The Age of the world System

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Metaphysics in thought experiments

Science and its perception have been greatly transformed throughout the history of mankind. This can be traced both chronologically and logically. As a result, various theories arise regarding the causes of such changes and their practical or philosophical explanations. One of such theories is Heidegger's “age for the world picture.” He suggested that at some point people began to engage in science, based on the assumption that nature is calculable.[[1]](#footnote-0) In fact, this allows us to present nature as some kind of image enclosed in the specific framework of this assumption. This idea will be described later. At this stage, the most interesting print is that Heidegger put forward this idea through a thought experiment, keeping its results in metaphysical space. The focus of this essay is such a thought experiment. Therefore, it seeks to answer a number of consecutive questions. Is a thought experiment a common link between “ancient” and “contemporary” science? Does it violate the assumption of the irrevocability of Heidager? Is it possible, in contrast to all the problems that arise in contemporary science, to assert that a thought experiment is more abstract and more metaphysical than a real experiment? After all, my thesis is that the contemporary thought experiment operates according to the same rules as before the age of the world picture and becomes a metaphysical method of science, which is why there is no chance of "thought" reversibility which means that every new step of any additional assumption will happen only in frameworks of calculable nature .

First, it needs to elaborate on what the thought experiment means. It was defined by Mach as a preliminary reproduction of a real experiment in the imagination.[[2]](#footnote-1) These experiments allow scientists to change the conditions of experience indefinitely or to consider all possible ways and give accurate answers as to whether the hypothesis is correct or not. Thus, the three most important characteristics of a thought experiment are the exact answer, paradoxical structure, and a clear and visually representable situation.[[3]](#footnote-2) Moreover, such experiments help researchers move from very complex scientific models to more understandable but also working ones.

Now, move on to the phenomena of the thought experiment in the periods of science before and after the assumption of the “world picture” and to the identification of the following periods mentioned by Heidegger. The first “epoch” is Ancient and Greek science. At that time, the process of getting was rather an empirical analysis, that is, of what was physically visible, audible, and tangible in the world without additional models and installations.[[4]](#footnote-3) Knowing also took place by appealing to authority, which was often religion.[[5]](#footnote-4) The knowledge of ancient science was not like the modern version of experimentation. Were thought experiments possible in this case if the experiments themselves did not form? There are some early and more or less primitive examples of such a way of knowing. They were discovered by Re-Sher in pre-Socratics times.[[6]](#footnote-5) So, Anaximander's arguments that the Earth freely rests in the center of the cosmos without any support can be interpreted as a thought experiment.[[7]](#footnote-6) Thus, it is a quite ancient phenomenon. However, previously, judging by Heidegger's way of interpreting, it was not hindered by the proposition of the calculability of nature. The most obvious example of a thought experiment was conducted by Lucretius. He raised the question of the finiteness of the space. The essence of the experiment was that an imaginary shooter could get close to the supposed end of the world and shoot an arrow. If the arrow flies further, then the boundary has not yet been reached; if it flies back, then there is some kind of space wall or barrier.[[8]](#footnote-7) These examples fully correspond to the conditions of the thought experiment defined by Mach. Thus, thought experiments existed in ancient science, but they were not defined by the term as such.

The question arises whether ancient thought experiments differ from their contemporary representation and use in science. It can be described in Schrodinger's cat experiment paradox. He imagined placing a cat in a sealed box with a radioactive atom that has a 50% probability of disintegrating in one hour and a gadget that emits deadly gas if the atom disintegrates, killing the animal.[[9]](#footnote-8) What is happening with the cat at the end of the hour? The wave function depicting the cat would be both "alive" and "dead" according to the Copenhagen interpretation.[[10]](#footnote-9) This would continue until the experimenter opened the box, when it would disintegrate into one of two states. Even non-scientists can conclude that the concept of a cat that is both dead and alive is ridiculous. Thus, we observe a situation typical for a thought experiment—a paradoxical situation with a concrete answer—a situation that is absurd because in the real world macro objects are not possible. It is also easy to imagine the situation, even if such an experiment is impossible in the real world due to moral, ethical, technological, and other reasons.

