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The Category of Thirdness in the New Mechanical Philosophy

Original Study

Barbora Jurková
Department of General Linguistics, Palacký University Olomouc, Czech Republic
barbora.jurkova01@upol.cz (ORCID: 0000-0002-7816-3710)

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Abstract: This paper discusses some of the possible connections between the principles of modeling in the new mechanical philosophy and the modeling used by Charles S. Peirce in his work on categories and evolutionary theory. The main goal is to show that the theoretical approaches used in the new mechanism can be beneficial for disciplines that are not clearly labelled as either humanities or natural science – for example, biosemiotics – and that this philosophical movement can help close the gap between natural science and the humanities. In individual chapters, this text deals with: the difference between the doctrine of the universal mechanism and the doctrine of the new mechanism, exploring the concept of the category of Thirdness and evolutionary theory in the work of Charles S. Peirce and finally focusing on the similarities between Peirce's work and the approach of the new mechanical philosophy.

Keywords: The New Mechanical Philosophy, Evolutionary Theory, Category of Thirdness, Charles S. Peirce

INTRODUCTION

This article is written with the intention of pointing out the similarities between the fundamentals of new mechanical philosophy and the principles of the philosophy of Charles S. Peirce. It is to some extent an attempt to show that, despite the current criticism of the mechanistic approach in the humanities and other scientific disciplines – such as biology (Henning, Scarfe 2013) – the new mechanism and its approaches can be useful for introducing new theories by using models as an explanator tool. We can follow the appearance of contradictions across the academic field in recent years. The approach of universal mechanism is traditional and still noticeable across many academic fields, however we can follow the rise of the new mechanical philosophy in the late 1990s and the early 2000s not only as a new philosophical trend. However, at the same time we can notice the increasing criticism of not only the universal mechanism but also any mechanical approach in humanities (Sharov, Tønnessen 2013). In this paper we try to show that to a certain degree the new mechanistic philosophical approach is an answer to this criticism. This article intends to show that there is still a place in various academic fields for mechanism in its new form and that some disciplines, particularly the intermediate ones can even benefit from it.

This study will present itself in three parts. In the first part, we mean to introduce the idea of 'the new mechanism' and its place in today's philosophy and science. We will focus on how it differs from the idea of 'the universal mechanism' which started in 17th century and is no opposed by humanities disciplines. The second part is dedicated to exploring the concepts of 'thirdness' and the 'evolutionary theory' of Charles S. Peirce. The third and last part will synthesize what has been presented of Charles S. Peirce's work and show the similarities between Peirce's theories and the approach of the new mechanical philosophy. The main focus is on modelling used by Peirce in his evolutionary theory and how it resembles the modelling used by scholars in the new mechanism. Most of the paper is based on Peirce's well-known and

fundamental work that was published in *Monist* (Peirce 1998), mainly essays published as the collection *Chance, Love, and Logic*.

UNIVERSAL MECHANISM VERSUS THE NEW MECHANICAL PHILOSOPHY

The mechanistic view of the world around us is currently one of the easiest ways how to think about the world even if we often do not realise it. Explaining the world and the phenomena happening in it by using schemes, diagrams, and mechanisms is almost natural for us now as using terms from the mechanistic approach, for example 'mechanism' and 'model'. However, there is still a certain line between the context of those words in the universal mechanism and the new mechanical philosophy. We also need to acknowledge the fact that because these concepts are so wildely used their meaning can be slightly changed depending on the scientific field we are talking about. However, for this article, we can make do just by using it in the context of philosophy.

For our purpose the we will use a concept of the universal mechanistic approach as it was founded by Hobbes in *Leviathan* (Hobbes 2009[1651]), however, we can argue that the foundational position given to the mechanism can be already found in the philosophy of René Descartes, in which the mechanism can also be connected to the *res cogitans / res extensa* distinction (Descartes 1985[1641]). Yet there is one interesting concept of the mechanism in the work of Sir Isaac Newton (Newton, Janiak 2004). While Descartes thought that animals and humans are completely mechanistic automata (Descartes, Hall 1972) (not in the same sense we talk about automata today, which tends more towards the concept introduced by Turing (Turing 1936), Newton had to accept a slightly different version of mechanism that would accept the law of gravity. Even though Newton's work seemed to correctly predict the movements of both celestial and terrestrial bodies, we still cannot rely on a universal mechanism in this case and must accept its weaker form. This legacy of Isaac Newton, this somehow weaker application of universal mechanism, was carried on by philosophers and other scientists.[1]

