SEEKING ANSWERS: LEARNING, KNOWLEDGE AND PHILOSOPHY

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The present essay intends to explore the relationship between science and philosophy from an epistemological viewpoint, discussing the relevance of scientific realism for developing a fruitful feedback between philosophy and science. First, I argue that changing the traditional definition of knowledge should not imply skepticism. Instead, scientific models of the mind can serve as an epistemological guide for defining the acquisition of knowledge as a dynamic process, where the learner interacts with reality. Second, I argue that these models can portray reality, though not in a direct and complete way. In this sense, science is regarded as providing a diversely-grained group of models that can be compared by philosophy in order to improve philosophical discussions.

Keywords: *realism, skepticism, learning, knowledge, evidence.*

BUSCANDO RESPUESTAS: APRENDIZAJE, CONOCIMIENTO Y FILOSOFÍA

El presente ensayo pretende explorar la relación entre filosofía y ciencia desde una perspectiva epistemológica, discutiendo la relevancia del realismo científico para desarrollar un intercambio fructífero entre ciencia y filosofía. Primero, argumento que cambiar la definición tradicional de conocimiento no debe implicar escepticismo. En cambio, modelos científicos de la mente pueden servir como una guía epistemológica para definir la adquisición de conocimiento como un proceso dinámico; dónde quien aprende interactúa con la realidad. Segundo, argumento que estos modelos pueden retratar la realidad, aunque no de una forma directa o completa. En este sentido, la ciencia es considerada como proveyendo grupos de modelos de diverso grano, los que pueden ser comparados por la filosofía para mejorar la discusión filosófica.

Palabras clave: *realismo, escepticismo, aprendizaje, conocimiento, evidencia.*

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1. Introduction

Many epistemological quests reach a point where they have to pronounce about philosophy, that is the same discipline or area where they are embedded. This seems quite natural, considering the circumstance that philosophy deals with knowledge in every of its areas. In this sense, epistemology, as a philosophical sub-discipline intended to investigate the theoretical intricacies of knowledge (not in vain, these days it is referred to as theory of knowledge), should be able to state some tenets about the nature and scope of philosophical knowledge. This confronts us with that uncomfortable sense of recursivity that make us think, dangerously approaching the slippery-slope of skeptic idealism, that maybe we cannot tell the whole story when we produce knowledge about knowledge.

Nevertheless, I do not pretend to give an account about the nature of metaphilosophy, if this is a necessary sub-discipline or not, or about epistemological discussions on the topic of philosophical knowledge. My scope is humbler and narrower: I want to argue in favor of the relevance of science (including social sciences) for philosophy and why the interaction between philosophy and science requires that philosophy itself becomes a relevant topic of discussion. Considering this, I think that epistemology has something to say about philosophical knowledge and, therefore, about methodologies and requirements of philosophical investigations. However, I do not want to focus this essay on epistemology itself, but on the implications of research on the Philosophy of Mind for philosophical problems. This focus may serve to extend some definitions of knowledge and how philosophy can develop some aspects of it.

I intend to propose that a concise way to give sense to philosophical problems and the research intended to assess and solve them is by considering scientific findings as relevant parameters for the development of general models of the world. For this purpose I will examine how philosophy can observe scientific evidence about the nature of knowledge and how that has relevant repercussions on the way we can approach philosophical investigations. In this regard, it is important to consider what is the basic human disposition with respect to knowledge: do we seek knowledge? Or, do we search for evidence and use it to construct knowledge? And if this is so, what is the relevance of this seeking process for philosophy?

2. Why surpassing the traditional definition of knowledge does not lead to skepticism

Sometimes a person who has recently moved to live into a new place experiences the sensation of waking up in his old bed and old bedroom, just for a short moment. If you have experienced this, the first reaction is trying to find familiar things that were part of the old room, the old environment, but those things are not there anymore. Maybe now there is an empty space where should have been a wall, or a night table where you could have found a desk. This is not fundamentally different from searching for a button when you are in front of an elevator or from seeking an address bar or search box when you start your web browser. We seek, in this sense, evidence to match with our prediction of the possible disposition of a specific environment, we expect to find things that we know should be there under certain circumstances. We *learn* patterns that allow us to map our environment and move through it, recognize new features or changes, or compare it with older or imagined representations.

