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NIETZSCHE AND SCIENCE

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(B. A. Thesis)

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Introduction

“That is a scientific fact” or “it is proven by real science” are types of sentences that can be heard on a daily basis, especially in the modern age marked by the rapid development of science, technology and media. It seems as if though there is a great amount of belief that if something is “scientific”, it is automatically truthful and irrefutable.

Scientific method and resources have considerably evolved since the Scientific Revolution, and, as science proposes more and more answers to the questions of human reality, it is only natural that society started considering science as a reliable source of knowledge and truthfulness.

However, does that mean science is unflawed and the only source of absolute knowledge of the outer world? Was science always around to clarify different concepts and processes that take place in the world, or was there something else, like philosophy?

Ever since ancient times, philosophy was the one that provided knowledge of such things. Wilfrid Sellars, the American philosopher whose philosophy was very scientifically oriented once said: “The aim of philosophy, abstractly formulated, is to understand how things in the broadest possible sense of the term hang together in the broadest possible sense of the term”. (Sellars, 1962, 35)

According to Sellars, humanity has a strong need for philosophy, because it actually has a strong need for understanding the human nature and everything that exists in the world.

The question that rises from all of this is - how should philosophy, which has always existed to explain the abstract and the concrete of the world, behave towards modern science (as we know it now) that has only been around since the 16th century?

Some philosophers believe science has its limitations and can answer the “How?” questions more often, rather than the “Why?”, with the latter being essential to philosophy. This is not only the central conflict of modern-day debates, but also a conversation that has been very much present since the beginning of modern science.

In this thesis, I will explore how science and philosophy should co-exist and cooperate, given that they both are among the main forces that control humanity’s perspective on life.

Some of the other mentionable forces are culture, upbringing and religion, which are very much important for the influence they have on society, but I will talk about them only in relation to philosophy and science, as that is the focus of my thesis. To do so, I will prove why I think philosophy should treat not only science, but also philosophy of science (which is a discipline in itself) as a matter that can be criticized. In my mind, philosophy and science can be regarded as equals in their dedicated pursuit of knowledge, since they both stem from the human desire to discover.

That is why I will base my arguments on the works of Friedrich Nietzsche (1844-1900), whose philosophy aligns with my points. Analytical philosophy favours him for his arguments about Christianity and God, but his philosophy of science is equally interesting and, nevertheless, sets a unique example of the role science plays in history and society. Furthermore, his type of philosophy of science is critical and questions itself. The American philosopher and scholar Babette E. Babich is one of the most prominent Nietzschean philosophers, and her interpretation of Nietzsche's philosophy of science as a philosophy that should be evaluative and judgemental aligns with my own conclusions that I draw from his philosophy. Her stance is evident from her article titled "*The Problem of Science in Nietzsche and Heidegger*", where the author states:

The task Nietzsche sees as his own from the very beginning of his reflections, may be expressed as the task of presenting "the problem of science itself, science considered for the first time as problematic, as questionable". (Babich, 2007, 207-208)

This section from the article proves why Nietzsche is interesting for the issues I will explore in my thesis. One of those issues is regarding science and scientific facts as absolutely reliable and truthful and the lack of questioning of those same facts. According to Babich, as it is evident from above, Nietzsche also "sees as his own task" to present science as questionable.

To understand the connection between philosophy and science, I will have to introduce and examine the philosophical theory called naturalism. Naturalism, as many philosophical theories do, has many aspects and interpretations, so much that there is not really a one specific definition and explanation of what naturalism really is. Self-proclaimed naturalists agree on defining naturalism as a force that draws from human nature and rejects any kind of notion of the supernatural.¹

For my thesis, I will use another American's scholar, Brian Leiter's, definition of it, because his philosophy is also oriented towards exploring Nietzsche in the context of the scientific debate and it is most aligned with "strict" natural sciences. When I say strict natural sciences, I mean sciences like chemistry, physics etc., i.e., sciences that conduct experiments and calculate the causality of how things work.

Moreover, another thing that naturalists agree on is the division of naturalism on ontological and methodological naturalism. Ontological naturalism believes that everything in our reality is arranged in physical entities, and there is nothing out of the body and physical, but this branch of naturalism is currently not relevant for this discussion. On the other hand, methodological naturalism is what I will explore and focus on in some parts of my thesis, as it represents the notion that philosophy and science should work together towards one goal and are essentially the same practice.²

¹ see more on *Naturalism* on *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/sum2021/entries/naturalism/>.

² see more on *Naturalism* on *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/sum2021/entries/naturalism/>.

Brian Leiter is definitely a methodological naturalist, as it is evident from the definition of naturalism that he proposes in his book, *Nietzsche on Morality*:

Naturalism in philosophy is, typically, in the first instance, a methodological view about how one should do philosophy: philosophical inquiry, on this view, should be continuous with empirical inquiry in the sciences. (Leiter, 2002, 3)

Methodological naturalism is a belief that binds together the scientific method and the philosophical inquiry. On the other hand, that does not mean that it provides a good explanation for how the two spheres should work together. It simply means that, in this instance of naturalism, philosophy is translating itself into science.

Now, what would this “translation of philosophy into science” mean? As I have stated above, methodological naturalists believe that philosophical inquiry relies on a posteriori evidence provided by science and its experiments. However, would that not mean philosophy is then the same as scientific observation? Where should one draw the line between a scientist drawing conclusions from his experiment and a philosopher constructing his theory?

Additionally, if philosophers only explored concepts that are proven by science, philosophy could lose some of its most relevant discussions and thought experiments. For example, René Descartes' experiments were never proven by science, but are ground-breaking for philosophy. Furthermore, intuition is not only important for philosophy, but for science also, as many scientists first envision (based on intuition) how will their experiments unfold. I do believe philosophy should draw from the sciences, but methodological naturalism seems a bit too narrow, in a sense that it suggests that philosophy should explore only the questions that are proposed by natural-scientific inquiry. Philosophy should raise questions that belong to the other domains of life, and not just science.

Nietzsche is the one that is frequently misunderstood to be this type of methodological naturalist, and to understand truly the point I am trying to make, I will have to deeply investigate what type of naturalist he really is.

