UNIVERSIDADE FEDERAL DE SANTA CATARINA

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A CRITICAL REVIEW ON PROBLEMS AND POSITIONS CONCERNING PHYSICALISM.

Florianópolis

2019

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AN OUTLOOK OF PHYSICALISM: A CRITICAL REVIEW ON PROBLEMS AND POSITIONS CONCERNING PHYSICALISM.

Trabalho de conclusão de curso para a obtenção do título de bacharel em Filosofia pela Universidade Federal de Santa Catarina - UFSC
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Florianópolis
2019

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AN OUTLOOK OF PHYSICALISM: A CRITICAL REVIEW ON PROBLEMS AND POSITIONS CONCERNING PHYSICALISM.

Monografia aprovada para a obtenção do título de Bacharel em Filosofia, no curso de Graduação em Filosofia da Universidade Federal de Santa Catarina

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Data da defesa: 03/12/2019

Acknowledgements:

There is a long list of people to whom I own sincere acknowledgement. To many friends in and out of the world of academia, for their ever-going support and company with the necessary relaxing hours. I also thank my adviser Celso Braida for inestimable guidance and constructive criticism, his trained eyes had opened mine for many unseen problems and issues. I further wish to declare my deepest appreciation to my family, that allowed for and stimulated my desire to go after answers to theoretical problems both materially and emotionally. My last recognition go to all professional researchers that I had read, their works prevented many of mine mistakes and their challenges will carry on to enhance the quality of anything I write.

Epigraph:

“We are a way to the Cosmos to Know itself” Carl Sagan (first episode of the television series Cosmos 1980)

Abstract- This Honours dissertation has as its goal portraying physicalism as an alive and well-suited metaphysical ground for the studies of the sciences of mind and brain. It is divided in two parts: the first establishes some of the main tenets of such a position as well as some of the most famous objections against it, e.g the Knowledge Argument, the Zombie Argument and the problem of Mental Causation. In dialogue with the first two objections, there will be presented three possible answers to each, the last one will be dealt with during the second part. The second part is concerned with presenting some formulations of physicalism and to show how they deal with the problem of mental causation. The formulations are: supervenience, realizationist and emergentist physicalism. Some objections to the formulations are discussed. I conclude that physicalism is, indeed, an interesting and promising option, especially the emergentist version, for it offers good empirical corroborations for its claims and, moreover, it gives a wide and clear metaphysical support for the naturalized world view.

Keywords: Metaphysics of mind;Physicalism;Philosophy of mind; Philosophy of Science.

Resumo- Essa monografia tem como objetivo apresentar o fisicalismo como uma fundação metafísica viva e adequada para os estudos das ciências da mente e do cérebro. Ele é dividido em duas partes, a primeira estabelece os principais pilares dessa posição, bem como três de suas principais objeções, a saber, o Argumento do Conhecimento, O argumento dos Zumbis e o problema da causação mental. Em diálogo com os dois primeiros serão apresentadas três respostas para cada, com o último problema se lidará na segunda parte. A segunda parte se preocupa em apresentar algumas formulações de fisicalismo e em mostrar como elas lidam com o problema da causação mental. As formulações são de: superveniência, realização e emergência. Algumas objeções às formulações são discutidas. Eu concluo que o fisicalismo é, de fato, uma opção interessante e promissora, especialmente a versão emergentista, pois ela oferece boa corroboração empírica para duas declarações e, além do mais, ela dá um amplo e claro suporte metafísico para a visão de mundo naturalista.

Palavras-Chave: Metafísica da Mente, Fisicalismo, Filosofia da Mente, Filosofia da Ciência

SUMMARY

1 INTRODUCTION

As the title may suggest, this work is about physicalism, more precisely, it is concerned with investigating the claim that “Completeness of the Physical(CP1): every object is a physical object”. My main objective in this introduction is to clarify some possible aspects of these investigations. I take that one can subdivide the discussion into five great questions based on CP1. The first thing philosophers may disagree is concerning the scope of the “every” operator if it talks about “every possible object”, “every existing object”, what kind of possibility is taken to be relevant to that claim and how is existence to be interpreted in this context.

Secondly, one may question what kind of different relations the “is” above is meant to be interpreted as. Sometimes, as would be the most standard interpretation, it is an identity claim which would guide us to the Identity Theory on the mind-body problem. However, many take the “is” to be a placeholder for relations such as supervenience, emergence, realization or constitution. Every one of these different relations has many sub distinctions and multiple formulations.

The third question raised by that claim is quite clear: what does it mean for an object to be physical, or, simply, what does “physical” means. This third problem may be the simplest to state and, on the other hand, it seems one of the hardest to solve. Yet, to explain it is indispensable for any physicalist theory that has some interest in been intelligible.

The fourth question is also straightforward and equally fundamental, however tricky: What should be considered objects? Only the physical theoretical items? Only the phenomenological data? Should a physicalist be an anti-platonist for mathematics? And so on. This question regards the more profound ontological commitment of the CP1 thesis.

The last question is also the most obvious of all and yet it is only meaningful after the others have been sorted out with sufficient clarity: can we find a way to define and organize the nuclear parts of the physicalist claim in such a way that it is true? How could we know if it is true? What would be the consequences of such a claim being true?

After analyzing the physicalist claim above, I shall explain how this work will relate and deal with such questions to make a defence of physicalism, a very brief defence, I must add.

Before that, notwithstanding, I must make a quick methodological remark: there are vast amounts of papers and books discussing the related aspects of the questions mentioned above, knowing that must obligate us to be humble, however noble and to remember the reader that none of the issues settled here are settled. None of the topics will have an exhaustive review. I will try to focus on those authors who lead or established the discussion and point toward dissidents of those positions as much as I can. Of course, that deciding which are the leading exponents of some views is not an uncontroversial matter. Yet, I have tried to follow some manuals and introductory books as much as the current opinion on recent publications, thus, avoiding choosing only due to my personal opinion and preference.

After acknowledging our limitations, let us proceed without further ado. The two parts of this paper are going to deal with different aspects of those questions. Some of the proposed answers, however, presuppose the fixation of the others. For example, when examining the scope of the “every” operator one would profit from already knowing what “object” is, otherwise it would be almost meaningless to work out the operator not knowing what it is operating on. The first thing we are going to do, then, is to present how we will use the word object in the physicalist claim. We must differ, however, between Stong, General, and Weak physicalisms. According to the first “object” means almost the same as “referent” and “physical object” must be taken as

a different property, not only the conjunction of “being physical” with “being an object”. So we could reformulate the claim as:

Strong Physicalist Claim (SPC): “every referent of a denotational term of a language, either does not exist or is a physical object.”

SPC would require that entities, numbers, identity, relations, propositions, etc. are in some, maybe not so clear, way physical or have some sort of relation to physical things. The relations may be diverse or indirect, but there is always a sense of dependence or grounding. Using David Chalmers’ jargon, once we fixed all the physical, we would have fixed everything simpliciter. (CHALMERS, 1996, p. 38). Of course, I am just sketching a possible way of seeing such a position. The claim by itself is unsustainable, and it must come with a well-developed background theory that answers all of the previous questions to be acceptable. We shall address these demands below throughout the chapters, so let’s keep it aside for now and proceed to General physicalism.

General Physicalism Claim (GPC) is, as the title insists broadly hold. There is no single unity on its grasp on the nature of objects. One could call it the “we-know-intuitively-what-objects-are” view. I can only give hints on what “object” may be to this that is the most famous way of dealing with physicalism[1]. Apparently, the standard way is an appeal to intuition taking “objects” as a primitive of the theory and move on. John Heil appears to think[2] (HEIL,2003, p.169) and I agree that this intuitive view is probably a mix up between mechanistic corpuscular theory and everyday use of the term “object” to designate material things, in particular, those with determined characteristic[3]. That would indicate that fields (in the quantum mechanical sense of field) and processes (in both the ontological and ordinary

[1] See: STOLJAR, 2010 in SEP. Particularly in there they will avoid the problem by removing the term “object” from the definition. So their claim stands as “Everything is physical” this compact manner may be more elegant, but I take it to be equivalent in both pros and cons.

[2] In his book he starts his brief discussion on what objects are by assuming the view to show it to be wrong. I think this mode of presentation has the rhetorical objective to criticize what is most hold, in order to create space for his proposal, hence, I take that he agrees with me.

[3] For those interested in Cognitive Sciences, perhaps we could add that the prototypical “object” is medium-sized, material continuants. For a brief exposition on the prototypical view on concepts Cf. Margolis, 1999, p. 27-43.

senses) are not objects. I feel[4] that processes for those who defend this position are constituted of objects, which would reinforce the corpuscular roots of such a concept. In spite of that, I think that if one asks a physicalist whether fields are objects, she would say “yes”. If this supposition is correct, it makes the intuitive ground too much ambiguous. It is, at the same time, similar to what I have said and it differs according to the intuitions of the philosophers without clear exposition about changes, that inevitably leads to doubts on what CP1 is saying and that is very problematic.

By avoiding the discussion, as it appears to frequently happen, of what is an “object” and taking the apparently easy way out, one may fall in the following problem: assuming that physics determine the objects in some loose sense. Thus, objects are composed of fermions and bosons interacting accordingly to forces or something like that. Great! But, then, physicalism is a tautology. Obviously, if one defines “object” in terms of physics the “physical object” will not go very far and also relates very closely to such scientific theories. Hence the definition would be circular. What we want with physicalism, as a theory, is that the more general predicate “object” relates itself to the more restricted one “physical object” in such a way that we learn something when declaring the existence of such relation. We would profit from observing that SPC does offer us that. It may not go deep on the ontological aspects of the “object”, but it is quite simple to know what an object would be. The third option, Weak Physicalism, says that every referent that is taken to be causally powerful is physical. Thus:

Weak Physicalism Claim (WPC): Every item of the reference domain of a language is a physical object. Considering a domain of causally powerful things.

This position is consistent with the postulation of many entities that the first one rejects or grounds in the physical. There may be propositions, numbers, etc. existing in their realms. Only the causally efficacious must be physical. This option gives answers to the scope-of-the-operator question; it is evident that is not every possible object that would be physical, for a contingent non-causal thing may exist. It would,

[4] Unfortunately I cannot know precisely what are the intuitions of other philosophers, they change way too much.

however, swift the discussion from what “objects” are to what “existing” means. Many would not accept that the friendly ghost that lives with me, albeit invisible and absolutely out of causal powers, actually exists. Numbers, on the other side, are very existent (to most people) and this is the most relevant case in which the first and the third positions differ. It is unlikely that numbers do not exist in any sense. If both sides accept this premise, one of them must go after a physicalist way of explaining the existence of mathematical objects[5] and the other, the Weak, would not have any problems.

In the next pages, I hope to open room to Strong Physicalism, yet, most of the time, because this is a critical review, we will investigate the General Physicalism that is the most widely spread. The Weak Physicalism will be examined in the second part, for I take Realizationist physicalism to be a member of such a theory (see chap.7). Beyond that, all argument presented will support only Weak physicalism, for the strong version would require a long digression on ontology and those are not in the scope of this paper.

Now, let’s proceed to other aspects of the discussion on physicalism that are directly linked to the arguments against its truth. Explanation, description, reduction, and elimination are widespread terms in this literature. The first thing we must observe is that explanation and description are epistemological and linguistic concerns; a reduction in both epistemological and ontological and elimination is a reduction in an extreme form.

It’s easier to explain elimination and after that to explain the others in contrast. According to eliminativism, there isn’t anything except the physical. The truth-value of the claim “I am feeling pain” is wrong because “pain” does not exist. The correct claim would be “there are such and such complex phenomena happening to me, that activate such and such receptors that I associate with pain”. Eliminativism can be coped with retentivity, that is, accepting that special science (sciences other than physics) are true. But it would require a different notion of truth, a contextual or local notion, the stronger sense of truth can only be given to physical descriptions or explanations. Elimination says, then, that there only exists the physical, so the only

[5] Which they have gone after see: Cf. Szabó, 2003, p. 117-125

factual description is physical, the only adequate explanation is in physical terms and everything that is not already in terms of physics can be

reduced to be only physical and to research and study the reduced object, we must go after the study of the physical parts; all those requirements are in principle. Proponents of this position are well aware of the practical impossibilities they face, but the eliminationism is rather an epistemological and metaphysical guideline than a description of successful investigations[6].

Reduction is vast in its aspects, and it can distance itself a long way from total elimination, using the previous concepts we can obtain that one can reduce descriptions, explanations, and phenomena. Passing from one kind of reduction to the other frequently causes problems so let's evaluate some differences.

One can take that physicalism says that every description of a particular fact can be reduced to a physical description, i.e. a description of the vocabulary of physics (present-day physics or future hypothetical physics, that does not matter now). This is a strong claim and, as we will see, is what motivates the Knowledge Argument in Chapter 3. A description can be as long as one wants, and it may not be understandable by humans. One may create a computer to describe in a binary language all the words found in this paper (something that my laptop had already done to process my commands) and print it. The result would be a description of a text that another computer could read, but no humans would be able to. Also, given a perfectly unambiguous language, a magical creature could use it to describe every phenomenon that happened in the world in a finite time, but it would be unreadable by humans. The critical remark is that descriptions are just representations of a given event in a language; they have no mandatory connection to understanding or the cognitive capacities of any subject. This is not a definition, for sure, but it is enough for our purposes.

Another option that is similar to this one is that one can say that all explanations can be reduced to physical explanations. It is hard to get precisely the implications that this assumption inspire, for what exactly is an explanation isn't

[6] Of course that the defenders of this view have a rather more sophisticated story to tell. Yet so, I have shown the broad lines of how most people use the term and to what view they associate it. For good defenses see: Churchland, P. M. (1989)

obvious[7], yet so, we can follow Hempel and assume that explanations provide us with correct expectations for some phenomenon, in other words, the least that an explanation must offer to us is that if correct we can expect a phenomenon to occur in a specific manner (WEBER, VAN BOUWEL, DE VREESE, 2013, p.4). Even accepting only these criteria, which is insufficient, we can already see that, without further development, the reduction of all explanations to physical explanation is unobtainable. For if we try to explain how cells multiply using only the vocabulary of physics, humans would not understand what would have been said. Moreover, attempting to develop such a physical explanation would, probably, take too long for such endeavour to make sense. If one accepts that explanation is related to understanding in some sense, the increasing complexity of the phenomenon will prevent us from going back to physics whilst trying to explain it. Accordingly, a view that challenges that all explanations can be reduced to physical explanation is presented by the Emergentist view (Chapter 8).

