Neurophilosophy: a bridge between science and contemporary philosophy

Written by: Andrey Astafiev

# Abstract

Scientific discoveries must have more impact on philosophy (Bechtel, 2001. Part. I.I.). That is the thesis of the American professor of philosophy William Bechtel. Applications of the insights from the neurosciences could perhaps lead to a breakthrough in solving metaphysical and religious questions. Philosophers must assume the task of building bridges between the exact (and cognitive) sciences and contemporary philosophy (Bechtel, 2002. 49). This paper is a critical analysis of the promises of a relatively new discipline: *Neurophilosophy*.

**Key words*:*** *Neurophilosophy – philosophy of mind – cognitive sciences – connectionism – hard problem of consciousness – William Bechtel – Andy Clark*

# Introduction

If you ask any contemporary philosopher whether recent discoveries in neuroscience have anything to do with ancient philosophical questions, it is difficult to predict which answer you will get. Some philosophers will tell you that philosophical problems are essentially pre-scientific and can only be cleared up through an *a priori*analysis and former discussions regarding people’s opinions on these kinds of problems (Bechtel, 2001. Part I.I.). More classic thinkers might want to convince you that certain problems not only escape the grip of sciences, but are also completely unsolvable by science itself. Professor William Bechtel, a leading American (neuro)philosopher, strongly disagrees with such conclusions. In his book: “Philosophy and the Neurosciences” published in 2001 he argued that (neuro)scientific discoveries can and should have a major impact on the way we practice philosophy. In his more recent work from 2007: “Mental Mechanisms”, he further argues this belief and links discoveries in neuroscience to philosophical theories about the nature of our self-image, consciousness free will, knowledge and faith. The central question of this paper will be: “Does the neurophilosophical approach of Bechtel make sense, or is it an unfortunate attempt to solve unscientific and perhaps even unsolvable questions?”

Using empirical findings to approach philosophical problems is essentially nothing new. Aristotle was a strong supporter of observation and focused experimentation from as far back as ancient Greece (Bechtel & Abrahamsen, 2002. Sec. 1.1.). Unlike his teacher Plato, he did not primarily look for universal answers to transcendent metaphysical questions but instead went to search for the workings of our physical reality. The growing influence of the works of Aristotle would change philosophy forever with the emergence of modern science (Bechtel, 2007. 11). In past times, philosophy had a more important role compared to all the other domains of science. Through time philosophy was reduced to the study of those problems that did not seem empirically approachable.

Many of these problems related directly to the human mind. The dualistic approach towards the human being and the world in general, introduced by Plato and later refined by Descartes, divided reality into to two domains (Bechtel, 2001. Part I.I.). First we have the *Res Extensa*, the material substance of object in the spatial-temporal reality, namely the physical body. And second we have the *Res Cogitans*, the immaterial aspect of reality, namely, the mind. Empirical techniques simply did not apply the immaterial and invisible realm within the mind. Philosophy of mind thus acquired a clear metaphysical character and was forced to retreat to the study of consciousness and logic, and various other (non-chemical) processes in the brain (Bechtel, 2007. 17).

# Part I: Is it possible to maintain a dualistic separation between mind and body?

After the emergence of psychology in the second half of the nineteenth century, empirical data was used increasingly to supplement the study of what was happening within the mind. In the twentieth century, the idea of getting reliable knowledge from using empirical data to study what was happening within the mind was definitively problematized, partly in light of the growing belief that much of what happened in our mind was hidden from consciousness (Bechtel, 2001. Part I.I.). Important neurological and psychological discoveries confirmed these critical intuitions. For example, the study of the influence of brain damage on the behavior and mental functioning of patients made it rather difficult to maintain a dualistic division between body and mind. Many physicalist philosophers also became convinced that the mental should in principle be reducible to the physical (Clark, 1997. 23). The materialistic worldview of the exact sciences had discarded Descartes’ problematic substance dualism.