To do so, I will focus on the target paper: *Nietzsche's Naturalism* by Richard Schacht. After I indicate and depict the relevant problem and historical context of this discussion, I will summarize the main points Schacht made about Nietzsche because:

1. It creates a new perspective on Nietzsche's naturalism and naturalism in general.
2. It introduces the new term *scientian*, as a philosophical outlook on science, which I think is relevant for this discussion.
3. It does not paint Nietzsche as strictly naturalist, nor as completely oppose to science, which aligns with my own arguments supporting this perspective on Nietzsche. (Schacht, 2012, 185-187)

This thesis will be divided into three sections. Firstly, I will offer the historical review of modern science from its beginning in the 16th century to now and introduce the semantics of the word ‘science’, as this will help to illustrate the key issues that concern philosophy of science.

Secondly, I will explain Schacht’s arguments that prove Nietzsche was not a naturalist in archetypal way. Subsequently, I will justify why I think Schacht’s opponents, specifically Brian Leiter, offer a rigid and bland interpretation of Nietzsche’s thoughts on science.

Then, I will introduce the American philosopher Babette E. Babich who brought the connection of philosophy and science, as well as lack of criticism of science from philosophical perspective, into the focus of contemporary debate and suggested that Nietzsche is a serious philosopher of science.

The aim of this thesis is to interpret Nietzsche’s philosophy of science and to prove that Nietzsche is not critical of science as it is (because he perceives it is as something that is unmistakably human), but he is critical only of the social and dogmatic values it holds.

I do not agree with the claims proposed by Brian Leiter that name Nietzsche a strict methodological naturalist, nor do I support some of the theories that suggest Nietzsche completely rejects the sciences. My point of view is the closest to the interpretation of Richard Schacht, specifically when he remarked that Nietzsche is not a typical type of philosopher that can be defined with only one philosophical theory. I take Nietzsche’s philosophy of science to rely on naturalism that is in range with evolutionary ethics, and has influences from science, history, culture and philosophy.

1. What is ‘science’?

To understand better the discussion that will uncoil in this thesis, one has to ask oneself the meaning of the word ‘science’. The question seems rather easy, but it is every bit as difficult as asking oneself what ‘art’ or ‘game’ is (Wittgenstein was the first who mentioned, in his philosophy of language, the problem of defining the word ‘game’). (Okasha, 2002, 17)

When we think of ‘art’, ‘game’ and ‘science’, we usually think of different types of the word that fall under one big category that is that word. Per example, when someone asks us what do we think ‘game’ is; things like football, basketball, tennis etc. will come to our mind, although those are just categories of something that is ‘game’.

Similar to that, when we think of science, we will think of mathematics, biology, chemistry etc., and that is just, as Samir Okasha says in his textbook *Philosophy of Science: Very Short Introduction*: ‘a mere list of activities, not what *makes* something a science’. (Okasha, 2002, 1)

The answer to what makes something a science may be in the specific features that science has to possess to be different from all the other practices – and that is, according to Okasha, the use of experiments. (Okasha, 2002, 2)

Modern science has evolved greatly with the use of experiments and they are definitely something that is particular to science, however, not all sciences use them.

Some sciences simply cannot conduct experiments and can rely only on observation (like astronomy and social sciences) and that poses a problem to defining science. If, right from the start, we can find cases that differ from what should be common to everything that is science, the experiment theory can be argued and questioned.

However, we can definitely say science relies on constructing theories and providing proof by conducting experiments and building models.

Finally, science may not be easy to define, but it is definitely an omnipresent sort of intellectual and experimental activity that significantly affects our grasp of reality.

1.1. History of science

In this subsection I will make a brief overview of the history of science and put the debate of how should philosophy and science treat each other in the historical context. I am guided by the example of Samir Okasha, who also explored the history of this debate in his textbook, with the aim of explaining the development of philosophy of science and clarifying its key issues. Furthermore, the aim of this subsection is to point out the tight link of the history of science and the history of philosophy, and at what point exactly did philosophy of science become critical toward its object of studying.

Okasha starts his overview with mentioning how some forms of science existed even in the ancient times, when Aristotle proclaimed everything is made out of four elements: water, fire, earth, air. I believe he chose Aristotle, who is a symbol of “the philosopher” (people who are not philosophers nor are, in any kind of way, experts in philosophy know who Aristotle is) and his philosophy to prove how people always yearned for knowledge, both in the theoretical and practical way. Surely, philosophers of that age relied mostly on intuition and (mostly false) thought experiments, but they also relied on observation (Aristotle obviously observed the four elements), which is a feature that makes science and is one step to *conducting experiments*. (Okasha, 2002, 3-5)

Given these points, science and philosophy have co-existed for a very long time.

It is obvious that science in the time of Aristotle was not ‘‘real science’’, or rather science as we know it now, and if we want to debate philosophy and science, we should take into consideration the development of modern science.

For many historians, but also scientists, philosophers, and philosophers of science, that development is marked by the Copernican revolution (or the Scientific Revolution) in 1542.³

The Copernican revolution posed a first major threat to the Aristotelian world-view as the astronomer Nicolas Copernicus condemned the geocentric model of the universe and introduced the heliocentric model, which put Sun in the centre of the universe. His discoveries were later substantiated by Galilei’s and Kepler’s experiments which further resulted in the evolution of physics as well.

To understand how science has become such a crucial part of our society, we have to mention geniuses whose theories have completely changed humanity’s perception of reality in the last five hundred years. Scientists like Galileo Galilei, Isaac Newton, René Descartes and Albert Einstein are all responsible for how much people respect, fear and admire science presently.

Importantly, science is a discipline that is evolving rapidly ever since the Science Revolution, and especially today with the advancements made in the field of technology. I am portraying this change and development of science throughout the history, as that change is one of the main concerns of the philosophy of science. Furthermore, I am taking a critical approach towards ‘‘science-worship’’, which Nietzsche also did when he stated the problem of science is how society looks at it – and that is an entity that is not able to be disputed or refuted. Philosophy of science is also critical towards science in a way that some philosophers of science question the rapid scientific change.