There is, nonetheless, another sense in which physicalism may be reductionist, i.e. the ontological sense. One can say that a given kind of entity is reducible to another type of entity. In this case, we are not talking about conceptual, nor propositional relations, but about how the objects of our world relate to each other. I take this to be the most crucial sense on which physicalism is required to be reductionist.

We must now contrast the different forms of reductionism if we have a true descriptive reduction we would also have, given a correspondentist view on truth, a reductive ontology, for the ontology would have to carve the world in its joints so it could be a true description. That also implies that the object toward which the description relates is a physical object. However, the explanatory reduction is stronger. It would imply all the others given that an explanation always occurs in a given language, and that would require a description. Supposing the truth of that explanation, for the same reason as above, the ontology should also be reductive. But, for the reasons stated above, an explanation is more restrictive than a description given the cognitive aspect involved. One could use the laplacian

[7] For specialized discussions on the topic see: Fetzer, 1981 p. 77-175 and for a critical introduction see: Weber, Van Bouwel, De Vreese, 2013. The whole book is dedicated to the topic.

calculator as a useful heuristic device. A laplacian calculator is a magic calculator that once completely fulfilled with perfectly precise laws of physics and complete information about the initial conditions of any given system (perhaps the whole universe) it could predict the behaviour of every part of the system in any instant of time. That, of course, assumes determinism and a reductive ontology. The calculator would use finite but colossal amounts of steps to predict all the positions of all the particles in the system. The mathematics would very likely occupy billions of lines. It would be a perfect description of all the things physical, but it could not be an explanation of how the system would behave, at least not for the humans, for we arguably would never be able to understand the results.

As said I said before, the "understanding" criteria is a rather weak one. There must be more about "explaining" than merely "being understandable" and "linguistically expressible", I am taking those, however, as necessary conditions and relying on them enhance the distinction between description and explanation presenting a stronger critique on the request for a reductive explanation.

What is left is to show how we could obtain an ontological reduction without descriptive reduction. For us to do so, it would be convenient to see again the heuristic device above and draw some distinctions. We need to distinguish between propositional descriptions which we will take to be comprehensible-by-humans-now descriptions (henceforth CHN-descriptions) and absolute descriptions. In this movement, I am not only adding arbitrary limitations to the concept, because we have actual computers processing equations that humans would never be able to process, and processing descriptions of different phenomena that are too detailed for humans alone. Nonetheless, I do not take the computer's description to be an absolute description. I accept that, in principle, a human being could understand parts of such descriptions and thousands of humans may get the whole meaning. Furthermore, the computers may be wrong in their processing (at least because we can be wrong while programming them).

I take an absolute description to be a metaphysically true description of the world. Now, we can say that there is no CHN-description in physics that could reduce a phenomenal description or a social description, or a biological description, so on and so forth, but that is different than saying that there is no absolute

description in physics that could reduce such phenomena. The absolute description is the ontological one. We cannot move from the lack of CHN-description to the lack of absolute descriptions without further arguments. The existence of reductive absolute descriptions is an important claim of physicalism.

Absolute descriptions are unattainable because the languages humans use and understand, require high levels of vagueness or abstraction to be actually useful. We can qualify objects by proper names, but then we allow for significant physical variations, and hence, considerable vagueness on the objects named. Or we can go to an exact language that does not apply to any individual in particular, which would be the mathematical languages. An absolute description would need to be particular and precise, absolutely of both. In chapter three, we will investigate the Knowledge argument for qualia, and there we will make use of this discussion on descriptions and reduction.

To conclude this part, we can briefly talk about ontological reduction. The very idea when one says that x is ontologically reducible to y is to claim that when having y one already have x. There is nothing over and above y that composes x. This will be important ahead, in chapter 4, when we address the definition of materialism given by David Chalmers and can make some difference in the overall understanding of the discussion[8] .

The first part of this work is concerned with giving an evaluation on the question "is physicalism true?"; the second chapter is a straightforward defense of the position. What the literature takes to be the "minimal physicalism" is sketched. Subsequently, I had argued that the position is consistent; that it has been proven as a fruitful metaphysical landscape in which to develop the methodologies of the natural sciences and also that the efficiency of such sciences gives indirect evidence for the truth of physicalism. I attempt an argument that tries to show that substance dualism is inconsistent with current physics, and this closes the second chapter. The third chapter is focused on the Knowledge Argument where we present how qualia may undermine physicalism, I show objections to this argument and move to the

[8] On the topic of reduction, Hohwy & Kallestrup (2008) offers a series of short texts discussing various points on the reductionist literature.

next chapter where I deal with the Zombie Argument again; objections are given to complete the chapter. The fifth chapter, and last in the first part, introduces Jaegon Kim's Supervenience Argument, which plays against mental causation. If successful, it shows that mental causation is impossible if one accepts three principles that Kim takes to be very plausible. The argument exposed, but no objection to it is shown in the chapter, for such will be one of the objectives of the second part of the paper.

The second part consists of presenting variation to the minimal physicalism that escapes the problem of mental causation. The sixth chapter is used to show how Kim intends to generalize his arguments to physicalism as a whole based on extending the Supervenience Thesis to other forms of physicalism. After that, I criticize the notion of supervenience and its use in the context of the philosophy of mind. The seventh chapter presents Andrew Melnyk's Realizationist Physicalism. I show how his position answers all five questions above and how he escapes Kim's argument. Criticism also follows the exposition. The last chapter is devoted to Emergence Physicalism. The evaluative process is the same as before, showing how the position answers to the questions and how it avoids the supervenience trap. I present some critics to the position but still endorse it. The conclusion tries to reinforce that physicalism is a very alive position and that most of the arguments against it are not well funded.

Part 1:

PRESENTATION AND PROBLEMS FORM MINIMAL PHYSICALISM

2- Minimal Physicalism:

As stated before, Physicalism can be seen as the broad thesis that every object is a physical object. This thesis is just an underlying assumption, and no theory in today's discussions could be summarized only by this claim. They always state a few more conditions and many more explanations about how we are supposed to understand the world to the above thesis to make sense.

Physicalism finds little objection when the nature of geology, biology, chemistry, etc. is concerned. The problems arise in two fields: physics (ironically). In the several inquiries concerning human activities, for example, Arts, sociological and political behaviour, economics and perhaps linguistics, nonetheless, the most significant source of problems for Physicalism is psychology and all sciences of the mind. Physics offers difficulty when we are concerned with giving an account to deal with laws of nature and the ontology of space and time. Laws of nature can hardly be understood as objects (in the intuitive sense). Yet, they have a vital role to play in our scientific explanations of the world, and thus, in understanding Physicalism. Yet, notwithstanding, copping laws of nature with Physicalism is a hard metaphysical problem. What does it mean to say that a Law of Nature is a physical object? Or if it is no object, what are they?

Still, in the physics domains, the ontology of space-time (following the General Relativity)is a problem for the Physicalism because most accounts of 'physical'

depend directly on a Spatio-temporal relation of objects and the intuitive understanding of 'existence' is attached to space and time, in a great variety of ontologies. Frequently, physicalist denies the existence of objects by merely saying that they are not in space-time, or define the objects that they think that exist by appeals to spatial-temporal existence.[9]

Of course that non-physicalist views cannot claim victory due to those problems, given that a traditional vision of abstract entities is "things that are not in space-time" which, without further explanations on the nature of space-time, is as empty of meaning as the physicalist claim would be.

These problems are, no doubt, essential ones, and physicalists should find good answers to them. But that would require a lengthy investigation on the philosophy of physics which is not the point of this work. Here we are concerned with the philosophy of mind and the problems proposed by the other field of knowledge above mentioned, i.e. the investigation of humans, and more importantly, their cognitive powers. Those are, without doubt, the most significant source of problems for Physicalism (in a quantitative, not qualitative, comparison). The hardest of which is the Hard Problem of Consciousness (CHALMERS, 1996, p.1-28), that is, how could consciousness arises from purely physical entities. Other problems are less complicated but are still puzzling. We will deal with the latter, mostly because there are few, if any, reasonable answers to the Hard Problem[10] and to dive into it would lead us astray in the mind-body problem that is not our main concern. Yet, I must make some preliminary comments: the debate concerning whether Physicalism is or is not the case is different from the Mind-body problem debate. They, however, are tightly interconnected, and some positions in the mind-body discussion are due to some standpoint on the physicalist debate. For example, cartesian dualism is incompatible with all physicalists positions that worth its name, functionalism can be

[9] This point is further sustained and explained in Cf. Texeira, 2011, Chapter 3 of the online edition. In this moment I am only introducing the overall rationale of the problems of physicalism.

[10] That is, most philosopher that claim had solved the problem had actually dissolved it. For a claim of solution see: Daniel Dennett's "consciousness explained" 1991, see also Paul M. Churchland "a Neurocomputational Perspective" 1989. For a skeptical position regarding the explainability of consciousness in terms of the physical see: Chalmers "The Conscious Mind" 1996; Jaegon Kim, "Physicalism, or Something Near Enough" 2008. For historical and contemporary discussion about the methodology applied in studying the mind and consciousness see: Owen Flanagan "the Science of Mind" 1991.

copped with dualism, but is usually taken as a physicalist alternative for the problem. Due to this fact, this work is not going to focus on the mind-body discussions, and their peculiarities will only be mentioned when requested for an explanation.

Most authors include some thesis as to form the minimal Physicalism. One of the most important is the principle of Causal Closure of the Physical, the Exclusion Principle and the Supervenience Thesis (STOLJAR, 2017) [11].

The Causal Closure of the Physical (CCP) says that every step on a causal chain either is a physical object (or property, process, event, etc.) or is realized by a physical object. That means that no matter how far in time we advance or return if we consider a causal chain, all its parts will be physical. (KIM, 1998, pp.32-7 adapted), in other words, every event (object, property, etc.) that has a cause has a physical cause.

The Exclusion Principle (EP) says that: "If an event e causes event e*, then there is no event e# such that e# is non-supervenient on e and e# causes e*" (STOLJAR, 2017). That means that any event has only physical causes.

The main difference between the Exclusion Principle and the Causal Closure Principle is that the latter affirms that every object has a physical cause. Still, nothing guarantees that besides the physical cause, there wouldn't be a non-physical cause. The Exclusion Principle claims that if something has a physical cause, it won't have any other causes, but it does not guarantee that everything has a physical cause. Those two claims can be put together, no doubt, in as much as one can accept either one of the statements and reject the other, it's common to separate both to facilitate the analysis of Physicalism.

The Supervenience Thesis (ST) has found mainstream acceptance as entailed by all kinds of physicalisms (see Chapter 6); however, some theorists may disagree on this (see Part 2 of this work). For now, we will follow Kim (KIM,1998, pp.20-7) and pretend that every physicalist position accepts it. Here, I shall introduce the principle in the context of the mind-body debate. Nevertheless, prima facie it can be generalized. The principle is as follows:

[11] Here we follow both Stoljar and Kim (Kim,1998,pp 1-27) , this however is not uncontroversial and in the second part of this paper we will discuss why supervenience is held here and why some authors deny it.

Mental properties supervene on physical properties in the sense that if something instantiates any mental property M at t, there is a physical base property P such that the thing has P at t, and necessarily anything with P at a time has M at that time. (KIM, 1998, pp.10)

Determinism is sometimes accepted as entailed by Physicalism in addiction to some views on the ontology of laws of nature. Still, we will leave this debate aside.

To get the discussion on reduction more directly in our context its usual to distinguish Physicalism in a few groups. It can be non-reductive or reductive or eliminative. Reductive Physicalism asserts that every mental phenomenon can be explained (described or "just be") as a brain phenomenon, at least in principle. That is to say that mind operations can be reduced to brain operations. Of course that the non-reductive will claim that they can't, not because of any substantial ontological difference, but because their behaviour is different, or because of some fundamental epistemological difference. For the non-reductive physicalist, there are only physical things; nonetheless, they can have aspects not reducible to physical description[12]. The eliminativist claims that there is no such thing as a mind (ontologically speaking). That is, there are only brains and their operations. The mental is, then, just the brain operation seen from a different perspective by another brain. For some emergentist, one can be a reductionist and yet not an eliminativist, the mental has an emergence relation to the brain. For the non-reductionist, supervenience or realization is usually seen as the main kinds of the dependence of the mental to the physical (however, see chapter 7 for Reductive Realizationism). This is just a sketch. In the following section of this chapter, the concepts and differences will be analyzed in more detail. For now, I just need the reader to be aware of these distinctions in the mind-body problem debate.

Now, the critical question is: is Physicalism true? Two arguments may be found to sustain the affirmative answer, the first is known as the "The Argument of

[12] However, Gustavo Leal-Toledo claim that every non-reductive physicalist is a {“disguised dualist”} See: (Leal-Toledo, 2018, pp.95-118). Some non-reductive physicalists accept a dualism of properties (Kim, 2008, pp.22)

Causal Closure" it assumes the Principle of Causal Closure (no surprises here), the plausible supposition that mental events cause physical events and the Exclusion Principle above. The argument can be put in the following way (STOLJAR, 2017)[13]:

1- Every event that has a cause, has a physical cause (CCP)

2- A mental event can cause a physical event

3- There are no non-physical causes that act over physical events (EP)

4- If mental events can cause physical events than mental events are physical events or supervene on the physical

5- Mental events are physical events or supervene on them

6- If minds are physical or supervene on them, Physicalism is true

Therefore: Physicalism is true.

