Article

Mathematics is Physics

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Abstract

In series of articles we continue to advance idea that mathematics and physics is the same. We bring forward two basic assumptions as principles. First is the primacy of life as opposed to dominating reductionism, and second – immaturity of epistemology. Second principle says that we have reached stage of epistemology where we have stepped outside simple perceptibility only on level of individuality (since Aristotle) but not on level of collective mind. The last stage has reached only most of religious teachings but not physical science that is still under oppressive influence of reductionism. This causes that what we call research in physical science turns out to be simply instrumental improvement of perception within visional confinement we call field of information. We discuss and try to apply principle that within field of information we can't invent or discover anything that doesn't existing.

Key words: quantum mechanics, mathematics, physics, cognitive machine, mathematical mind, field of information, instrumentality versus rationality, religious teachings.

1. Introduction

The roof of natural sciences is physics as some physicists use to say. What is mathematics is question of debate for centuries or may be referred to as eternal problems. Mathematics and physics are so different things. Could someone imagine that both things could be placed on equal ground, or even identified?

Physics first of all is experiment, and we link in our mind it with something connected with building experimental equipment to register physical phenomena both qualitatively and quantitatively. Experimental equipment may be as simple as any in physical laboratory in school, or as large as Large Hadron Collider (LHC). Nevertheless, the ground for what we understand under physics is just physical experiment and equipment built for that reason. But there is theoretical physics too. Both Newton and Leibnitz developed mathematics calculus to make way for theoretical physics, and both made first firm steps along it. Since that time we know experience in developing deductional ways of thinking in theoretical physics clearly demonstrated by Einstein with his relativity. Here comes in foreground something that may have forgotten physics being experimental science, since deduction there is made on ground of general ideas that directly can't be measured. Further theoretical physics develops ideas that in no way can be confirmed by experiment, say string theory. Is this still physics? Many physicists start to ponder on this question seriously, see (1; 2).

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Let us look on things from side of mathematics. Mathematics deals with mental objects. Mathematics may be said to take its idealized objects from nature, mathematics develops on its own rules, which are found in itself and by itself, in this sense being self-content. It is as non-physical in our mind as the expression of the idea that mathematics is not science at all but only way of thinking. And then physics comes seriously in mathematics and gives it problems and forces it to become in some sense physical – as in case of mathematical physics. It is still pure mathematics, but to negate its connection with physics wouldn't be correct. With era of quantum physics something incredible occurs in relations of mathematics and physics. We come to conclusion that we start to loose understanding of what goes on (3), when trying to distinguish where there is mathematics and where physics. Notions of axiomatic used before only in mathematics come firmly in physics via quantum mechanics. From time to time some efforts are made to distinguish pure mathematics from applicational, mainly pointing to physics. See for example Apology of Hardy (4). But already here Hardy expresses doubt in saying that maybe mathematics may have to deal with reality more than physics. What this? How could both things be confused? Could this be a mistake or error by Hardy? No, – at least very clever mistake if any, as we are going to show further.

Let us try see on both mathematics and physics not confronting them but uniting them. Well, let us disconnect for a moment from our usual way of thinking where mathematics for us is „way of thinking" and physics – „measuring". Let us look on mathematics as on pure mental activity that doesn't bother about nature around. Then comes mathematical physics, but it covers only part of methods of mathematics, say, differential equations and differential geometry. With relativity part of mathematical physics grows, at least differential geometry becomes Riemannian and algebraic calculus tensorial. With quantum physics mathematical physics grows immensely but still mathematics has many areas which we could designate as pure. Say, number theory. But wait. With fifties mathematical world experienced incredible development of mathematics, mainly in its pure part, algebraic geometry, abstract algebras, cohomologies, cobordisms. But then comes something incredible. Part of these new pure mathematical disciplines become applicable in physics too, one by one. Then comes era of string theories and more and more mathematical theories become required by physicists. Some start to blame these physicists for being not physicists at all. But nobody can stop mathematics loosing more and more from its assumable pure part. P-adic analysis becomes part of theoretical physics (5). Mathematics looses one of its strongest outpost and stronghold – number theory. What next? Mathematicians nowadays are behind some fortification that could be called Goedelian mathematics. They say – „This fortress isn't possible to take because there isn't match in reality for such eventuality." But the same was told about zeta function in number theory. Nobody could explain their applicability in physics but to neglect it was impossible too.

