual scientific revolution to its social counterpart as far as the philosophy of the Enlightenment accomplished an analogical transfer therefore assisting, e.g., for the French revolution. Indeed, any proper scientific theories cannot act on society directly, they need social, i.e. non-conservative generalizations as well as their popular translations for being able to call social revolutions. So, preventing the transformation of scientific ideas into philosophical ones, the eventual revolutionary influence of science or reasonability over society or sociability would be prevented as well, limiting science within its role to serve society rather than to transform it.

Indeed, that interpretation is not proper and standard as for both doctrines which explicitly declare to defend science from philosophy, but the present approach suggests that they endeavor to defend society from science in fact only pretends to care science, and really destroys the "philosophical bridge" for translating proper scientific ideas into social ones really able to call for revolutions. The present study does not investigate their works in detail, even more so that the corresponding doctrines are not self-consistent, especially those of Wittgenstein furthermore not utilizing the standard thesaurus of philosophy. Speaking loosely, one might doubt what Wittgenstein has wanted to say in fact, therefore admitting quite different interpretations, even directly contradicting each other. One can only sketch a conjecture relating to philosophy not to interfere with science, thus preventing science from calling for social revolutions in the final analysis (which in turn the thesis advocated here is). Consequently, the present viewpoint can be reduced to two statements, only the former of both explicitly available or at least revealable in their doctrines, but the latter being a direct corollary from the former, though implicit, hidden, and unarticulated.

So, one is to demonstrate initially that deduction: philosophy not to intervene science implies that science not to revolutionize society, but a preliminary arrangement is necessary. It refers to the obvious fact that science changes society directly and crucially by means of techniques and technology. Nonetheless, those absolutely new devices, for example, the smartphones all over the world and the omnipresent "social networks" do not revolutionize society immediately: they turn out to be consistent (though presumably in different degrees) with various enough social and political organizations, cultural and civilizational traditions (rather than only with the West where they were invented and initially propagated), being ambivalent and ambiguous as all tools, instruments and devices assisting various or even contradicting objectives equally well.

On the contrary, philosophy predetermines certain human choices and decisions as relevant and consistent with the general worldview initially elaborated by science though restricted to its problems at the start. Science contradicts common sense, the everyday experience and established traditions very often, though all of them underlie both social order and hierarchy, thus human socialization and sociability in the final analysis. Thus, science undermines the socio-political system as its ultimate result. On the contrary, religion, being unchangeable unlike science, supports it, which is a basis and one of the main premises for their contradiction and fight, even "war."

There exists a series of well-known examples thus being sufficient only to be mentioned. The Copernican heliocentric system directly contradicts common sense's everyday experience, and

thus it tends at least to admit alternatives of the traditional social organization even its revolutionary substitution by quite different ones, or in other words, social experiments once their scientific counterparts had turned out to be so successful and fruitful. The humans' reason has started to dominate over the tradition, to doubt in a Cartesian manner and then to transform it including as to the social order and hierarchy even in a revolutionary way. Science implies the emancipation of reason embodied in the human mind and its gradual prevailing over tradition. People began to decide constantly about all essential practical problems by means of their reason in elected parliaments working permanently. So, one can conclude that the human mind's emancipation from the tradition, accomplished by science, is a necessary condition for the main contemporary form of socio-political organization (or at least, the Western one)

Another and not less known example is Darwin's doctrine of evolution including humankind's gradual origin from the primates being quite animals though. Obviously, it contradicted the traditional understanding in the Old Testament that God had created the first man, Adam, as the ultimate part of the Creation of the world. So, Darwin's mind, supported by scientific methods and observations, dare challenge the Church, its hierarchy, not least all the society, its belief and tradition, and even gaining victory over them. One can notice an intermediate mismatch: if people voted, at least in the nineteenth century after Darwin's doctrine had appeared, they, including the elected Victorian Parliament, would reject his revolutionary new worldview, especially to the position of people as "monkeys" though only originated from them.

Thus, the human minds' emancipation turns out to be internally contradictory: which human minds, either those of all Britain adult people elected the Parliament and eventually rejected absolutely democratically Darwin's doctrine or Darwin himself's mind dare argue to and with the tradition and belief? So, the discussed above opposition of sociability and reasonability can be visualized by the counterfactual conjecture that the British Parliament would vote and eventually reject Darwin's doctrine. Of course, no parliament, no court can decide or has ever decided about whatever scientific hypothesis, including that one which might influence society, even call for proper social revolutions. So, science is able, at least as an effectivevoption, to suspend democracy, to impose a solution repudiated by the majority, even by almost all voters excluding an insignificant minority of scientists, at that only those working in certain disciplines, e.g. evolutionary biology, anthropology, and genetics.

So, though the emancipation of reason has been a stable trend since the beginning of Modernity, it is ambiguous and self-inconsistent, as that is sketched above: whether the science's reason by too sophisticated theories and experiments or the society's common sense relying on people's everyday experience and democracy? Obviously, their mismatch has existed, and even much more, it has exponentially increased. Humankind as all its individuals is not able only to read (not to speak to understand) any specialized contemporary scientific articles since even their language (for example that in an advanced mathematical paper) is artificial and quite different from any natural one.

The translation of ideas borrowed from scientific theories has been realized by philosophy therefore more or less unifying and synchronizing the current social organization with what nature is (or at least, should be) in the corresponding "picture of the world" collectively created by science. Human society depends on nature and has to fit it. However, the expanding rift sketched above has made that inherent task of philosophy more and more difficult so that itself in turn has been gradually "torn" due to its endeavor to link between each other the two more and more diverging "shores" (visualizable, for example, by Charles Persy Snow's "two cultures"). Forced to choice, burdened furthermore by the Socratic "human engagement", philosophy remained on the one "shore", that of humankind, society and humanity, particularly being enumerated among "humanities and arts" or among "social sciences".

Meaning that observation, Popper's doctrine, especially his "demarcation line" between metaphysics and science by the criterion of "falsifiability", on the one hand, and Wittgenstein's one(s) distinguishing "Whereof one cannot speak thereof one must be silent" from whereof one can speak, eventually describing the latter whether as in the Tractatus or by means of "language games", on the other hand, can be both interpreted to be simultaneously reflections and results due to the internal tension or even break between those two "diverging shores". Thus, both philosophers had continued the modern emancipation of reason and human mind but in a rather paradoxical way:

They implicitly advocated for its counterpart, resultatively remaining on the opposite shore, the emancipation of society from science so that the former can further develop following its own laws and rules, absolutely independent of those confessed by science, especially by exact sciences. Whatever scientific discoveries or ideas might appear in the future, they should not be able to influence society at all (not to speak of revolutions) being reliably divided by an abyss (more or less similar to the Cartesian one). They are proclaimed to be two independent "countries" with their own and quite different constitutions "since now and forever".

"Whether and how far?", one might question in Heidegger's manner. Science, especially the fundamental one, depends on society for its funding absolutely or at least crucially. Though society in turn needs technology and techniques originating from fundamental scientific discoveries, there exists no mechanism for the latter to be directly encashed: even more, that mechanism seems to be impossible in principle. Fundamental science searches for discoveries in many directions, but nobody knows or might guess which from them will turn out to be the most fruitful ones, or at least rentable. The fundamental discoveries, though concentrated in certain areas, are rather "God's gift and grace", occasional results of "good luck". So, society is a necessary mediator to encash only a few of them and then to fund all the frontier of scientific research by the gain of the former. The metaphor of science depending on society as a teenager dependent on the parents might be mentioned though being rather superficial since the "teenager's siblings" rather than the "parents" themselves are who gain money.

Summarizing, one may conclude that fundamental research is "unsaleable". It as a "good" possesses crucial disadvantages: (1) it is a "package deal", and almost all of its "items" have no value, but nobody can guess in advance which of them are worth to be "bought"; (2) it is

extremely expensive so that only the society as a whole by means of the state (even only by the richest ones) is able to fund it. Nonetheless, regardless of the just mentioned two disadvantages, the “package deal” even on those conditions is exceptionally profitable, so that those richest countries, being able to allow for it, become much richer and richer just due to it. So, fundamental science needs society even only to exist.

The dependence of science on society is the obvious “half” of the just hinted socially and scientifically “hermeneutic circle” . The converse dependence of society on science seems to be not less obvious even at a first glance: at least the contemporary global society needs technique and technologies not for its exponentially accelerating development, but, nowadays, even only to be stable and to continue to exist resolving the new and new problems generated by that too fast development. However, if techniques and technologies can be called “socially responsible and engaged” in a sense (to be ambivalent and applicable to different social organizations and hierarchies), the same cannot be repeated for fundamental research literally. It is rather ambiguous and uncertain: on the one hand, it implies and generates those technique and technologies so important for society; on the other hand though, its own development is featured by “scientific revolutions”, destabilizing society for they call for social revolutions and for the relevant revolutionary transformations of society, at least to fit for further funding fundamental research.

That “dark side” of the dependence of society on science is not articulated enough or even at all in the corresponding literature. However, that articulation is the proper subject of the present study necessary also for revealing and demystifying the dystopian endeavor of the 21th century’s society to distinguish and then divide the “socially responsible” part of fundamental research, generating the so necessary technique and technologies, from its “dark” counterpart calling for social revolutions. The course of thought shared by the propensity for that distinction is the following. If there exists a hidden equivalence and the one half of that equation is prevented, the other half of the same equation is rejected “still in its infancy” even not needing any explicit discussion about it.