I do not want to be too misleading with these examples; so I will go directly to the point. This conception of knowledge as learned patterns is derived mostly from research in cognitive sciences and neuroscience and imported to philosophy due to the inconveniences that have emerged when Gettier[1] proposed his famous problems regarding the traditional conception of knowledge as justified-true-belief. As Paul Churchland[2] has argued: learning shape neuronal patterns by constant stimuli or by the absence of them, that way we constitute maps from objective features of the world. These maps are neural configurations that together constitute a conceptual framework. And this is a result of perceptual knowledge, understood as an activation space that has been sculpted in the brain[3]. This means that the only possibility for reliabilism, outside the scope of propositional languages, is that these learned maps can be (momentarily and partially) reliable in relation to different states or configurations of the world. Sometimes they are not, and this results, for example, in some counterintuitive findings of science, such as earth's movement or gravitational fields.

Although this argument seems to lead us to idealism, it is in fact intended to support a scientific realist approach. The first conclusion we can reach from this position is that the brain forms models and schemas to represent the world and these models are tested and compared only against other models or maps. Even more, this could imply a return to the positivist or empiricist supposition that we only dwell in an internal world produced by sensations and perception. However, I think that externalism, or external realism to use Searle's term[4], can be sustained and we can disregard the skeptical argument of circularity

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1 GETTIER, Edmund, "Is Justified True Belief Knowledge?", *Analysis*, Vol. 23(6), 1963, pp.121-123, Retrieved August 29, 2009, from: http://www.jstor.org/stable/3326922.

2 CHURCHLAND, Paul, "What Happens to Reliabilism when It Is Liberated from the Propositional Attitudes?". In CHURCHLAND, Paul, *Neurophilosophy at Work*, Cambridge University Press, Cambridge, 2007, pp. 88-112.

3 Idem.

4 SEARLE, John, *The construction of Social Reality*, Penguin Books, London, 1995. The problem with Searle's

with two conclusions: i) the acceptance of Scientific Realism; ii) the rejection of justified-true-belief knowledge as the only form of knowledge. Considering this, four arguments can be provided to escape radical skepticism, at least when it takes the form of idealism.

1) Skepticism posits various problems to the justification of knowledge. For instance the problem of realiabilism and induction. However, prediction makes it possible to escape this problem when we observe theories that are capable of predicting facts that were unknown or not previously considered. Prognosis is an elemental test for diagnosis and etiology[5]; that is a system that is able to predict some descriptive or causal features in the world is not basing that prognosis of unconsidered elements in an internal source, but in an internal model that represents an external source. Another support for this pers-pective is the *inference to the best explanation*, or *abduction* in Piercean terms, which basically consist of the configuration of a predictive schema that can predict observable, unobserved or unobservable data in inductive terms, so capable of fitting reality in an approximately truthful way[6]. For example, the prediction of light deflection because of gravitational fields by the theory of General Relativity is not a coincidence, but a well-established prognosis of a consequence of physical laws that are formalized through scientific laws; patters of nature ontologically precede their epistemic representation.

2) Idealism cannot deal with some inconsistencies between intuition and reason. One of the most important of these inconsistencies is the one that results from the clash bet-ween the intuitive approach to phenomena and the reasoned conclusion that postulates the ideality of those phenomena. And one of the relevant arguments derived from that problem posits the notion of embodied knowledge (e.g. procedural knowledge) and its involvement in representational conceptual frames of the world[7]. This implies, there is a practical interaction between our perceptual knowledge and other types of knowledge that have evolved to deal with features of the environment that precede us, including social aspects of human interaction, such as empathetic emotions[8]. The development of the different sub-systems of our bodies are not independent processes, but they interact among them and with the medium as well; knowledge, understood in this way, requires pre-existent sources of stimuli.