But let us try to make some estimate as if from outside: if mathematics becomes more and more applicable in physics, let us apply linear dependency estimate – what outcome it should give us? Mathematics all as it is would come under physics (6). So what *is* mathematics? Why we can't discover or invent anything that doesn't exist in nature?

2. Quick explanatory theory of unreasonable effectiveness of mathematics

Let us start with the last question and build from this an answer to the question. *Why we can't discover or invent anything that doesn't exist in nature?* Let us take this as an axiom. Let us state – *We can't discover or invent anything that doesn't exist in nature.*

How we could legitimize such a viewpoint?

Think of existing world as of some general motion: whatever exists or proceed is part of this general motion. Then all motions are part of this general motion – this sounds very persuading. But the same we must say what regards things too: whatever exists in world of things is part of the general motion. Why? Thing was created, what was motion; thing changes in state, and that change is motion; the only unconventional thought is to assume that what is between states of change and would be thing itself, say, as Kant's *res in se*, isn't much to be taken in account if only all the motion in general is taken into consideration. There isn't anything else except one general motion. This sounds unconventionally? But think about applying this generalization of things as generalized motion only once and only by global application it to the whole existence. At least quantum mechanics would tend to say "yes" to such picture of nature (7; 8; 9).

What is mathematics in that case of existence of one general motion? Mathematics describes this motion, mathematics we discover as pertaining to this general motion. In some definite sense we could say that mathematics is from what this general motion is built. But actually there we could easily err because – actually we don't know much about this general motion except that some experience with mathematics to what extent we know it says us that something like could be assumed to be in ground of all existence in nature.

What we could deduce from such assumption of general motion as certain? Mathematics might be said to be some general invariant of this general motion. We could even say more: mathematics is irreducible invariant pertaining to this motion. To this extent we are about to say that we don't know anything else than, say, fact that mathematics is its irreducible invariant. At least it sounds reasonable and comply with our experience what this mathematics could be.

What would be consequences of such world picture? *Mathematics* and *physics* would be the same (10; 11). But we are used to think that mathematics and physics are quite different things. And now we want to say that they are equal. Why equal? First, mathematics is subset of physics because we can't invent anything except existing with regard to general motion. Let us rename this general motion *Motion*, with use of capital letter for this case (11). To get reverse, i.e., that mathematics includes physics, we must apply more subtle assumptions but we leave this for further in discussion about cognitive machine. In this chapter we say only that we can't perceive or measure anything outside Motion.

3. Observer in physics and success of physical science

In physics observer doesn't affect physical phenomenon in general. This fact serves as basic assumption in solving problem of observer in physics. As a matter of fact, observer is human being, *homo sapiens*, not cat, not lilies on field, not stones. Except that we do not know what

would be results of physical observations by these "observers" because we don't possess tools to examine these alternative options. What actually makes choice of *homo sapiens* so exceptional? That is the *success of physical science*, or, effectiveness of physical science. In other case nobody would speak about such principle. Everybody knows that observer should possess mind to perceive and then to say crucial words "I am observing, I am measuring", and then perform actions which are prospective from *homo sapiens*, not from cats, lilies or stones. *Homo sapiens* perform physical experiments, develop physical theories and write books, implements discoveries in tools for everyday use. But nevertheless, we may assume that observer may be excluded from experiment. Why? Why wrong assumption leads to seemingly correct result? Because it worked. Yes, the physics developed in this way was very successful. Even more, incredible successful. Success of physical science we see all over. It constitutes whole of our world view. The picture of universe with galactics and metagalactics. The success of astrophysics. The success of electronics. We use planes, we use cell phones, we use all sources of energy and their applications. All this is due to the physical science. Physics is most successful of all sciences, where others comparatively may have problems in their development (13). But not problems for physical science what concerns its immense, unbounded, incredible progress. Does all this success stand on false ground? No, it stands on *working ground*, on *working principle*, on very successful principle in that sense that it turned out to be so productive everywhere in every possible way. But, in general, the principle is wrong. It works but works *only* for time being. Where from we can see this? First signals came from theoretical physics. Lee Smolin fixes this in his excellent book "Trouble with physics" (1). We tried to correct Smolin saying that the problem is not in physical science as it develops but in choice of observer (14; 15; 16). The problems of physics and its relations with mathematics are tackled in the book of Peter Woit "Not even wrong" (2). What is string theory what regards physical science? Part of physics or type of outsider? The correct answer may give only new scientific approach that considers string theories in their variety as parts of mathematics and of physics. They are excellent descriptions of motion and excellent parts of Motion what regards mathematical physics. Alas, physical science is so successful to develop on the ground of the principle of independent observer, but isn't able to abandon this wrong assumption when it starts to give mishaps and failures. But this is maybe for time being only. It may turn out that just LHC may force physicists to change their observer assumption (9).