So, that equation would be “scientific revolution = social revolution”. However, again Heidegger’s “Whether and how far?” is relevant since common sense, including the philosophical one, would resent and grumble: any scientific revolution is a “subjective”, imaginary, metaphorical “revolution”, only in the “mind”, unlike any social one being “objective”, real, literary “revolution” occurring in the “world” thus both being reliably divided from each other and excluding any mutually influence and interaction by means of the Cartesian abyss. So, the “equation” at issue would be nonsense in definition: it wrongly equates entities incommensurable by virtue of that abyss. And that objection would be quite reasonable as long as the Cartesian insurmountable distinction was granted as an axiom thus not allowing any doubt.

However, one is rather easy to temptate for reflecting in Einstein's manner of “Gedankenexperimenten” on a non-Cartesian philosophy, including holistic philosophy of science and society as an inseparable whole, in which that equation is postulated as an axiom

being the negation of the alternative axiom granting the Cartesian abyss. In the frame of ontomathematics, particularly and especially as the relevant "first philosophy", that non-Cartesian axiom is absolutely natural, consistent, e.g., with the theorems of the absence of hidden variables in quantum mechanics or with all phenomena of entanglement and the concept of quantum information.

Then, the revolutions "in the mind", i.e. scientific revolutions, and those "in the body", i.e. social revolutions would be or at least might be considered to be inseparable, "entangled":

Here, "entangled" is used rather literally, after "ontomathematics" and "quantum information" than metaphorically. The definition of that literal use (as for the relation of science and society) would mean the corresponding "spaces of events" (e.g. after Kolmogorov's axioms of probability theory) are overlapped (whether partially or thoroughly), so that there exists events being simultaneously "scientific" and "social" (respectively, "mental" and "bodily"). Then, if one considers the corresponding "characteristic function" of their probability (density or not) distributions, they would be just entangled wave functions: *literally*.

Furthermore, those events simultaneously scientific and social should be demonstrated, otherwise they would be "nonentangled", for example following the pattern of the Cartesian abyss between them. Obviously, science is nowadays realized as a social institution with its own order and hierarchy so that all those "events" happening within it are really scientific and social simultaneously. On the other hand, "social constructivism" in philosophy and sociology of science (e.g. after Bruno Latour) suggests even for the established scientific theories to be reckoned as social facts occuring in "social networks" rather than as epistemological "truths": in other words, a result of the really existent entanglement of science and society.

Finally, one can offer a distinction of "calculation" versus "thinking" in science following the just sketched viewpoint that it is really entangled with society. "Calculation" is a *finite* procedure, repeatable in principle by a Turning machine, though accomplished by people, at least initially or for composing a relevant software program. On the contrary, thinking is an *infinite* "procedure", or a "quantum algorithm", nonetheless finishing for a *finite* time. Practically, that is a probabilistic algorithm with a result being ambivalent and ambiguous in principle, but interpretable by humans and their experience unambiguously enough, at least as to practical aims. So, calculation does not need any interpretation, being unambiguous inherently, even definitively. On the contrary, thinking needs a certain interpretation comparable with quantum measurement where the apparatus as if "interprets" the result ultimately, though fundamentally randomly.

Though thinking just as understanding should be a hermeneutic interpretation (now meant as after Heidegger or Gadamer), but not needing a human interpreter at least after the former once the Socratic human problematics has been in advance abandoned, "bracketed", or "destructed". The sense of that "destructed" or "dehumanized" interpretation after Heidegger would consist in its relation to the relevant whole meant, e.g. by a hermeneutical circle. Summarizing in a single statement: calculation relevantly set in the whole to which it inherently belongs is already thinking. Following the metaphor about the trees and forest, calculation is able to "see" only the

"tree" whether better or worse, but fundamentally unable to "see" the "forest" unlike thinking, though in turn not quite suitable for observing a separate tree in detail.

Then, one can realize the title of the present study as a call for a global look at the "forest" as a whole.

VII THE PHILOSOPHER HEIDEGGER'S WORDS "WE DO NOT THINK YET" VERSUS "SHUT UP AND CALCULATE!" ASCRIBED TO THE PHYSICIST FEYNMAN

The conclusion in the last sentence of the previous section will be now thought out by an opposition (added *ad hoc*) between two "slogans": Heidegger's versus "Feynman's"[7] (in quotation marks, as his authorship is only supposed), both being famous enough, but "separately" rather than "entangled" as here.

Heidegger's statement is paradoxical, even scandalous, since humankind has been distinguished from all animals by the capability of thought. Even more, all humans have been heralded to decide about the correspondence of the entities of the two shores of the Cartesian abyss. One should realize the way in which Heidegger's criticism to all Modern philosophy (just because of granting the "abyss" at issue) is related to his aphorism in discussion.

Obviously, the doubtless capability of all humans to think might be linked to their position of the only arbiters whether (as an example) any mathematical model corresponds or not to a certain observable phenomenon. Does the search or research for that correspondence relate to the "yet non-thinking" meant by Heidegger?

Then, thinking at least reflected philosophically refers to the concept of truth. Heidegger might mean that the correspondent truth, unlike his "Aletheia", predetermined for what common sense considers to be, namely, "thinking" not to be yet thinking in a proper sense anyway. Of course, science at all and especially natural science hold just that correspondent truth as "adaequatio" traceable back at least to Aristotle explicitly, but implicitly to Plato. Science generates various hypotheses and then tries whether and how far they fit reality. Those of them for which the scientists in a certain domain have decided to correspond to reality are proclaimed to be *truthful theories*.

Obviously, any correspondence to reality is granted implicitly and even inarticulable to be *local* since human experience is inherently local, or *within the light cone* (respectively, the imaginary domain of Minkowski space) in terms of special relativity. So, one can interpret Heidegger's "Aletheia" as a generalization of "truth" (whether conservatively or not) to nonlocality unlike "correspondent truth" valid only locally. Thus, the latter is fundamentally forced to ignore any influence on local experience if it is due to nonlocality. If one grants that both "dark matter" and "dark energy" as originating from nonlocality, they can be utilized to demonstrate physical phenomena being out of (or "beyond") the concept of truth as "adaequatio". Of course, that is only an interpretation of "Aletheia" presumably unacceptable for Heidegger himself, but nonetheless relevant to ontomathematics in the internet sense to be "first philosophy", so that Heidegger's incompleteness of "destruction" (namely not to be naturally

[7] For example: Johansson, Andersson, Salminen-Karlsson, Elmgren 2018; Kaiser 2014; Montandon, Baars 2011;

deepened to Pythagoras and his school), would be the reason for the rejection of the interpretation at issue.

However, one can think of the relation between "adaequatio" and "Aletheia" furthermore generalizing philosophically distinction between the "Hamiltonian" and "Lagrangian" editions borrowed from mechanics or that between the nonstandard and standard infinitesimal calculus (meaning Robinson's "nonstandard analysis" for the former) borrowed from mathematics itself. (Of course, that would be nonsense for Heidegger himself as confusing, e.g., regional and fundamental ontologies.)

The proper philosophical generalization consists in the analogical, "doubled" or "complementary" interpretation of the pair of locality and nonlocality. Then, "adequatio" would be in Hamilton's manner unlike "Aletheia" rather in Lagrange's one, however being inherently equivalent to each other. Adopting the just mentioned viewpoint, "Aletheia" would be rather another, "complementary" version of "adequatio" than its conservative generalization.

Analogically, the relation of "calculation" versus "thinking" (for example "after Feynman" versus after Heidegger: according to the design of the present section) might be grated to be representable by two equivalent ways: (1) as the relation of a single calculation versus two ones being absolutely independent of each other or at least probabilistically dependent on each other; (2) or as calculation being inherently incomplete to thinking thus justifying Heidegger's constantation that "we do not think yet" since an abyss separates any calculation from "thinking" in a true sense.

One can again utilize the metaphor of the trees and forest also to the former of both equivalent ways for representing the relation of calculation ("after Feynman") versus thinking (after Heidegger). The "forest" can be considered by means of the function successor (as it is defined, e.g., in Peano arithmetic) applicable to any enumerated "tree" so that any finite set of "trees" can be granted to be another ("generalized") "tree" studiable or representable by a relevant finite calculation consisting of all (always a finite number) sub-calculations, each of which relevant to a certain "tree".

Without the metaphor of the "trees and forest", i.e. rigorously and mathematically, "calculation" versus "thinking" can be opposed to each other as an *unambiguous* procedure (algorithm) in arithmetic to the "same"[8], but now interpreted to be a certain first-order logic (i.e., a certain mathematical theory) belonging to the class of all possible first-order logics, grantable to be set theory, eventually formally equivalent to the standard "Aristotelian" propositional logic as Boolean algebra. The equivalence of the aforementioned "same" is embedded in the definition of the "Turing machine" and thus in any contemporary computer (without including rather experimentally implemented "quantum computers"), since its "tape" is the "same" calculating whether arithmetically (proper "calculation") or logically (i.e., thinking modeled by a logical algorithm and thus following propositional logic). In both cases of arithmetical and logical calculations, a well-ordered set of "states" of the Turing machine corresponds always to finite binary strings, but organized alternatively: either as an arithmetical calculation or as a logical

[8] That "same" is (once) "many trees", but (twice) the "forest".

one. That distinction is visualizable by the "halting problem": no Turing machine can calculate whether its calculation would end or not:

Any calculation whether arithmetical, logical, or any finite combination of both is in definition only "many trees", or speaking rigorously, a proper arithmetical calculation thus obeying Peano axioms, including the axiom of induction (according to which all states of all Turing machines are finite[9]). However, the "halting" after the "halting problem" means that a certain amount of "many trees" is granted to be a "forest", i.e. a set after set theory, therefore admitting for it to be infinite in principle[10]: that is interpreting the arithmetical calculation as a certain first-order logic, thus as a logical one within the framework of propositional logic.