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notion of External Realism is that it seems to be a soft version of Scientific Realism. Therefore, speaking directly of Scientific Realism is better; especially considering that Scientific Realism presupposes an externalist idea of the world.

5   Bunge, Mario, *Causality and Modern Science*, Dover Publications, New York, 1979.

6   Lipton, Peter, *Inference to the Best Explanation*, Routledge, New York, 2004. Even though I have said that truth as justification has serious problems, I think that theories understood at the cultural level can be evaluated in referential terms if they are not considered as single propositions in a one-to-one relationship with their objects of study.

7   Jacobson, Anne, *Keeping the World in Mind: Mental Representations and the Sciences of the Mind,* Palgrave Macmillan, New York, 2013. The problem with Jacobson's approach is that it postulates an isomorphic relationship between representations and the world. But we can see in the third argument that this is the first step to a slippery slope into idealism. Despite Jacobson identifies this Humean inconsistency between primary knowledge and reason, she never states how that can fit into the (partially) realist perspective she proposes.

8   Churchland, Patricia, *Brain-Wise: Studies in Neurophilosophy*, The MIT Press, London, 2002.

3) Idealism is the result of a slippery slope resulting from the conception that semantic content should resemble real properties; thus, this posits the problem that concepts cannot denote real properties, leading the argument from skeptical doubt to idealism. However, there is no reason for thinking that semantic content should resemble real or external properties; if one maps the world in different ways (e.g. using different organs) that means that those maps (perceptual representations) do not resemble real properties in a one-to-one relationship in the Lockean style, but those maps resemble the world through an abstract structural resemblance[9]. Even more, we can notice this by observing that the world is not presented as Humean impressions, elemental simples, but it is presented to us as a fuzzy panorama and we make and discover categories in it through a life learning process[10]. Thus, a learning process of this kind shows that there are no internal representations that come from nothing; on the contrary they are carved (more or less rigidly) in our brain according to the different external stimuli that are present during our lives.

4) Skepticism cannot deal with the problem of epistemological or ontological precedence. In other words, as radical skepticism claims the nonexistence of external reality and in extreme cases it states that mind generates the world; a skeptic of this sort would have a hard time explaining how mind can precede existence. A mind that has come from nowhere and is sustained in nothingness would be a violation of Lucretius principle: *ex nihilo nihil fit*[11]. This can be observed in the Humean skeptic circularity that tries to disproof the efficiency of causation. If we access only impressions, and impressions are momentary (without past or future), then the world starts anew every time we perceive it; so these premises presuppose the goal of the argument, namely that causation is defective due to the impossibility of the past to act into the present[12]. Hence, accepting radical skepticism would mean that we have to deal with the conflation between causation and regularity[13], but that clearly presents the problem that our perception of regular features of the world is what causes those features in the world and that would mean that perception precedes existence, so ontology would be derived from epistemology; and that is clearly an inconsistent result.

Now, we can see that our consequences derive smoothly from these four arguments. First, it is relevant to accept internalism because naive realism would be an easy prey of radical skepticism. However, the fact that our internal representations only capture mediated and fragmented features of the world does not imply that there is no external world or

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9 Churchland, Paul, *Plato's Camera: How the Physical Brain Captures a Landscape of Abstract Universals*, The MIT Press, Cambridge, 2010.
10 *Idem.*
11 Bunge, Mario, *Causality and Modern Science*, Dover Publications, New York, 1979.
12 *Idem.*
13 *Idem.*

that reality is generated by our mental states or predispositions. As it was observed above, a world-generating mind cannot emerge out of nowhere. The opposite case, in my view, is the accurate one: mind (understood as the result of brain processes) is determined, at least in some degree, by that external reality. Thus, internalism is only possible if it is derived from a precedent existent world. Second, I think that the stance that is capable of dealing with this problem is Scientific Realism. This approach provides different solutions to deal with the problem of approaching a world that can only be accessed through a mediated way. For instance, systems and methodologies developed to explore reality, such as science, provide models of the world that can be culturally shared and tested independently.