Then it is worth considering whether this experiment solves the physical question or remains on the basis of philosophy and metaphysics. Schrodinger solved the global question of quantum mechanics. But in fact, the experiment itself does not answer the exact mathematical, physical, or any other question. After all, in the course of it, the scientist receives an answer: the situation is absurd. Why is it absurd? Because in the world that a person perceives and understands, this simply cannot happen. That is, absurdity is an assessment of the situation, or, in other words, the first step to the pre-philosophical layer of judgment about the situation. And the second important aspect is in which interpretation of the world this judgment takes place. In fact, it is "absurd" to say that in the Heideggerian framework of the calculability of nature, in which man has enclosed it, this situation is impossible. So it makes sense to move to another layer, most likely a metaphysical one. And such a conclusion is absolutely logical, because as a result, science has come to the decision that such an experimental setup at the molecular level will lead to the fact that this strange simultaneous state of two opposites will occur with photons.[[11]](#footnote-10) The molecular world is just an example of why the assumption that nature is calculable is meaningless and somewhat erroneous if we forget about it. So people came to the conclusion that in this field it is impossible to describe phenomena without philosophy. Even science itself refers to this idea, but in other words.[[12]](#footnote-11) However, measurements of nature, even in such complex environments as quantum particles, are still possible if we assume and add new logic to them.

But the same thing happens again here: later, people kind of forgot that they agreed with the state of superposition described also in the Schrodinger experiment. And now they continue to study quantum mechanics with such prepositions. This issue can be considered from two sides. First, humanity has really adopted a new additional rule: a picture in a picture. That is, point a—nature is calculable; point b—the macro- and micro-worlds are calculable in different ways. Secondly, it is possible to interpret a superposition as something that is explained and studied as before; that is, it puts a new term into words and uses the framework of old theories and principles in order to make it suitable for the world. But it is worth noting that even if we switch to the metaphysical layer in this matter, nature remains calculable. Another remark made on the basis of observational Internet sources and not only scientific works suggests that almost constantly the superposition is identified as an "admission" or one might say, an exception to the rules adopted in the world.[[13]](#footnote-12) It is also interesting that it began to be studied at the beginning of the 20th century, that is, the 1940s, which Heidegger calls “modern”[[14]](#footnote-13), in fact one of the initial ones for realizing the calculability of the world.[[15]](#footnote-14) and it became generally accepted after the 1960s[[16]](#footnote-15), as if the most important framing of nature were important for such an assumption.

Is it possible to conclude on this basis that the adoption of new assumptions is impossible, or is this acceptance limited? In other words, even if thought experiments are at the metaphysical level of research, they remain formed into the framework of the calculability of nature. Or did the metaphysical end in its free and abstract existence at the stage of the appearance of the "age of the world picture"? At this point, the essay starts to approach the question: is it possible to reverse the period "before" the present situation, and is it possible through a thought experiment? The previous example of the superposition showed that a return is impossible; the person only continues matching. However, why is this happening? Because, in fact, the picture of the world has not changed from ancient science to contemporary one, there were also thought experiments and other similar patterns conditioned by the logic of the course of history. However, what has changed in Heidager's modernity and continues to exist to this day is that the world has become a picture.[[17]](#footnote-16) It turns out that we can say that the world has remained the same, but the person's attitude toward it has changed. In fact, even in the moments before the age of the world picture people think of as concrete pictures and images, conditionally, they can imagine their representation in the present quite realistically. Thus, it makes no sense to judge thought experiments as a wonderful tool of metaphysics that can change the structure of human representation.

The metaphysical thought experiment has rather become an additional method of studying the world, it manifests itself when any science and mathematics added to it can no longer cope with determining the answers about the nature that people want to study relative to the mathematical laws they have defined.[[18]](#footnote-17) The question of the problematic nature of mathematics arises both in Heidegger and in Cohen, who, however, describes exactly the thought experiments. But in the case of Cohen, this is just a step towards the singularity of such an experiment, whereas Heidegger’s interpretation in general does not distinguish it from other methods of science in any way. There is a clash between analytical philosophy and the more abstract philosophy of Heidager. The difference is that the first one is based, among other things, on mathematics and formal logic, while the second one goes deeper into metaphysical layers.[[19]](#footnote-18) Can we conclude from this that the difference between two assumed epochs of science is precisely that philosophy becomes almost completely analytical? That is, the limitation of human’s picture of the world is just the literal calculability and formalization of nature by man?