Science is often-times portrayed as a ‘‘quest to pursue knowledge’’ or an ‘‘accumulation of truth’’, but if it changes so much and so fast, people can criticize it, as the concept of ‘‘truth’’ usually does not involve constant change and altering. For example, when someone alters their story multiple times and cannot be consistent with his or her previous claims, we would naturally assume that the person is lying.

The most influential philosopher of science that deals with the problems of scientific change is Thomas Kuhn. He believes scientific revolutions should not be desired nor celebrated, as scientists should strictly follow their values and scientific training. Kuhn’s observations are mostly rejected, by

³ Thomas Kuhn explores this specific point in history, while Karl Popper uses historical overview to systemize his falsificationist methodology, see *Thomas Kuhn and Karl Popper on The Stanford Encyclopedia of Philosophy*, URLS = <https://plato.stanford.edu/archives/spr2021/entries/popper/>, <https://plato.stanford.edu/archives/win2018/entries/thomas-kuhn>

other prominent names amongst which is Karl Popper, who believes in the negative of scientific revolutions, i.e., the theories that were proven false by the change and development.⁴ Personally, it seems hard to agree with Kuhn, as some of the most important scientific discovery came from the trial-and-error method. Also, common sense tells us that, as society and its tools evolve and progress, our scientific findings and inventions will be more precise.

By portraying this picture that involves the historical context of the development of science and corresponding meta-scientific reflections, I am introducing Nietzsche's philosophy of science that is also, as I have proven in the introduction, evaluative.

Furthermore, I suggest that philosophy has always served not only to teach us how to think creatively and construct new concepts, but how to doubt and challenge emerging ideas. That is why philosophy of science should serve to critically examine the problems of science.

1.2. The *how* of science vs. the *why* of philosophy

Science explains the outer world by showing "how" things work. It describes different processes that lead to the creation of something, so it can be said that most of its mechanisms rely on cause-effect theory.

For example, a simple mundane thing, such as leaving your cup of tea on the kitchen counter to cool down, can be explained by the second law of thermodynamics.

This physics concept portrays how heat travels from the hot water into the surrounding air of the room which is much lower, until they level out and become the same temperature (and that is the room temperature, because heat can only travel from hot to cold objects, but not vice versa). In other words, thermodynamics neatly proposes how things work.

On the other hand, philosophy is concerned with "why" things work the way they work. Rather than being concerned with the cup of tea gradually becoming colder, it is concerned with questions such as *why* do scientists even feel the need to conduct these sorts of experiments, *why* did they develop scientific method, explanation and induction and *why* has science suddenly become so important in modern discovery and should it be?

Of course, science is also filled with the *why* questions, but I am trying to make the most basic distinction between the why of science that is based on observing and experimenting and the why of philosophy that is based on concerning itself "the matters of life". What these "matters of life" are will be explained further on with Nietzsche's and Babich's philosophy of science.

⁴ see more on *Thomas Kuhn* on *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/win2018/entries/thomas-kuhn/>

Some of the many questions philosophers of science propose are - how and why do scientists perform experiments? What is the nature of scientific reasoning? How much faith should we put in scientific discovery? (Okasha, 2002, 12)

I chose Nietzsche's philosophy of science, to find a perfect balance between philosophy and sciences, one that would not make philosophy subordinate to any type of science, but that regards science and philosophy as equals, both well-grounded but sometimes flawed.

Nietzsche is, according to Schacht, a type of philosopher (or a "naturalistic thinker") that respects and draws conclusions from sciences, but does not limit himself to relying completely and absolutely on them. (Schacht, 2012, 185)

2. The link between naturalism and science on the report of Richard Schacht

Schacht, in the target paper that I am focusing on in this thesis, introduces a notion that philosophy and science are linked through naturalism. That seems evident from the introduction of this thesis and Leiter's definition of naturalism, which connects philosophical inquiry and scientific method. Consequently, to talk about the relationship between philosophy and science, one has to talk about naturalism.

Many prominent philosophers of science, among which is Schacht, choose Nietzsche because he is, regardless of one's understanding of naturalism, a "fundamentally naturalistic thinker" (Schacht, 2012, 185). Schacht offers this conclusion about Nietzsche's philosophical thinking by introducing these three premises:

1. Nietzsche himself uses the language of naturalism in a positive light to justify his theories.
2. He is not hostile nor dismissive toward science (specifically natural sciences), but he actually attaches a great importance to natural-scientific inquiry and believes it can further philosophical thinking.
3. His stance is *scientian*, which means that he respects and draws on "the sciences" (or *Wissenschaften* – a German umbrella term for sciences, in which Nietzsche also includes history and linguistics), but does not respect science-worship nor does he believe scientific inquiry can answer every question about human reality. (Schacht, 2012, 185-187)

Firstly, I will analyse and explain Schacht's claims in detail. In the first premise, he states that Nietzsche uses the language of naturalism to express and support his philosophical thinking. This is true and can be found on various occasions, e.g. in *The Gay Science* when Nietzsche speaks about God and says: "When will we complete our de-deification of *nature*? When may we begin to 'naturalize' humanity in terms of a pure, newly discovered, newly redeemed *nature*?"

(Nietzsche, 1882, 169) or in *Beyond Good and Evil* where he clearly states that “translating man back into nature” is humanity’s task:

In effect, to translate man back again into nature; to master the many vain and visionary interpretations and subordinate meanings which have hitherto been scratched and daubed over the eternal original text, HOMO NATURA; to bring it about that man shall henceforth stand before man as he now, hardened by the discipline of science, stands before the OTHER forms of nature, with fearless Oedipus-eyes, and stopped Ulysses-ears, deaf to the enticements of old metaphysical bird-catchers, who have piped to him far too long: ‘Thou art more! thou art higher! thou hast a different origin!’—this may be a strange and foolish task, but that it is a TASK, who can deny! (Nietzsche, 1886, 200)

By putting this much emphasis on “translating man back into nature” being a *task* of humanity, it is clear that Nietzsche has a naturalistic type of thinking. Furthermore, when he says that “old metaphysical bird-catchers” piped humans for way too long that they are higher and of different origin, he mostly thinks of the distinction people make between themselves and animals. Higher reasoning, education, knowledge, cognitive power, language, art – those are all abilities human pride themselves with and consider themselves superior and different than animals because of them. Nietzsche argues that humans are much more natural and closer to animals than they think, which, in my opinion, shows that he definitely relies on biological and physiological. If we look at his perspective on humanity simply by focusing only on his claim that it is its task to translate itself back into nature, it is understandable to conclude that Nietzsche is a methodological naturalist. However, there are different parts to his naturalism, that are even expressed in this section when he says that humans have been “hardened by science” that tell a different story.