Then, the application of Bohr's "complementarity" is quite relevant: the "working" Turing machine thus suggesting a proper arithmetical model even realizing a logical calculation is fundamentally complementary to the "finished" Turing machine consequently representing a first order logic as an ultimate result of the calculation at issue (accomplished by the dual counterpart of the "working" Turing machine). Also the viewpoints of the "sorites paradox" or that of "Achilles and the Tortoise" are applicable:

A "working" Turing machine adds new and new "grains of sands" or Achilles's new and new "running steps", anyway not and not being able to outrun the Tortoise or to constitute a "heap of sand", accordingly. On the contrary, the "finished" Turing machine means the inherently complementary viewpoint of whether Achilles has already outrun the Tortoise and that of the heap of sand. So, those antinomies as well as the Gödel dichotomy about the relation of arithmetic to set theory or the "halting problem" (proper to the Turing machine) share the same formal structure or Bohr's "complementarity", or respectively, the metaphor of the "trees and the forest" informally.

However, the just sketched viewpoint to "thinking" as complementary to "calculation" is not the proper viewpoint of Heideger's "not-yet-thinking". It would be Heideger's in a counterfactual universe, in which he were continuing his destruction of philosophy and its origin further to Pythagoras and his school. As to Heidegger in our real universe, his "not-yet-thinking" is rather vague, unambiguous and ambivalent, thus allowing for a standalone study far beyond the present frame, in which only a possible interpretation of Heidegger's "not-yet-thinking" is enough to be demonstrate: for example, that after Nietzsche's "Übermensch":

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[9] Indeed: "1" is finite; if "N" is finite, "N+1" is finite. Then, the axiom of induction implies that all natural numbers (all "N", but not the set of all natural numbers, {N}) are finite.

[10] Even finite, but utilizing the Dedekind set-theoretical "finiteness": an option mentioned for the first time by Skolem (1922).

According to Heidegger's interpretation[11] (e.g. *Heidegger 1961*), Nietzsche had remained within the framework of the Socratic "human problematics" and modern Western philosophy regardless of his claim to overcome them. Even more: the subjectivism of "superhumans" is even stronger than that of "humans". The fact that humans are the only arbiters about whether the "things" and "ideas" correspond to each other or not is emphasized, hyperbolized, even transformed into nonsense by suggesting "Übermensch". Thus and speaking rather metaphorically, the "superhumans" after Nietzsche would share and even emphasize that "not-yet-thinking" of humankind rather than overcome it. Indeed, there is no "super-choice", which would correspond to superhumans to distinguish them from humankind.

However, quantum information can be anyway interpreted as a kind of "super-information" transforming the standard and inherently finite human choice (i.e. always restricted within the "finitude") into infinity. Then, one might offer a modification of Nietzsche's conception so that if all humans deal with information and a corresponding finite number of choices, the discussed "superhumans" might accomplish a qualitative jump from human thinking into infinity by means of quantum information. So (and speaking loosely), quantum information relates to classical information analogically as Nietzsche's "Ubermensch" does to humankind. If humankind "calculates", the corresponding "super"-counterpart should think, thus really overcoming Heidegger's "We do not think yet".

In fact, the computers calculate, furthermore much better than any human, so that if humankind would like to distinguish form them, humans should start actually thinking, and it is really about time for it in order not to obey AI (for example, as Elon Musk suggests or prophesies). However, that interpretation of Heidegger's "not-yet-thinking" corresponds rather to his philosophical reflection on "technique"[12] starting dominating over humankind (as far as "Das Man" is relevant to humankind) than to Heidegger's criticisms of Nietzsche. Extrapolating the latter, one might suggest that the identification of thinking with quantum computation would be rejected by Heidegger himself not less categorically than Neitzsche's "Übermesnsch".

Anyway (besides the criticism of the Western metaphysics and Nietzsche's doctrine within it), Heidegger suggests a positive conception of thinking as "understanding" and "hermeneutic

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[11] Many enough papers consider Heidegger's rather nonstandard interpretation of Nietzsche (e.g., Botha 2016; McNeill 2015; Mitchell 2013; Winkler 2013; Bryan 2012; Hargis 2011; Markov 2011; Stolorow 2010; Murchadha 2005; Kroker 2004; Campbell 2003; Irwin 2003; Crooks 2002; Müller-Lauter 1998; Sikka 1998; Ireton 1997; Ibáñez-Noé 1995; Smith 1995; Thiele 1994; Babich 1993; 1989; Conway 1992; Cousireau 1992; Detmer 1989; Lawrence 1989; Gillespie 1987; Caputo 1985; Storrs Lilly 1985; Eiland 1984; Luft 1984; Schrift 1984; Krell 1976; 1975; Zimmerman 1977: 1976; 1975; Lampert 1974; Congdon 1973; Assaad-Mikhail 1968; Gray 1953;

[12] Heidegger's "techne" is widely discussed: e.g., Swer 2019; Lindberg 2017; Rendall 2015; Rogobete, 2015; Ma, Brakel 2014; Mahoney, Toadvine 2014; Nelson 2014; Rae 2014; 2012; Lotz 2013; Faye 2012; Magrini 2012; Riis 2011; 2008; Sikka 2011; Belu, Feenberg 2010; Harman 2010; Harries 2010; Donohoe 2008; Wolff 2008; Tabachnick 2007; Rojcewicz 2006; Thomson 2005; 2000; Waddington 2005; Zitzelsberger 2004; Bambach 2003; Botha 2003; Dreyfus, Spinosa 2003; Khong 2003; Parkes 2003; Feenberg 2000; Glazebrook 2000; Ziarek 1998; Thiele 1997; Bammé, Kotzmann, Oberheber 1993; Weinberger 1992; Smith 1991; Zimmerman 1990; 1975; Weber 1989; Campolo 1985; Marx 1984; Beausoleil 1983; Loscerbo 1977; Lovitt 1973;

interpretation" in "philosophical hermeneutics" relative to "fundamental ontology" and Husserl's phenomenology, but not in the way of transcendental and phenomenological psychology (at least directly and immediately as in "Sein und Zeit"). So, one might test whether the eventual "already-thinking" correlative to the original "not-yet-thinking" could be "understanding" or hermeneutic interpretation, or implemented in the present context: "seeing the forest rather than the trees" though just the "trees" are essential for any practical application, rather than the "forest" relevant to fundamental research and thus, to philosophy in particular. Of course, it should be the proper subject of another study, far away from the present one.

What is worth now to notice is that who understand or interpret are humans, thus implicitly remaining or returning to the Socratic human problematics ostensibly abandoned at least as an unfeasible wish. Heidegger himself penetrated clearly enough into the internal inconsistency and contradictions of his doctrine even after the "turn" thus crucially tending to restrict himself rather only to criticism than involving positive conjectures, a leading topic in his famous interview "Only a God Can Save Us" (1966). As to the present viewpoint, Heidegger's inconsistency is unavoidable and predetermined due to his basic theologian and philosophical education allowing for him to criticize the "Western metaphysics", but not to overcome it, needing the further deepening of his destruction into the origin of philosophy to Pythagoras and his school.

VIII PAULI'S "PARTICLE PARADIGM" IN QUANTUM MECHANICS VERSUS "DARK MATTER AND ENERGY" AND ENTANGLEMENT

One can admit that Heidegger could not continue his "destruction" further to Pythagoras and his school by virtue of his basic humanitarian education forcing him only to criticize the 'Western metaphysics' and 'humanism' "apophatically", not being able to overcome them "cataphatically" by virtue of his mathematical ignorance (unlike Husserl) as well as by virtue of the absence of all those theoretical and experimental discoveries in physics and astronomy happened later. In particular, he would not be able to oppose any proper philosophical, physical, and mathematical arguments to that "Shut up and calculate!" ascribed to the Nobel winner Richard Feynman, even only due to the circumstance that Heidegger might not read his physical papers (not to speak to understand them or to interpret them philosophically).

Would one try to reconstruct Heidegger's rarguments in favor of the eventual "already-thinking" if he were a great mathematician and physicist not less than a great philosopher and, admissibly, theologian (for example, as Descartes, Leibniz or Newton were)? At least, one might outline and sketch them due to the crucial advantage of all that development of quantum mechanics and information in the end of 20th and beginning of 21th centuries as well as the relevant advance of mathematics, logic, and philosophy.

One first step is to penetrate into the realization of that "Shut up and calculate!" as Heidegger's "not-yet-thinking" in quantum mechanics, really embodied by means of Pauli's "particle paradigm", Hermitian operators, unitarity and energy conservation, culminated in the Standard model in the final analysis. In other words, the proper initial objective now is for one to see how "Shut up and calculate!" means "not yet to think", but in terms of quantum mechanics rather than in philosophical one as Heidegger did. The starting point once entanglement and

quantum information have been already established by the authority of the 2022 Nobel Prize in physics might be the following: how the cherished “already-thinking” is embodied in them though implicitly and timidly, without any ontomathematical claims.

The eventual first observation that if entanglement and quantum information are granted to be physical quantities, they break the dogma that only Hermitian operators can correspond to physical quantities in quantum mechanics. However, what means that dogma philosophically since it is formulated by physical concepts without a clear and unambiguous correspondence into philosophy, not only in the “first philosophy”, in terms of which Heidegger thought and wrote, but also in the rather specialized philosophy of science, physics, and mathematics? A philosophical “deciphering” of “Hermiticity” is necessary:

“Hermitian operators” are an exactly defined class of operators on the separable complex Hilbert space utilized by quantum mechanics and thus interpretable as transforming an observable quantum state into another also observable obeying the following restriction: any value in a certain measurable probability (density or not) distribution can change only its probability. Speaking loosely and rather metaphorically, they do not “exchange” their probabilities transformed by any Hermitian operators. If they “exchanged” them, the operator describing the exchange at issue is not Hermitian in definition, but just that is the case after entanglement.