The first premise comes directly from our definition of minimal Physicalism. Kim defends the second premise as a necessary feature of our explanations concerning the relations between physical and mental. Otherwise, we wouldn't be able to explain some phenomena as human agency, subjective price in the economy and many others. We just happen to have the strongest of believes that our mental deliberation is related to our movements and actions, and that is what is at stake in denying premise two (KIM, 1998, pp.31-2). But defend how that can happen is a troublesome question that we will discuss later (see chapter 5). Premise 3 also comes from the definition of Physicalism. Premise 4 follows from 1-3[14]. Premise 5 follows from 2 and 4 by Modus Ponens and, finally, premise 6 comes from the reasonable assumption that the non-physicality of the mind is the best counter-example against Physicalism and that if the argument proves that minds are physical or supervenient on the physical the best counter-example would fail to deny Physicalism, we must add that the kind of Physicalism proven to be true is the Weak reductive kind. Many authors find independent reasons to doubt whether 5 is true, the most damaging attacks come from the Knowledge Argument, the Zombie Argument and others that try to show that the mental is irreducible to the physical, if

[13] I am only canonizing the argument found in the indicated site.

[14] One way to show this is by RAA, suppose 1-3 true and 4 to be false, than minds would not be physical, but by 2 they cause physical events, which contradicts 3, therefore 1-3 entails 4.

not the mental, at least the phenomenal[15], these lines of reasoning entails the denial of 3 and put to an end the minimal thesis of Physicalism. More on that later.

If we are honest, we have not proven any kind of Physicalism to be true. The above argument had been extracted from Stoljar in his entry on Stanford Encyclopedia[16]. But I don't think that one can, indeed, prove the truth of a metaphysical position. The very best one can do to show that it is plausible, consistent, thus, more generally, to make a good case for its acceptance. The plausibility is given by the premises, which a dualist would already reject[17] the upshot of the argument is to show that it is consistent with maintaining Physicalism and mind reductionism. Note 17 indicates that the non-physicality of minds is inconsistent with the principles of Physicalism, as desired. That is what had just been proved, although the argument does increase the plausibility of the physicalist doctrine. David Papineau takes a version of this argument to imply the acceptance of Physicalism. But he also notes that the most one can expect to compel by what he calls the Causal Argument is the WPC (see introduction). I take his observation to be correct. Non-causal objects are not affected by this argument.

The second argument offered in SEP is called "the argument of Methodological Naturalism" can be seen either as an optimist meta-induction or as the consequence of Quinean metametaphysics. It is as follows:

1- It is rational to be guided in one's metaphysical assumptions by the method of natural sciences

2- The metaphysical picture of the world led by natural sciences is Physicalism

3- it is rational to believe in Physicalism

Hance physicalism is true.

This argument is due to Stoljar in his entry in SEP, but, despite the author's opinion that this is a stronger argument than the previous, I take it to be much less appealing. I do endorse premise one. On the other hand, In today's discussions on

[15] David Chalmers concedes that much of mentality can be reduced to physical description. That is what he calls psychological consciousness, and yet, he is a dualist because the phenomenological aspects of mind are, according to him, irreducible. Cf. (Chalmers, 1996, pp.10-12)

[16] For a similar argument see: Papineau, 2001, p. 9

[17] For an analysis of the possible outcomes of the rejections see: Papineau, 2001, p. 9-13

the metaphysical foundations of science, there had emerged plenty of objections to the Quinean standpoint (ARENHART, 2012, p.339-356). One of the strongest is the subdetermination of metaphysics by physics. Especially in the contexts of Quantum Mechanics, there are a lot of mathematically and experimentally equivalent theories that put forward different and incompatible views of the world (KRAUSE, 2017, p. 148-9).

Even though it is rational to accept a metaphysical picture of the world according to natural sciences, I suspect that the use of 'rational' is problematic, mostly because I do not think that "it's rational to believe that P" entails "it's true that P". I do believe that, in the natural language use of rational, there can be found a lot of moments in which a rational belief is, still, wrong. I do suspect that Aristotle's Biology had been rationally developed. Still, I also believe that natural selection and further developments in evolution theories had shown his teleological view of biology to be equivocated, and thus, much of his conclusions on the subject.

I will present my version of the above argument in a less Quinean view, based on some examples found in the history of science. We will consider the advantages to scientific development made by the victory of cartesian mechanism over the Aristotelian framework and from that extract a view over the best stipulation we can make about how the entities in our world are. After that, we will proceed to show that a two criteria methodological standpoint can be called to rule over contemporary scientific theories and, at last, claim that Physicalism entails this successful view, giving it an embasement.

The first thing to be done to defend this argument is to discuss the historical and epistemological victory that mechanism had over his metaphysical competitors, in particular, Scholastic Aristotelianism. This discussion is supposed to exemplify a distinction that will make clear some of the characteristics of modern sciences that make it successful and what are the relation of those to Physicalism. Hopefully, this analysis may bring some light in explaining why, more precisely, the natural sciences are related to Physicalism in a way that the previous argument had not shown.

Daniel Gerber in his chapter on the compendium "Cambridge History of Early Western Science Vol 3" (Gerber, 2008, p.22) wrote that the Aristotelianism in the sixteenth century was not a pure form of it. Some of its core points had been

changed due to Christian dogma, theology and the medieval discussions. The Aristotelian framework is not, no surprises here, a homogeneous one. Different interpretations were as common then as now. Nonetheless, the framework had some unchanged characteristics among its followers and exponents, at least in didactical grounds. The Jesuits' Ratio Studiorum from 1586 was a common ground. This document is a "studies guide" that made the teaching of Aristotle's doctrines a somewhat inescapable routine across universities

"Aristotle's Logic, Metaphysics, Natural Philosophy was to be followed," said the Ratio and that was a useful way to guarantee a unified formation across a great many universities. The history of Aristotelianism is enormous, and there is a lot of different doctrines that share the same space under this name.

Yet, our concern is not related to an exegetic view, but with a methodological one. Because of that, we will follow the presentation of the Aristotelian framework as given by Gerber and point out those observations that, as it is hoped, are overwhelmingly common throughout metaphysical and natural philosophical accounts, especially those derived from Aristotle (but not only).

We start by exposing what was called then (in the XVI-XVII centuries) "physics". This area of enquiry occupied a significant part of the natural philosophy and had dealt with the natural way of things. For example, the nature of bodies is to go toward the centre of the world. Mechanics, on the other hand, had dealt with core notions concerning how to avoid the actualization of the natures of the bodies, in the present example, how to lift the object of the ground.

The physical domain is constituted by Primary Matter, Substantial Form and Privation. The first is what underpins identity to an object; in other word, it allows a substance to change without becoming another thing. The second is what guarantees that an object is the kind of object it is, that could be seen as the embodied idea, the very point that made Aristotelianism a non-Platonistic approach. And, the last, the part called "Privation" is the lack of some properties that allow for the substance to acquire new properties(GERBER, 2008, pp. 24).

He follows pointing that every object, according to Aristotle's followers, are made of four elements: Air, Water, Fire and Earth. Each of them has a pair of characteristics, that is, Water is cold and wet, Fire is hot and dry, Air is hot and wet,

and Earth is cold and dry. However, those are the properties of the sublunar world. The moon and all above it, are made of a different, unchanging element called "quintessence".

Now, I intend to show where the methodological problem with Aristotelian positions arises. Two points are to be the centre of the problem: a large number of entities taken to be irreducible primitives and a large amount of purely intrinsic properties.

Apparently, almost all explanatory gaps are fulfilled by the addition of an entity whose only reason to be postulated is to fill the gap. Ockham's razor wouldn't be a trouble. Those entities were not posited without reason. The problem is that we have no reason to suppose that we can further explain the world beyond the entities. They are fundamental because all visible phenomena had been explained and that's all.

Nonetheless, we have no "cause-effect" framework. We have a purely qualitative explanation. We cannot use Aristotle's physics to describe how a future event in particular contexts will behave, mostly because that is not what the philosopher wanted. There doesn't seem to be any instrumentalism in his reasons for enquiring over physics. The non-instrumentality is not a problem on its own, and that might be only an interpretative misconception. Still, the real problem is that the entities as the Substantial Form or the Quintessence are doing their jobs someway, that, because they are basic, we cannot further know.

Quintessence is perhaps the best example. Planets didn't seem to change. They move in circles not in lines, etc. Planets didn't seem to be as other entities, and hence, with no further reason, they are made of a different element. Problem fixed. But we learn nothing about what others aspects the different element present to the celestial bodies and we are not even entitled to ask because the difference is based on a way things are in virtue of their very nature. The methodological aspect to be seen as wrong is the very notion of *explanation*[18] that Aristotelian tradition holds.

The second point is that they focused too much on what things are and too little on how things relate, We cannot know why quintessence does not corrupt, why it makes celestial objects to move in circles instead of lines. And more importantly,

[18] a full-blown account on “explanation” is not the concern here, but one must be given in order to make from this argument something more than a sketch.

we cannot know how to compare some object's tendency to move toward the centre of the world with other object's tendency to do the same. The tendency is given by nature. There is no further claim about it. We may say that more massive objects will move faster toward their positions, but that precludes exactness. That precludes mathematical precision.

From now on, I will call the physical interpretation based on dismissing explanatory gaps by the mere addition of new intrinsic properties without a precise determination of the relations among objects a "qualitative ontology". Of course that Aristotle is the main expositor of such a physical ontology, but he is, by no means, the only one.

In comparison, Robert Boyle gives very clear, empirical characteristics of the Universal Substance, identity criteria for objects to be natural bodies; for example, it must be extended, divisible and impenetrable. At least one of its parts must be capable of motion. Its smaller parts must have at least two properties, that is, magnitude and shape (GERBER, 2008, p. 43-44).

The pure qualities of objects must be explained by appealing to the size, shape and motion of basic constituents. Governing these constituents, there are the laws of nature which, although obscure in terms of intrinsic nature, are not only knowable but mathematically describable. They must only to be taken as insurance of the regularity in the world, and that is enough for the basic framework of mechanism.

It, indeed, may say very little, by itself, about how the world is, nonetheless offers us some advantages. First, it put mathematics right in the middle of natural philosophy. The benefits concerning mathematics are many, but to cite two: it gives a precise definition of the debated terms, and it makes it easy to determine if an account of physics was right or not. Second, it does say a lot to us about how the world behaves and how to predict the behaviour of things without needing to go by test and error every time (although trial and error take frequent place on labs)

Together with mathematics, Boyle's criteria above are all observable and can be precisely determined in terms of an objective measuring method. This also favoured the discussion, facilitating the refutation of theories. That cannot be done for most of the Aristotelian claims above. Let's call this kind of ontology whose

entities are postulated given dispositional (or relational) properties that are mathematicallyDescribable in relation with other entities of the theory and among objective measuring devices “quantitative ontology”.

We must stop and say something about why I am calling this an “ontology”. I am following Krause (KRAUSE, 2017, p. 15-7) in saying that the demarcation between ontology and metaphysics is not well drawn. Either way, the problem is “how to pass from a methodological commitment to an ontological (or metaphysical) thesis. The rationale behind the passage is the following: before making a theory, one must establish some presuppositions concerning the object of inquiry. One of them is if we can study the object by methods of measure or only by rational abstraction. That is largely an epistemological presupposition, but it is accompanied by an ontological (or metaphysical) one. When we say that entities are mathematically describable, that says something about the way things are. When we say that everything has some characteristics that are known by thus and such a method, that is both an ontological and epistemological intuition. So when one insists on saying that an object has some characteristics by nature or by relation to others, we are making an ontological claim. Hence, my point is about ontology, even if it is also about methodology.

A simple example can be found in Isaac Asimov’s “A Short History of Biology” were the ancient greek physicians tried all kinds of sacrifices to cure people. Their background ontology was one in which gods caused the diseases. Their healing method would have proven adequate if the god were like they thought they were and if they existed. However, what Hippocrates did was a subversion of that ontology. He took that health is connected to a metaphysics of “humour” and of equilibrium. His healing strategies consisted of not doing much, and that was utterly better than making people drink bizarre liquids and be near decomposing animal sacrifices. (ASIMOV, 1980, p. 1-10). This is clear evidence that the methodology and the metaphysical presuppositions are interconnected. The success of a given methodology is indirect evidence of its adequate capture of the world because it would only guide one’s actions to the desired goal with sufficient justification if it is right about its predictions and those predictions are claims about how the world is or will be. Yet, the more detailed one gets in the metaphysical aspects behind the

methodology in question the least one is well-evidenced given only the success of the methodology. For many different explanations could be brought to compete as the adequate metaphysical explanation for the success. To illustrate, the humour theory is only correct in respect of the body needs for balance and rest. Those are the very general aspects of the theory. Those are consistent with numerous details that could compete as the metaphysical explanations for why balance and rest are needed. We are well evidenced in believing that balance and rest are good for health, but we are increasingly less evidence to believe in the particular details about the theory of humour. That's why I take that quantitative ontologies are justified by the empirical success mechanism had found, but mechanism in itself is not.

It's not only mechanism that enters in the "quantitative ontology" party club, Alchemy as conceived by Paracelsus (GERBER, 2008, pp.29-33) could also enter in this group. In current physics, all opposite theories to collision mechanics, such as electrodynamics, are also quantitative ontologies. I hold, for the sake of argument, that if such ontology becomes mainstream in the scientific academies, it tends to spread better description of reality, even if the first theory postulated in this scheme happened to be completely flowed, for the above reasons. The point is not about particular theories. It is about a way of taking the objects postulated by the theory under consideration. It is, thus, both an ontological and a methodological claim, as I said above.

I cannot give much further historical demonstrations that quantitative ontologies had made important progress, for it is not the point of this work to try to settle such a hard question[19], so I will limit myself into pointing one more historical debate in which this kind of theory had proven itself better in describing the world[20].