One way to express problems around physics in case of remaining it faithful to old notion of observer we fixed in the article (7) saying that physical science in its old settling bothers for fixed reality where this is nonsense what regards epistemology with observer without reference to cognition or consciousness. According (7) we must think in terms of instrumentality but not in terms of rationality in its search after reality.

4. Crisis in physics and new observer principle

Today theoretical physics holds to its old observer principle, what we call false, and in the same time it copes with somewhat absurd situation how it tackles quantum mechanics. Richard Feynman qualified quantum mechanics as something that nobody can understand and the moving into this non-understanding deeper with moving deeper in quantum mechanics itself. In one sense he was right because it was necessary to cope with the old observer principle. Copenhagen interpretation stands as type of pretext there without any ability to

explain whatever and in speaking about reality doesn't much help there. May it do except sweep dirt under the rug?

What to do? Tackle things how they come before us. Abandon things that were assumed only for time being. We have come to point where observer principle should be changed in favor of *homo sapiens. Homo sapiens* is observer and possesses mind. Mind is the thing that entangles with "reality" in some way we can't discern yet clearly (17; 18; 19; 20; 21; 22; 16). The old principle of observer is wrong in sense that it doesn't work properly anymore. It partly works and partly not. What to do?

How to find new way to where observer principle would start to work more properly?

We introduce principle of cognitive machine. On what ground? Our mind works due to cognitive machine (16). We are not conscious each by him/her-self but due to collective mind – collective machine, mind machine, what we suggest to call *cognitive machine*. The only obstacle to come to this point is that reductionism doesn't want to accept that we are all connected into one common living essence – life. We call this *vita principalis* or *principle of life*. We say that life is indivisible[1]. It is interesting that people in most their human activities are ready to accept point that we are all connected. See for that religious teachings (22), see literature (23). But physical science can't find any proofs for such connections. Or can (20)? In any case, general science doesn't accept this saying there are not sufficient proofs for that.

Now we come to some crucial point in our argumentations and say: if we could accept only existence of such cognitive machine then we could explain why mathematics is so unreasonably effective and change our observer principle in place of independent observer placing cognitive machine. Because cognitive machine would be that instrument in ourselves who/which "knows" mathematics and discovering mathematics we actually discover along with mathematics features of our cognitive machine. In other words we could say that mathematics as irreducible invariant is such in reference to cognitive machine too. Now Platonism (24) comes before us in some touchable way: Platonic world of ideas could be nothing else than cognitive machine or at least something pertaining directly to cognitive machine. Accepting cognitive machine approach we would accept actually new but maybe not so new world picture: searching nature we search actually ourselves, our mind. In doing research we use our cognitive machine or, simpler, reconstruct our cognitive machine in some reference system. In (7) we say this otherway: we develop not our understanding about nature but we develop our abilities to research, yes, without understanding about nature whatever much at all. That is nature of ourselves what we research, not nature around us.[2] In (25; 21; 11) it was said that life represents actually its reference system as that or pertaining to that what we discover via cognitive machine.

[1] Strange it might sound but word "individuality" might just try to say that we belong to something indivisible.
[2] Maybe it sounds strange but in Medieval word "*natura*" in Latin had meaning "nature of human being" not of "nature around us" i.e., "physical nature" as we perceive it today.