3. Portraying the World and the Relevance of Scientific Realism

Now I want to focus on the first examined argument where prediction proves to be a test for inductive or abductive hypotheses based on the presumption of facts that are independent of internal representations. To start with I will consider the case of abduction, because it is present in more basic and habitual forms of knowledge, and it plays a relevant role in our perceptual and cognitive processes. For example, face recognition can be understood as the activation of connection patterns in the brain that are successfully and repeatedly activated until they get (more or less) solidly established[14]. However, when the same face is wearing glasses it is possible to recognize it as well; this is an example of abduction, because the face understood as a stimulus activates a pattern (or group of patterns) that best matches it, this includes the possibility of getting a wrong match[15]. And this, as Churchland[16] explains can be considered a feature of two forms of knowledge: 1) first-level learning that results from the conformation of activation patterns by synaptic modification, and 2) second-level learning that results from the dynamic redeployment of those patterns, namely learning by comparing, categorizing and modifying them.

Indeed, a fundamental feature of these learning processes is Hebbian learning, which allows the establishment of activation patterns in the brain that become more solidly fixed with time; and those are the patterns that together can interact to conform *cognitive maps* that be redeployed by a second-level learning[17]. Different authors (who have quite different philosophical positions in other respects) have recognized the relevance of this theory[18][19][20][21]. Hebb's hypothesis basically states that learning is the result of synaptic reinforcement of adjacent neurons that can conform cerebral cortex patches and cerebral nuclei[22]. It is not my intention to give a more detailed account of this process, neither it is possible for me to

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14 Churchland, Paul, *Plato's Camera: How the Physical Brain Captures a Landscape of Abstract Universals*, The MIT Press, Cambridge, 2010.
15 *Idem.*
16 *Idem.*
17 *Idem.*
18 Bunge, Mario, *Matter and Mind: A Philosophical Inquiry*, Springer, New York, 2010.
19 Churchland, Paul, *Plato's Camera: How the Physical Brain Captures a Landscape of Abstract Universals*, The MIT Press, Cambridge, 2010.

explain it entirely. However, this gives us at least a general account about how brain plasticity has been explained by neurobiological research and how that provides philosophy with a good instrument to deal with problems related to mind. For instance it shows why propositional knowledge is not a necessary feature for non-linguistic cognitive processes and pre-linguistic animals.

Therefore, truth-dependent knowledge is only a particularity of creatures that can use language. This is what Churchland[23] has called third-level learning, a process that is related with the emergence of language in a society that has developed a culture where the symbolic representations characteristic of languages can be distributed. This has been recognized by Bunge[24] as the human possibility of formulating scientific postulates that can represent patterns in the world; in other words the discovery, formalization, and explanation of natural laws. First order laws that are the very patterns in the world, or factual laws in an ontological level; second-order laws, or epistemological laws that correspond to the formalization of first-order laws; and third-order laws that are tested in a cultural level, so the experimental application of second-order laws[25]. This, in my view, is not so far from what Sellars[26] tried to explain as the *scientific image of man* as opposed to the *manifest image of man*. Sellars saw philosophy as the search aimed to conciliating these two images, namely our perspective of the world through our phenomenal and conceptual frameworks with our cultural development, collective creation, and factual findings.

In this sense we are not completely different from other animals when we confront the world from our cognitive maps developed by the two most elemental levels of knowledge. Let suppose that you have a cat that, like most domestic cats, meows in front of its empty (or partially empty) dish and when you give him more food it starts to eat quietly. It is not possible to say very much from this overt behaviour, just that the cat was apparently hungry or that he wanted to eat and he acted according to a habitual routine where you fill the plate every time he meows in front of it. One thing that this behaviouristic approach can tell us is that we cannot give a better explanation of other creatures' conduct by only observing overt behaviour in habitual situations; this includes humans (with the exception of some linguistic uses). If you see the same man taking bus number 176 and no other bus every day of the week, maybe you can assume that he can only use that bus to go to his destination. However, cognitively speaking it is possible to say that both the cat and the