Speaking already properly philosophically, Hermiticity restricts probability (and thus possibility if it is granted to be the corresponding quality to the quantity of probability) to be only a property (of some necessary existing entity being the carrier, or speaking logically, the subject of the property in question) rather than a relation or a physical interaction in particular. In other words, no probabilities or possibilities “by itself”: any probability or possibility is always a probability or possibility of a certain “thing”, whether as an “objective probability” or as a “subjective probability”. Thus, even only the conjecture, even only the abstract admission that probabilities or possibilities can be smoothly (and by itself) transformed in actually existing things or entities are excluded in definition as well as and in particular, any “creatio ex nihilo”. This needs “God to create the world” since the real way for creating the actually existent world from possibilities or probabilities is prohibited for any scientific research.

Then, “we do not yet think” implies that we need God who to create instead of people to investigate, understand, and think of anything can appear from nothing where “nothing” at issue is already interpreted to be whether mathematical probabilities or abstract possibilities by themselves. Though contemporary physics officially states to be “atheistic”, “not needing the hypothesis of God”, it continues to be inherently religious, “not being able yet to think” where Heidegger’s “not-yet-thinking” can be “cataphatically” defined as the incapability for thinking of how anything appears, in particular in relation to the universe, to which physics needs the “Big Bang” instead of researching and thus necessarily thinking of how the universe omnipresently and omnitemporally appears from its “only probability to appear”, from its “pure possibility” to be, and thus without whatever “God’s help”, but “by itself”, this means “ontomathematically” where mathematics, physics and philosophy are merged into the “same” of ontomathematics.

Then, one can discuss Kolmogorov's axioms of probability theory (at that, the “space of events” after them can be interpreted to be relevant to both “objective” and “subjective” probabilities equally well) to demonstrate and distinguish the different understanding of the fundamental concept of probability in that “not-yet-thinking” to the new style of thinking heralded by entanglement and quantum information. The original version implicitly suggests for the space of events to be the single one and the intersection of any subspaces of it to be empty so that any probability is unambiguously determined as for that single space of events as to any subspaces of it.

On the contrary, one can now reject that admission allowing for more than one single space of events furthermore intersecting each other by arbitrary sets of any set-theoretical power whether finite or infinite. As to those intersections, the corresponding probabilities cannot be unambiguously defined as “properties of entities” additionally depending on the answer of the question to which space (respectively subspace) of events they are considered.

Then, one can further utilize the hypothesis of hidden variables (very well known from quantum mechanics and categorically advocated by Einstein), now still in relation to Kolmogorov’s axioms of probability theory: its new interpretation would mean that one can indicate *unambiguously* for any entity to which space of events it refers, so that the belongingness at issue is the “hidden variable”. However, if one has in advance already allowed for any nonzero intersections of spaces or subspaces of events the unambiguous answer of the question about any element of the intersection is impossible, even meaningless.

Indeed, it is a trivial corollary from set theory. One grants any nonzero intersection of sets in advance. Then, the question to which set the elements of the nonzero intersection belong is meaningless since it does not allow for an unambiguous answer. Thus, the hypothesis of “hidden variables” (in a rather generalized sense) or more exactly, its rejection can be inferred still even from set theory in an obvious way. Whether and how far the condition for the single space of events (respectively, that of zero intersections of its subspaces) is relevant will not be discussed now since it needs a standalone investigation in detail. Anyway, it would be (whether granted as a postulate or not) a specific property relative only to probability theory rather than to set theory where it is nonsense.

Another and proper philosophical viewpoint to the uncertain probabilities of any nonzero intersections of events is possible on the ground of “relational ontology” since the class of intersections can be defined by the condition that their corresponding characteristic properties are those logical relations irreducible to properties being admitted, e.g., by Russell. Then introducing “ontology” in the standard way traceable back still to Aristotle and his debate with Plato, the relevant class of ontology is inherently “relative” (the word “relative” can be used as in theory of relativity) and called “relational ontology” as usual. Even more, relation ontology is a conservative generalization of the traditional ontology of properties just as “property” can be deduced from “relation”, but not vice versa.

Meaning the last consideration, one can notice an essential feature of what should be the new “already-thinking” (after Heidegger): it means relations rather than only properties and thus

those relations irreducible to properties as well. However, the most (if not almost all) human languages (and in particular, those belonging to the Indo-European one) have the predicative structure of separate sentences. That predicative structure fits thinking by properties rather than that new thinking by relations. One can further suggest that the predicative structure of many natural human languages corresponds to the organization of the human brain, which in turn originates from certain fundamental and thus general characteristics of the medium where humankind has appeared and continues to inhabit also now.

One is to research the characteristics at issue causing that organization of the human brain embodied in many human languages and presumably selected by evolution to be more successful. The medium habited by humankind is macroscopic and described by classical physics by means of smooth infinitesimal equations, relevant also to the "apparatus", but not not to the measured quantum entities, microscopic and commensurable with the Planck constant. In other words, the predicative structure of almost all natural human languages (furthermore originating from the evolutionarily established organization of the human brain) corresponds to the non-quantum and local (i.e. without any nonlocal correlations of entanglement discovered only at the end of the 20th century) medium presupposing the states of quantum decoherence as its condition even merely not suspecting the fact that they crucially prevail in the universe (e.g. as the ratio of the "dark" energy and mass to the "light" ones):

One might utilize the metaphor of the small island of locality among the boundless ocean of nonlocality, where humankind has appeared and lives now (and has lived all the time until now), and where physical laws are simpler and constant allowing for a gradual evolutionary complication including that of human cognition. That initial local medium can be also likened to the "baby swing" as a symbol of the protected human childhood since the humans' brain, mind, and reason need decades of years to appear, strengthen, learn and be educated to become standalone in the final analysis only after about twenty years.

One is able naturally to admit a "phylogenetic mapping" (at least as a metaphor, but not only) in the progress of humankind analogically needing about two millennia (e.g. those notated as "AD") for appearing, strengthening, learning, and self-educating in order to become standalone only now in the beginning of the 21th century. Then, Heidegger's notorious "not-yet-thinking" might be quite easily explained and illustrated by the baby's, the child's, the teenagger's "not-yet-thinking" in comparison with the adult's "already-thinking" (at least that of almost all adults). Humankind has presumably already "grown up", the previous protection is even already harmful and preventing the future development just as overly caring parents treating their adult daughter or son like a child not allowing for her or him to take his fate into his own hands, however difficult or tragic it may turn out to be in the future.

Humankind is already "adult" enough and ought to think "like an adult" abandoning the safe harbor of locality, though absolutely necessary in the "younger years" meaning metaphorically the preceding two millennia AD where each century would figuratively correspond to an "ontogenetic" year (of any human individual).

Abandoning metaphors, one is to enumerate the most essential feature of that "already thinking as an adult" as to humankind. Two of them are mentioned above though cursorily: (1) probabilistically, and thus partly indefinitely, vaguely, ambiguously unlike the previous deterministic, casual, definitive, clear, unambiguous "not-yet-thinking in younger years" (however possible only in the safety of locality); (2) relationally rather than predicatively as almost all human languages since the relations irreducible to properties crucially prevail after the new "adult life of humankind".

The list of that "adult already-thinking" can be continued in relation to human empirical experience and scientific experiments being inherently local (at least until the end of the 20th century and the discovery of entanglement and quantum information) unlike philosophy since Plato's parable of the "cave" with the "chained people" or unlike religion postulating supernatural phenomena in definition. Nonetheless, all known (until now) nonlocal phenomena suggest partial local images (to which Plato's metaphor of "shadows on the wall of the cave" is quite relevant). However, one can also admit at least only theoretically that nonlocal phenomena without any local counterparts would be possible to exist. Anyway, the present consideration will be restricted only to those nonlocal phenomena studied by their local effects, but being fundamentally different from all properly local phenomena (for example according to classical physics and science):

Phenomena of entanglement are observable only by quantum correlations and their unique property to violate "Bell's inequalities" as well as other analogical conditions revealed later. Particularly, they are beyond the requirement of absolute repeatability of all observations and experiments in classical science and physics. If nobody can repeat any observation or experiment (e.g., as after the notorious "cold nuclear synthesis"), it is rejected. However, meaning the "dark" and fundamentally random quantum correlations, one can admit that a certain unique phenomenon is really observed, but remaining unrepeatable just as any "religious miracle". An essential problem is that the "miracle" at issue might be both real nonlocal phenomenon or human phantasy whether ill-intended (i.e. lie) or not (i.e., subjective mistake). In other words, the practical criterion of scientific objectivity consisting in the requirements of absolute repeatability is necessary to be generalized, but nobody knows how exactly this should be done.

In fact, quantum mechanics met an analogical problem for the fundamental probabalisticality of many real phenomena. Its solution is the following: the absolute repeatability of any single measurement in classical mechanics or physics is generalized to a quite (and unambiguously) determined probability (density or not) distribution or its characteristic function, being the wave function of a certain quantum state. Ergo, just that generalization implies the phenomena of entanglement: a corollary noticed by Einstein, Podolski and Rosen (1935) and by Schrödinger (1935), independently of the former three ones.

So, scientific repeatability seems to be easily generalizable to that of probability distributions and their eventual correlations being absolutely objectively observable in a class of experiments rather than in a single one as in classical mechanics and physics. Nonetheless, the problem is not resolved as to any single empirical observation or scientific experiment, which is classically

intended, but it might be occasionally influenced nonlocally resulting in some “miracle” in the exact and non-religious sense of a single and unrepeatable result. Should those be thoroughly ignored as the “not-yet-thinking” recommends? If not, how might the “already-thinking” distinguish them from a lie or a subjective mistake?