It is therefore indisputable that the results of the empirical sciences have had an important influence on the historical development of philosophy in general, and on our elementary conceptions of the human mind in particular. Professor W. Bechtel predicts that this trend will continue whether we wants it or not (Bechtel, 2001. Part I.I.). Now that technological progress makes it possible to investigate the brain in ever more detailed empirical studies, it is quite likely that every psychological question will soon have a neuroscientific answer. However, because neuroscientists in general use quite a different vocabulary than continental and sometimes even analytical philosophers, the research results are often hindered by a communication gap (Bechtel, 2002. 49). Bridging this gap is essentially a philosophical task, not only because questions about the fundamental nature of mind are traditionally posed by philosophy, but also because philosophy, past and present, holds a wide view on the different scientific disciplines and thus forms the ideal place where these different conclusions and theories can meet, be tested and perhaps even be merged with one another. His field of study covers three problems (Bechtel, 2002. 51):

* Epistemological problems related to representation and learning
* Metaphysical issues of self-knowledge, consciousness and free will
* Religious questions and beliefs

The contribution of various scientific disciplines to epistemology, the study of human cognition, is clearly visible today. After all, since Alan Turing paved the way for the modern computer, many difficult questions about our cognition have definitely lost their dualistic appearance (Clark, 1997. 21). Contemporary research in disciplines as diverse as psychology, AI or linguistics, is fundamentally based on the premise that we can compare our cognitive abilities to some kind of computer program. This program is performed in a special biological computer, namely our brain (Clark, 2014. 9). Scientists and physicalists believe that once we know how the brain is programmed, we can understand how it absorbs, processes and applies information. In philosophy this view and approach is referred to as functionalism. The central idea is that mental states (states in which our mind is at a particular moment) are characterized by their causal role, that is, the ability to activate other mental states at another moment or to induce concrete behavior (Clark, 2014. 9). In short: mental states are constituted solely by their functional role. According to this belief, as long as the causal and functional role of every neuron connection of the brain is respected, one could make, for example, cottage cheese “experience” mental states. Of course, this is just a metaphor. Our brains are not really made up of electronic components and therefore not an actual digital computer. When modern cognitive sciences speak of the mind in terms of computer programs, they make use of statements that do not refer directly to the empirical properties of the brain (Clark, 2014. 11).

Some cognitive scientists think that the neuronal level is too concrete and too specialized to contribute substantially to solutions for more general epistemological problems. This approach is motivated by the view that specific implementation of programs is of little importance. For example, if we want to investigate how visual perception is established, we need to know which operations ensure that the information that our eyes catch is transformed into a 3D-firstpersonperspective representation of reality (Van Gulick. 2014. Sec.2.). Whether those things are programmed in Python or Java and whether they are performed by a Windows-PC or a set of brains does not matter, in principle. What matters is whether the computer in question is put in the correct states and generates the desired output. According to some scientists, it appears that neurological and technological discoveries can direct or correct the search for solutions for the easy and hard problems of consciousness. Knowing more about the neural mechanisms that implement cognitive functions can provide clues for developing cognitive models. In contrast, according to me, our insight into the mind-boggling complexity of the brain is so limited that the entire project is of a highly speculative nature and is excessively ambitious

A relevant practical example is the development of connectionism (Bechtel & Abrahamsen, 2002. Sec.2.1. and Clark, 2014. 69). The classic 20th century approach to the mind emphasized language as a medium of representation and logical deduction as the core of our reasoning ability. For example, research on AI used expressions based on propositional logic to represent knowledge and logic to infer new conclusions. This approach proved very successful for machine solving mathematical problems or logic related puzzles. Think about the famous IBM project of the notorious computer, which defeated “the greatest chess player of all times”, Gary Kasparov, at a game of chess (Clark, 1997. 34). These projects, despite possessing “superhuman intelligence”, were very incompetent in implementing more general human intelligence, like talking about the weather (Clark, 2014. 20). For example, machine learning – the way of teaching a computer non explicitly programmed skills – was a troublesome matter with symbolic logic and was the only system of representation available. This representation of the mind also raised some justified questions in philosophy. For example, it is unclear how logical symbols in a computer system could possibly have meaning. After all, the symbols were in no way connected with the outside-the-system reality of the spatial-temporal world, which mankind subjectively experiences. Depending on the program, as far as the computer was concerned, the symbol 0 could just as well represent a cat, a plane or a hot cup of English tea. In which case the concept of hotness would need to be specified for a computer that lacks the ability to experience something being hot, apart from the object being at boiling temperature.