He expresses his belief that human beings, as they are now, are no different from human beings at the beginning of humanity (when they were completely *natural*; without civilization). They were simply *hardened* with disciplines such as Wissenschaften, thinking that their cognitive power and ability to think rationally makes them better than the first, “natural” humans. I find the use of this particular adjective “hardened” interesting, since it is clearly used in the negative context here. This stance reminds me a bit of moral and political philosophy of Jean-Jacques Rousseau, the philosopher who inspired the progress of Enlightenment throughout Europe, as his thinking was based on the notion that humanity was corrupted by the development of civilization.⁵ Nietzsche definitely believes science has a mostly positive influence on life, so I would not say he thinks science itself corrupted

⁵ see more on *Jean Jacques Rousseau* on *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/win2020/entries/rousseau>.

the ‘‘natural humans’’, but the social status of science definitely did, as did relying solely on the causal, deterministic scientific inquiry – that is why he said humans are ‘‘hardened by science’’.⁶

The proof for Schacht’s second premise that declares Nietzsche sometimes relies on natural-scientific inquiry can be found in *Human, All Too Human* where Nietzsche mentions how science and nature, occasionally and in many ways, further the usefulness and welfare of man. Furthermore, he states how science is an imitator of nature in its ideas, which, once again, proves the link between naturalism (*nature*) and science. He also proclaims how Renaissance had positive forces that were the strongest and will never be as strong as then, because of the liberation of thought, the disregard for authorities and the *enthusiasm for science*. (Nietzsche, 1878, 58)

The truth why Nietzsche has a lot of respect for the period of Renaissance is because he values art above everything, and believes science should be criticized through the aesthetical, which I will mention later in this thesis. Nevertheless, he definitely values the impact of emerging sciences of that age on cultural and social atmosphere.

Lastly, Schacht introduces a new term – ‘‘*scientian*’’. There is already a term used in the philosophy of science that sounds similar, but has a completely different meaning, and that is ‘‘*scientism*’’ and ‘‘*scientistic*’’ as in *scientistic* thinking. Okasha also refers to this term in his textbook, explaining how *scientism* is used among some philosophers as a derogatory type of word as it describes science-worship and belief that science is a privileged (and only) path to knowledge. (Okasha, 2002, 121). Those who do not advocate for scientism argue that science is not the only way of obtaining knowledge of certain things. Schacht is opposed to the kind of naturalism that favours deterministic causes from scientific experiments and applies them to every concept in the world. He calls this type of thinking ‘‘decisive in its authority’’ as those type of naturalists do not see anything problematic with giving this much power to natural-scientific inquiry and explanation. (Schacht, 2012, 187)

Nietzsche is *scientian* because he, as always, finds himself in the middle of the two opposing theories - science-worship and condemnation of science. In typical Nietzsche fashion, his philosophy is always different and ‘‘fresh’’, and that is why both continental and analytical philosophers claim him; but he is neither here or there, since his thinking has always been unconventional.

Therefore, Schacht criticizes philosophers of science who restrict Nietzsche’s thinking by characterizing him as only one thing, and for the American philosopher and legal scholar Brian Leiter that is labelling Nietzsche as an *M-Naturalist* (a methodological naturalist).

⁶ Leiter (2002) p. 7 has a different interpretation of this passage from Nietzsche's book, saying that this idea of a man being "hardened by science" is striking in a positive way, because it suggests humans have greatly improved with the use of the scientific method

2.1. Schacht's criticism of his opponents

In his book *Nietzsche on Morality*, which is a commentary on Nietzsche's moral philosophy, essentially rooted in naturalism, Leiter insists that Nietzsche is a *scientific* thinker, a methodological naturalist that draws everything from nature, and defines what "methodological" stands for:

Philosophical understanding, in short, must be the same as scientific understanding: it must employ the same methods of understanding that the sciences deploy with good effect elsewhere, and it must heed the result of the sciences that nature is "everywhere the same." (Leiter, 2002, 4)

He compares Nietzsche's naturalism to one of Baruch Spinoza, whose views on God, morality and knowledge were extremely naturalistic. Schacht states that he agrees with the basic outlines of Leiter's argument. He can accept that Nietzsche (for his naturalistic views) belongs in the company of Hume (who rejects anything supernatural and find answers for everything in the human nature) and Freud (whose whole philosophy and psychology is based on human consciousness, i.e. human nature); but what he doesn't agree with is Leiter's interpretation of Nietzsche's naturalism. (Schacht, 2012, 187-188)

To revert to Schacht's first premise of his argument that Nietzsche is fundamentally a naturalistic thinker – I have already discussed how Nietzsche makes positive use of the language of naturalism. However, Leiter takes it a step further and asserts that: "the bulk of his [Nietzsche's] philosophical activity is devoted to variations on this naturalistic project" (Leiter, 2002, 11), saying not only that Nietzsche uses the language of naturalism to express his thinking, but that the majority of his philosophy is *devoted* to naturalism.

Leiter also compares Nietzsche's naturalism to Hume's, proclaiming how his naturalism is "speculative" and "substantial", meaning that, same as Hume, he did not believe in anything but the natural. (Leiter, 2002, 3-6)

Schacht completely disagrees with Leiter's assertion that Nietzsche falls under any of these two categories Leiter neatly proposed to be naturalism. Even Leiter seems unsure while claiming that Nietzsche is a complete M-Naturalist, mentioning (in a dismissive manner, how Schacht describes it) how some parts of his philosophy (specifically when he says that "philosopher" is a term of art and it means "the one that creates values") are not part of this *naturalistic project* Nietzsche seems to have. This part of Nietzsche's philosophy Leiter calls "independent undertaking", without further elaboration.