If one conjectures the entanglement hypothesis of Einstein’s gravitation (particularly as the solution of the quantum gravity problem), nonlocal correlations would be expressed by physical forces and interactions, being a main subject of classical physics since Newton’s age. The problem would consists in the following: nonlocal correlations are physically dimensionless (representable by the “quantity of quantum information”) and thus no (nonzero) energies might correspond to them, but their local images (if gravitation is granted for them) possess energies even colossal as to stars, nebulae or any other astronomical entities. This means that the “creatio ex nihilo” being absolutely prohibited by classical science, including even as a demarcation line between science and religion, is now involved to describe the transition from nonlocality and locality furthermore suggesting a natural hypothesis about the nonlocal origin of the locally observed “dark matter” and “dark energy”, or speaking rather loosely: “gravitation is entanglement” and this can explain the origin of the universe quite otherwise than by means of the “Big Bang” and here is how:

Entanglement, if one grants physical quantities for its description needs non-Hermitian operators, and thus non-unitary, including not conserving energy, since still the definition of entanglement (namely, not being any tensor product of the wave functions of the entangled quantum entities) implies that their interaction is irrepresentable by any Hermitian operator. So, the experimental observable facts of entanglement imply as a direct corollary the omnipresent and omnitemporal violation of energy conservation as far as entanglement itself is omnipresent and omnitemporal consequently establishing the notorious “creatio ex nihilo” to be omnipresent and omnitemporal.

The question, which follows is, why no contemporary physical experiments observe the phenomena of “creation from nothing” at issue. First, all numerous enough experiments confirming entanglement therefore corroborate the corresponding violation of energy conservation. All experiments in classical quantum mechanics investigate only Hermitian operators, i.e., unitary, conserving energy within the framework of the Standard model, even where the experiments are intended to test its alternatives, however also starting from classical quantum mechanics. One can admit that the quantity of “light energy” and “light mass” (as notations opposite to “dark energy” and “dark mass”) in a given space-time volume influences the appearance of more of both, being an obstacle decreasing the corresponding probability for that creation from nothing. Since or as far as the experiments of classical quantum mechanics are “terrestrial”, where much “light energy” and much “light mass” are already available, the “creatio ex nihilo” phenomena would be featured by correspondingly much less probability for being observed.

Furthermore, all observations of “dark energy” and “dark matter” can be interpreted as immense violations of the conservation of “light energy” and “light mass”. Energy is not

conserved in the framework of Einstein's general relativity so that all observations and experiments confirming it, directly or indirectly refute energy conservation. Meaning all those considerations (as well as others not mentioned in the above brief sketch), one should reformulate the question: why nobody *wants* to observe the numerous and obvious facts about the violations of energy conservation rather than the initial question, why nobody observes violations of energy conservation. The new, so reformulated problem might be the following reasons of its eventual answers:

That is an "ideology of localism" inherently rejecting "nonlocality", even more so that the social organization of humankind all over the world obeys the same localism as the only possible organization at all (as well as the human experience since the beginning of the standalone evolution of homo sapiens sapiens, also imprinted in the human brain and natural languages) means that localism as the "conditio sine qua non" of any thinking however realizable (after the above sketched interpretation of Heidegger) as the rather primitive or at least immature "not-yet-thinking" in comparison with the new generalized and fundamentally nonlocal forthcoming "already-thinking".

One might illustrate that conjecture staring at the process of human evolution only continuing the preceding biological one shared at least by all animals if not by all species: the local factors or agents have been prioritized as much more essential unlike the nonlocal ones always only probable thus allowing for one only to "pray to God" for them not to happen if they are unfavorable, or on the contrary - to happen if they are favorable. No human might influence "God's will" as to any unique events, but the human society has soon revealed that it is able to neutralize any "supernatural influence" originating "whether from God or the devil" by averaging over a sufficiently large set of events, thus taking advantage of the law of large numbers, but unavoidably abandoning the "problem of luck" and how it can be used for one or another human purpose. Speaking loosely, one might conversely notice that, indeed, luck is even too important for all practical human deals and for human history, but nobody knows how to control it: otherwise, no casinos or even whatever gambling business might exist. Indeed, the real gambling business restricts itself only to the law of large numbers to be in its favor refuting the option for ruling the luck as various frauds. So, one could conclude more or less aphoristically that the eventual new nonlocal "already-thinking" would be the gambling business's end.

However, is any luck real excluded from the human deals and history, both obeying the law of large numbers alone so that one's luck is always balanced by the correlative unluck of more than one and so that the law of increasing entropy (in turn being correlative to that of large numbers) triumphs everywhere for any long enough period of time? Whether and so far?

Obviously, the law of large numbers is automatically suspended (even yet in definition) as to any unique events. Indeed, human society consisting of many people obeys the law of large numbers so that though each individual can be a lucky human or not during a certain period, the society, to which the human at issue belongs, obeys social laws, the objectivity of which is derivative from the law of large numbers in relation to many enough people or to a long enough period. One can immediately objects the following: society presumably: "yes", but history just

oppositely: “not”. What is a “historical event” is unique in definition, so that it is not able to be unified with other “historical events” in order to be switched on the law of large numbers as for a long enough period of time.

That distinction of history to society (or history versus sociology as asciences) can be visualized by any calculation accomplished by any Turing machine, especially in the present context featured by the opposition of “calculation” versus “thinking”. Any successful calculation ending in an unambiguous ultimate result is due to a certain software program, which might be postulated to be the shortest one so the corresponding string of the Turing machine tape to be the shortest possible one in turn and notable as $2^{n_{min}}$ so that the same result might be reached randomly and naturally after “$(n_{min})!$” attempts at the worst case as to that best algorithm: that is a so incredibly great number of attempts so that the result is practically impossible to be obtained in a natural way and therefore the availability of the result implies (though only probabilistically, but with a corresponding probability tending to “1”) the existence of some hidden program though unknown explicitly.

Then, one can think of “history” in a way opposing it to “society” so that the any current historical state is interpreted to be a certain “result” (for example in a Hegelian manner therefore necessarily suggesting “Reason in history” more or less equivalent to some implicit software program as in the consideration above). That is an immediate corollary from the definition of “historical event” to be unique, i.e. irrepetible and thus fundamentally ununifiable in any relevant class of equivalence, to which it might belong.

In other words, history and society are opposed to each other analogically to energy and time or as any two conjugate physical quantities thus allowing for involving both Bohr’s generalized complementarity and then, entanglement once it has been generalized to be a philosophical concept far beyond the framework of quantum mechanics and information in a similar way for being applicable to history and society in advance granted to be complementary to each other (which is also a new idea, though).

Then, one can oppose the viewpoint of classical science, including classical quantum mechanics, after which history and society are absolutely divided from each other, and even incommensurable to each other so that history and sociology, in particular, are two absolute different sciences belonging to “Art and humanities” and “Social sciences” correspondingly, on the one hand, to the new worldview advocated in the present study, on the other hand.

Accordingly, the latter suggests the existence of a certain nonzero intersection of history and society, “where” (socially) or “when” (historically) both are in a “coherent state” or “entangled” in a generalized and rather philosophical sense. Anyway, one is to describe just that intersection, furthermore admitting for it to increase gradually forcing the society to become more and more “liquid”, even eventually “gaseous” in the future. Of course, both “liquid” and “gaseous” are metaphors used as predicates to society as the subject of the proposition so that the use at issue needs an exact, or at least more rigorous definition:

For example, one can start extending the metaphor by likening all social hierarchies being inherent for what may be called “classical society” to many “crystals” predetermined for the

classical society at issue to be in a “solid state” just as metals at room temperature consisting of many tiny crystals, each of which being hierarchically ordered following the pattern of a certain crystal lattice. If that piece of metal is heated to an increasingly higher temperature, it will pass gradually in a “liquid state” as follows: increasingly more (as a number) and more extending segments of it will be liquefied until the entire piece turns out be liquefied so that no crystals (respectively, social hierarchies as for its interpretation as the discussed metaphor) exist in it any more.

The heating of the metal can proceed in two ways: by an influx of energy from the outside or adiabatically, by decreasing entropy, i.e. “generating information” within it. The modern society is “heated” rather “adiabatically” since knowledge and cognition (cognition meant more or less figuratively as the first derivative of knowledge to time) increase even accelerating more and more therefore “liquefying” accordingly more and more the society consequently increasingly destroying more and more social hierarchies.

One should pay attention to the real historical pathways (for example, in France) for “heating” the then and there society by means of the “Enlightenment” and the resultative “French revolution”, which, following and continuing the above metaphor, transformed a solid state before the revolution into another solid state after the revolution, initially increasingly “heating” the society (including, by the revolutionary terror), but then gradually *freezing* it during into the period of the Napoleon dictature and wars (which also in turn allow for extending the “thermodynamic metaphor”):

The modern knowledge and cognition increased essentially starting from the 16th century and even earlier until the beginning and middle of the 18th century not causing any observable influence on tts social organization as to France just as a metal, which is heated, but far under its “melting point”. Then, what did the Enlightenment do properly? It transformed the “heating” at issue, being due to modern science and the geographical expansion of the West, into a general philosophical idea therefore relating it to the then French society, at least to its educated enough part initially, from the two restricted spots, where the heating appeared, to the society as a whole.