# Part II: Can the application of research in neuroscience provide a possible way out of the scientific and philosophical problems?

Application of research neuroscience provided a possible way out of these scientific and philosophical problems. By comparing a simulation of how chemical impulses behave in networks of neurons, to our mind. Problems requiring complex techniques in the classical approach to artificial intelligence turned out to be relatively easy to solve using simulated neural connections (Bechtel & Abrahamsen. Sec 1.3.). For example, such networks of connections could learn new concepts or skills by configuring themselves using examples. In this case, the explicit programming by human programmers was not required (Clark, 2014. 71). Because this connectionist approach offered a breakthrough to the problematic logical way of viewing the mind, a number of philosophical questions were also viewed from a different perspective. Where the older paradigm surrounding the meaning of symbols turned out to be a hornet’s nest, the new paradigm offered an elegant solution. The holistic way in which neural networks represent their knowledge made it possible to relate concepts – in the classical approach represented by simple symbols – to basic sensory information. After all, this information can be used by the network in the learning process, for example, when learning to distinguish between dogs and cats on the basis of pictures. It is this implicit holistic information that makes a concept refer to entities or states of affairs in reality and thus gives them meaning.

Evidently, this connectionist approach is not the perfect solution (Clark, 2014. 92 and Bechtel & Abrahamsen, 2002. Sec. 2.2.). Neural networks also have their limitations and many philosophical and scientific questions remain unanswered. Yet the emergence of this new paradigm illustrates that insights at the neuronal level can meet, and have a significant impact on, a variety of disciplines. Problems from philosophical epistemology also appear not to be immune to this influence. Changes in the existing conceptual framework make it possible to view old issues and questions from a new perspective.

The direct relevance of neuroscientific discoveries is much more controversial (Bechtel & Abrahamsen, 2002. Sec. 1.1.). As I briefly mentioned before, the hard problem of consciousness, or in other words, the problem of “phenomenal consciousness”, remains one of the hot topics in the philosophy of mind, adding to the controversy. The hard problem of consciousness is the problem of how physical processes in the brain, like processing audiovisual inputs, give rise to the subjective experience, like memories and emotions, in the mind (Van Gulick, 2014. Sec. 5.4.). As we have noted, almost all neurophilosophers, as well as their scientific colleagues, agree that mental states are a product of the brain and thus have a material basis (Bechtel, 2001. Part I.II.). From a philosophy of science point of view, the reduction of cognitive functions such as memory to neural and/or computational mechanisms does not seem problematic. Fortunately for the more classic thinkers, there is also a category of mental states for which this reduction is philosophically much less transparent. A striking example is the experience of pain. The qualitative aspect that accompanies a pain state – the actual subjective painful feeling itself – is called a quale in philosophy. The phenomenal consciousness is our ability to experience these qualia. Examples in addition to pain are the experience of our body and the stream of consciousness like a narrative in our head, the sweetness of a ripe mango or the blueness of the clear summer sky. Now, it is very unclear how qualia can be reduced to material or functional properties. Even if we had all possible scientific knowledge about pain states, we still cannot deduct and experience what it is like to be in pain (Clark, 2014. 95). The semantic code: [PAIN], cannot be grasped in a 4-letter combination. It is not the same as the actual pain a living thing, like a bat or human, experiences. Because of this, the qualitative aspect of our experience seems to fall outside of the realm of what is scientifically knowable. In a nutshell, one must experience pain to truly know what pain is.