This "independent undertaking" is exactly what Schacht needs to declare Leiter's theory "shaky" and argue his points. According to Schacht, Nietzsche's naturalism is not as near as

scientific as Leiter thinks, but it actually seems that his naturalism is (even on purpose) an antidote to this very type of thinking Leiter believes in.

Leiter later revisits his claims that Nietzsche is a speculative M-naturalist (same as Hume) in his article *Nietzsche's Naturalism Reconsidered*. In it, he discloses that when one reads Nietzsche as a naturalist, he or she has to consider that he was a *speculative* naturalist, i.e. he constructed his philosophical thinking and perspective of the outer world on *speculation* that draws on the sciences. Moreover, according to Leiter, Nietzsche's imagination of "how things work" is actually a scientific imagination, but it is speculative because, same as Hume, their conclusions were not proven by any type of science to this day. (Leiter, 2008, 3)

Schacht reflects on this very harshly, saying how Leiter's definition of the varieties and doctrines of naturalism are Procrustean beds (a pattern in which someone or something is arbitrarily forced) in which Nietzsche simply does not fit. (Schacht, 2012, 189). He does not deny that Nietzsche believes that everything started as natural, and he does not reject that Nietzsche respects and constructs some of his world-view based on sciences, but that still does not mean his thinking is scientific. He even goes as far as labelling Leiter's theory as "back-bone naturalism" (as it relies only on the scientific method) while he himself believes Nietzsche's naturalism is hungry for flesh; employing the biological, physiological and scientific, but also cultural, social and historical as spheres which shape human reality.

2.2. 'Nietzsche's naturalism in a nutshell'

To summarize Schacht's ideas regarding Nietzsche's naturalism and its connection to science, he says that "Nietzsche's naturalism in a nutshell" actually lies in his most famous concept - "the death of God". (Schacht, 2012, 194). I will not talk about Nietzsche's observations on religion and God in general, because the aim of this thesis is to explore his philosophy of science; however, his de-deification is relevant to this discussion in a sense that he rejects any reality that is "supernatural", "higher" and "truer" than our concrete, natural reality.

His naturalism greatly relies on human beings *naturalizing* themselves, or, in other words, finding the true meaning of life and the outer world in nature – be that in the world around us or in human nature, and not in something beyond this world, omniscient and unattainable.

Science (and history, which is very important to Nietzsche) is a mere activity that helps to understand how everything came to be by contingencies, it is not perfect nor the only true source of information. It is simply a "guiding idea", as Schacht puts it, and not "a set of doctrines" (on which Leiter insists on) which explains how through accidents and contingencies that were later

systematically and rationally organized through set of activities like Wissenschaften, art, history etc. our understating of the world and nature came to be.

Furthermore, the author proposes that Nietzsche's philosophy involves "attempting of accounts of various sorts", and only some of them are based on scientific models. Most of his accounts are merely hypothetical, but that is only to show that humans can build different models and ideas in the constriction of this world.

Schacht interprets that the key issue Nietzsche's philosophy of science concerns itself with is causality of natural-scientific inquiry: "...he takes the refinement of and reliance on causal thinking in the natural sciences to be at once their strength and their limitation in their partnership with philosophy...". (Schacht, 2012, 195). Nietzsche does rely on science, so in some sense, he has to rely on the causality science operates on (let us remember the cup of tea from the 1.2. section of this thesis), that is why he calls it "strength", but at the same time, he thinks this type of deterministic thinking is restrictive. According to Schacht, Nietzsche believes everything in this world is "shot through with necessities, influences, attractions, constraints, reactions, interactions, and power-relations of many sorts" (Schacht, 2012, 195), but he doubts the causal thinking of science as it reminds him too much of religion. Again, his main matter of criticism and what he is most famous for intertwines itself with his philosophy of science. His condemnation of natural-scientifically modelled causality is consistent with his views on religion, which he rejects because of its deterministic and dogmatic ways. Religion and science are both deterministic because they believe every effect has its own cause, and that relationship and balance is always the same. On the other hand, Nietzsche believes, as I have mentioned above, in the contingencies of life – meaning that he does not simply believe in the straight-forward explanations of science only, but in the nature of the humans that makes them error and learn things through their mistakes.

To conclude, from what I have gathered from Schacht's perspective on this matter, Nietzsche's naturalism revolves around the notion that the higher reasoning and cognitive abilities of us humans, the *rationality* that we are so proud of and what makes us consider ourselves *human*, and not *animal*, is more rooted in physiology than we think. Philosophers oftentimes forget and overlook the biological and physiological that participated in the development of man. According to Nietzsche, the body and its functions are as equally important as history and man-made disciplines (among which is science). Furthermore, Nietzsche's naturalism is developmental – it advocates that the humans developed from the first humans that were completely natural and closest to animals through the effects of historical and cultural events. This developmental aspect of Nietzsche's naturalism is important for the understanding of his "natural" humans. As I have previously mentioned, Nietzsche believes it is in human character to make errors, and through this "too human" practice society has

developed and continues to develop. Societal and cultural development is regarded positively and connected with relying on biological, as this development stems from human nature.

3. Problems of philosophy of science and science in general

Since Nietzsche lived and wrote in the 19th century, his take on science consists of science only up to that point, and with the rapid change and growth of technology, scientific discovery, media and internet, a lot of things changed from then. That is why I chose contemporary interpretations of his philosophy of science, so one can compare the sciences of Nietzsche's time with the sciences today. I have already analysed most of Schacht's arguments and now I will introduce another Nietzschean scholar that I believe, essentially, has points about Nietzsche that are very similar to Schacht's.

That philosopher is Babette E. Babich, who I have mentioned before, and who is one of the most prominent names in the world of interpretation of Nietzsche's thought.

Babich is more favourable of continental than analytical philosophy, saying that analytical philosophy does not do Nietzsche's philosophy of science any justice, constantly mentioning his theories on religion and morality only. She suggests Nietzsche is a serious philosopher of science and shifts the focus to contemporary debate about the status of philosophy and science, and the problems within the discipline of the philosophy of science.