We can trace the influence of Newton and his form of mysticism to the 19th century and a circle of scientists including Charles Darwin. The trend then was to follow specific dogma and during the time Charles Darwin had been working on his evolutionary theory, they reached back to Newton's version of mechanism (Porter, Ross 2003). Darwin's theory of natural selection works the same way as Smith's invisible hand and Malthus's population theory. There is always some invisible force, some invisible mechanism, which serves to solve eve-rything, An exemplary connection to Newton and mechanism can be found in the last sentence of Darwin's *Origin of Species*: "There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or one; and that, whilst this planet has gone circling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved" (Darwin 2011[1859], 564). The universal mechanism seems to be too binding and takes the idea of nature as an automaton too seriously. On the other hand, Newton's version admits the existence of an invisible force, which is acceptable, but not exactly ideal because it technically is not explained. For example in this letter to Richard Bentley: "So then gravity may put the planets into motion, but without the divine power it could never put them into such a circulating motion as they have about the sun; and therefore, for this, as well as other reasons, I am compelled to ascribe the frame of this system to an intelligent agent" (Newton, Andrew 2004, 100).

The universal mechanism is deeply rooted in the way we perceive science and technological development. The new mechanical philosophy is not a replacement for the universal one. We could rather look at it as a completely new philosophical movement developing around modern science, especially fields like neuroscience and biology. Currently, the term mechanism itself is used rather freely, no matter the scientific field or specific discussion. It is understandable, because mechanism offers an easy scheme of explanations, and it can illustrate the problems quite well, especially in the context of the 20th century and the era of information theory and cybernetics. Nevertheless, with the progress of scientific fields such as neuroscience and medicine in general, it became clear that this version of mechanism is not simple enough, and it cannot cover most of the problems of modern science (Glennan 2017).

The new mechanism is a philosophical trend that emerged in the early 2000s as a new kind of framework of thinking and problem modelling across scientific fields. New mechanism primarily presents itself in the context of biology and the study of living systems, however, the philosophical origins can be traced back to the mind-body problem. The philosophy of mind was influenced by the new mechanical philosophy, mostly because it offers a way to model mental states. When it comes to the new mechanism we are discussing three definitions of basic models, however, we start with the most general definition that appears in T*he New Mechanical Philosophy* by Stuart Glennan. "A mechanism for a phenomenon consists of entities (or parts) whose activities and interactions are organized to be responsible for the phenomenon." (Glennan 2017, 92)

Glennan calls this a minimal mechanism, and the definition was drafted to be purposefully vague. It shows

1 We can observe its influence in almost every possible field, starting with the concept of the invisible hand of the market by Adam Smith (Smith 2010[1759]) or the whole population theory of Thomas R. Malthus (Malthus 1989[1798]). This connection is explained in *Darwinism evolving: Systems dynamics and the genealogy of natural selection* by Depew, David J., and Bruce H. Weber. (Depew, Weber 1994).

us that almost anything can be considered a mechanism, it just needs to meet the minimal requirements. This concept of mechanism does not apply exclusively to this minimal definition, but to real mechanism as they appear and function in the world, as well. The philosophy of the new mechanism is defined by three fundamental definitions, describing the main three ways of new mechanical modelling and three basic models based on the following definitions. The models connected to the given definition are models of explaining phenomena. Each one of them is different based on what the definition of the new mechanical philosophy is focusing on. The first definition, and probably most known, is by the trio known as MDC (Machamer, Darden, and Craver): "Mechanisms are entities and activities organized such that they are productive of regular changes from start or set-up to finish or termination conditions" (Machamer et al. 2000, 3).

This definition is similar to the one proposed by Glennan. It also corresponds to the exact so-called *underlying* type of model, and there are also two other models connected to the other two definitions, which are usually primary definitions for the new mechanical philosophy. We are talking about a more detailed definition by Glennan and the last one by the duo of philosophers Bechtel and Abrahamsen.