Biology offers us an example, especially considering when natural selection had won the epistemic dispute against the notion of final cause and many others. In this example, the natural selection could not be measured in mathematical terms when it had been proposed, but with the development of artificial intelligence, one can, at least in principle, create a model for natural selection evolution. However,

[19] The idea is only to show a possible way out. A full structure and defense of such an argument would require almost a book.
[20] Although, see Papineu 2001, aforementioned, for a historical discussion on the Rise of Physicalism.

that can't be done for final causes mostly because we do not know which kind of variables one should embrace for such calculation.This is oversimplifying, of course[21] The point here is merely to illustrate the method of analysis that sustain the argument.

Many other examples can be found, and thus, I suppose, one is entitled to believe in the first premise of the argument bellow. The argument is as follows:

1-Accepting a quantitative ontology had proven to be better suited to describe the world in some great discussions concerning the methodological and ontological foundations of sciences.

2-we have better reasons to suppose that this success is due to better approximation in describing the world than in supposing the opposite.

3-Physicalism entails a quantitative ontology

4-Physicalism entails better approximation to a description of the world

Therefore, Physicalism is true.

The second premise is, perhaps, somewhat problematic, although intuitive. One may say that there can be no correct description of the world, or that because we have infinite propositions, we also have infinite ways of describing a phenomena, hence we can be infinitely wrong about our descriptions of the world, and thus, it doesn't matter how many explanations we rule out we will never be sure that the world is as we describe it.

Many other objections had been proposed to this scientific optimism. Yet, this discussion must be left aside. Is important to note, however, that the premise 2 makes a very weak claim, it is not concerned with scientific truth nor with realism. An anti-realist may very well agree with it and say that despite this approximation is getting better, our entities or theories are not correct in the strong sense. The second premise is completely compatible with this way of seeing the development of sciences. Only a truly sceptical or a scientific pessimist may disagree with this point, but such a philosopher would deny the whole enterprise here undertaken.

[21] To explore in more depth the relevance of mechanism to Darwin one can see Serafini's " The Epic History of Biology (1993)"

3 is more fundamental to us. I hope to show that the physicalist picture of the world will always imply a quantitative ontology. The point is that, given the assumption that all entities are material, they must interact with each other without any non-physical intermediate. It implies that for all we know an object is the way it relates itself with more basic entities until the very ground[22]. That being so, every object is strongly related to many others and explaining how something came about, is to explain relations among objects. Adding the EP and the CCH there cannot be anything coming from outside the universe to make part of this relational game, be it a non-physical individual or property. So every object is strictly, or almost so, a relationally defined object and no unexplainable relation is proposed except those primitive in microphysics. So, considering that the world is regular in every theory available to us, we can assert that there can exist a mathematical description of every physicalist picture of the world, for there is express regularity in the interrelations among objects even though one may not know how to calculate or may lack the processing capacities for calculating such complex relations. We can, therefore, say that the way entities are, according to Physicalism[23], must always be a quantitative ontology Even though physicalism implies a quantitative ontology, the opposite is not true. The cartesian mechanism was the lair of substance dualism. The claim that everything physical is such and such does not imply that everything is physical.

4 follows from transitivity of implication. If a quantitative ontology implies a better description of the world and physicalism imply a quantitative ontology, we can infer that physicalism implies a better description of the world.

5 came from a weak notion of truth. It Is a merely contingent truth as every scientific position. I am not claiming a knockdown argument or anything nearly as powerful. We just have good reasons, and I also suppose that they are enough reasons to believe in the truth of physicalism, one may say that this argument is merely a supporting argument, that it by itself, does not imply truth. I am, indeed, attempted to believe that this is the case. The truth in 5 can be understood, perhaps

[22] The complexity of these interrelations is left aside in this explanation. I don't think it creates problems. Ahead we will see a theory of emergence and some of its epistemological and metaphysical aspects and none of those is to block the present conclusion.
[23] I meant only reductive or eliminative physicalism.

more adequately, as a pragmatic truth. We just take it to be the case that our effective methodologies have a reason to be effective and meanwhile they have not failed us, we can assert the truth of the worldview we can infer from its success.

There is little reason to suppose that this argument will cause a great impression on a convicted dualist, for she may object that it is inductive and based on a particular reading of the history of sciences. Nonetheless, I am inclined to disagree that is enough to pose the possibility that the argument is wrong[24] to refute it. One should present a real counterexample of great qualitative ontology bringing us closer to the pragmatic approximation to reality and to better manipulation of the world.

This possible dualist may also claim that inductive arguments are not well suited to deal with the major metaphysical claim we are dealing. I respectfully disagree. The first reason for that is that as materialism or physicalism are very broad metaphysical claims, it's hard to see what facts could be prior to them, in actuality, so that the truth or falsity of physicalism could depend on that.

The decisive counter-argument would be much simpler. For refuting those views, the mere existence of one non-physical object would be enough, but for stating its truth, one must appeal to certain generalizations. Given the wide variety of objects that the sciences deal with, they seem like the best source of the desired generalizations, that is, they are the best source of saying how the world is if accompanied by adequate philosophical inquiry.

The very success of the sciences is our best lead, however not a necessary truth. The metaphysics behind the methodology of an inquiring is also refuted by the failure of the inquire in producing reliable evidence or explanation. For example, our satellites refute the view that we live in a dome as the dominant metaphysics until the Copernican-Galilean revolution had held for so long.

Once again, though, the success of a theory cannot guarantee the metaphysical methodological truth behind it. It appears that only an induction could be used to sustain the truth of a metaphysical methodological or foundational claim, in the way we want it.

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[24] no one would deny that, after all, the argument is inductive.

Those two defences of physicalism are heavily questionable, but our point in this part of the chapter is only to propose the theory, in what follows three major problems against physicalism will be discussed. The dualist reader may enjoy it. But before that, there are still some things we must say against dualism.

We can start imagining the very common situation in which one painfully hits his foot little finger on a wooden edge. The event immediately brings about sharp pain. That may make us think that if we have a soul, it would necessarily be in temporal relations with us. The reason is quite clear. If we are in time, that is, we exist in a period of time (a claim that I take to be fairly uncontroversial) and there is some neurological substrate for pain that communicate, somehow, to the soul. Either the soul is temporal and, hence, body input in t1 provokes soul's output in t2, or even in t1, this relation could be simultaneous, the soul is atemporal. If it is atemporal, it is rather weird to think of how could it be synchronized with us. For if it is outside all temporal relations, any output it sends would lack time processing, so nothing whatsoever could guarantee that the output would be felt exactly in the same (or roughly the same) time as my painful physical experience would happen. I don't think that anyone had ever argued that the soul is outside time. Apparently, Descartes accepted timely souls.[25] I am further assessing that this is the correct idea in order to show a contradiction in cartesian dualism and contemporary sciences.

Given all we said above, souls are temporal substances; that is, they exist in time. They can either be contingent or eternal, in either case, it faces the following problem: given General Relativity there isn't any separation on space and time. So if souls are on time, they must be in space as well. Then where in space?

Considering that no one thinks that we could find a secret habitat in which souls live, a good suggestion might be that they are in the brain. This guess has a problem, however. Souls could be eternal, for all we granted above. They could be here from before Big Bang to now and forever. However, our brains had come to its current form in something like 200 thousand years ago. So either the mind is not in the brain or it isn't eternal. Well, the mind, if it isn't in the brain than (if it is an existing thing, we are accepting this premise given the dualist thesis), it must be somewhere else. But again, no one expects to find the Island of Souls, so accepting that they

[25]See: Flanagan, 1991 chapter 1 and also Heil, 1998 chapter 2

aren't in the brain is a bad option[26]. Thus we should embrace the vision that minds aren't eternal. But now, minds are both spatial and temporal, hence they would be material if they have causal powers, most people grant that they do so let's stick to that. But we had accepted that the mind is in the brain, and now we had been led to accept that they are two material objects and we know that no two physical objects can occupy the same place in space[27]. What to do? We can either take the mind to be a unique counterexample for the impenetrability thesis (brains are too big to behave like quantum particles (or fields), so we can assert that impenetrability holds). That would do but would be completely Ad Hoc. The other option is to identify the mind with brain, either type/type identity or token/token, or to assert that there are only brains and mental life is just a bunch of properties of these brains, being either properties of parts of the nervous system operating or emergent in some sense. I have further reasons to deny co-location of mind and brain if the mind is taken to be a different non-physical entity. They are as follows:

First: what does it mean to be at somewhere when you have no area whatsoever? That is if one wants to define its spatial location relative to something, a good and very precise way to do so would be to choose a random point and start a three-dimensional coordination system. Your position will, then, depend on where your area begins and where it ends. Or you could facilitate and calculate the medium point of your whole area, but if you have no area, you cannot do either. It's plain, though, that having localization requires having an area, something that souls do not have, by definition. Of course, that one may defend that souls do have an area, but it would require an independent argument and criteria for delimiting what it would be. That makes the claim that minds are co-located in the brain very hard to understand, and therefore not preferable without additional reasons.

Second: How would the mind stay in the brain if it has no mass so that it could have inertia, no electromagnetic field so that it could resist the tensorial pressure of

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[26] João Texeira presents some difficulties about this topic. He claims that we have no reason to situate minds in the brain, he claims only that we can know that they are in the body. I think that this position is very unlikely, given that people without legs can think, drugs that do not accelerate or diminishes our heart beats can alter our perception and semantic processing and so on. The point is that we have fairly good reasons to believe that if the mind is in our body it is in our brain. He there discusses a very similar argument created by Lockwood. Cf. Texeira, 40-44, 2000

[27] That is not actually true, some quantum entities do not follow this thesis. for example: Bose-Einstein condensates. See: Krause, 2017, p. 163.

the skull and (considering that it is co-located with the brain) can penetrate matter without problems? Even if one gives criteria for immaterial objects to have an area, some account of how this immaterial object could move with the movement of the head without the possibility of some movements make you literally lose your mind[28] would be needed.

I'm surely not hopeful that there could be found great answers to this questions, especially considering that any substance dualism attributes very few characteristics to their souls and none of them are dispositional properties, as we discussed above so that they could reverse the game. I suppose, then, that the best way to understand the mind is from a physicalist perspective. Of course that all of the arguments above rely on the view that minds are something, an entity. If the mind is taken to be a set of properties or a byproduct of brain activity or having different kinds of dependence to brains my point does not hold, nevertheless, for each of the other objections may be put forward. I hope to have shown that the physicalist position is at least plausible and that my desire to maintaining this position is not merely aesthetic, a preference for desert landscapes.

For now, I have shown how the assumption of a substantial dualism and General Relativity being both correct is contradictory. In doing so, I hope to have shown where exactly philosophical naturalism and substantial dualism find their tension.

Until now, we have an argument to show that physicalism is consistent, one that shows that is maybe correct and one that stands for the denial of physicalist's greatest enemy. I think that at this moment we are able to start investigating the famous objections available in the literature (few of them) and assess how much damaging they are.

To the present objections, it is not required to have a full physicalist account sorted out in order to appreciate the arguments. They all concentrate on some tenets

[28] In here, I am arguing against Lycan's paper called "Given dualism its Due", he poses that non spatiality should be denied by the dualist, because it might be problematic with General Relativity, he, however, does not present any argument to show why it would be problematic (as, I hope, I have done) further, his claims that it can be done without any problem are supposed to be put in cause by the very basic counter arguments I had proposed here. Cf. Lycan, 2014, 551-563.

of the thesis that are usually taken to be important parts or motivations to physicalism. Without further ado, let's call up the dualists!

3- Knowledge Argument for Qualia

The three basic tenets of physicalism above mentioned had found a great challenge. Most attacks against it try to show that either there are non-physical objects or that causal chains cannot be completed without some non-physical infiltration. The second usually takes the form of inference by the best explanation, because it would be rather odd to prove the existence of non-physical objects empirically. The first, on the other hand, uses pure ontological argumentation to assert that the existence of abstract objects is required so that we can have an intelligible account of the world. We will start discussing the most important and widespread non-physical entity that put a rock on the physicalist's shoes: Qualia.

Qualia are frequently taken to be physicalist most persuasive enemy. They are the subjective sensation of experiences. It could be described as the conscious sensation one gets when perceives an object, it's the "redness" of red, for example. In the words of Thomas Nagel and in current use in today's philosophy of mind: qualia are "what it is like to have an experience" (NAGEL, 1974, pp. 335-50). The existence of Qualia is rarely doubted. After all, we are very acquainted with our own personal experience. (more with it than with anything, actually--would add the dualist

or non-reductive physicalist[29]). However, its existence is very hard to be explained in the physicalist framework, as have been pointed by Jackson in 1982 (JACKSON, 1982, pp.127-136) and 1986 (JACKSON, 1986, pp.291-295) in his famous papers "Epiphenomenal Qualia" and "On What Mary Knew" respectively, he proposes a clear argument to sustain that the existence of qualia is a tread to physicalism, his argument is called the Knowledge Argument, and it goes as follows:

Imagine an incredible scientist, Mary, that knows everything physical about colours and the neurophysiology of sight (or whatever more things one wants her to know that belong to the realms of physics and neurobiology). For any reason, she was raised and taught in a black and white room, through black and white TVs. Despite this fact, she was able to conduct research on other people's colour perception. One beautiful day, she is released, and while happily walking out of the room, she finds a ripe tomato in a nearby neighbour's backyard. When she looks at it, she learns something about colours and perceptions that were not in the books and neither could be taught to her by mere speech. She learns what it is like to see a ripe tomato and the colour red. She acquired qualitative experience or quale. However, by supposition, she knew all things physical there were to be known, and according to Jackson (1982), physicalism entails the view that all true information available are physical information. That is, all the facts that we can know about the world are physical facts. So, if Mary knew all physical facts about sight and colours, but she learned something new about it, there are some non-physical facts in the world contradicting the physicalist approach. Therefore, physicalism is false.

In the paper of 1986, he points to a slightly different claim that is consistent with the above scenario, and focus on the knowledge Mary obtains towards other people. We will deal with these versions and follow the author in using the exact same structure he used to put forward his argument:

"1-Mary, (before her release) knows everything physical there is to know about other people

[29] Descartes held that we had a direct access only to our minds. Everything else must be proven. concerning Descartes philosophy of mind see: Heil, 1998, pp. 13-26. see also: Flanagan, 1991, pp. 1-18.