5. Mathematical mind and cognitive machine

What is our mind and how it is built? We have now new insights there which try to step outside traditional reductional way of mind models, e.g. (17; 27; 20; 18; 28; 5). Up to now all our approaches to understand mind suffered from one common fault. These explanations tried to place new mind concept in an old world picture. But what if mind is primary with regard to what we try to represent it? Pure idealism we know only in philosophy and maybe in religious teachings. How science would tackle this new problem if being forced for this, i.e., to become "idealistic" science in sense mind to become principal before "material" world?

Let us assume that we had some world picture where things were arranged on traditional material base where all idealistic or pertaining to mind activity were subordinated to material. Let us imagine that someone said us that we must try to perform some turnover, scilicet, place material things in dependence of mind activities and functions. Can we perform such turnover in our epistemological picture of reality? In case we have lost all paradigms we might start anew all with philosophy, e.g. (28) or (18) or (20). Thenafter we might search among existing things some who could have been survived in such turnover. But what should survive in physical science? In physical science we have such survived unit, namely, quantum mechanics. It is mostly independent from ontology, even more, in quantum mechanics ontology may have become indivisible from epistemology (29; 30). Even more, we would tend to think that quantum mechanics and quantum mechanical theories don't have tools to distinguish between ontology and epistemology. As a result, quantum mechanical theories of consciousness can't discern "mind aspects" from "matter aspects" at all.[3]

Why we suggest to speak about turnover? Because without this, we cannot step into new scientific area where cognitive machine approach resets old observer in physical science. We must accommodate us to a standpoint that all what we saw before now we must look as if standing on head. Actually, we must accept another two principles. First, the way we looked on world before was turned upside down. Second, we must get used to apply both ways of thinking, "standing on foot" and "standing on head" not distinguishing between both what regards their primacy. In reference to principles of old observer and new observer we may now think as about outer observer and inner observer both being united in a common world picture. What would be new that both ways should be equally legitimate and even equal. Actually, what we did was making legal way of thinking that ideal is another side of material but now on mind-matter relation's footing. What is expected from physical science, to accept this new approach as principle of observer.

Next unusual thing to accept is that mind is mathematical, namely, that mind could be characterized more precisely as cognitive machine in sense it functions as we discover mathematical way of thinking. When we discover mathematics we discover how our mind works.[4] This last issue is not unfamiliar to scientific thought, e.g., when mind as computer is

[3] By old tradition we often speak about consciousness and matter where their distinction doesn't make much sense. For contemporary researchers it poses many problems, because we find hard to follow what different researchers have in mind when discuss these problems.

[4] Actually, this applies to whatever other level too. When we think, we allow our mind to soar in some space of ideal matter that is existing matter. By thinking we can't capture much of thinking power, we feel of it more when we apply it in some systematic way. Mind should be initiated in order to start to feel what actually mind power is. Forms of initiation we know are many, e.g., religious, mathematical, and other ways.

suggested to consider, only we point more on some levels lower where this "computer mind" could have taken its beginning. Quantum leaps approach says more that "leaps" belong to physics but what is played on "leaps" is mathematics. We think about mind machine as being rather functional than material, we think about mind machine as playing Motion as it is represented in reference system of life.

Mind machine is that tool that downplays all what we perceive as reality. Let us start with vision. What we see is an integral functionality of the collective mind. As end users we account by vision specially for functionality that we recognize as locality, but locality itself is generic function and it may turn out that it doesn't match in reality what we perceive as space-time to that extent how material way of thinking wants to attribute to it. Solving space-time problem for physical science may be as crucial as question of observer. It may turn out that we need rather to speak about space-time-matter continuum or completely abandon all distinctions in favor of one global geometric model, e.g. (5). All this has direct relation to vision because vision is that tool that takes from that more general manifold than space that is most fit for us to exist. Religious teachings call it "mercy of God" (MoG). We are not far from point when physicists would be forced to accept this MoG theory as working. When physicists start to speak about anthropic principle, they are about to do just this (12). According this point about MoG we are not much protruded ourselves from our *niche of life* but mostly deeply sleeping there what concerns our material understanding about world around us. How far our religious thinking is from our material thinking is some measure how deeply we sleep in our niche of life.