Glennan defines the new mechanism as follows: "A mechanism for a behaviour is a complex system that produces that behaviour by the interaction of several parts, where the interactions between parts can be characterized by direct, invariant, change-relating generalizations" (Glennan 2002, 344). We can connect this to the so-called *producing* model.

The definition given by Bechtel and Abrahamsen is connected to the last *maintaining* model. "A mechanism is a structure performing a function in virtue of its component parts, component operations, and their organization. The orchestrated functioning of the mechanism is responsible for one or more phenomena" (Bechtel, Abrahamsen 2005, 423).

What can be seen here is the essence of the new mechanism which is established with four crucial elements. For us to use a mechanistic model in the sense of the new mechanical philosophy, we require, as a minimum, a phenomenon to describe, an understanding of the phenomenon's parts, the causes behind the phenomenon and the organization inside the phenomenon. This can evoke the feeling that we are talking about a *living* system and that the mechanistic model can be applied to the understanding of our world. We could argue that models were also used in the concept of universal mechanism, be they clocks as suggested by Descartes (Descartes, Hall 1972), or recently computers within the camp of the information paradigm. However, these models are very machine-like, and maybe suited to physics and mathematics, but they are inapplicable to living systems. These 'old' models are not suitable for modern research, be it work in philosophy of mind, neuroscience, or modern biology.

The most significant parts of the new mechanical philosophy are entities and activities. Generally, we can say that entities are referred to by nouns – objects – and activities by verbs – process – and they involve change in time. This is no by means a proper definition, but it illustrates the function inside the model (Glennan 2017, 20). For some philosophers like Glennan activities and entities are real and they cannot simply be abstract (Glennan 2017, 20), which excludes such models as the Turing Universal Machine or von Neumann's probe. We need to be able to locate them in our physical reality, and without activities they are not entities and vice versa. When it comes to entities, we can imagine almost anything, be it protein, organism, or the whole society. It is important to note that one entity is comprised of many smaller entities. On the other hand, the activities represent what is happening with those entities, be it passively or actively. They are activities, in the new mechanistic conception, that are behind the changes in the system (Machamer et al. 2000). The main activity for entities is mutual interaction – some even argue that we cannot call something a model unless there is a proven interaction between each entity. The next important requirement for a model to work in the new mechanism is that the entities and activities need to be organized and responsible for certain phenomena (Glennan 2017). We could use almost anything as an example, as we already stated that by the definition of the minimal mechanism, almost anything can be a mechanism or mechanical model. It also shows us that we need these kinds of models not only to explain concepts but also to understand them. It was already stated by biologist John Maynard Smith, that: "We understand biological phenomena only when we have invented machines with similar properties" (Smith 1986, 99–100).

Although his statement is about biology, it can be applied across many fields of science. The fact that mechanistic concepts are still needed not only in formal science and humanities but also in intermediate disciplines that are trying to bridge the gap in the academic and scientific worlds, is shown in the concept of extended mechanism in the work of Marcello Barbieri, especially in his theory of code biology. Barbieri's book *Code Biology: A New Science of Life* points out that mechanism is not just a philosophical theory, but we can work with it as with a proper *scientific method*: "Mechanism, in short, is virtually equivalent to the scientific method. The difference is that the *hypotheses* of the scientific method are replaced by *models*, i.e., by descriptions of fully functional working systems. Mechanism, in other words, is '*scientific modelling*'" (Barbieri 2015, 16). What is different from the new mechanism and Barbieri's understanding of extended mechanism, is the question of how 'real' the models have to be. For Glennan and the others, the realness of the model is based on the concepts of both activities and entities, meaning that Glennan excludes such mechanical models that are based on theoretical work, for example Turing Universal Machine. However, Barbieri uses the argument of Count Alfred Korzybski that

"the map is not the territory" (Korzybski 1933, 58) and it is possible to accept such mechanical models as Turing Universal Machines based on the premise that models do not have to precisely correspond with reality. If we accept this, we can argue that this way mechanism itself is incomplete and there is a possibility of evolving (Barbieri 2015). It can be illustrated by these following quotes:

"The model of the chemical paradigm is the steamengine whereas the model of theinformation paradigm is the computer. Both of them are very different from the clock-model of Descartes but they are all *mechanistic* models of life, so we need to ask ourselves '*what is mechanism?*'" (Barbieri 2015, 16). And also here: "Now we face a new challenge, and once again we hear that mechanism is not enough, that we need something completely different. Which could be true, of course, but mechanism remains our best chance to find out what makes living systems tick. Mechanism may well be able to change again and introduce in biology not only the concepts of energy and information, but also the last frontier, the concept of *meaning*" (Barbieri 2015, 17).