2-Mary (before her release) does not know everything there is to know about other people (because she will learn something about them on her release)
Therefore
3- There are truths about other people (and herself) which escape the physicalist story" (JACKSON, 1986, pp.291-295)

When Jackson defends his view, he points out that the knowledge that Mary acquire is not merely the qualia, but also some knowledge about other people's mental states. She learns that when people with normal colour sensitivity see a ripe tomato, they will also experience a quale as she had. This would then be an informative fact about the world and should be grasped by a complete physicalist description. Nonetheless, accepting premise 1, she would know all facts physical about this episode and, if she learned something, physicalism could not offer us this complete description. This is the argument in its full power, in the author's formulation.

However, some explanation is due to show why physicalism entails the view that, if a complete science shows up, it must explain everything in non-mental terms. To see this is quite straightforward. If all existing things are physical, then all of them must be physically described, that is, there must be a physical theory about every event or phenomena. There should be no extra facts in the world.

If we take the distinctions proposed above (see introduction), we could already get very suspicious of such a construal of the argument. It passes from reductive descriptions to explanatory reductions to ontological claims very fast. I want to show that these passages aren't for free and that some problems could be brought to light. The contraposition of the above statement allows us to see where the argument strikes physicalism and also allows a different point for analysis.
If something is not physically describable, then it must not be physical. The notion of "description" become central to the point. We intuitively would accept that description require propositional knowledge. It requires, thus, complete linguistic explanation, and that is exactly the problem posed by qualia, we do not learn them through the description in the aforementioned sense, they can only be experienced, and that makes them ungrabbable in a physicalist framework. Although intuitive, this may not be the case, and perhaps that is one of the problems with the argument.

The idea that all things are physical is an ontological claim. The idea that all physical phenomena can be linguistically described is an epistemological one. There may well be some purely physical phenomena that we do not have a language to express. Some would point to quantum mechanics or four-dimensional entities as examples. We can mathematically talk about them and from the math extract verbal analogies to grasp the intuitive meaning. However, these strategies are limited and not very precise, we always must keep in mind that all verbally expressible claim about the behaviour of quantum entities are "as if they are as" or "as if they behave as".

Having this in mind, we can evaluate if the experience isn't an example of this kind of linguistically indescribable phenomena. If visual perception makes us feel particular qualia and no complete physical description of the elements necessary for that perception will produce the same experience, one may ask if the problem isn't related with how we process this two kinds of information: propositional and visual.

The processing of visual information is related to particular areas of the brain that processes the visual stimuli non-linguistically. So no matter how much description one reads and hears, the areas of the brain responsible for detecting the colour red will not be activated. We simply do not process the two kinds of information in the same way[30].

Hence, when we talk about the experience of red colour, we either give examples of situations and hope others to have done something similar so that they can infer what we experienced or we say that we experienced something and try to explain it in terms of different experiences, but never getting a precise description. The experience is "as if they are as".

When considering well-known colours, we frequently use the first strategy, and when talking about more sophisticated situations, we tell a story, not only to illustrate the sensation but also because there are no other way to convey this kind of information, words alone can't do the job. We must make the other imagine herself in our shoes. If they had been in a similar situation, the chance they have of actually

[30] One can read an interesting introduction to sight science in the chapter 9 of Roberto Lent's (org.) "100 Bilhões de Neurônios?"

knowing what we have been through is much bigger. Or so this line of reason would imply.

To summarize what had been said: physicalism sustains that everything is physical, if it is correct we can explain all situations by mere physical description using language. But some sort of physical phenomena are not propositionally describable, not because there is something other than physical things, but because this kind of phenomena is processed in different areas of the brain. So, Mary does learn something; that is, she learns how to process the red colour. This processing happens in a highly complex system that has immense interconnections, so she becomes able to do a lot of different things with the new knowledge, for instance, infers that sensation to other humans.

The error of the argument is to posit that, because we cannot learn about something reading about it, it must be because this phenomenon is ontologically distinct from the thing we can learn about by reading. It takes the epistemological claim to debunk the ontological one. More explicitly, to this view, knowing all things physical about colours requires experiencing them because some physical information is processed in non-linguistic ways.

The real answer against Jackson's argument by the proposed interpretation is that, either the first premise is false, for Mary did not process, and hence, does not know some physical information, or becomes an obvious error, since in order to the first premise to be true she would have had to contact with colours and would not learn anything new.

There is a way of seeing things that make this assessment of the Knowledge Argument even more intuitive. Our cognitive apparatus evolved to deal with huge amounts of information coming from very distinct sources and to react adequately to it. There is no surprise that the experience of seeing red things is different from hearing about it; the very source of information is distinct and nonetheless very physical.

Other objections and defences of the argument had been published, and a lot of different interpretations of what this argument implies are available. I will explore other sources of objections coming from Daniel Dennett and Frank Jackson himself.

For starters, Daniel Dennett is known as one of the leading names defending materialism. His essays, articles and books are hugely influential and quite controversial. His style is quite irreverent, and that had both brought forward defenders and intense opposition. To our purposes, we will focus on Dennett's essay called "On What RoboMary Knows" (DENNETT, 2007, p. 14-32) it is fulfilled with sarcastic humour as would be the rule to his traditionally non-orthodox writing style. Dennett draws some arguments that are based on reversing the burden of proof against the second premise of the knowledge argument; that is, he denies that Mary would learn something new. His strategy is first to ask on what grounds do the dualist assume that you can't learn what is like to see red by reading.

He says that no one had offered any reasons for that, limiting themselves to say "it is obvious". His dismiss of this move is mostly based on mockery, but anyhow he is right to assert that the apparent sobriety of this fact is coming, mostly, for two mistaken views: first, considering that Mary is a normal person and not a super, duper, amazing scientist who does know everything physical of a complete physical theory. It may well be the case that normal people wouldn't learn, yet, this wouldn't be any objection for physicalism. The Amazing Mary, on the other hand, is beyond simple intuition and without independent argumentation, nothing guarantees that she wouldn't be able to deduce (in a 4,765 steps proof, he adds for fun) how is it like to see red.

The second error that happens to be illustrated in the huge number of steps of the proof he used above is the problem from concluding that is impossible from the data we have, that says, mostly, that is very hard, although logically possible, to infer colours from texts, audio files and others. Dennett claims that it may be the case that we cannot, but it is not obvious. An argument must be brought to light in order to settle this. He maintains that the scenario we are invited to test is a highly unimaginable one, fist because it is unimaginable how will it be a complete physical theory and what kind of development one would need to have to grasp it.

Dennett also points out that the scenario is scientifically very problematic. He gives several examples of how someone could see colours in a black and white room if the scenario is fixed for all problems, it is unlikely that the acquired complexity allows us to use it as a fruitful thought experiment.

RoboMary only shows up to show how its at least possible to learn how to see colours without doing the actual seeing, exposing the failure of the argument a little more. Yet so, the reconstruction of the case of RoboMary is highly complex, and we do not need to revise it here.

His critics seem sound to me. The Knowledge argument, when presented either in 1982 and 1986, does not offer us any reason to believe that she does learn something, only asks us to do so and says that it is obvious. It isn't, as it's usually the case in philosophy, all that obvious.

However, I do think that neurophysiology gives us quite good reasons to suppose that we cannot, indeed, learn how to see red without proper stimulation of cones and rods, or the optic nerve or the occipital cortex Linguistic abilities, on the other hand, are processed in other areas some common examples are Broca's and Wernicke's areas, where damage can cause different kinds of linguistic deficiency. To say this is not to say that the brains process this informations isolatedly. Conceptualization, can perhaps, be exactly the kind of phenomena that relates this two. However, one can have linguistic problems without visual ones, the contrary mat also happens, which may show us the fact that some parts of seeing and some parts of linguistic abilities are isolated to specific processing[31].

Despite these remarks, Dennett's arguments are straightforward and powerful. of course, that nothing rules out the possibility that further developments on the notions within the argument may very well save it.

Frank Jackson is the father of the knowledge argument, and yet, a few years later, the self-called "qualia freak" (1982) started ascribing de physicalist side of the force. One of the things he had to deal with was his own argument. His response is quite famous, among other reasons, because is a intense father-killing-son story. Without further delays, let's to it:

Jackson's strategy is to attack what he thinks is the most important intuition behind the Knowledge Argument. After long years of development, he is inclined to assert that this intuition is as follows: "she learns new ways for some objects of experience being similar to each other" (JACKSON, 2007, pp.51-76).

[31] For a long review and development on the neuroscientific aspects of language one can see: Hickok, 2014. all chapters are devoted to different aspects of the topic.

Although it is stated as "the intuition" behind the Knowledge argument, in his previous papers (1982 and 1986) he did not mention this, so one can infer that this new way of seeing things makes the Knowledge Argument assume a stronger position that survives previous refutations. Giving the dualist his high ground, the author proposes his version of representationalism, which he calls "Strong Representationalism" (SR).

This view suggests that perceptual (in this case, visual) experience is essentially and exhaustively representational. He calls the view that experience is essentially representational "Minimal Representationalism" (MR). Jackson assumes it to be true without argument, for he claims this doctrine to be orthodoxy and very intuitive.

In addition to MR, he assumes (also without argument) diaphanousness. This means that "accessing the nature of the experience itself is nothing other than accessing the properties of its objects" (JACKSON, 2007, pp.55) that means that all characteristics and properties found on the experience itself are characteristics and properties of the objects of experience and vice versa.

Some part of his essay is devoted to showing that diaphanousness is not a direct argument for representationalism, accepting the first may not imply the other. But that is not our concern here. I will skip this part of the article and focus on the argument he delivers to indicate how MR and diaphanousness together imply SR. As before, I shall present the canonical form of the argument and then I explain the steps.

1- Experience is essentially representational (MR)

2-All properties of the experience are properties of the object of experience (diaphanousness)

3-"Let's assume that E is the relevant properties of an experience in virtue of which it represents that the way things are is P" (JACKSON, 2007, p.58)

4- From 2, E is a property of the object of experience

5- The object of experience is either a Spatio-temporal object (which would undermine representationalism) or an intentional object (which is consistent with representationalism)

6- It isn't Spatio-temporal

7-from 5 and 6, it is intentional

8-from 2, if the object of experience is an intentional object, then the experience's properties are one and all the properties of how things are being represented to be.

C¹- from 7 and 8, the experience's properties are one and all the properties of how things are being represented to be.

C² is the complete statement of SR, so this argument is supposed to prove that diaphanousness in addiction to MR implies SR.

1,2 and 3 are premises given without an argument, but taken to be highly accepted. 4 follows directly by diaphanousness, and the definition of "E" in 3. 5 is a common assumption given the kind of experience we are considering, the perceptual experience cannot be of abstract entities, so 5 is very plausible and acceptable even for the dualist.

6 is somewhat complicated. It depends considerably on the first two premises. This step is a reductio against the hypothesis that the object of experience could be material (spatial-temporal). Two points are made against it: first, assuming 1 E must represent P essentially, but sometimes the object of experience have very distinct properties from the object it represents. Jackson proposes some examples: being square is clearly a property of objects but not from experience, or more strongly, sometimes experiences represent that something is in a certain distance from the subject, but the experience is never at some distance from the subject. E and P must, because of 1, be essentially connected, but as the examples had shown they would frequently be very different from each other. The second problem is deeper. How can two material objects, being them equal or not have an essential representational relation? Given that E=P, P can represent itself unproblematically, however, how can P represent something else? The author explores a possible exit through the use of a relation of projection and ends up by showing that either it violates diaphanousness or MR.

Material objects must indeed be at someplace or be some way. Intentional objects have the advantage of being mental and hence much more adaptable to be a representation. That is what his arguments are showing, mostly that a material object wouldn't do the explanatory role correctly.

This whole move may seem like aggression against physicalism; after all, he is claiming that a material object cannot be the object of experience. But that is a flawed view. Firstly, "representation" is a concept widely used in computational sciences and it would be quite odd to say that a computer only works given to abstract parts that get in it at some moment of its construction, although there is a sense in which computer programs are abstract, they must always be realized by some very physical things.

Another point is that the object of experience being an intentional object does not mean it isn't a physical object. It is not, as Jackson points, a true object. It is just a by-product of the functioning neurons processing information. Asking for that the experience object to be material is something as hoping to open someone's head and find a miniature cow when the subject experience such an animal. It is not surprising that it would not be the case.

Back to the argument, 7 results from the simple use of disjunctive syllogism. 8 Is an important step, it follows directly from diaphanousness and the fact that all objects of experience are intentional. If the properties of experience are entirely the properties of the object of experience, and this object of experience is a mental representation, we can conclude that the properties of experience are entirely mental representations. 2 and 7 guarantee the antecedent of this conditional, so we are allowed to believe in SR.

Now, we can proceed to the argument against the dualism or productivity of Qualia. The whole point, he argues, is that the quale “red” is a new property that aggregates all token experiences of actual seeing red colour. And, not being describable by the physical descriptions available in a complete physical account of the world, “red” is a non-physical property.

But “red” is also a perceptual experience, so given SR, it must be essentially and entirely representational. As before, I shall present the argument in its canonical form for better appreciation:

1- The nature of perceptual experience is essentially and exhaustively representational (SR)

2-The Knowledge Argument implies that there is a property (above cited) in the perception of visual tokens that escape physicalist description

3- From 1, either the visual tokens are alike in how they are represented to be or in the fact that they are so represented, there are no other ways for it to be alike

4-The first disjunct is not a true problem against physicalism

5- The second disjunct is not a problem to physicalism

C- The Knowledge Argument is not an objection to physicalism (JACKSON, 2007, pp. 59-63)

1 comes from the framework built for independent reasons. 2 is assumed by the author as the main intuition behind the Knowledge Argument. 3 comes from SR, considering that if all perception experience is representational, then visual perception experience is. And those two are the only ways a representation can be similar to other. 4 is defended by claiming that commonalities in the ways objects are being represented are commonalities in how things must be for the experience to represented correctly. He follows saying that commonalities of how things are being represented to be are not instances of properties because there must be a difference between the quale being a property instance, that Mary will end up learning about, and what is shared by how things are being represented to be. Either it is an instance of a property or a commonality among various instances, not both ways.