The Enlightenment was to be a philosophy starting from the rise of science in the modern age in order to be able to transfer the adiabatic heating from science to society. However, at least from the viewpoint of Cartesianism, that transfer is fundamentally impossible because science (being “ideal”) and society (being “real”) are situated on the opposite shores of the abyss postulated by it. So, there should not exist (but only ostensibly) any causal link between the modern scientific revolution established empirical science relied also on experiments and opposed to the authority of both Church and tradition, on the one hand, and the bloody French revolution, on the other hand. Then and particularly, the Enlightenment could not serve as the real bridge between them.

On the contrary, the ontomathematical viewpoint to them means for both to constitute a coherent whole rather than to be only connected causally.

IX THE INEVITABILITY OF THE "METAPHYSICAL TURN" IN PHYSICS AND MATHEMATICS

What is to be discussed are the dimensions of "already-thinking" as for mathematics and physics once the "not-yet-thinking" as "calculation" in a wide sense is especially relevant to them, even being able eventually to serve as a "meta-paradigm" in both, therefore predetermining the ideal of any "exact science" nowadays as well. That wide sense of "calculation" may be illustrated by the already used many rimes metaphor about the "trees and (the) forest": the study of any separate "tree" in more and more detail, and so on, is already a calculation in the wide sense at issue.

It can be also rigorously and mathematically defined as a cognitive procedure (usual notated as an "algorithm" though in an analogical wide sense not requiring its explicit and constructive reference) fundamentally admitting an arithmetical model thoroughly within Peano arithmetic. The crucial is the axiom of induction implying that the cognitive procedure allowing for an arithmetic model even if it is not explicitly indicated is always *finite*, since both current and eventually ultimate result of any calculation is a corresponding natural number belonging to the relevant arithmetic model. This is so since the axiom of induction implies for all natural numbers to be finite as a direct and elementary corollary[13]. So and returning to the metaphor, by virtue of which, speaking loosely, the arithmetic model thus necessarily involving the axiom of induction guarantees that the cognition of the "tree" at issue will investigate it only "crawling up" rather than jumping onto another (at least as an intention, though falling onto the ground in almost all cases) since any cognitive leap weather successful or not means a certain *Gestalt change* inherently *creative*, not allowing for it to be a conservative continuation of the algorithm followed until now and designated for "crawling" rather than for "jumping".

The abstract existence of an arithmetic model (this means without the condition to be expressly indicated) is the essence as well as the exact meaning of a "Turing machine" as relevant to class of all calculation, which is necessary to be in advance described if the further objective would be the rigorous and mathematical definition of what is to be understood as the whole of at least as two "trees", therefore necessarily including any successful "jump from the one on the other", i.e. the relevant Gestal change". The whole of any number of trees, but at least two, can be granted to be the "forest" (though initially postulated), without explanations (which however follows further) therefore allowing for a mathematical interpretation of holism (being by itself rather a general philosophical idea).

Properly, set theory, very well established among the foundations of mathematics, sometimes granted to be sufficient even alone, should be identified as that description of the whole at least by the concept of "infinity", which, however, will be now discussed both mathematically and philosophically, namely by means of holism and opposing common sense's intention about the mathematical intuition of infinity (namely, to be "much more" than any finiteness) and traceable back still to Cantor involved the well-ordered hierarchy of infinities as an essential even maybe crucial part of set theory. Meaning the above metaphor, the holistic interpretation of the

[13] See footnote 9.

mathematical concept of infinity would consider as definitive just the jump between at least two trees, respectively the necessary Gestalt change switching on from the “calculating” study of a single “tree” (by the way, suggesting the classical ontological reflection based on propositions as predications) to the new holistic and inherently relational ontology since the “jump” or the relevant Gestalt change is impossible to be described only in terms of either of both “trees”.

Then and particularly, the fundamental result of Gödel (1931) about the dichotomy of arithmetic to set theory (either incompleteness or contradiction) can be now translated as for the relation of “not-yet-thinking” to “already-thinking” in the foundations of mathematics, therefore hinting at the possible generalization of the Gödel theorems at issue as to the relation of “calculation” to “thinking”. Meaning the metaphor of the “trees and (the) forest” as it is above reduced to the opposition of studying a single “tree” versus the case of at least two ones as sufficient to represent the “forest”, Gödel’s viewpoint, though rather loosely, would be representable as follows. The mathematical model of a single “tree” is inherently either incomplete or contradictory to that of two or more ones (i.e., the “forest”), also, admissibly, reducing the relation of (arithmetical) “finiteness” to (set-theoretical) “infinity” only and thoroughly to a relevant Gestalt change; and indeed:

One can immediately observed that the axiom of induction, an elementary corollary of which is the statement that all natural numbers are finite, on the one hand, and the axiom of infinity (for example, in the usual ZFC tuple of axioms for set theory), on the other hand, mean the same formal structure as their premises, but nonetheless their conclusions are opposite to each other and contradictory; namely: “all natural numbers are finite” (in arithmetic, e.g. in Peano arithmetic fo certainness) versus “the set of all natural numbers is infinite”. In other words, one means “all natural numbers” in both cases, but realized by two opposite Gestalts thus inconsistent to each other; the “trees” of all natural numbers (in arithmetic) versus the “forest” (i.e., “set”) of all natural numbers (in set theory). The conclusion is obvious: both theories, being two of the three “whales” (together with propositional logic as third one), on which mathematics is grounded as its foundations mean the same, but in two inconsistent Gestalts even directly contradicting each other.

If the statement that the relation of arithmetic to set theory is also equivalently representable absolutely only as a relevant Gestal change is adopted, the next problem is whether the relation of propositional logic might not consider analogically as another Gestalt change: and the answer is (or at least is to be postulated to be) positive if propositional logic is interpreted to be the single zero-order logic universal for all mathematics, and set theory accordingly, as the class of all possible first-order logics (i.e., “mathematical theories” in the rigorous meaning of the term). So, the eventual “Gestalt change”, able equivalently to describe the relation of propositional logic to set theory, would consist in the interpretation of a certain structure once as the single universal zero-order logic, but twice as the class of all possible first-order logics. The “certain structure” in question is also well-known: “Boolean algebra”. As for the postulate for them to be equivalent, it would be not other than a reformulation of the well-known principle (utilized for example by Russell and Whitehead in their “Principia mathematica”) establishing the bijection of

all (at least non-contradictory) propositions and all sets by means of the characteristic properties of the latter, thus rejecting any set irrepresentable by its characteristic property, on the one hand, as well as any proposition (even contradictory), to which no set corresponds, on the other hand.

If one uses again the "trees and forest" metaphor, but now in relation to the three "whales" in the foundations of mathematics, the conclusion should be that propositional logic and set theory suggests two equivalent Gestalts to any "mathematical theory", "first-order logic", or "model" (as the fundamental result of Gödel in 1930 can be also interpreted) and it consists in the equivalency of both viewpoints: that of "any two trees" (in set theory) and that of the "forest as a whole" (in propositional logic). Rather unexpectedly, counterintuitively, or even paradoxically, the viewpoint of "any tree" (i.e. as in arithmetic rather than that of set theory) is fundamentally either incomplete or contradictory to that of the "forest as a whole", respectively the corresponding Gestalts in which any "mathematical theory", "model", or "first-order logic" could be realized, and that is a direct corollary if one unifies both Göödel results (1930 and 1931) after which the incompleteness (respectively contradiction) of the arithmetic Gestal to that of set theory together with the equivalence of the latter to that involved by propositional logic implies the incompleteness (respectively contradiction) of the arithmetical Gestalt to the logical one (in the rigorous and narrow meaning of classical propositional logic).

If one also utilized the suggested already above identification of "calculation", the arithmetic Gestalt and "not-yet-thinking" as for the proper framework of mathematics, the new "already-thinking" would be defined by the following formal and mathematical properties: it should somehow overcome the Gödel (1931) dichotomy of the arithmetical Gestalt to the set-theoretical one (respectively to that of propositional logic). One might admit that there would exist many ways for achieving that, partly or absolutely equivalent to each other. One of them involving the new concept of Hilbert arithmetic is suggested in much detail in other papers (e.g., Penchev 2021 August 2024):

Its essence consists in doubling Peano arithmetic with an anti-isometric counterpart and resultatively involving the concept of information in the foundations of mathematics to represent the Gödel dichotomy in a consistent way. That is immediately visualizable by the elementary structure of a bit of information: either of both alternatives (often notated as "0" and "1" as for arithmetic or as "false" and "true" as to propositional logic) is either incomplete or contradictory to any bit as a whole therefore repeating and embodying the Gödel (1931) dichotomy. So, the concept of information by the structure of its elementary units allows for the dichotomy at issue to be involved in the foundations of mathematics only changing the Gestalt to it in comparison with the usual one interpreting it to be a "meta-result" to the foundations of mathematics. Or again by the "forest and trees" metaphor: one may overcome the inconsistency of a "single tree" to "two ones" only doubling the former by a dual twin (for example, anti-isometric) and including that "doubling" (i.e., the concept of information by its elementary unit of a bit) in the descriptions of the "forest as whole", therefore allowing for the three inherent mathematical Gestalts to it to be unified and thus established to be consistent to each other. That is to be an exact example of the new "already-thinking" as for mathematics, particularly implying the

neo-Pythagorean viewpoint of ontomathematics (in much more detail in: *Penchev 2024 April 16*).

Summarizing, one can question: whether or how far would the new mathematical "already-thinking" be unavoidable? All elements of it have been available since a long enough time ago. What has not yet happened is only for them to be unified in a single whole, in an inseparable "Gestalt". The history of humankind has demonstrated that the step of that kind has been always made until now, ergo, the most natural suggestion is that it will be made now again, and the new "already-thinking" is really unavoidable as for mathematics.