The extended mechanism builds on aspects of the new mechanism, but it does not attempt to explain mental states and processes by using simple physical mechanism or medically observable brain activity. Extended mechanism suggests that living systems can be understood as complex machines. In this case, these complex machines operate according to principles and physical laws, meaning a real possibility for us to predict the behaviour of the organisms (Barbieri 2015). The problem thus becomes the specification of what exact principles and physical laws. This can naturally be problematic insofar as all such rules would be chosen by the human researcher. In seeking proper principles, we must naturally ask, 'what is the line between the living systems and the artificial ones?' We can also notice that the development of the new mechanical philosophy and proposal of extended mechanism by Barbieri share some similarities with what happened to the concept of universal mechanism in the context of Newton's work. We found a loop through the stricter part of the new mechanism proposed by Glennan by introducing meaning into the new mechanism (Barbieri 2015). Even though that extended mechanism seems like a softer version of the new mechanism, there is one important takeaway from both theories: when it comes to the universal mechanism or just the general idea of mechanism, it always works with the idea of models being strictly mechanical and based on mathematics. In the new mechanism and especially in the extended mechanism, we can see that it is not necessarily true. Both theories by their definition accept models that are not formal in the sense of the universal mechanism. For now, we can include Barbieri's extended mechanism as a part of the new mechanical philosophy, and we will come back to it in the third part of the paper.

THE INTERPRETATION OF CHARLES S. PEIRCE

The 19th and 20th centuries saw many revolutions – it was also the time of the rise of the universal mechanism, as machines of all kinds became part of daily life. It would be possible to list many important names that arose during this period of thought. One of these brilliant minds was also Charles S. Peirce, who will be the focus of the rest of the study. As stated earlier, we will be focusing on his late work as it concerns the categorical notion of Thirdness and his evolutionary theory. To best understand these points, we must circumstantiate Peirce's work. Peirce saw himself as a scientist, and thus spent most of his life in the natural sciences, especially mathematics and chemistry. It wasn't until later in his life, after entering his 30s (Peirce 2009), that he started focusing on the philosophy of nature. Peirce's background in natural science shaped his view and gave him the possibility to approach and interpret philosophical dogmas more as a scientist than a philosopher.

Knowing Peirce's background in natural science, it is a bit surprising that Peirce is not very satisfied with the universal mechanism. This dissatisfaction arose primarily from not meeting the needs of science. Peirce did not exactly criticize the universal mechanism, just pointed out that something is missing from the classical doctrine, mostly a lack of versatility and adaptability to the new progress in natural science and the humanities: "Secondly, the necessitarian may say there are, at any rate, no observed phenomena which the hypothesis of chance could aid in explaining. In reply, I point first to the phenomenon of growth and developing complexity, which appears to be universal, and which though it may possibly be an affair of mechanism perhaps, certainly presents all the appearance of increasing diversification. Then, there is variety itself, beyond comparison the most obtrusive character of the universe: no mechanism can account for this" (Peirce 1998). The classification of science during the 19th and 20th centuries was quite different and there wasn't such a gap between natural science and the humanities. Peirce himself classified science generally into Practical and Theoretical at first, later dividing them into more categories (Peirce 1903); however, versatility and adaptability are essential parts of the new mechanical philosophy since the intent of the new mechanism was to be widely applied across most scientific fields, mostly focused on biology, for which the universal mechanism was not ideal. Applying the new mechanical philosophy and its explanation of mechanisms to Peirce's work might seem to be a stretch; however, as it will be argued later in this paper, certain similarities exist between the new mechanism and Peirce's work on the category of Thirdness and his concept of evolutionary theory. Since Peirce studied philosophy through the lenses of natural science and logic, it led to unexpected and new observations. It also became one of the reasons why certain parts of Peirce's work can be controversial.