Actually, vision would be main area where we might expect physical science to start to acknowledge new type of observer. We need only to start to think about vision as mathematical functionality as pertaining to Motion. All what relates to vision is mathematical and pertaining to Motion, and what builds vision builds all other aspects of our life functionality, be they pertaining to body or mind.

6. Strong and weak observer principles (16)

All what we say concerning cognitive machine should be complying with what requires physical theories and not more. But actually nobody has discovered anything like that that could stand for such machine that were accepted by all scientific community. Actually, we need to acknowledge that what we build is some eventual functionality that could work to that extent that could explain everything in physical science. Thus, we actually do not know what is behind all this that works just in this way how we perceive what we call reality. So we may speak about principle of observer on two levels: first – strong observer principle that tries to explain all in new conditions of epistemology; and second – weak observer principle where we say that nature behaves just in this way where we can't explain why it behaves just so. Using both principles we could demonstrate our understanding of what pertains to observer in physical theory: strong principle would be applicable where we pictured how it could be done by nature or *vita principalis* if any at all, and by weak principle saying that it could be done by nature in quite another way which contemporary science doesn't yet know.

7. Instrumentality versus rationality

How to explain why physical science holds so fast to its old observer principle? The reason might be simple: it holds to rational world picture, and next, to outer world picture what is caused by reductionism. What we have as success in physical science is due to reductionism and we can't invent much outside this reductionism; when we come to border of all faculties of reductionism we come to stop in physical science, and crisis in physics says that such might be eventual outcome. Is there some escape? We suggest to use instrumental approach in place of rational (8).

Actually, what science has developed since times of Aristotle is instrumentalism, not so much rationalism, where under rationalism we understand material world picture with space and time and causality as ground notions, namely, just that where Aristotle has given ground contribution. But other thing is also true. Just Aristotle gave first firm support to *instrumentality* too, namely via his work "Organon". His suggested tools were logic and sort of scientific method. However Aristotle's main tools were "tools of mind" and Bacon was who suggested *Second Organon*, his "Novum organum", where experimental or empirical method actually was added (8). Only hundred years ago appeared *Third Organon*, "Tertium Organum" of Peter Ouspensky, where physical phenomenon was supplied with *numinous*, i.e. that what has remained outside rational scientific method and most often came under authority of religious teachings. Now we claim that quantum mechanics appear as "*Quartum Organum*" where epistemology comes to take place of ontology (32; 8). All these four stages may be supposedly assumed as stages of development of instrumentality as opposing to reconstruction of reality via space-time and causality.

Why we need to contradict instrumentality with rationality in our viewpoint? Because, according our statement in (8; 32), just rationality has been the hindering obstacle in the development of physical science after quantum mechanics has come into being. Why? Because thinking that we develop understanding of reality actually we have developed only tools for the research understanding about the reality leaving far from what could be called rational (8). Trying to hold to rationality, physical science has actually lost its rationality. But in this struggle we, physicists are not losers, we are winners, because physical science has received effective tools of research.

8. Why mathematics is physics? Field of information as source of information and access to information

Let us consider why mathematics is contained in physics. First of all we come to this by our experience: theoretical physics gradually has lead us to this assumption. Secondly, as we saw before, we may simply state this as principle that we can't invent anything that doesn't exist. Thus, whatever belongs to mathematics should be invented or discovered, what is the same thus belonging to physics by this general assumption. From point of view of our common mind we could say that collective mind provides for us mathematical way of thinking, we are only to accept it, or find rules how to get access to it.

Let us consider why physics should be contained in mathematics. It follows from assumption that we may access whatever in nature only via our collective mind, via language of

mathematics. We are within mathematical mind that generate for us picture of reality and provides for us all what we perceive. Whole reality initiated for us is actually activity of our mind machine.