Firstly, as I have said before, to interpret Nietzsche's philosophy of science, we have to understand his naturalism. Schacht concluded that his naturalism is oriented towards "the animal part" of the human, while Babich says not only his naturalism, but also his whole philosophy of science is ecophysiological. (Babich, 1994, 85). This means his thinking is determined by physiological constitution of the interpreting perspective (perspective as in a person's point of view, which I will explain in the section called perspectivism), and its relative, ecological position in the world. While Schacht claims Nietzsche's naturalism is not methodological, and attacks Leiter for claiming that it is, it appears that some parts of Nietzsche's naturalism actually align with methodological naturalism. I would say that some aspects of his naturalism, like relying on the biological, physiological, and now, as Babich states, being limited by the body and the ecological position in the world, definitely draw from methodological naturalism. However, methodological naturalism draws on the sciences completely, as far as Leiter's definition suggests, and I would not say Nietzsche believes science is the only source for discovering reality. On the other hand, this "ecophysiological" philosophy is interesting because it can be connected to some Darwinian concepts like evolutionary ethics. Evolutionary ethics connects philosophy and natural sciences by suggesting natural selection created moral ideas. However, most scholars claim Nietzsche believed

in Darwin's theory of evolution, but strongly rejected that any kind of desirable social values and morality came from it.⁷

Secondly, I have concluded that Nietzsche's philosophy of science is critical, and in her book, *Nietzsche's Philosophy of Science: Reflecting Science on the Ground of Art and Life*, Babich argues the same. She explains how Nietzsche argues that the problem of science cannot be observed through itself (with experiments and observation), as its own system of values is what is resulting in the problem. Accordingly, one has to find a right sort of discipline and "path" through which science can be observed and criticized, and that is through aesthetics and art. (Babich, 1994, 9)

As Nietzsche, himself, wrote in the preface of *The Birth of Tragedy*: "to look at scientific enquiry from the perspective of the artist, but to look at art from the perspective of life. . .". (Nietzsche, 1871, 3). Because of that, Babich grounds her philosophy on Nietzsche, and later Nietzsche's influence on Heidegger.

Nietzsche binds science and art together and explains how they draw on the same creative forces, which I will further elaborate later in this thesis.

To start, in her article "*The Problem of Science*" in *Nietzsche and Heidegger*, Babich criticizes the discipline of philosophy of science, especially the analytical philosophy of science, which, according to her, is a "robustly well financed and well-established and ergo redoubtable discipline". (Babich, 2007, 206)

The main point of her criticism is the lack of raising the problem of "science itself", i.e. the lack of questioning the credibility of science. The author believes it is shameful for philosophy, that proclaims itself as the "queen of sciences", and that is shaped completely on questioning, to fail to question science and to permit it to become this sort of entity that represents knowledge and rationality and is dogmatic and authoritative in doing so.

Consequently, she believes philosophers of science failed in not engaging Nietzsche's philosophy of science sooner, as his type of philosophy is critical: "Nietzsche's question is the critical question of the possibility of truth itself and it is in the same critical and Kantian spirit that he reflects upon the dynamic of scientific inquiry." (Babich, Cohen, 1999, 1). Babich sees many problems with developing such a philosophical discipline that is philosophy of science, and not using it to debate and comment on the status of philosophy as opposed to science.

Not challenging science and "installing it in the place of philosophy", as Babich puts it, helps in the destruction of critical thinking and marks the end of philosophy. Therefore, modern-day impressions of science as "new religion" (i.e. following it blindly and without question, expecting everything that is scientific to be truthful and good) are not the solution for the relationship between

⁷ see Birx (2000), URL = https://philosophynow.org/issues/29/Nietzsche_and_Evolution

philosophy and science that both deserve to be regarded as providing knowledge about “how and why things work”. This interpretation of science as “new religion” is exactly what Schacht proposes when he talks about how Nietzsche’s naturalism in a nutshell lies on his concept “the death of God”. In other words, both Schacht and Babich (and Nietzsche) reject the deterministic and dogmatic mechanisms of science. I believe Nietzsche wants to install, in the place of this traditional values, some “positive values” that rely on the human nature more than the social conventions. However, although he was critical of traditional values, he never seemed to offer an exact explanation of what these positive values are.⁸

Additionally, “the gift of science”, as Babich mockingly says, is not always the pure, intellectual ascension. Today, in the modern-day world of internet (and especially social media, which was only in its early days when this article was written, but now, in the early 2020s, it is an unavoidable part of contemporary society), science has provided us with virtual and alternative worlds that serve simply for advertisement and profit. While philosophy, especially in the days of Socrates, served to hermeneutically reveal the truth and knowledge about matters of reality, science (or rather, technology and media) exploits fantasy, desire and imagination that have no connections to the “real world”.

It is evident that Babich attacks the institutionalization and commercialization of science, the very things that need to be criticized through philosophy. However, here she attacks the imaginative world (suggesting fantasy that science, through internet and media, provides is damaging to reality) while at the same time she praises art through Nietzsche’s philosophy. But is art not also a fantasy? Here I will briefly introduce and explain my claim that I agree with Babich that certain fantasies (promoted by science and social media) are damaging, but I also believe art is a certain type of fantasy that is greatly beneficial to humans. It seems that Babich also thinks that, considering how much she praises Nietzsche’s desire to discover things about life through art.

For example, certain type of instances of the imaginative world are problematic and damaging to the real world, like the ones in the context of consumerism (e.g. video games). Flooding people with advertisements, with an aim of preying on customers and making them addicted to the virtual world in order to make profit poses a threat to the real world.

On the other hand, fiction and alternative realities in the form of art are much more accepted and praised. People enjoy art and artistic practices exactly for that, for the imaginative fiction that, among other things, provides them with an escape from reality.

This is Nietzsche’s stance as well as he states, in *The Birth of Tragedy*, that art is an antidote to the deadly insights of tragic knowledge.