Another part of this controversy is the problem of studying and interpreting Peirce's work which does not belong to the camp of the accessible. The misinterpretations of Peirce's work are well documented and common, one of the most known in the work of Roman Jakobson (Švantner, Gvoždiak 2017), and generally, the

issue of misinterpreting Charles S. Peirce by scholars across academic fields has been documented.[2] One of the most important factors in this issue is the question of the formal education and overall background of not only Peirce, but especially contemporary scholars. Peirce has already been discussed here in this context, a natural scientist who towards the end of his life was mainly concerned with pragmatism and philosophy. His view of these areas was shaped gradually, as he examined the fundamental philosophical writings, starting with Kant and his *Critique of Pure Reason* and the rest of the celebrated German philosophical works, continuing with making acquaintance with Greek, English and Scholastic philosophy, while he was studying chemistry and mathematics (Peirce 2009), so it is not surprising that he treats semiotics and logic as scientific methods. Overall, it is the approach of the natural sciences that is noticeable through his studies and essays. Despite being a natural scientist in all formal aspects, Peirce's work has had the greatest influence on the humanities and interdisciplinary fields such as biosemiotics. What is typical for Peirce and many other scholars in the late 19th century is crossing the epistemic line between disciplines and, more importantly, between the humanities and natural science. Since his time, however, most disciplines, whether within the humanities or the natural sciences, have profiled and focused on a specific kind of research. It can therefore be difficult to grasp all the relevant details in Peirce's work, as a result of the habitual fragmentation and specialization we have today witnessed in the humanities and natural science. The other side of this problem is the writing itself. Considering Peirce's topics of choice, his work can naturally be a bit inaccessible. Moreover, there exists the fact that a lot of Peirce's work remains unpublished. This combined with the plethora of Peirce's manuscripts that are not easy to decipher can make Peircean philosophies inaccessible.

The discussed problems are the reasons why we are trying to look at Peirce's work on the category of Thirdness and evolutionary theory with a new perspective influenced by the new mechanical philosophy. Not only does the new mechanism seem well-suited to Peirce's work, but we also notice that Peirce was using similar methods while building up his triadic approach to philosophy.

THE CATEGORY OF THIRDNESS AND THE EVOLUTIONARY THEORY OF CHARLES S. PEIRCE

The dominant pattern in the philosophy of Charles. S. Peirce is triadicity. This does not simply mean seeing the world in trichotomies and triadic relations. There is no clear evidence why Peirce chose to follow this pattern, he argued that it is just following the phenomenal appearances, and while many phenomena seem to be divided into three, it is also probably the combination of his studies of Kant and his categories and the triadic structure in Hegel (Stjernfelt 2014); or maybe he continued in a certain Newtonian trend and tried to make his work fit the dogmas of Christianity; or it may be Peirce's rejection of Cartesian dualism. Be that as it may, Peirce's strangely chaotic order in his philosophy allows us to explore perhaps one of the most engaging concepts in his work, namely the category of Thirdness, from which we can move freely into Peirce's theory of evolution. What is missing is a clear and constant definition of the categories throughout Peirce's work and it is almost impossible to talk about just one of the categories since they depend on each other. We can define the category of Thirdness like this: "Thirdness, in the sense of category, is the same as mediation. For that reason, pure dualism is an act of arbitrary will or of blind force [...] The dyad is an individual fact, as it existentially is; and it has no generality in it. The being of a monadic quality is a mere potentiality, without existence. Existence is purely dyadic" (Peirce 1894).

To understand this quote properly, we need a little bit more context, especially addressing the different categories. For that, we need to use another example directly from Peirce's writing, this time from his essay *The Architecture of Theories*: "First is the conception of being or existing independent of anything else. Second is the conception of being relative to, the concept of reaction with, something else. Third is the conception of mediation, whereby a first and second are brought into relation" (Peirce 1998, 176).