So, one is able to abbreviate the analogical discussion for physics (in fact for physics based on quantum mechanics and information) only relevantly modifying the pattern already involved above, even in an absolutely rigorous meaning elucidated in other papers (e.g. Penchev 2023 May 3), so that the idea can be now mentioned cursorily. Its essence consists in the introduction of "Hilbert arithmetic in a wide sense" for quantum mechanics and information and thus for physics at all by its identification with the qubit Hilbert space being able to underlie them as the relevant counterpart of "Hilbert arithmetic in a narrow sense" where the standard and usual arithmetic units of the later are interpreted by the correspondingly enumerated "empty qubits" of the former, i.e. the class of equivalence of all possible values of each qubit or in other words, by "eidetic reduction" in relation to the former:

"Eidetic reduction", though notated by Husserl for philosophical objectives by a specific and memorable term, is the general method for constituting any mathematical notions starting from physical or other mathematical entities so that all mathematical concepts can be considered to be classes of equivalence, or respectively definable by the discussed "eidetic reduction" after him. So, the idea can be loosely represented as an arithmetical unification of both physical and mathematical worlds (and thus following the covenant and pathway of Pythagoreanism) in their foundations so that the mathematical ones are unambiguously defined classes of equivalence starting from their physical counterparts.

Then, what is demonstrated above by the "trees" of usual arithmetic units about the Gestals of arithmetic, set theory, and propositional logic will be only repeated by substituting for the "trees" being now qubits, i.e. "quantum units" instead of their usual arithmetic counterparts after the postulate that any quantum unit, qubit, or "tree" can be identified as the mathematical "forest" as a whole. In other words, the two levels, the mathematical and physical ones can be considered to be mutually idempotent to each other so that each of them is the corresponding next "metalevel" to its dual "twin". Indeed, all arithmetical units are the immediately next metalevel to their corresponding quantum counterparts being defined as classes of equivalence, on the one hand. On the other hand, however, each qubit is the immediately next metalevel to the arithmetic units being identifiable with their "forest", i.e. the set of all of them. In brackets (as to the proper subject of the present section), one might mention that concept of completeness (whether physical, or mathematical, or philosophical) needs idempotency rather hierarchy, even more so that both pairs or oppostons, "completeness - incompleteness", on the one hand, and "idempotency - hierarchy", on the other hand, can be granted to be equivalent.

The next step is the correspondence of the three fundamental mathematical Gestals, namely arithmetical, set-theoretical, and logical (one means classical propositional logic), as those of classical quantum mechanics, quantum information, and the "quantum universe" (a newly introduced viewpoint to the existent term, which will be explained and distinguished a little below) accordingly, once the arithmetical units has been in advance substituted by quantum ones, i.e. qubits. One can immediately observe the mapping of the qubit Hilbert space introduced by quantum information (being practically equivalent to the separable complex Hilbert space of quantum mechanics) onto Hilbert arithmetic in a narrow sense and thus derivatively, that of the quantum-mechanical Gestalt onto the arithmetical Gestalt under the only condition for each arithmetic unit to be considered as the class of equivalence of all possible values of the corresponding qubit, i.e. as an "empty qubit". As for the mutual dual pair of both set-theoretical and quantum-information Gestals, a more detailed justification is necessary due to entanglement being definitive for the latter alone:

In other words, one needs a relevant set-theoretical realization of the conception of entanglement after substituting qubits with arithmetic units. Its idea consists in the option to be considered the arbitrary intersection ("overlapping") of the neighborhoods of any two infinitesimally close points of a real continuum (or any other one) since just the introduction of smooth continuum distinguishes practically (or after set-theoretical foundation of infinitesimal calculus) the set-theoretical Gestalt from that of arithmetic featured by discrete transitions between any two units of it. If quantum entanglement is interpreted to the arbitrary nonzero "overlapping" (i.e. the intersection of the corresponding variable sets) of any two probability density distributions, the set-theoretical equivalent is to be reduced to the intersection at issue under the specific additional condition that the corresponding variable sets refer to neighborhoods of infinitesimally close points (consequently, at least two) of the relevant continuum. Actually, classical infinitesimal calculus considers the transition from a point to another (being infinitesimally close to the former), but only by means of the limits of such transitions, which is sufficient for the conception of "derivative" to be defined. Robinson's "nonstandard analysis" pays more attention to that problem since distinguishable nonstandard models correspond to the *different* ways for a variable to tend to its limit in a certain point unlike classical infinitesimal calculus discussing their class of equivalence, first of all. Once the set-theoretical equivalent of entanglement is thus introduced, it implies the unambiguous correspondence of both Gestalts (those of set theory and quantum information); and here is how:

Now, one is to stare at the term "Gestalt", meaning that the same is only interpreted in (at least two) Gestalts, i.e. inconsistent to each other, as for the Gestalts of classical quantum mechanics and quantum information. Indeed, the former means that the discussed quantum system is investigated as a single one, i.e. the relevant Gestalt suggests an observer out of it and thus able to measure it by the apparatus external to it. On the contrary, the latter means implicitly, but necessarily an internal position of the hypothetical observer linked to a certain true part of the system as whole, therefore implying a complement to the whole so that the defined two quantum subsystems are thus just entangled: that is the wave function of the entire system cannot be

described as the tensor product of the wave functions of its parts. Obviously, only the Gestalt, respectively, the observer is fundamentally changed so that the same quantum entity is investigated or measured in two alternative ways: as a whole versus as composed by parts (at least two, but arbitrarily many in general).

So, utilizing "Gestalt" as above to both physics and mathematics involves relational "ontology" where the use of "ontology" is rather inappropriate, though traditional and usual. The relevant concept is "ontomathematics" rather than "ontology", and the adjective "relational" is redundant since ontomathematics is inherently relational (this means that ontomathematics which is not relational is wrong in definition). That proper relational meaning of mathematics can be illustrated by general relativity being the most impressing application of "relational ontology" (and thus "ontomathematics" in fact) to physics. It defines the fundamental concepts of "mechanical motion" and "gravitational interaction" only relatively so that their interpretation to any *single whole* is meaningless. General relativity is inherently "anti-holistic", in a way just opposite to the not less inherently holistic classical quantum mechanics definitively meaning the measured quantum system as a whole and any possible observer (eventually supplied by the *macroscopic* apparatus) as only *external* to it:

Then, one should conclude that the well-known mutual inconsistency or contradiction of general relativity and classical quantum mechanics, after which in particular any theory of quantum gravitation consistent with both fails, is due to the above observation. In fact, classical quantum mechanics and general relativity mean the same, but realized in two Gestalts "incommensurable" or "complementary" to each other: "absolute" (in the sense of an *absolute* reference frame due to fact that the observer attachable to it can be only external) as to the former, but "relational" as for the latter since "mechanical motion" and "gravitational interaction" can make sense only "relatively", i.e., "relationally". The formal structure of that "Gestalt change" is analogical to those between arithmetic and set theory, on the one hand, and between (classical) quantum mechanics and quantum information, thus allowing for the conjecture that the viewpoints of quantum information and quantum information can be in turn unified by a relevant "Gestalt change" once the analogy at issue is interpreted to be a mathematical homomorphism in the final analysis.

That alleged eventual "Gestalt change" able to link inherently quantum information and general relativity would be described as follows. It should transform between each other: (1) the discrete viewpoint of quantum information and the smooth (thus continuous) viewpoint of general relativity; (2) Fourier transform and inverse Fourie transform: (3) Hamiltonian and Lagrangian "editions" of mechanics; (4) the macroscopic studied by classical physics and the microscopic studied by quantum physics; (5) the existent and possible; (7) probability density distribution and relative physical motion; (7) locality and nonlocality; (8) the sub-luminal imaginary and hyper luminal real domains of whether Minkowski space or pseudo-Riemannian space. The tuple is not complete and can be continued. Nonetheless, it is sufficient to hint at the hypothesis that entanglement, or more exactly, a relevant entanglement theory of gravitation

would be the cherished “quantum gravitation” however realized generalized, in a relational way fundamentally impossible for classical quantum mechanics being inherently not relational.

The Gestalt change at issue can be also loosely understood as it transfers “through” (and in both directions) the light barrier between locality and nonlocality, therefore allowing for the relation of locality and nonlocality to be in turn described as a Gestalt change. Particularly, the locally observed by their effects “dark mass” and “dark energy” after that Gestalt change would look like the omnitemporal and omnipresent universal entanglement of all “parts” of the universe, “from which” the visible “light” universe appears also omnitemporally and omnipresently as if “from nothing” instead of the mythical “Big Bang”.

The counterpart of the Gestalt of classical propositional logic (in advance identified with that of set theory as the same structure of Boolean algebra) is called the “quantum universe” with the proviso that a special meaning of the term is intended. If the identification of both Gestalts at issue as Boolean algebra means that the relevant zero-order logic and the class of all first-order logics is the same, its counterpart relating to the pair of the quantum universe and quantum information Gestalts suggests that the whole of physical entities (or “things”) and all entities are the same.

Furthemore, the concept of the quantum universe means that it is a single whole, at that being single in definition. This, combined with the relational interpretation of both entanglement and gravitation after general relativity, implies that the quantum universe is physically “nothing”, and all entities physically existent need their relational counterpart for existing really. That statement might be philosophically reflected that the existence is negative, in the sense to be “less than nothing”, since whatever being existent needs its relational counterpart complementing it to the whole of the quantum universe to exist so that both constitute “nothing”.

Of course, the standard viewpoint to what is existent is “positive”, thus opposite, and respectively, the creation “adds” rather than substracts which is also one of the reasons for the mystical “Big Bang” to be adopted. On the contrary, the alternative conception that the universe appears from nothing permanently, omnipresently and omnitemporally, only by virtue of the ontomathematical unity of mathematical and physical laws suggests, that the creation is *negative*, ant it happens necessarily in whatever “nothing” once it has been structured so that different parts and their relations can be consistently defined.