We, i.e., collective mind, see and reconstruct whatever in language of mathematics. Whatever appears new that we don't recognize as familiar we translate into language of mathematics and forward to our consciousness. Thus we all see as mathematics. It is similar as with eye. What we see is picture within eye notwithstanding of the nature of images wherefrom they could come. Different teachings would suggest different explanations about what is the nature of objects we see, but in whatever case we "see" image what is formed in brain. In this sense mathematics is eye, instrument of vision. In this sense we may say that we perceive all as field of information. All this applies similarly to case of collective mind. Except we do not know what is what we see in sense we claim now when we say seeing some reality outside.

This field of information plays dual role for us as individual persons. We all perceive as information within collective mind, and we are within confinement of this field because we can't say whether does there exist some "other reality" outside this field of information or not. In this sense we are to say that we can't yet protrude outside this confinement of perception but only "live" inside it. What we see via mind machine – outer reality or our mind or something else – we can't say, because we are too deeply within this our perceptibility.

9. We are within confinement of field of information. Is nature there outside?

Thus, the picture of equivalence of mathematics and physics, at least until we find way out from this confinement, says us very simple thing. In our development we are on the stage where we can't step yet outside the confinement that we should call field of information. Collective mind supply us with ability to see world via mathematics, or physics, what is the same, but this is all. This ability and world in this way projected before us we may call properly *field of information*. We can't see outside it and even say – *Is there anything out there behind the confinement of field of information or not*? Materialists would be these who would claim that world outside is the same we perceive inwardly. Idealists would be these who say that what is within is the same outside. Or else? It is not altogether so simply to decide.

10. Nature behaves as if ...

We may reformulate our strong and weak observer principle very simply. We may say that there exists collective mind and we may say that nature behaves as if collective mind exist. First would be strong principle formulation and the second – weak. This approach we may repeat as many as we like times. Strong argument says: we are within field of information; weak argument says: nature behaves as if we were within field of information. This approach gives us key how to approach observer principle via these two assumptions, via strong – where we try to interpret in a way how nature could do one or other thing, and via weak – simply saying that "nature behaves as if ...". If we like we may remember that that was way, or similar, how we defined manifold, i.e., in concrete coordinates and in general coordinates

generalizing situation with possibility not to specify coordinates at all. Now we may go on with this analogy and say: as concrete interpretation may be taken whatever interpretation, say, collective mind, or other, and as generalization, or as general interpretation, may be taken weak principle "nature behaves as if ...". From this we may take two ideas. First, we may generate as many as we like concrete interpretations of observer, collective mind observer being is if one of these eventualities. Second, we may ask – what is sense to generalize observer in this way, if it can't fix any "fixed observer" as we had before – "physics is independent from outer observer". We think that just this way to check our ideas via these considerations give us way to new observer or "manifold of observers" in physical science.

11. Two whales of our theory

How we can claim that our approach is sensible? How we could test its intelligence? Whatever theory may be checked on how many principles are on base of it. If too many hypotheses lay on ground of some idea it may be wrong by this simple fact.

We have too main assumptions that we may call fundamental for our approach. First, we assume that we have not yet stepped outside our perceptional world picture and, second, we assume that we are a collective mind. What we have reached is because we have stepped outside individual perceptional world aggregation picture and arrived at new border what is caused by collective mind but nevertheless still at a border of a perception, not more.

Trying to test our principles we may easily conclude that second should be correct almost trivially. The only obstacle is fact that contemporary science can't find argumentations to break down ruling reductionism in favor of life primacy, in favor of *vita principals*. But second our principle can give simple explanation – why. We are on too early stage of development as a civilization.

Second principle easily follows from first. Stepping outside perceptional world have at least two levels – that of individuality and that of collective mind. First we did in times before Aristotle. Second step takes more time, as we see from our history of epistemology. Many teachings on our earth recognize collective mind. The last stronghold of reductionism remains contemporary physical science, nonsense? Maybe it is good. We must check all if we want to be called science.

12. Paradoxes of epistemology

One of the main paradoxes of contemporary science may turn out that whatever religious teaching gives more correct picture of reality then, say, physical science. Why so? Physical science is the most forwarded science of all sciences, its enormous success can't be denied. But the main fault of physics that it, yes, gave excellent instrumentality for researchers, but in the same time gave completely wrong picture of reality. Wrong? Maybe it is not so wrong if we come to correct understanding of what this all is what we see. But in case we want to deny we are speaking about and go forward further and further along the way of reductionism then this picture becomes more and more wrong. In this sense we say that contemporary science gives wrong picture of reality.