20 Churchland, Patricia, *Brain-Wise: Studies in Neurophilosophy*, The MIT Press, London, 2002.
21 Damasio, Antonio, *Self Comes to Mind: Constructing the Conscious Brain*, Pantheon Books, New York, 2010.
22 Damasio, Antonio, *Self Comes to Mind: Constructing the Conscious Brain*, Pantheon Books, New York, 2010.
23 Churchland, Paul, *Plato's Camera: How the Physical Brain Captures a Landscape of Abstract Universals*, The MIT Press, Cambridge, 2010.
24 Bunge, Mario, *Matter and Mind: A Philosophical Inquiry*, Springer, New York, 2010.
25 Bunge, Mario, *Causality and Modern Science*, Dover Publications, New York, 1979.
26 Sellars, Wilfrid, "Philosophy and the Scientific Image of Man". In Sellars, Wilfrid, *Science, Perception and Reality*, Ridgeview, California, 1963, pp. 1-40.

man *expect* something and that those expectations are based upon previous experiences; they have learnt something from those past events.

Therefore, we can consider that knowledge is something that is happening in the cognitive system of the creature in question, that is (in a broad and not very accurate sense) in the brain of the cat and the brain of the man. What the cat and the man do not consider in the moment of the action is that they act only regarding a possible result; so this result is contingent: you could have run out of food, or the bus could might be unexpectedly diverted. Hence, this cannot be a type of justified-true-belief, because the conditions that need to be fulfilled in order to make true the route of the bus, for instance, can only be met when the bus completes its route. The man only knows this by experience, he seeks for evidence in the environment that can confirm the presence of the bus, in this case the number 176. Extra unexpected evidence could make the man to refrain from his intentions, for instance a sign that says that the bus is not on service. In this respect, what really makes the man different from the cat (regarding knowledge) is that the man can create complex syntactical compositions endowed with semantic content to share information with other members of his species. More elemental forms of knowledge have the same basic features.

Nevertheless, these observations are not arbitrary. They are the result of more than sixty years of research in cognitive science and neuroscience. I think that, despite algid controversies around this topic, the conclusions drawn by many philosophers, including most of the researched works in this essay, are the result of careful observation of and reflection upon scientific findings. I think that this is consistent with Sellars' proposal where the gaps and shortcomings of our manifest image of the world can be supplemented collectively by reshaping our cognitive maps, our scientific models, and our philosophical principles and reflections. Peter Lipton[27] has portrayed this as an external and an internal network, where the external is an aggregation of beliefs that come from the external world, and the internal is the evaluation of and contrast among those beliefs. This is consistent with our first approach (maybe excepting the notion of belief) that considers two levels of learning, plus a third one, that is present due to culture and language. For Lipton[28] what we include in these internal evaluative networks is evidence, evidence from which we can infer explanations.

Considering this, other skeptical arguments, such as the supposed circularity of the abductive (inference to the best explanation) argument or the pessimistic induction, must

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27 Lipton, Peter, "Evidence and Explanation", In Bell, Andrew, Swenson-Wright, John & Tybjerg, Karin (Eds.), Evidence, Cambridge University Press, Cambridge, 2008, pp.10-28. This seems contradictory, regarding some of my arguments based on Churchland's (op.cit.) idea that we cannot understand cognitive frameworks as webs of beliefs in the Quinean sense. However, I think that Linpton's idea does not necessarily imply that the network's elements are sentence-like, Lipton's internal network allows the possibility of other interpretations, including Churchland's prototypical networks. For Lipton, just in the external side of the network, that is the linguistic-cultural side, we can find an aggregation of beliefs; the internal network is an space of evaluation and comparison, similar to Churchland's second-level learning by redeployment.
28 Idem.

not be taken as a "straight right" to realism. The first one has been shown to be a good support for realist[29], though it is non appealing to skepticals because it still supports the idea that our best explanations have good results in predicting and explaining previously unknown successes and phenomena. As Psillos[30] has noted, what really motivates anti-realists to oppose the abductive argument is their rejection of unobservable entities as existents. However, observables would not do better under that perspective, because our representations of the world are already the result of a segmented and transducted senso-rial stimuli. In spite of that, our cognitive maps can still be reliable[31]. Thus, our day-to-day experience, being not less theory-laden than our cultural scientific development, makes several of our theoretical evaluations more reliable than isolated evidence[32]. Regarding pessimist induction, it is possible to say that the failure of old theories does not falsify all their propositions, and the development of a new theory does not necessarily eradicate its predecessors[33] but it constitutes a more fine-grained model that can preserve the accurate elements of old ones.