5 states that the second possible similarity, a similarity in how the quale presents itself in various different experiences, is not about a kind of experience, for the nature of experience is about how things are represented to be and not about the fact that they are so represented. In other words, if this similarity is chosen, the Knowledge argument stops talking about the nature of experience and hence becomes self-inconsistent. Thus concluding the counterargument.

These two answers had been chosen because of their very different approaches. Dennett attacks the structure of the argument itself, showing that it doesn't prove what it is supposed. Jackson's paper develops an independent framework that happens to dismiss the Knowledge Argument's background intuitions.

It has been suggested by John Heil (Heil, 1998, i-xii), and by Martine Nida-Rümelin that the position one takes in the philosophy of mind is much

dependent on other background assumptions the philosopher has. Jackson's case was introduced as an example of this important remark.

Some notes must be made. His arguments are very technical and strongly dependent on the truth of representationalism. The MR claim is taken without argument, anyone that, for independent reasons, deny representationalism will also not accept his objection to the Knowledge Argument[32]. Another important thing is that there are many different ways of interpreting Mary's scenario. Dualist defend it pointing to failures in the counterarguments proposed. David Chalmers will be our favourite dualist in the next section. In his "Conscious Mind" (Chalmers, 1996, pp.145-53) He argues in a very sophisticated fashion that none of the arguments against the Knowledge Argument holds. None of the defences he addresses there goes against the physicalist contentions here presented. However, they do shed some light in important points and pose counterarguments to frequent objections. We will not pursue his defences here, however even though there are good reasons to not to think that the argument holds, at least in its original formulations.

[32] Gustavo Leal-Toledo presents a possible objection to it given the mirror-neurons. In a very simplistic characterization, he claim that some of the developments on mirror-neurons research might imply that no representation is needed for thought and action. Cf. Leal-Toledo, 2010, pp.179-94.

4- Conceivability Against Physicalism: The Zombie Argument

Chalmers' Zombie Argument relies heavily on a framework made from the relations between language and metaphysics descending of a tradition on analytic philosophy that goes all the way until Kripke and his "Naming and Necessity".

In the second chapter of his dualistic masterpiece, Chalmers built his framework for dealing with qualitative phenomena and experience. He starts assuming Supervenience as a dependence relation that unites in a clear and adequate way all the dependence that higher-ordered properties (or facts) have on their lower-ordered properties (or facts)[33].

have on their lower-ordered properties (or facts).

He starts defining Supervenience in much the same manner as we have done above: "B-properties supervene on A-properties iif no two possible situations are indiscernible with respect to their A-facts while differing on their B-facts".(CHALMERS,1996, p.31) As we can note, B-properties are higher level (or

[33] There is not much rigour throughout the text and “properties” or “facts” will be used in the same context, however controversial this may be, I will not address the issue here. I suggest the reader to have the biggest of hermeneutic charity toward this loose use of words.

order)[34] properties while A-properties are lower-level properties. Nothing new under the sun so far.

He follows by making two pairs of distinctions. Supervenience can be local or global, logical or natural. We will start in order:

Local Supervenience: "B-properties supervene locally on A-properties iif any two possible individuals that instantiate all the same A-properties also instantiate all the B-properties."

Global Supervenience: "B-properties supervene globally on A-properties iif any two possible worlds that instantiate all the same A-properties also instantiate all the B-properties."

Clearly, the difference between these two kinds of Supervenience is a difference in generality. Chalmers claim that local Supervenience implies global Supervenience, I am not going to question whether this is the case, all we need to know is that for further arguments if all A-properties of an individual is set, all A-properties of a world is set, but not the other way around. Now we proceed to the more important parts of his framework, the distinctions between logical and natural Supervenience.

Logical Supervenience: "B-Properties supervene logically on A-properties iif the B-properties in our world are logically determined by the A-properties in the following sense: for any possible world with the same A-facts the same B-facts will hold". This definition arises after some considerations of possible counterexamples he considered as relevant. This is the "official" definition that will be used hereafter (CHALMERS, 1996, pp.37).

Natural Supervenience can be seen as the same as logical Supervenience but restricted by the natural laws that hold in our world. So natural Supervenience is much weaker than logical Supervenience and includes much less bizarre worlds, only those that are equal to ours in terms of their nomological conditions.

The most important form of Supervenience for our purposes is the global logical Supervenience defined as: "for any logically possible world W that is A-indiscernible from our world, then the B-facts true for our world are true of W".

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[34] Kim (1998) make some differentiation on theses two terms, nonetheless most philosophers appear to take them as synonymous

It is the most important because it is the one that, he thinks, captures the best of our intuitive truth-conditions of Materialism, these are thus formulated: "materialism is true if all positive facts about the world are globally logically supervenient on physical facts". It is supposed to capture the following intuition: "if materialism is true, then once god fixed the physical facts about a world, all the facts were fixed" (CHALMERS, 1996, pp.37)

This part of his framework is based on establishing a coherent and somewhat precise meaning for the notion of Supervenience. The next part is based on building the analysis of the notions of "logical possibility", "metaphysical possibility", "conceivability" and their relations. Those notions being defined we will be able to determine and to judge the Zombie Argument that I shall present shortly. Let's proceed.

His theory related to necessity and meaning is called the "Two-Dimensionalist Theory"[35]. This theory follows from famous results of contemporary philosophy of language, modal metaphysics and intensional semantics and sums them all up to synthesize this approach.

He starts defining an intension as a function from a set of possible worlds to a set of referents. He proceeds asserting that every concept has actually two intensions. The "primary" intensions describe the kind of dependence that a given intension has with the states of a given world, the reference in that world. The "secondary" intensions relate those primary intensions with a set of counterfactual worlds. In other words, primary intensions are a function that is a given, specific, world relates a concept with its extension (heat is mean kinetic energy of molecules). The secondary intensions take the primary extensions and pick up its references in counterfactual worlds.

The best way I can think of for explaining the distinction is the following: primary intensions select a concept in an actual or counteractual world, that is, it selects a concept both in this world or in other worlds taken as actual. The secondary intensions fixate the concept in this world and think how this, the actual

[35] Actually, this is but one two-dimensional account. One can see: T. S. Gendler and J. Hawthorne (eds.), Conceivability and Possibility. The book's introduction provides good background and further developments on views like this.

world, could be. The first does not fixates anything except the concepts and their application conditions the other takes all the a posteriori truths in consideration.

Chalmers says that a good way to understand the primary intensions is taking water as an example. We may say that water is x, where x is a given description or property that holds for water in our world. We can call the sets of all x's "watery stuff" so we are correct in claiming that water is watery stuff (and vice versa, it's an identity relation) in our world. But we may have a world as Putnam's Twin Earth, where XYZ is the watery stuff. However, taking our world into consideration, water is H2O so, for every possible world, water is H2O. However, it is not true that watery stuff is H2O for every possible world, for it may be XYZ. Nonetheless, our water is not XYZ in any possible world. The important detail is that the descriptions that compose the watery stuff are details about a thing that is denoted by a word. Primary intensions are the way concepts denote in our world.

Some additional facts should be said, first: primary intensions are held to be known a priori, while secondary intensions are a posteriori. We know that watery stuff is water in our world without further investigations and yet, we do not know that water is H2O in our world without long years of scientific enquiry. Also, the logical possibility is understood as coherence in the primary intension, and metaphysical possibility is related to what we a posteriori find out about how things are. The framework has further details and discussion, but what has been presented is enough for present purposes[36].

The Zombie Argument is an anti physicalist argument. It is commonly used to sustain the Naturalistic Dualism, as Chalmers call his notorious view, or to hold against materialist views. That being said, it gets easy to see why he spends some energy in also defending the Knowledge Argument. In his own book, Mary saves the zombies in one moment and is saved by them in the other. First, he uses Jackson's argument to endorse non-reductibility of mental, and later he takes his framework to defuse some famous counter-arguments against Mary's new knowledge.

[36] In fact, a discussion concerning if conceivability does, indeed, entail possibility could be very relevant. However the point is not settled and the terms of this discussion take this framework to very technical valleys, hence, giving a trustworthy explanation of the discussion would require too big a digression. Interested reader may find some discussion on Anders Berglund's "From Conceivability to Possibility: An essay on modal epistemology. 2005."

In all the following expositional journey, we will be based on Gustavo Leal-Toledo's Master's thesis (LEAL-TOLEDO, 2005, pp. 39-63). Despite Leal-Toledo's own expositional structure I prefered to maintain the method used so far and start presenting the basic formulation of the argument, and from that presentation, we follow to examining the more subtle details that make a claim plausible, before that, however, I must clarify what a zombie is.

Zombies, as much as Mary and Bats[37], are important figures in philosophy of mind's most prominent "conceptual mythology"[38], a zombie, more particularly, a phenomenal zombie[39] is a complete physical replica of a human except that they have no phenomenal mental states. They lack all consciousness. They had entered the philosophical scenario with full strength in Kirk Robert's article "Zombies vs Materialists" published in 1974. Now their introducer is one of their opponents and our favourite Australian dualist, their best friend. The zombies are taken as if their mere logical possibility defy the physicalist enterprise. The framework above had been made in order to show how that would happen.

Returning to the argument, we will follow the exact exposition given by David Chalmers:

"1- In our world, there are conscious experiences.

2-There is a logically possible world physically identical to ours, in which the positive facts about consciousness in our world do not hold. (The Zombie World)

3-Therefore facts about consciousness are further facts about our world, over and above the physical facts.

4-Therefore Materialism is false." (CHALMERS, 1996, pp.109)

We can see that premise 1 is taken without argument. Chalmers says that his book is written for those "who take consciousness seriously", that is, for those who

[37] From Thomas Nagel's "what is like to be a bat" and all discussions about it.

[38] I heard this term during classes with Nazareno E. de Almeida, who, I suppose, created this provocative expression.

[39] There are many other kinds of zombies that serve to different conceptual purposes, For example: Functional Zombie are functionally identical to us but may not be physically so. Behavioral zombies behave as us but may be physically and functionally different and so on. Cf.Leal-Toledo, 2005, pp.34-7. Also, the term "phenomenal" is equivalent to "conscious" in Chalmers' book and I shall use it this way as well.

believe that there are conscious mental states. We will take that claim, for we have no better reasons to deny consciousness then he has for proposing it[40].

The second claim is much more debatable. It comes from an auxiliary argument given earlier in the book that states that zombies are conceivable in the sense that they are not a priori false. In Chalmers terms, they are possible in virtue of their first intensions. There is no apparent contradiction implied in assuming that a zombie as conceived is possible. So, he follows, if this world is conceivable, this world is logically possible. This move is highly questionable, and we will discuss it ahead. We can see the formulation as this:

1-Zombies are conceivable

2-(In the conditions we have now) conceivability entails possibility

3-Zombies are possible (in any relevant sense of possibility)

4-If zombies are possible, then Materialism is false

C^1-Materialism is false.

C^1 comes from a series of premises exposed and defended throughout the work. A possible way of seeing it is acknowledging his claim that all reductive explanation requires a logical supervenience relation between the reducing phenomena and the ground one wants to reduce the other to. Given that this logical Supervenience is Supervenience in all possible worlds, the mere existence of a possible world where identical physical aspects do not entail identical phenomenal aspects proves that conscious life is not reducible to purely physical explanation.

The last move is the claim that Materialism (and physicalism, in this case) entails a complete physical description of the world and because of that, the Zombie Argument undermines Materialism (and physicalism).

Obviously, this kind of modal argument creates great suspicion on the materialist reader. There seems to be an unexplained jump or an unargued premise to reject. The literature is divided between those who think that the zombie world is conceivable, but not possible. Logically possible, but not metaphysically possible. Unconceivable and, hence, not possible. And, even if correct irrelevant against physicalism (LEAL-TOLEDO, 2005, pp. 34-47). We will not investigate all kinds of

[40] Not deny consciousness is different than accepting that Chalmers view on the subject is the correct one.

answers, but only those that take the zombie world to be inconceivable and one that makes the conceivability-possibility passage questionable.

To show that we cannot conceive a zombie and much less a zombie world, Leal-Toledo assumes as his first premise that zombies are humans without qualia. Further, he accepts qualia as an existent entity conceding to the dualist his premise. We must recapitalize that qualia are subjective. They can only be accessed in the first-person perspective. We must also accept that qualia are not physical. Otherwise, a complete physical copy of a human would include all his qualia, as well. This may be seen as a circularity of the zombie argument, but that would be a mistake. Qualia may well be physical in this world. However, it is possible that they are not physical (or so the Zombie Argument goes) so they are only naturally supervenient on the physical.[41] Until here, only dualist claims were accepted, Chalmers and other dualists, apparently, could not reject any of them without rejecting their own view.

Zombies are very close to what, arguably, Patricia and Paul Churchland defend that we are and they are taken as radical physicalists, proving the point that zombies *per se* are no problem.[42] Leal-Toledo sketches his position, declaring that the difference between humans and zombies is crucial to the argument he is trying to object. And he is correct. Chalmers position in "taking consciousness seriously" rejects right away the eliminativist position exactly because none of his arguments would make sense without the supposition that consciousness exists and having it makes us different from zombies.

Gustavo follows pointing out that, if zombies are indistinguishable from any humans, we cannot know if this is the zombie world or not, for all behaviour in zombie world would be exactly as it is in this one. This makes it clear that we cannot actually see what the difference between a zombie and a person and, hence, we cannot conceive a zombie world is. We cannot think of it on different grounds than thinking about our world. So this argument rejects premise one of the secondary argument that defends the second premise of the Zombie Argument. In other words,

[41] This is oversimplifying, ahead we will discuss the issue in more detail
[42] Their eliminative materialism is defended in a number of places, Patricia's 1989 and Paul's 1989

it denies that a zombie world is conceivable, which implies that there is no possible world as a zombie world, and this, by its turn, rejects the Zombie Argument.