⁸ see *Friedrich Nietzsche* on *Stanford Encyclopedia of Philosophy*, URL = <https://plato.stanford.edu/entries/nietzsche/>

3.1. Science and art

“Tragic knowledge” is a concept that is connected with the limitations of human knowledge. Nietzsche calls Socrates, and other philosophers – *optimists*, because they are optimistic in their pursuit of knowledge and truth. (Nietzsche, 1871, 41). Same thing can be said about scientists, who are excited about revealing things about the world by conducting experiments, building models, inventing new gadgets etc. However, scientists (same as philosophers), reach the limit of their thinking (constrained by the restrictions of the mortal mind), and even their experiments, methods and models cannot provide them to see anything beyond. That realm of knowledge that is “in the dark” is tragic knowledge:

When, at this point, he sees to his horror how at these limits logic turns around on itself and finally bites its own tail — then a new form of knowledge breaks through, tragic insight, which, in order merely to be endured, requires art as a protector and healer. (Nietzsche, 1871, 41)

Nietzsche constantly mentions art in a positive light, here in *The Birth of Tragedy*, calling it “a protector and a healer”, and, as I have mentioned above “an antidote to tragic insights of deadly knowledge”. This is relevant for the discussion about science because Nietzsche implies that science and art draw from the same creative powers and are both directed to the purpose of life. I believe this is important and agree with Nietzsche that art and science draw from the same creative, “human” powers, because I perceive art to be a fundamentally human desire to express oneself and learn things about oneself through creating, same as science is a “all too human” desire to reveal knowledge about how everything came to be. This can also be connected to Nietzsche’s naturalism according to Schacht, as it proclaims we must celebrate everything that is naturally human. In Schacht’s case, that means we must rely on the biological and physiological, but I suggest that we can also rely on the desire to create, as it is in our human nature.

3.2. Nietzsche’s perspectivism as a baseline for his philosophy of science

Now, I will introduce Nietzsche’s theory called *perspectivism*, as it is relevant for his evaluation of science. Perspectivism advocates that everyone has their own perspective, and that perspective limits their thinking, as it is subjective. In other words, we perceive things how we are, through our own perspective, and we cannot escape it because we cannot leave our mind and body. Therefore,

Nietzsche believes a lot of scholars and scientists have not taken into consideration how their own perspective limits their discovery.⁹

According to Nietzsche, the notion that there is one absolute truth to the universe that can be gained through pursuit of knowledge via e.g. science is false. One's perception of knowledge is bound to one's internal perspective. The belief that there is one objective perspective is incorrect, there are actually as many perspectives as there are minds who are perceiving and the concept of the "absolute truth" is actually an illusion. However, it can be argued that this stance is simply just another perspective.

His perspectivism can be seen in *On the Genealogy of Morals*: "...to see differently, and to want to see differently to that degree, is no small discipline and preparation of the intellect for its future 'objectivity'", and "...we can use the difference in perspectives and affective interpretations for knowledge". (Nietzsche, 1887, 86)

Moreover, one can conclude then that he believes science (which is constantly on the hunt for knowledge and revelation of the absolute truth about the outer world) is also an illusion. However, just because there is no concept of the one absolute truth, i.e. the one predominant perspective on life, does not mean truth cannot be found through alignment of *multiple perspectives*. As stated by Babich:

What we, in the Western perspective, call (factually or potentially true) "knowledge" expresses, for Nietzsche, no more than our own perspectival life-position, whether it is acknowledged as such or not. Accordingly, if this interpretive focus is exclusive (which at its height is precisely what the Western knowledge ideal means to be), it is a falsification – or a lie. (Babich, 1994, 6)

This can be translated into modern-day science and problems with one predominant perspective based on financial status, race or gender. However, Nietzsche thinks this firstly in metaphysical sense and then in social and cultural.

Fundamentally, the problem of science lies in the perceptions of the word "truth" and "knowledge", as both of them are approached from the standpoint of one perspective. Scientists constantly claim they are on the quest of pursuing knowledge and truth, but what is truth? Is truth only one, as in there is one objective perspective whose opinion and influence is most respected and should be held the most important? Or there are multiple perspectives and parts of life which can name their shared experience "truth"?

From his thoughts on art and problems with science and one predominant perspective, one can conclude that the connection between science and art is crucial not only to Nietzsche's philosophy of

⁹ Today, perspectivism is used in both science and philosophy, with examining and debating different perspectives on some topic. Perspectivism does not have to be regarded as something negative as Nietzsche regards it, in fact it is even praised in some fields, as different angles in approaching certain concepts help to clarify them.

science, but also to his philosophy in general. Nietzsche condemns science in the form of praising one single truth (one perspective), but accepts it and draws from it only when it admits its responsibility, and that is that science is actually “decidedly human and perspectival pursuit”. (Doyle, 2016, 858)

In other words, science (same as art and philosophy), should be regarded as something shamelessly human, something that is valuable in the sense of learning and improving one’s perspective. Similarly, as Schacht claimed that Nietzsche’s naturalism is full of flesh, his philosophy of science is equally rich and fruitful.

To revert to Schacht, he concludes his paper with the claim that Nietzsche’s philosophy is “multiperspectival and interpretively experimental” (Schacht, 2012, 210). I believe Nietzsche has a great respect for history and culture, and the impact its development had on the human character. His naturalism is, in some ways, methodological. I would say that I definitely see connections and similarities of his type of naturalism with the concept of evolutionary ethics. Moreover, Nietzsche relies on one’s internal and external perspective that is physiological, i.e. he relies on the biology that shapes one’s values. I believe his general philosophy employs science, naturalism, art, history and culture as main spheres of life that should work together towards obtaining knowledge. As I have already said, Nietzsche’s philosophy of science does not criticize the science itself but the social status it holds.¹⁰

To recapitulate, the Nietzschean philosopher need to be attuned to scientific type of thinking and be aware of its contribution to humanity, while at the same time respecting and drawing from other spheres of life that are fundamentally human – such as history and culture. His philosophy should be “full of flesh”, since the body and the animalistic are as equally important as the mind and the rational.

Philosophy and science should work together as partners, since philosophy is the one that falls under this other category of “fundamentally human things”. That is not to say that science is also not fundamentally human, because it definitely is, in its joy and optimism in pursuing knowledge about life, but it is usually traditionally perceived as something that is “superior to ordinary human and life” and something that separates us from animals. Science should be responsible for providing transparency of its flaws and shortcomings, while philosophy should examine and make an overview of both science and human things and human nature in the context of cultural and historical phenomena.

¹⁰ Nietzsche’s philosophy and his attitude towards the sciences of his time were greatly influenced by his philosophy that wants to destroy the traditional and social values. He is sceptical towards the sciences because he rejects the traditional and dogmatic values under which they operate.