To a certain degree, both quotes are telling us the same. For our purposes, we may understand the Peircean categories as the following: the category of Firstness represents potentiality or possibility, the category of Secondness is about actuality, and the last category of Thirdness is about necessity or generality. This is not a detailed definition of any particular phenomenon so much as it is a mode of understanding the universe of phenomena in a consistent and reproducible model. Peirce tells us that the instance of Firstness is a possibility of the existence of something without it actually existing, existence comes in the instance of Secondness when there is an interaction between monadic entities and it was said, existence itself is purely dyadic, meaning that unless we want to talk about evolution there is no need to add another dimension which would lead to the category of Thirdness. Then the instance of Thirdness is what brings it all together and makes up the world around us. To put it again in the words of Peirce just a few paragraphs after the previous quote: "Chance is First. Law is Second, the tendency to take habits is Third. Mind is First, Matter is Second, Evolution is Third" (Peirce 1998, 177).

This is the point when we might say that Peirce is not giving us enough information, just listing the possibilities of what individual instances could be or represent and it

2 Just for example: "A misunderstanding of Peirce's phenomenology" (Ransdell 1978), "Iconismo primario e gnoseologia semiotica" (Paolucci et al. 2015) and *Diagrammatology: An Investigation on the Borderlines of Phenomenology, Ontology, and Semiotics* (Stjernfelt 2007).

is up to us to make the connections. We can find examples like these in different contexts throughout Peirce's work. It makes the understanding and interpretations of this triadic concept chaotic at best. However, it is still possible to draw several conclusions about Peirce's triadic theory, especially focused on evolution. Peirce said himself that if we want to focus just on simple existence without any changes in it, we are talking about the instance of Second, or to put it in slightly different terms, the mechanisms behind something bigger, in this case, the instance of a Third – or to be more precise, evolution. For Peirce, Thirdness is about connecting two previous categories into one complex, since: "the First is the beginning, the Second is the end, the Third is the middle, and the connection between them" (Peirce 1931, CP 1.337). The properties of each category change depending on how much value we give them in the triadic relationship between them. The category of Thirdness seems to be always in the position of connecting everything and completing the whole picture. In this case, we will look at the category of Thirdness in the form of Peirce's version of evolutionary theory. Peirce acknowledged three different evolutionary theories besides his own. First is the theory of evolution by Herbert Spencer, where Peirce criticizes the mechanical approach. For him the theory is not complete. In Darwin's theory, Peirce is more focused on the mathematical aspects of evolutionary theory. The closest to his own beliefs is probably the Lamarckian theory of evolution, which Pierce connects directly to his concept of categories. "But more broadly and philosophically conceived, Darwinian evolution is evolution by the operation of chance, and the destruction of bad results, while Lamarckian evolution is evolution by the effect of habit and effort" (Peirce 1998, 164).

It is the act of habit-taking and effort-making that is the fundamental part of the Third and also the key to Peirce's evolutionary theory. Another part of this phenomenon is the process taken from Peirce's scientific methodology called *unlimited semiosis* (Eco 1979), which is one of the 'mechanisms' behind the concept of evolution. The principle of unlimited semiosis allows us to combine both Darwin's and Lamarck's theories – or at least the way Peirce interprets them – by also emphasizing the role of change based on interpretation in the system. Now, we notice that Peirce is very careful when it comes to using the term *mechanism* or anything related to it. It is understandable, as it was stated earlier, that the doctrine of universal mechanism does not exactly fit Peirce's work; nonetheless, it is worthwhile to try to put it in the perspective of the new mechanism.

MODELLING

The importance of models across many academic fields, and not just natural science, is unquestionable, as it is modelling that allows us to understand many concepts and phenomena. We are constantly building models such as the ones in new mechanism to understand concepts across many academic fields using similar principles as in new mechanism without even realizing it. In the first part, we focused on the new mechanistic philosophy and mainly on the models that are used and that are the main contribution of the mechanism to current philosophy and science. One of the simplest definitions of the model is this one: "S uses X to represent W for purposes P" (Glennan 2017, 60).

Currently, the trend is to oppose the doctrine of universal mechanism and we can notice it even in the new mechanistic philosophy. Even Peirce himself had certain arguments against the universal mechanism and its approaches. "The mechanical philosopher leaves the whole specification of the world utterly unaccounted for, which is pretty nearly as bad as to boldly attribute it to chance" (Peirce 1998, 200). And also: "Then, there is variety itself, beyond comparison the most obtrusive character of the universe: no mechanism can account for this" (Peirce 1998, 200).