Then, in order to understand the features of a thought experiment in terms of different sides of philosophy, it is necessary to evaluate metaphysics itself as ideas in the context of the age of the world picture. The definition says that the study of the primordial principles of existence, identity, and change, as well as space and time, causation, necessity, and possibility, is known as metaphysics[[20]](#footnote-19). It explores the nature of consciousness as well as the interaction between mind and matter. All the thought experiments described above correspond to this concept. But in addition, we can conclude that Heidegger himself conducted a thought experiment. He essentially set up an imaginary experiment in which he eventually confirmed the moment at which a person determined nature to be calculable.[[21]](#footnote-20) As in any experiment, there is a competitive answer; here it is "yes." But his experiment or assumption turns out to be two-sided. Firstly, it is metaphysical. And at the same time it claims that there is practically no metaphysical awareness in the context of science in his modern period and therefore in our days. Then does his explanation remain totally metaphysical if, in itself, it is also attributed to a period of analytical and less abstract philosophy? In this case, although an experiment is taking place on the edge, it still retains a metaphysical basis, since the very awareness of boundaries, as it were, demonstrates the idea of their possible absence. That is, Heidegger accepts the analyticity of modern philosophy but at the same time remains one step closer to a more abstract, mental basis, which can be analyzed both within the calculability of nature and a little outside of it.

And finally, this paper brings an example of traveling in time, which, however, is always associated with Heidager’s irrevocability. After all, even if we mentally go to the past, we will still think about it from the point of view of our modern assumptions about nature. Such a thought experiment, even if it ever becomes possible in reality, will still give the answer no, irrevocably, because a person will study the chronological past as his metaphysical logical present. This example still meets the conditions of the thought experiment and the conclusions drawn above in the course of the argument.

Thus, it makes no sense to divide the world into two periods: the Ancient and the Contemporarу, from the point of view that they are strikingly different from each other. This does not happen even in such a subtle way as a thought experiment. Because metaphysics itself begins to be interpreted in a different way: less abstractly and more analytically. The reason that the world has not changed is that only our idea of it has changed, namely, that man began to consider it within the calculability of nature, clearly understandable to him. And even if something is not clear or unthinkable, as in the case of a superposition, a person continues to explain the phenomenon from the point of view of its representation, that is, they try to create a new framework that, however, is within the previous calculable ones.

Bibliography

Cohen, Martin. “Wittgenstein's Beetle and Other Classic Thought Experiments.”

Google. Google scolar, 2008.

<https://books.google.ru/books?id=5EaL4FIm8KgC&lpg=PR5&ots=7PF4rAZDbI&dq=Cohen%20M.Wittgenstein's%20Beetle%20and%20Other%20Classic%20Thought%20Experiments.%20Oxford%2C%202005%3B%20Tamar%20S.%20Thought%20Experiment%3A%20On%20the%20Powers%20and%20Limits%20of%20Imaginary%20Cases.%20N.Y.%2C%202000%3B%20Haggqvist%20S.%20Thought%20Experiments%20in%20Philosophy.%20Stockholm%2C%201996%3B%20Sorensen%20R.%20Thought%20Ex&lr&hl=ru&pg=PR5#v=onepage&q&f=false>

Curlie, ed. “Analytic Philosophy.” Analytic philosophy, January 18, 1995.

<http://www.rbjones.com/rbjpub/philos/inter016.htm>.

Filatov , Vladimir Petrovich. “Thought Experiments in Science and Philosophy.”

CyberLeninka, 2010. <https://cyberleninka.ru/article/n/myslennye-eksperimenty-v-nauke-i-v-filosofii>.

Heidegger, Martin. “The Age of the World Picture” in *The Question Concerning Technology*

*and Other Essays*. New York: Garland Publishing, 1977.

Jitse, M. “." Encyclopedia of Philosophy. . Encyclopedia.com. 20 Mar. 2023 .”

Encyclopedia.com. Encyclopedia.com, March 21, 2023. <https://www.encyclopedia.com/philosophy-and-religion/philosophy/philosophy-terms-and-concepts/metaphysics>. Orzel, Chad. “How to teach physics to your dog”. Scribner. New York, 2009.