Some require from physical science to recognize existence of God. Of course, it could be simplest way to throw off reductionism. But more essential for scientific world view would be to recognize life primacy, *vita principalis*. What we call God is behind life primacy in sense we can't accept God without life. Besides, most religious teachings deny possibility to access God directly, may this presumable access be epistemology or else.

Even simpler possibility is to recognize collective mind primacy. When we speak about Karl Jung's collective unconsciousness, we are about to start to do just this. This would save reductionists trouble to speak about God and even about life primacy deducing the last from the former, i.e., the life primacy from the collective mind, but already on some "materialistic" ground. Maybe this opportunity we may expect in eventual future.

13. What we who understand life primacy are to do? We must study mathematics

People who believe in God can't understand unbelieving folks. The reason is not hard to find. For example, the people who understand mathematics cease to understand those who don't see these simple things. We call this *initiation*. Theoretical physicist Landau used to say that he can't remember himself not knowing integration. People who come to conviction of primacy of life can't understand those who are against it. How to persuade them? The best way is to show what this new opportunity gives, what advantages, what privileges. As in case of physicist Nobel price winner Landau.

We suggest to study mathematics and to study to much more extent than we could motivate us to this otherway. Why? Reductionism in physics has caused amid mathematicians two types of negligence – against mathematics used in physics and against mathematics itself.

Firstly, some mathematicians get used to think that mathematical physics or mathematics used in physics is very primitive. Mostly these are those who do abstract mathematics becoming exercises in building new branches of mathematics on axiomatic grounds without eventual applications.

Secondly, independence of axiomatic choice in mathematical theories has caused negligence to mathematics itself. This negligence may spread among abstract mathematicians too. What sense in these results of mathematical science if they are results of mere exercise of mind that can be redone and redone with endless effect? What sense if in near future this is supposed to be done by computers? Many mathematicians may abandon their chosen subject in favor of some other in order to find sense in what they are doing. Yes, this way is favorable to reductionism and this way of thinking is caused by reductionism. Only theoretical physics and mathematics together may give sense to this process of creation of mathematics nowadays. This mostly complies with us as collective mind.

To oppose these who spread negligence against mathematics we must study mathematics and motivate for this all people. Reductionists are happy that young people become programmers and do not exercise mathematics. More and more departments of universities teach subjects of programming in place of mathematics. Programmer may earn money and mathematicians are doomed to poverty, to fatality to become oddballs, losers of life. We must teach that mathematics should be studied, taught and exercised everywhere on much higher level.

Mathematician is not only who can invent new theorems and theories in mathematics but who can understand mathematics and get initiated in mathematics. Mathematics is way of initiation in most direct way. Mathematics is natural way of our thinking, but not only, it is the natural way of how we are built, how all around us is built too. We must think that we understand only some very basic level of mathematics and this science only starts to open before us. Mathematics should be studied and developed as science of our collective mind and cultivated as way of thinking in searching new ways of initiation there.

14. Conclusions

We try to explain why assuming mathematics and physics being the same we can come to some simple principles that could suggest us new way to build new epistemology. In order to overcome reductionism we forward principles of life primacy over reductionism and second – collective mind principle saying that we are within field of information. We try to interpret this with immaturity of our epistemology. What we tried to interpret as outer reality we should consider as some informational picture what collective mind generates and what we perceive as something like picture of reality, where actually these pictures we "see" are functionality of field of information.

We use term – immaturity of epistemology because we can't step outside the informational confinement that is provided from our collective mind. We may say that we have stepped outside simple perceptibility only on level of individuality (since Aristotle) but not on level of collective mind. In this sense we can't say whatever about whether there is some "other reality" outside collective mind or not, or, we simply can't yet judge about "what there could be outside collective mind" at all, only saying that we are yet only on level of perceptibility of our collective mind – we can say that we see but can't say what we see.

We may apply "nature behaves as if ..." paradigm in whatever situation, making our strong arguments into weak arguments.

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