In summary, the theoretical evaluation of evidence and the assessment and discussion of those theories make them more fine-grained and reliable maps of the world. According to my present perspective, evidence could be used to establish truth-valued explanations in a third-level level of learning, where we can formalize this knowledge. And this process is not radically different in its basis from our day-to-day evaluation of evidence, because when we explain the evidence that we can find in the world using an inference to the best explanation (abduction) we are just extending our basic cognitive models to a more com-plex and abstract representation. Although, what is different, is the possibility of assessing those explanations (that usually come in the form of hypothesis) in the face of: i) their plausibility, ii) their testability, and iii) what they can predict. Plausible descriptions and explanations can be fruitful predictive sources, and when faced with predictions derived from a formalized model with our present models or maps of reality we find coherence in the redeployment of those representations; we have understood something new and reshaped our view of the world. In this sense, predicting (prognosis) by using acquired knowledge is a process that results from all our learning levels; from our perceptual gras-ping of the world to our scientific exploration of reality.

29   Lipton, Peter, *Inference to the Best Explanation*, Routledge, New York, 2004.
30   Psillos, Stathis, "The Present State of the Scientific Realism Debate", *The British Journal of the Philosophy of Science*, Vol. 52, 2000, pp. 105-728, Retrieved December 07, 2014, from: http://www.jstor.org/stable/3541614.
31   Churchland, Paul, "What Happens to Reliabilism when It Is Liberated from the Propositional Attitudes?". In Churchland, Paul, *Neurophilosophy at Work*, Cambridge University Press, Cambridge, 2007, pp. 88-112.
32   Lipton, Peter, *Inference to the Best Explanation*, Routledge, New York, 2004.
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4. Conclusion

I have argued that over our first-level learning processes we do more than just receiving stimuli and processing information and we can search for evidence to reshape our cognitive maps. Hence, when we seek an answer to some problem that is intriguing us, namely a gap or inconsistence in our representation or model of the world, we do not search for knowledge. Knowledge, in this sense, corresponds to those representations or maps. Although this sounds pretty obvious, it is not uncommon to find references to knowledge as something that can be found; weird expressions difficult to interpret, maybe they respond to naive realism (we know things as they are) or to nativist idealism (we had that knowledge in ourselves). On the contrary, knowledge is modeled by searching evidence and rearranging our past models of the world to develop perfected and perfectible representations; including the world-view that we want to develop as a more coherent and reliable perspective to be shared through culture with our society. The most basic inferential and predictive activity allows us to expect this social reciprocity and it give us a ground to search for answers of complex problems: communication.

This last task is not only a personal but a collective effort as well. We do can share our knowledge, not by interchanging knowledge itself, but by behaving intentionally in such-and-such manner, or (more complexly) by linguistically interchanging expressions endowed with semantic content. When we communicate, linguistically or not, we modify others' cognitive activity; namely: we affect or change their neuronal patterns and consequently we can modify their mental representations. During our day-to-day lives we do this constantly, not only among humans but with creatures of other species as well. Philosophy, in this sense, help us to explore and conceptualize these representations, to make them interact and to critically asses them. Furthermore, philosophical activity is discussion as well; so it is a constant process of humans changing others and accepting to be changed by others. With this I am not trying to give a fuzzy conclusion, but to state that when philosophy uses evidence to nurture its task, philosophical problems acquire a new weight and new possible solutions emerge into the discussion; we can seek answers in novel and more complex ways.*

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