Korzhimanov, Artem. “Quantum Superposition: How Physicists Learn to Understand It

Correctly .” XX2век, February 15, 2017. <https://22century.ru/popular-science-publications/quantum-superposition>.

Wikipedia. “The Principle of Superposition.” Wikipedia. Wikimedia Foundation, March 17,

2023. <https://ru.wikipedia.org/wiki/%D0%9F%D1%80%D0%B8%D0%BD%D1%86%D0%B8%D0%BF_%D1%81%D1%83%D0%BF%D0%B5%D1%80%D0%BF%D0%BE%D0%B7%D0%B8%D1%86%D0%B8%D0%B8>.

1. Martin Heidegger, “The Age of the World Picture” in *The Question Concerning Technology and Other Essays*. (New York: Garland Publishing, 1977), 117. [↑](#footnote-ref-0)
2. Martin Cohen, “Wittgenstein's Beetle and Other Classic Thought Experiments.” (Google scolar, 2008), viii, <https://books.google.ru/books?id=5EaL4FIm8KgC&lpg=PR5&ots=7PF4rAZDbI&dq=Cohen%20M.Wittgenstein%27s%20Beetle%20and%20Other%20Classic%20Thought%20Experiments.%20Oxford%2C%202005%3B%20Tamar%20S.%20Thought%20Experiment%3A%20On%20the%20Powers%20and%20Limits%20of%20Imaginary%20Cases.%20N.Y.%2C%202000%3B%20Haggqvist%20S.%20Thought%20Experiments%20in%20Philosophy.%20Stockholm%2C%201996%3B%20Sorensen%20R.%20Thought%20Ex&lr&hl=ru&pg=PR5#v=onepage&q&f=false> [↑](#footnote-ref-1)
3. Cohen, 4-6. [↑](#footnote-ref-2)
4. Heidegger, 121. [↑](#footnote-ref-3)
5. Heidegger, 121. [↑](#footnote-ref-4)
6. Vladimir Petrovich Filatov , “Thought Experiments in Science and Philosophy,” (CyberLeninka, 2010), 7, <https://cyberleninka.ru/article/n/myslennye-eksperimenty-v-nauke-i-v-filosofii>. [↑](#footnote-ref-5)
7. Filatov, 7. [↑](#footnote-ref-6)
8. Filatov, 2010. [↑](#footnote-ref-7)
9. Chad Orzel, “How to teach physics to your dog”, (Scribner. New York, 2009), 91. [↑](#footnote-ref-8)
10. Orzel, 91. [↑](#footnote-ref-9)
11. Orzel, 92. [↑](#footnote-ref-10)
12. Orzel, 92. [↑](#footnote-ref-11)
13. One of the examples: Wikipedia. “The Principle of Superposition.” Wikipedia. Wikimedia Foundation, March 17, 2023, <https://ru.wikipedia.org/wiki/%D0%9F%D1%80%D0%B8%D0%BD%D1%86%D0%B8%D0%BF_%D1%81%D1%83%D0%BF%D0%B5%D1%80%D0%BF%D0%BE%D0%B7%D0%B8%D1%86%D0%B8%D0%B8>. [↑](#footnote-ref-12)
14. Heidegger, [↑](#footnote-ref-13)
15. Artem Korzhimanov, “Quantum Superposition: How Physicists Learn to Understand It Correctly ,” (XX2век, February 15, 2017), <https://22century.ru/popular-science-publications/quantum-superposition>. [↑](#footnote-ref-14)
16. Korzhimanov, 2017. [↑](#footnote-ref-15)
17. Heidegger, 130. [↑](#footnote-ref-16)
18. Cohen, viii. [↑](#footnote-ref-17)
19. Curlie, ed., “Analytic Philosophy,” Analytic philosophy, January 18, 1995, <http://www.rbjones.com/rbjpub/philos/inter016.htm>. [↑](#footnote-ref-18)
20. M Jitse, “." Encyclopedia of Philosophy. . Encyclopedia.com. 20 Mar. 2023 .,” Encyclopedia.com (Encyclopedia.com, March 21, 2023), 1, <https://www.encyclopedia.com/philosophy-and-religion/philosophy/philosophy-terms-and-concepts/metaphysics> [↑](#footnote-ref-19)
21. Heidegger, 128. [↑](#footnote-ref-20)