Is the new “already-thinking” in physics cursorily sketched adobe by the three Gestalts: corresponding to classical quantum mechanics, quantum information, and the quantum universe as inevitable as it is in mathematics? The main obstacle is the common acceptance of the “Big Bang” and the divine positive creation originating from God as the Creator, in which at least three of the world religions, namely, Judaism, Christantinty, and Islam believe. Nonetheless, a few other, also world ones, such as Buddisms and Taoism do not share the same belief, approaching the worldview about the negativeness of what exists.

Anyway, both dark mass and dark energy need their explanation, which seems to require nonlocality as a necessary counterpart of locality, and thus the new already-thinking also in physics, regardless of the enumerated and other obstacles.

X INSTEAD OF CONCLUSION: WHAT FOLLOWS, OR THE NEW CHAPTER OF THE LOVE SAGA OF SCIENCE AND SOCIETY

Are society and science absolutely standalone? That is a problem even granting the Cartesian abyss, after which science can be considered to be on the “bodily shore” of society being obviously a social institution or investigated by sociology of science as realizable only in “social networks” as after social constructivism. Anyway, classical epistemology is strong enough preferring “essences” and “truth” rather than “networks” and “actors”, once the transport between the shores at issue is a fundamental mystery for Carrtesianism, thus and particularly unresolvable by a so secondarily and applied discipline as sociology of science.

However, adopting ontomathematics and “entangling” those two opposite “shores” so remote as for classical cognition, science and society are already identifiable not less than distinguishable for example utilizing Bohr’s later and philosophically generalized concept of “complementarity”. For example, the obviously social institution of science can be considered to be “complementary” to its ideal essence obeying truth as classical epistemology postulates. Then, one or another degree of entanglement between each other is admissible even allowing for them to be granted in a fundamentally indistinguishable “coherent state” among the framework of which they are the same:

If one introduces social experiments or observations to that inseparable “socio-science”, what would be relevant results refer to society abandoning science to be absolutely vague so that the metaphor of Heisenberg’s uncertainty is quite relevant. As well as vice versa: if one “measures” science utilizing classical epistemology, after which science would be an ideal creation of the human mind, its bodily realizations in a certain social institution or networks melt and vanish into thin air in the final analysis.

As far as “we do not yet think”, science and society are investigated only “after decoherence” (“after measurement”): this means inherently locally as classical science and even philosophy require imperatively. However, if “one already thinks” seeing that “whole of the forest” tnot worse than the separate “trees”, and thus inherently “nonlocally”, and speaking otherwise, whether philosophically or metaphysically, but most exactly, ontomathematically, they are the same, to which the concept of “coherent superposition” is quite relevant though borrowed from quantum mechanics, but now generalized ontomathematically.

Any “scientific revolution” is simultaneously a “social revolution” as to that “coherent state of socio-nature” or “socio-science”. One can naturally suggests that the 2022 Nobel Prize in physics for entanglement and quantum information is the beginning of a scientific revolution revealing and explaining the boundless ocean of “dark matter” and “dark energy”, among which is our small and safety island of locality where humankind was born and the childhood and adolescence took place: maybe accustomed, comfortable and cozy, but too narrow for the “adult” humankind attracted by the newly discovered ocean of nonlocality and quantum information and by those forthcoming adventures though rather dangerous, but expecting and beguiling with unimaginable possibilities and achievements, in comparison with which all the human advance until now would seem to be a “childish game”.

Of course, the space of the nonlocal ocean of quantum information needs the relevant nonlocal "adult already-thinking" substituting the local "childish and adolescent not-yet-thinking", though originating from the latter as a conservative generalization. One might compare the local space of the "island" being all the visible universe with the newly revealed space of the nolocal "ocean". The former, no matter how vast it seemed to us until recently, is only an "island", our island among the latter, which is also the true "space", to which the old imagination about the local cosmos visible on the night sky as stars and nebulae is only a childish realization of the real and inherently nonlocal cosmos.

It is very well known that enthusiasm, which was caused by the first space flights and the huge expectation about the eventual expansion of humankind into the remote cosmos. However, those expectations were not met at all. The conquest of space proved to be too difficult, even impossible, at least locally. The amount of both energy and time necessary for the cherished flights through space is overpowering. Humankind does not manage to produce so much energy as well as the longevity is quite insufficient compared with the distance to the astronomical objects out of the solar system. So, the *local* mastering of space was in a dead end and seems to be fundamentally restricted by the physical laws.

The dreams of human space expansion in any local ways were rather generated by that "not-yet-thinking", and the criticism to which is the subject of the present paper. The cosmos needs for one to "already-think", i.e. inherently nonlocally as it is sketched above, particularly overcoming the light barrier, which is that of locality in fact. The CERN colliders endeavoring to penetrate deeper and deeper in the secrets of the universe and its alleged beginning in the mythical "Big Bang" are in an analogical dead end since they require much and much energy, respectively exponentially much and much greater radiuses of the accelerators for which all the earth will be soon insufficient and their money value overpowering for humankind. They are another byproduct of the same "not-yet-thinking" fortunately being much easier surmountable only by means of the Gestalt change to "already-thinking", i.e., nonlocally.

As for the just mentioned physical restrictions about the necessary colossal energy (as well as the correlative temporal periods as to space flights to remote stars and planets out of the solar system), the Gestalt change at issue suggests for the local distinction of energy and time to be abandoned (or "bracketed") in favor of inherently nonlocal quantum information or correlations. Just the mutual division of energy and time is wrong and caused by the ideology of localism ostensibly necessary for science obeying empirical human observations or experiments, but only seemingly. What one needs for eventual space travels in the future or for the much more deeper penetration in the secrets of the "creation" is not greater and greater energy obviously unachievable, but only that "greater already-thinking" after the Gestalt change and abandoning localism falsely postulated to be "condition sine qua non" for any natural science especially experimental. That is an absolutely wrong "axiom". It is due to the not-yet-thinking of humankind as well to the corresponding "crystal" hierarchical organization of society rather than to the laws of nature. Of course, the former is unchangeable, but, fortunately, the former two

ones, namely both thinking and social organization can and should be transformed in order to correspond to the latter.

Furthermore, the ontomathematical realization of the laws of nature presupposes that unity of society and science (as this is elucidated above), after which scientific and social revolutions are indistinguishable from each other. If the 2022 Nobel Prize in physics for entanglement and quantum information established the beginning of a scientific revolution already as a well-corroborated fact, the forthcoming correlative social revolution has already started though implicitly, hiddenly, even secretly: but how? What is for the contemporary society to change itself in a jump-like revolutionary way in order to correspond to science in the "coherent" (or "ontomathematical") unity of "socio-science" (or respectively that "society based on science and knowledge" to which the EU, for example, endeavors, at least according to the official documents)?

One might try sketching, though quite cursorily, what should feature the future society, corresponding to nonlocal science and already-thinking, which can be also called "nonlocal society". First of all, it is to be "liquid" or even possibly "gaseous", "adiabatically heated" by the ever-exponentially growing amount of information. As an immediate corollary, all "crystals" of any social hierarchies would be melted gradually merging into a homogeneous and inseparable state thus erasing even only the outlines of the "crystals" of the previous social hierarchies. One might utilize the metaphor of "permanent revolution" abstracting from the fact that was involved as an ideology, at that the ideology of a too hierarchized society tending rather to unify all social crystals into a single one, "totalitarian monocrystal", being in a sense even "more solid" than the solid enough usual piece of metal consisting of a huge number of extremely small crystals, i.e. hierarchies. Even there exists a viewpoint, starting from which the "totalitarian monocrystal" and the "nonlocal liquid or gaseous society" could be compared to each other both being homogenous though in two quite different ways: correspondingly "solid" versus "liquid or gaseous"

Reflecting back to today's "solid" society though not being a "totalitarian monocrystal" in general, but now from the viewpoint of the just outlined future "nonlocal society", one is able to say that any social hierarchy or order is due to ignorance, and its destroying does not mean "anarchy" but the omnipresent dominance of knowledge and cognition "controlling and ruling" the new kind of society much better than any social hierarchies featuring all societies until now. One might also utilize the metaphor of the "society of social networks" since none of the now existing ones does have any hierarchy and particularly, any "boss" (including each of their founders or owners), being thoroughly obeyed the wide and fast exchange of information, therefore excluding any solid hierarchies even on microscales.

Then, continuing the same metaphor, one may conjecture for them to melt and gradually dissolve all existing hierarchies including the crucial ones, that of the state setting the rigid, "solid" hierarchical macro-frame, on the one pole, and that of the family establishing the huge number of minimal "crystal" micro-hierarchy allowing for the society as a whole to be in its solid state usual at least until now, on the other pole. One might also reflect on the concept of

both social and social revolutions presupposing only the transition from the one “old” solid state to another, “new”, but also solid state being necessary only for the transformation of the former into the latter, but needing not less the counterpart of a relevant “counterrevolution” in order to “cool and harden” the new set of micro-hierarchies and the corresponding macroframe of the state and unified social order.

Indeed, the new “revolution” from any local and thus “solid” and hierarchical societies to the conjecture future nonlocal society would be qualitatively different as excluding in definition its “counterrevolutionary” counterpart being rather comparable to the phase transition to a new aggregate state corresponding to the passing over a certain temperature featuring the phase transition at issue. Of course, the new aggregate state with higher temperature does not allow for any essential cooling returning to the former aggregate state featured by the much more limited (both as volume and speed) exchange of information …

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