Gathered from his ideas and the ideas of the scholars that examine his works, I believe Nietzsche wanted science to reject the belief that it is a practice that makes us ‘‘higher’’ than humans, that makes us *godly*. His naturalism that respects and draws on biology, his views that reject God and his praise of ‘‘decidedly human’’ things such as creating art and pursuing knowledge create a picture of a very grounded philosophy that has a focus on this world, and not any other, higher world. With all this being said, in my opinion, Nietzsche respects science, he just wants it to fulfil his duty of admitting it is simply human.

Conclusion

This paper stems from the desire to understand the relationship of science and philosophy, as well as philosophy's status in contrast to science. I have chosen the philosophy of science (as well as his general philosophy) of Friedrich Nietzsche, as his specific type of naturalism and experimental philosophy align with my suggestion that philosophy and science represent different spheres of life that should work together in discovering the mechanics of the world. Moreover, I believe science should be evaluated and questioned, and philosophy should serve the purpose to explore the emerging challenges and difficulties of this discipline.

In the first chapter, I made a brief summary of semantics of the word science and its historical impact on the society. I wished to bring the attention to the humanity's need for pursuit of knowledge, which is presently most evident in the development of science. However, my point was that philosophy has served this role since ancient times and should be treated with equal respect.

The aim of the second chapter of this thesis is to describe and define what is 'Nietzsche's naturalism in a nutshell', and that is a naturalism that respects and draws on the sciences, but recognizes that they are human disciplines that are full of false conclusions and errors. Since human knowledge is limited, science is limited and restricted as well. Furthermore, what we perceive of ourselves to be superior and worthier comes a lot more from the physiological and 'animal' than we think. I believe Nietzsche was not opposed to science, he simply wanted it to remove itself for any kind of 'trying to play God' and admit that it is, essentially, a human discipline that deals with human nature.

Additionally, the connection of science and art is constantly brought into the focus of this discussion. They are described as equal in the sense that they both draw their creative powers from life, so they are both the 'antidote to tragic knowledge'. This claim that science and art are the same serves to prove Nietzsche's (and my own) point that science is among that what Nietzsche calls 'fundamentally human things'.

I employed the notion of Nietzsche's perspectivism to show the main point of his criticism of science. Believing that there is only one objective, predominant and 'true' perspective, we set ourselves up for life in illusion and ignorance. However, accepting that there are multiple perspectives and multiple truths, that can work together in pursuit of one truth, through shared experience, is the key of discovering the world.

Finally, we arrive to the final conclusion of my thesis, and that is the suggestion that philosophy and science should work in alliance, as they are advocates of critical thinking and discovering of what is human. Similar as Nietzsche, I believe philosophy should serve to doubt and criticize science's shortcomings, while science should continue to explain the causal part of the world. I summarized

Nietzsche's points that pursuing knowledge of the future should happen through passions of life, that are fundamentally human (as they bring people joy and excitement), such as philosophy, culture, science and history to prove that his philosophy of science is a mixture of his naturalistic thinking and his views on social and cultural values.

References

1. Anderson, R. (edition from 2017). *Friedrich Nietzsche, The Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.), Retrieved August 23, 2021 from <https://plato.stanford.edu/archives/sum2017/entries/nietzsche/>.
2. Babich, B. (1994). *Nietzsche's Philosophy of Science: Reflecting Science on the Ground of Art and Life*. New York: State University of New York Press.
3. Babich, B. (2007). "The Problem of Science" in *Nietzsche and Heidegger*. *Revista Portuguesa De Filosofia*, 205-237. Retrieved August 13, 2021, from <http://www.jstor.org/stable/40419516>.
4. Babich, B. and Cohen R., (edited in 1999). *Nietzsche, Epistemology and Philosophy of Science*. Dordrecht: Springer Science+Business Media.
5. Bird, A. (edition from 2018). *Thomas Kuhn. The Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.). Retrieved August 22, 2021 from <https://plato.stanford.edu/archives/win2018/entries/thomas-kuhn/>.
6. Birx, H. J. (2000) *Nietzsche and Evolution. Philosophy Now*. Retrieved August 23, 2021 from https://philosophynow.org/issues/29/Nietzsche_and_Evolution.
7. Doyle, T. (2016). *Nietzsche and the Reciprocal Relationship between Art and Science: A Question of Philosophical Methodology. Filosofia 71*. No. 10. pp. 858-868.
8. Leiter, B. (2008). *Nietzsche's Naturalism Reconsidered. University of Chicago Public Law & Legal Theory Working Paper No. 235*. Retrieved August 13, 2021, from https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1203&context=public_law_and_legal_theory.
9. Leiter, B. (2002). *Nietzsche on Morality*. London: Routledge.
10. Nietzsche, F. (edition from 2003, original from 1886). *Beyond Good and Evil*. London: Penguin Classics.
11. Nietzsche, F. (edition from 1996, original from 1878). *Human, All Too Human: A Book for Free Spirits*. Cambridge: Cambridge University Press.
12. Nietzsche, F. (edition from 1999, first published in 1887). *On the Genealogy of Morals*. Oxford: Oxford University Press.
13. Nietzsche, F. (edition from 1974, original from 1882). *The Gay Science*. New York: Random House.
14. Okasha, S. (2002). *Philosophy of Science: A Very Short Introduction*. Oxford: Oxford University Press.

15. Papineau, D. (edition from 2021). *Naturalism*. *The Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.), Retrieved August 22, 2021, from <https://plato.stanford.edu/archives/sum2021/entries/naturalism>.
16. Schacht, R. (2012). *Nietzsche's Naturalism*. *Journal of Nietzsche Studies*, 185-212. Retrieved August 13, 2021, from <https://www.jstor.org/stable/10.5325/jnietstud.43.2.0185>.
17. Sellars, W. (1962). *Philosophy and the Scientific Image of Man*. Edited by Colodny, R. *Frontiers of Science and Philosophy*. Pittsburgh: University of Pittsburgh Press.
18. Thornton, S. (edition from 2021). *Karl Popper*, *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), Retrieved August 22, 2021 from <https://plato.stanford.edu/archives/spr2021/entries/popper>.