However, as it was stated, some parts of the universal mechanism's doctrine work well even nowadays not only in formal science, and its influence is still noticeable. We can also see certain fundamental thoughts of universal mechanism in the new mechanical philosophy (Porter, Ross 2003). The new mechanism is very liberal especially when it comes to models. One of the strongest arguments against comparing Peirce's purely abstract models and mechanical models is the 'abstract' part, because mechanical models are usually viewed as something grounded deeply in reality. However, in the new mechanism, we do not talk about just a 'push-pull' model as we do in the universal mechanism. The definitions of what can and cannot be a model are broad and basically anything – if we use the right arguments – can be accepted as a model. Even something so abstract as the Universal Turing Machine (Barbieri 2015).[3]

Peirce's work contains many unique concepts, but one of them provides the key to how to connect his work with today's philosophy of science. In the previous parts, we talked about the triadic model of sign and how resembles the first proposals of mechanism in the new mechanical philosophy. We can take it to a bit bigger scale. After almost two decades since MDC (Machamer et al. 2000) first published a paper focused on the new mechanism, some scholars have tried to come up with a more clear definition of mechanism. One of them is by the duo Illari and Williamson: "A mechanism for a phenomenon consists of entities and activities organized in such a way that they are responsible for the phenomenon" (Illari, Williamson 2012 120).

One of the biggest phenomena in semiotics and Peirce's work is the concept of Thirdness – evolution. We could call Thirdness an umbrella term for *meaning,*

3 For some, for example Stuart Glennan, a model in the new mechanism has to be to a certain degree grounded in reality. In the case of the Turing machine, Glennan argues that since the machine itself cannot ever be built, it also cannot be a model for anything (Glennan 2017, 20).

habit-taking, law (Peirce 1998), and many others. As was already stated, Thirdness is needed at the moment we are talking about evolving and complex systems. The *mechanism* behind Thirdness is the relationship between the category of First and the category of Second and how they interact with each other through unlimited semiosis. This is the mechanism we need to explain the phenomenon of evolution. Peirce himself tied Thirdness to science, not only by using it to explain the evolution of the cosmos, but generally of the laws of nature, as we can see here for example: "Some of the ideas of prominent Thirdness which, owing to their great importance in philosophy and science, require attentive study are generality, infinity, continuity, diffusion, growth, and intelligence" (Peirce 1931, CP 1.340)

Or here: "Such components, however, are mere creations of the mind. What is the difference? As far as one isolated event goes, there is none; the real forces are no more present in the resultant than any components that the mathematician may imagine. But what makes the real forces really there is the general law of nature which calls for them, and not for any other components of the resultant. Thus, intelligibility, or reason objectified, is what makes Thirdness genuine" (Peirce 1887–1888, CP 1.366)

We can easily see that Thirdness fits the approach of the new mechanical philosophy. Peirce uses the same methods to explain phenomena – in this case Thirdness – by using the smaller parts and showing how the mechanisms work between each other. He works with the categories of Firstness and Secondness as certain smaller parts of the whole triad tied together by semiosis happening inside. Thirdness as a complex *theory of everything* does not work without its mechanistic, lawful nature. We need to start with Secondness and the relationship between object and representamen. Once we add the dimension of interpretant we are not exactly approaching thirdness and meaning, but it is the first step to it. The next one would be semiosis. And if we accept the proposition that Thirdness can be a complex explanation of the world around us, semiosis is just one of the mechanisms behind it.

CONCLUSION

The comparison of the similarities between modeling in the new mechanical philosophy and modeling in the work of Charles S. Peirce, focused on the category of Thirdness and his evolutionary theory, can help us understand why a certain type of mechanical approach is useful for making better models across academic fields, and to close the gap between natural science and the humanities. The criticism of the universal mechanism is on point, but we need to understand the difference between it and the new mechanical philosophy. Charles S. Peirce was not satisfied with the universal mechanism and with its certain dependence on real machinery, however, he still used mechanisms to explain his concepts. His concerns about the universal mechanism were close to the ones we notice nowadays; nevertheless, the need for mechanisms and models is still obvious. Peirce's category of Thirdness is an explanatory mechanism of evolution in the sense of a new mechanism. New mechanical philosophy takes its fundamentals from the universal mechanism, but it's flexible and open to abstract models such as Thirdness and others that fall more on the side of the humanities.

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