This twist is proposed with the use of a great variety of "intuition pumps" which make it very reasonable to think that, if one press the point, we do not know what is the difference between a conscious and an unconscious entity if no physical or behavioural or functional attribute is changed. One of them is given by Raymond M. Smullyan in 1980 in a short paper called "An Unfortunate Dualist" (SMULLYAN, 1981, p. 383) in which a dualist who feels very sad wants to stop having qualitative states and goes after a special drug that would do the job. However, during sleep, his friend gives him the drug so that he would save time in going after it. When the zombie dualist wakes up, he goes to the drugstore and takes another dose of the drug because he had no idea he had become a zombie.

The point is that, for the Zombie Argument to work, qualia must be causally inefficacious (otherwise, a zombie world wouldn't be equal to ours), but if it is as such, then there is no perceivable difference between zombies and non-zombies. If there is no perceivable difference, there cannot be conceived such a difference, and the argument follows.

The Brazilian philosopher carries on in a, arguably, stronger argument. The intended conclusion remains the same: to prove that zombies are unimaginable or inconceivable (LEAL-TOLEDO, 2005, pp 63-9).[43] He goes on by saying that zombies are people without qualia, so conceiving zombie is to conceive a person without qualia or to conceive a person and then remove the qualia.

The first requires to imagine an "exterior" and an "interior". The exterior is basically to imagine a human being. The interior, however, requires one to conceive what is like not to be conscious. To conceive what is to be null "inside". But to imagine nothing is not to imagine at all, hence to imagine a zombie is to imagine its exterior, which is very simple, we must only to imagine a person. But again, the argument truly requires us to conceive the difference between humans and zombies, so this line of thought is not the appropriate way to follow.

Let's try to imagine a human and afterwards imagine the removal of its inner qualitative state. The problem, obviously, is not related to imagining a human, the

[43] The author takes those terms to mean the same or roughly the same.

problem is to imagine the removal of qualitative states. The point is that imagining the removal presupposes imagining the qualitative states by themselves, but qualia are exclusively subjective, we can only access them on the first-person point of view. This line of thought comes directly from Thomas Nagel's article "What is like to be a bat" from 1974 (NAGEL, 1974, 435-450.) Nagel is a dualist and his arguments hoped to undermine Materialism. This bats vs zombies line of thought are very unpleasant to the dualist and exactly because of that. It is very powerful against them. The conclusion is the same if we cannot conceive of other people's qualia, we cannot conceive of us removing it, and thus, what we conceive are humans, and that is all. Again, the attack goes toward the same premise.

We can draw a more interesting conclusion from this line of argument, still following Leal-Toledo. The possibility of zombies put our qualia in doubt, the existence of qualia is the standard point against Materialism, this being so, the possibility of zombies undermine our certainty on the existence of qualia and show us a way of thinking about ourselves without it. Zombies, apparently, betrayed their creator. (Unconsciously, I must suppose).(LEAL-TOLEDO, G. & TEIXEIRA, J. de F., 2005. pp. 35 –52)[44]

As promised, we now follow to our third and last objection to the Zombie Argument that is supposed to prove that, even if it is correct, its implications are dubious. To be more precise, the very same mechanisms used to propose it sound, propose its negation as sound as itself, thus giving the dualist the problem of rejecting one of its own precious premises.

We follow in this argument, Keith Frankish (Frankish, 2007. pp. 650–666). His strategy is to show that the same background argumentation that Chalmers used to propose the plausibility of the Zombie Argument can be used to propose the "Anti-Zombie" argument. The Anti-zombie is a copy of a human being given the physicalist picture of the world, that is, a physical being with physically reducible consciousness in terms of metaphysically necessary, but logically contingent laws of nature. The argument is as follows in the author's own formulation:

[44]Leal-Toledo press this problem in his article: “Chalmers’ Paradox”. He concludes that accepting the existence of zombies undermine dualism. Cf. Leal-Toledo, 2010,159-173

1-Anti-zombies are conceivable

2-if anti-zombies are conceivable, then they are possible

3-If anti-zombies are possible, then consciousness is physical

Therefore, consciousness is physical (FRANKISH, 2007, p.654)

Premise 1 gives us some issues to discuss. The conceivability criteria used in the arguments above is quite loose. In this argument, it will be understood as "It is not a priori that not-p" taking p to be a description or a referential term, the same as above. It seems that the imaginability of an anti-zombie is not easy to be rejected (it is the same as imagining a person), but as shown before, the imaginability of a zombie is highly problematic. Furthermore, to say that the anti-zombie is inconceivable in the same sense used to say that the zombie are possible is to pose that a physicalist description of the world is a priori contradictory, but if anyone had an argument for this conclusion, there would be no need for a Zombie Argument. So we render that the very same conceivability criteria that work for the zombies work for the anti-zombies.

Premise 2 is defended by David Chalmers in a number of places, one of the most famous is in his 'Does Conceivability entail possibility?' (CHALMERS, 2002, 145-200)[45] such a discussion won't be addressed in here, as I have said, for it would take us astray far afield. We must say, however, that if one proves that this principle doesn't hold, the Zombie Argument falls apart. If one agrees that it is a valid principle, then the Anti-Zombie Argument also follows.

Premise 3 also takes Chalmers' own machinery and turn it against him. To comment briefly, the idea is that, if we can have a world in which consciousness is reducible to physical properties, then, given that Materialism is defined as a global logical supervenience of everything over the physical. If it is possible to be necessary that consciousness is reducible to the physical, than it is necessary across all possible worlds (this follows from S5 modal logic system) that Materialism is correct. Thus, if it is possible in the anti-zombie world that consciousness is reduced to the

[45] 'Does Conceivability Entail Possibility?', in T.S. Gendler and J. Hawthorne (eds), Conceivability and Possibility, pp. 145-200

physical (by Chalmers' own considerations") (CHALMERS, 1996, pp. 38), it supervenes logically on the physical and if it does so, it is necessarily true that Materialism is true.

The conclusion of the argument follows from a simple use of deduction[46]. The real conclusion is that something in the Zombie Argument is implying both the truth of Materialism (or physicalism) and the falsity of that same doctrine. So we may think that something in the argument isn't right. Most popular guess is the 'conceivable to possible' operation. However, for our purposes, it is enough to see that the Zombie Argument finds some strong pressure and is not an easy way out from the materialistic hands.

5. Mental Causation

Mental Causation is a clear name for an almost uncontroversial metaphysical supposition, that is, that our minds cause things in the world, mostly our own behaviour. The denial of that claim is usually associated with full-blown epiphenomenalism.

Epiphenomenalism is the thesis that our conscious mental life is a byproduct of physical activity that is caused but have no causal powers whatsoever. (FLANAGAN, 1991, p. 38). This position had also been defended by our friend Frank Jackson in his “Epiphenomenal Qualia” that, as we already talked about, introduced Mary to the philosophical concerning.

A brief overlook is due: Flanagan shows that Mental Causation is also very important to William James naturalist position on the metaphysical status of the mind because natural selection does not select traits that are not causally efficacious, for they do not give any advantages for those who get it. Jackson, on the other hand, argues that we may have had an exaptation on mental life, that is, natural selection selected our brains and by mere chance the functioning of brains generates epiphenomenal qualia. Epiphenomenalism is not a much endorsed position. Mental Causation is way too important to be denied without a fully adequate account of this phenomena.

Mental Causation is also relevant for explanations over the value changes that an economic system may have due to some News. It is assumed as necessary

[46] Either two instances of *modus ponens* or of transitive syllogism and one use of *modus ponens.*

conditions for agency and ethical behaviour and, beyond all that, we certainly feel like our mental deliberations are relevant for behavior.[47]

Our guide toward the mysteries of Mental Causation is Jaegon Kim. His two famous essays “Mind in a Physical World” from 1998 and “Physicalism or Something Near Enough” whose second edition is from 2008 are two of the most popular books trying to show that there is something as a Problem of Mental Causation. There only is such a problem if one’s commitment is to non-reductive physicalism, at least. But he thinks that it isn’t easy to be a non-reductive physicalist for the problems concerning reduction are even harder (KIM, 2008,p.1). The problems are, obviously, qualia and pretty much all those others that made Chalmers run for a dualist scape, according to these two authors there can be no complete reduction of the mental to the physical[48].

We already have seen that reduction of qualia is a tricky subject above, nobody claims that the issue is already settled for either side. So let’s now proceed to the argument that seems to put “the physicalism we can get” in a bad position. We, however, will not proceed as usual. In this section, I shall only to present the argument and explain it. In the next part of this work, we will see how each contemporary forms of physicalism deal with this and other objections. The reason for that is that one of the premises of this argument is presented in the minimal physicalism aforementioned and to reject it is to leave the delimited area of our present part. Kim tries to show that all physicalisms must accept his minimal physicalist picture, but we will show that that may not be true.

In what follows, we will take Kim as a guide to elaborate the somewhat technical argument known as “the Supervenience Argument” or “the Exclusion Argument” (KIM, 2008, p.32). In its more sophisticated presentation, the argument has two stages. The first stage is wholly based in supervenience relations. We already talked about these relations. They are taken to build a minimal physicalism and are fundamental to Chalmers’ argument, anyway we will announce it again just

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[47] Robb, David and Heil, John, "Mental Causation", *The Stanford Encyclopedia of Philosophy* (Summer 2019 Edition), Edward N. Zalta (ed.) See also: Kim, 1998, pp.31

[48] Chalmers’ whole book repeats and argues for this claim, however its third chapter is devoted specifically to show that. Cf Chalmers, 1996, pp. 83-109. Kim claims the same in the very first page of his “Physicalim, or something near enough”. Cf. Kim, 2005, pp.1.

to refresh the memory: a property B supervene on and property A iff there can be no occurrence of A without an occurrence of B. That's all we need by now. Chalmers had his own definition of supervenience that much more specific, but that one is likely to entail this one. With that in place, we may start:

First, let's suppose two mental properties M and M* and that M causes M* to happen. Let's also call the physical base of M, P; and of M*, P*. Now we can proceed in asking: if M* comes to be, and we assumed that M caused M*, we must also say that M also caused P* to happen, for M* only can come about if P* had come about. So the only way M could cause M* to come about is by causing P* to come about. Thus, the same level, causation requires downward Causation. That is the end of the first stage (KIM, 2005, p. 40).

Kim later generalizes this observation. He claims that for all higher-level causation, there must be downward causation. The important point is that there can be no same-level causation at any higher level than the most basic one, that is, of course, if supervenience thesis is correct.

The second stage starts now. He claims that there are two ways of completing his argument, we will investigate only the first, for the second is just a summarized version, it gives us no new conclusions over the subject.

In stage 1 we had that M must have caused P* so that M could have caused M*. Now we must remember that M supervenes on P. And so that M can happen we must have P. We must also remember that we are assuming the irreducibility of mental and the causal closure of the physical domain. So M is not a physical thing and cannot cause anything on P* which is a physical thing. So our best hope is to claim that P caused P*. But now we have, by the supposition that M caused P* and we deduced from this supposition that P caused P*. That is a problem because we have a very well accepted principle that excludes multiple sufficient causes unless we have a genuine overdetermination[49].

Kim asks us to say that is is not a cause of overdetermination, so we have two causes of P*, that is, either M causes P* or P causes P*. M is non-physical, so it

[49] The exclusion principle have a lot of counter examples. to cite just one: a pearson killed by two instantly shot bullets to his head. Obviously the cause of death is both shots and each of them is sufficient for killing. We later argue that mental causation is no instance of such violation.

cannot cause P* denying our very early supposition and leaving us to the conclusion that M does not cause M*. And more importantly, that there can be no mental causation at all, for either it is mental-to-mental causation, which can't happen due to supervenience thesis; or it is mental-to-physical causation which can't happen due to the CCP. And, hence, we conclude that: mental Causation is inconsistent with "(i) physical causal closure, (ii) causal exclusion, (iii) Mind-body supervenience and (iv) mental-physical property dualism" (KIM, p.22). This result is not very surprising, for it comes from the acceptance of property dualism and some of the main tenets of physicalism that we had shown to be inconsistent (see chapter 2).

Yet, of course, problems only arise because we had excluded overdetermination. Otherwise, we would have a dual (not necessarily a dualist) causal aspect of the mental over the physical and it would go just fine. Nonetheless, Kim asked us not to consider this option and, now, he follows telling us why.

The first reason is very simple. The kind of relevance attributed to the physical base in the Causation far exceeds the one attributed to the mental one, given the supervenience framework. The relevance is measured in terms of possible worlds. There may be a possible world in which M exists without P, nonetheless in this world there must exist a physical base for M, say A. And all the problems will arise again and we will end up with two causes M causing P* and A causing P*. But A is the relevant base properties, it is causally relevant in a more clear sense then M, whose role as cause of P* is given by hypothesis. Anyone willing to call for an overdetermination would have to show why both of them are actually relevant. I do agree with Kim in this, mental Causation on the way displayed would not be a genuine case for overdetermination. And I also agree that the argument is solid. Given the four principles above, we get contradictions.

As I have put, the answers to these arguments are going to be given together with a presentation of physicalist positions.

Part 2:

BRANCHES OF PHYSICALISM

6. Supervenience Physicalism

Supervenience had been already established above, where we took it (without arguments) to be part of the minimal physicalism we have been working with. In this section, I will present the arguments proposed by Kim to take Supervenience as fundamental to physicalism and further develop the Mental Causation Argument showing why it is taken to undermined all kinds of nonreductionist physicalism.

A background is due. Before the philosophical society decide that qualia are not reductive to the physical level, there were the Type Identity Physicalists, also called "Identity Theorists"[50] those views had been advanced in the late 1950s by Herbert Feigl and J.J.C. Smart, much development later, it started to be debunked by the arising of the computational paradigm in Cognitive Sciences and in Neurosciences that allowed functionalism to become an appealing position and with it, the non-reductionism. Non-reductionism dates back to the 1960's and is very tightly related both to the Multiple Realizability argument delivered at first by Hilary Putnam in his the "Nature of Mental States (PUTNAM, 2002, p. 76-77.) and to

[50] We will not discuss this issues deeply, because they are parts of the "mind-body problem" and as I said before this is not our concern in this work. However, See: Heil, (1998) for an excellent contemporary introduction. Flanagan (1991) the whole book and Flanagan (1993) the first and second chapters are great source for historical development Cf. Kim, 2005, pp. 138-164 In his work he discusses recent approaches for these theories and a more profound historical background.