Opinions differ on how to interpret this problem. Many philosophers with whose point of view I agree, think that we simply have to accept that reality, in addition to an objective and scientifical aspect, also has a subjective aspect. Some think that a new scientific framework could make it possible in the nearby future to describe this subjective aspect objectively, which in my opinion is highly implausible. Others are more skeptical and believe that, due to the cognitive closeness of our cognitive capacity, we will never be able to solve these fundamental questions about qualia. Bechtel defends an eliminativist position (Bechtel, 2007. 133) in this debate. He thinks that qualia will meet the same fate as the problematic entities that used to be part of our scientific theories about heat, life, life caloric fluid or life force. By persistently applying the scientific method, scientists develop new theories that eliminated these once considered essential substances and forces. Some neuroscientists and -philosophers think that scientific advancements will one day allow us to do the same with qualia (Bechtel, 2007. 260).

Many philosophers are particularly critical of this view. To understand why, we must keep in mind that for most thinkers the phenomenal consciousness is not an ontological but an epistemological problem. They are not concerned with the dualistic claim that qualia actually exist as entities in reality, but with how we should think about the relationship between phenomenal experiences and neural activity in the brain. Since empirical data only tells us about the neural and not the phenomenal aspect (Clark, 2014. 109), it does not seem that scientific knowledge will clarify our understanding of this fundamental problem. Philosophers therefore prefer to appeal to *a priori* analysis of problematic concepts by means of thought experiments. But, as it has already been shown in the context of epistemological problems, new scientific theories can also have an impact on the framework that produces philosophical problems (Clark 2014. 109). These problems are thus put in a new light and can lose their appearance of being unsolvable (Bechtel, 2002. 55). This means that a problematic concept such as qualia can be given a new interpretation not only through *a priori* reflection, but also through an intellectual reframing in response to new neuroscientific insights.

However, before proceeding with the last part, I want to give the reader something to think about. Imagine yourself telling a joke to a human being and to a robot who looks exactly alike. The response is the same; they both laugh and compliment your sense of humor. There is something off about telling a joke to a machine, yet you don’t know exactly how to put it into words…

# Part III: What about the self, free will and religious beliefs?

The critical reader will notice that the epistemological problem of consciousness can hardly be called metaphysical. The problems surrounding self-knowledge, free will and religion also quickly seem to lose all metaphysical gloss in the analysis of Bechtel. Thus, ‘the self’ turns out not to be an autonomous entity but a construction of the mind, a model that the brain uses to represent itself in thought (Bechtel, 2001. Part I.II.). Free will, which hovers above the causal determination of the world and can make rational decisions without the interference of emotion or some external agent, turns out to be an illusion (Bechtel & Abrahamsen, 2002. Sec. 1.5.). Even religious revelations and experiences of the sublime can be associated with neural mechanisms (Bechtel, 2007. 159). While Bechtel emphasizes that these findings do not detract from existing ethical principles, the causally determined agent remains responsible for his actions still. Religious experiences, feelings and beliefs are no less real or valuable because they originate in the brain. The neurophilosophical project essentially appears to be aimed at clarifying philosophical and religious questions by pointing out that the way we traditionally conceptualize them is not consistent with neuroscientific discoveries. The metaphysical framework within which these discoveries are implicitly placed is not questioned here. Philosophical problems are therefore always reduced to problems related to the way in which we know things such as consciousness or free will. The fundamental nature of reality of which these things are a part of is never questioned (Bechtel, 2002. 55).

# Conclusion

The epistemological nature of neurophilosophy does not necessarily indicate a lack of critical sense. With the hypothesis that scientifically “problematic” things such as consciousness and free will can be explained epistemologically within the metaphysical framework, is nothing wrong. It is the task of philosophy to continuously investigate whether this hypothesis applies to all philosophical problems. It is probable that scientific discoveries will guide this research by suggesting conceptual innovations and thereby avoiding problematic metaphysical speculation. It is therefore of utmost importance for philosophy, as it is for other cognitive science disciplines, to keep an eye on development in other fields. In today’s academic context, this is anything but a simple task. Neuroscientists and -philosophers can perhaps breaks down barriers between disciplines to enable productive and efficient interdisciplinary communication.

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