Donald Davidson's supervenience thesis proposed in his Mental Events (DAVIDSON, 1970, p.207-227).

The first argument affirms that all mental activities could be instantiated in other realizers, for example, a very sophisticated computer or an alien or even in animals with very different neurological arrangements as fishes; and assuming that identity theory implies that mental states are equal to brain states, one may easily derive a reductio from the combination of both premises, for it entitles the conclusion that our brain states are identical to the states of a computer, which they are not. Functionalism claims, however, that a sophisticated computer, aliens, etc. can, indeed, have the same mental states like ours, for mental states are understood as a software, a program that may be realized by any adequate physical realizer. This shift in how we saw things did put reductionism in a bad position.

Davidson's supervenience argument is rather more an assumption than an argument. He basically asserts that because physical entities are all nomalous, that is, they obey strict laws, and psychological states do not obey such one can conclude that there is a difference between psychological states and physical states. However, there are no two things. Psychological states only happen to supervene on physical states, and this relationship allows the mental to be anomalous despite not constituting anything further than the physical itself. Two decades later, reductionism suffered another great attack: Kripke's Naming and Necessity.

In Naming and Necessity (1980), a well-regarded masterpiece in analytical philosophy, Saul Kripke puts forward a number of critiques against strong positions held in the time, one of them are materialism, especially Identity Theory (KRIPKE, 2004, p. 131-133.)

He used an argument based on conceivability to show that there can be no necessary relation (and hence, no identity relation) between physical and mental attributes, especially phenomenal properties. His argument is based on the assumption that considering that we can conceive of C-fibers firing without the phenomenal mental experience of pain happening, we can assert that it is possible that C-fibers fire without pain, and because of that, it is not necessary (true in all possible worlds) that pain = C-fibers. From this, he concludes that materialism is false. I must say that this modal reasonings had found many controversies on the

literature, but we shall follow without getting too deep on this modal black hole[51].The important part is to remember that a great deal of the importance of Supervenience nowadays is to deal with this modal claims.

Supervenience had arisen before that, as I have said, in a famous paper of Donald Davidson called “mental events” where he tried to find a theory for the mind that is compatible with free causation on the physical world without rejecting physicalism. His theory is called “Anomalous Monism”. In this work, he establishes the use of Supervenience as a nonreductionist ontological dependence. His point is to try to reconcile mental events that, he claims, do not follow strict laws of physics with physical events that surely do follow such laws. One may ask how this view, that is a kind of token physicalism, that is, human mental events are identical to human physical neuro events, can behave according to laws in the physical aspect and not accordingly in the mental aspect, but we won’t pursue the issue here (DAVIDSON, 1970, pp.207-227)[52] [53].

From that to Chalmers’ The Conscious Mind, the concept of Supervenience had become of overall importance. In Kim’s Mind in a Physical World we can find the argument that he made to attest that the Supervenience Thesis required for minimal physicalism. He there argues that both emergentism and realizationism, usually taken to be alternatives forms of dependance of the mental to the physical both require, by their turn, Supervenience. Now we will proceed to show how that had been done.

Let’s define Supervenience as before:

Mental properties supervene on physical properties in the sense that if something instantiates any mental property M at t, there is a physical base property P such that the thing has P at t, and necessarily anything with P at a time has M at that time. (Kim, 1998, pp.10)

[51] For a summarized view of the argument, see: GENDLER, T. S, HOWTHORNE, J., Conceivability and Possibility, 2002. pp. 26-38. For a broader view and also a pleasant critical discussion on modal epistemology , see Berglund (2005).
[52]Kim makes critical comments in the beginning of his book. Cf. (Kim, 1998, pp.4-5)
[53] For another version of this story see Kim, 1998, pp.1-4

We can see that given a base physical property if a mental property supervenes on that physical property, the mental property it will hold every time that the physical properties hold and only those times. Pay attention to the time index in the definition above. Kim is talking about “instants of time” and property-property relations. Ahead these uses will be put in question.

Another important remark suggested by Kim is that Supervenience is not a position on the mind-body debate, that is clear because it, according to him, implies at least two opposite views on the mind-body debate. He takes Supervenience to be a plural device for dependence and, more importantly, covariance. It says how two properties relate to each other but leave the metaphysical ground quite empty (KIM, 1998, p.14).

To show that physicalisms all share this thesis and to say that it is a physicalist commitment, Kim starts pointing that substance dualism is not consistent with it. The reason is very obvious if we understand souls as independent entities, we must also accept that they can have soul-like operations without changing the physical base properties. Otherwise, souls would not be truly independent.

On the other hand, if you take and identity theory, that is, a strongly reductionist account of physicalism, it is also clear that the supervenience thesis would hold, because if minds are just brains they cannot change without changing the physical, after all, they are one thing only (WILSON, 2007,426–459)[54].

fter considering the extreme cases, one must seek for confirmation that all physicalisms require Supervenience. Until now, there is nothing said about the nature of this relation, as we said above, it is a mere description of covariance and dependence. If one takes mental states to be in any way distinct of physical states and yet related to each other, one should ask oneself “what does this relation consists of?”.

Is there any kind of relation in the mind-body debate? The belongs to the physicalist framework, and that does not obey supervenience thesis? That is, is there a relation between mind and body in which different mental states occur without changing the physical base? Or with the same physical base, but with other

[54] Kim just mention that supervenience works for reductionist physicalism and that it doesn’t for substantial dualism. I gave the arguments that I think he was presupposing for didactic reasons.

or none mental states? Are there any smooth subtleties that can render Supervenience false and maintain a difference between mental states and physical ones?

It is commonly thought that “no”.[55] Kim starts his try to show this by defining what he calls “Physical Realizationism”, a sort of non-reductive materialism that would be the metaphysical profile made to accommodate functionalism, and showing that the mere definition of this position entails Supervenience (and hence, as the majority of philosophers by that time were functionalist, he was expecting this majority to bite the supervenience bullet as well).

His argument starts by defining the terms and relations. Let’s start with the slogan as is usually done: physical realizationism is the doctrine concerning the metaphysical landscape of certain kind of mind-body relation that claims that if mental states are realized, they are physically realized (KIM., 1998, pp.19). That is, roughly, to combine the functionalist approach to the mind (e.g. that mental states are a type of functions, that is, being in pain is to perform pain-like behavior or neuro-activations of some sort that will function as being in pain) (BLOCK, 2004, pp.184) within the materialist approach to the possible nature of the realizers. (more precisely assuming the CCP. and EP).

We now have a type of property that is mental, such as pain and a physical base, e.g. some sort of neuronal activity that will realize the other property. Kim notes that the nomological conditions of a given world determine whether the physical properties will or not realize the mental ones. But the mental ones are abstract, formal structures that could, at least in principle, be instantiated by any adequate realizer. He, however, do not feel compelled to take this too seriously, for non-physical realization seems too heavy an ontological commitment to take.

Kim concludes this introduction by asserting that the realization relation depends on specific laws for specific realizers, but once they are fixed a system s in which P (physical property) realizes M (mental property), we obtain that for every similar system in nomologically similar worlds similar P realizes M.

After making this definition, Kim goes for the kill. He points that If P realizes M in a system S, the mere existence of P in S is sufficient to bring M about, after all,

[55]See also: Kim, 1998, pp.38

saying that something have P is just a token way of saying that a particular S instantiates a more abstract type M and, hence, it follows from the realization relation that S supervene on P. That was the whole point (KIM, 1998, pp. 23). Kim has, thus, showing that those who embrace functionalism and a weak notion of physicalism, also hold the supervenience thesis. As we have seen above, the supervenience thesis is necessary to establish the Supervenience Argument (the title is, indeed, indicative). Now we must see if emergence is also dragged by the supervenience argument.

We must make clear that the “emergentism” in Kim’s work is not the one we will see below. For him, an emergentism is a form of property dualism or nonreductionist materialism. Further, ahead we will deal with the more promising reductive emergentism, which is quite more fun as well. We will follow Kim as a mainstream position for now. He proposes that emergentism is very likely to be committed with Mereological Supervenience in his words:

Systems with an identical total microstructural property have all other properties in common. Equivalently, all properties of a physical system supervene on or are determined by its total microstructural property. (KIM., 1999, pp. 7)

The very idea behind this claim is that for the emergentist, complex arrangements of properties in lower levels “generate” new, exciting properties that cannot be reduced to their parts (KIM., 1999, p.3-36). So, if one thing holds the complex micro properties and maintain their interrelations, the new properties would arise, and if the new ones are changed, the microstructure must be changed as well. Kim just accepts that they are buying Supervenience and goes ahead, claiming that it follows by definition as before.

So the result is that all nonreductionists must accept the Supervenience Thesis as constituting the minimal physicalism, and because of that, all of them suffer from the causation problem above mentioned. But...is it true?

Briefly, before proceeding to the next section, we must see how this position deals with the five questions proposed in the introduction. The full formulation is:

Supervenience Physicalism (SP): Every existent object is supervenient to the physical.

Kim, in all of his papers and books considered here, never gives an account of what are objects, nor of what he takes to be a “physical object”[56]. He argues that physicalism (of the reductive kind) is only true to psychological states and not too phenomenal ones. He obviously renders S.P. as true, albeit the lack of clarity on some of its main parts.

He argues that physicalism (of the reductive kind) is only true to psychological states and not too phenomenal ones. He obviously renders S.P. as true, albeit the lack of clarity on some of its main parts.

After assessing the basis of S.P., we can open the very position to scrutiny. As we have seen, mental properties are held to supervene on physical properties if physicalism is correct. Supervenience is a metaphysically neutral thesis trying,in its core, to specify only covariations among properties and one can fulfil it with very different metaphysical cream, any flavour one preferes. Yet, what we are about to see is that supervenience may not be such a well description of covariations as Kim takes it to be, it may not be strong enough for some positions and it may be wrong.

The first line I shall draw is that there is a subjacent ontology to supervenience that does not quite hold for the service[57]. The point is that supervenience directs us to a view on mental and neural properties that I will call “Standard View on Mentality”. That Standard view states that brainly and mental processes are like a mechanical thing, mechanical being understood as Descartes would likely do, as something as an hidraulic automata. As if one part of the brain could be entirely responsible by a mental aspect by itself or that brain activations are like pressing a button in a machine.

What, in particular, makes me believe that that is the case is the “In a time t”, or “at t” part of the definition of supervenience. The mental state, or the subjective

[56] As pointed by Mograbi, 2016

[57] John Heil’s On an Ontological Point of View recommend one to take ontology seriously in any investigations one makes and that is the advice we are following here. Cf. Heil, 2003, p. 1.

aspect of seeing, for example, is long process. If one stops time in *an instant t* there wouldn't be any brain activation much less the complex arrangement that enables the mental properties to be as we experience them.[58] We only get visual *consciousness* when the occipital cortex is activated in the end of the visual perception process.

So, a problem arises when one consider the following situation in a given (interval of) time t, visual information V is being processed by the thalamus while previous visual informations V1, already processed by that area, is playing its role at the occipital cortex. Considering that both processesments are necessary for visual experience Ve and the occipital processment of V and of V1 are slightly different (the first is a ten centimeters difference in the focal site of a given object) and Ve is the relevant mental property that would be produced at the end of the process of V and V1. After all that one must ask: “Is Ve supervenient to V or to V1 processing areas?” Given the EP, if something have a cause it have only one cause (unless it is and authentic case of overdetermination). Both V and V1 processing areas are responsible and necessary for Ve and are very different areas of the brain. In other words, taking Ve to be called M, what would we call P, in order to the supervenience thesis to hold? Either V1 or V processing areas. Cannot be both, because of EP. One may want to say that both will give rise to one part of Ve, so Ve would be composed of Ve1 and Ve2. But as I put the difference between them is tiny. The temporal difference if equally small. How could we subdivide the experience in such precise ways? All and all, the supervenience thesis seems to be altogether uneffective to decide over such matters. If one insists in saying that the process described is a case of overdetermination, I think one could accept it, but this kind of overdetermination would be the rule, not the exception to the mental-neural relations and that would also maintain all problems as above.

Another thing that gives me this bitter taste in supervenience is the “necessity” part of the definition and the open gate that definition leaves opened. The necessity is problematic not because of its lead to modal discussions, but because, as is

[58] One can go after the aforementioned reference (see note 43) for further details.

known (LAURENCE & MARGOLIS, 2015, p. 117-151)[59], the same parts of the brains are used to do very different functions sometimes, so “having P” may not make M supervene. Also, “having P”, even if we accept that the “having P” in seeing as a particular “having P”. It still makes us wonder, which are the relevant physical parts of P? one special part? does the P related to the mental state during seeing a red ball involves those that conceptualize it as a ball? Does it include the external existence of the ball? All of those surely seem important parts of the mental state of “seeing a red ball” one could grant all that, but there is some more weird cases: does the ground below the ball also makes part? if the ground would that call for the whole Earth? Is the light required for the perception of the red ball part of P?

Well, I have no idea. I do know, however, that no one I had ever seen tries to specify what are they taking as the “relevant” physical aspects of mentality. Putting the “where to draw the line” problem aside, and accept that P is brain process, even so there can be thousands of different P’s for the P we want, there can be those that are related to language and will give conceptual structure to our view, that are not required to the sensation of seeing, but are required to the sensation of seeing a “red ball”. But for the conceptual structure to work, the Hippocampus and other memory related areas must provide support, are they included in the P we want? All of those parts are constantly connecting and disconnecting billions of synapses. This P is very not a fixed thing and I so think that taking it as if it was changes significantly what we can say about it and, hence, our philosophical accounts.

After analysing the physical aspects on this perspective, the same can be done to the mental states. It seems to be very hard to individualize mental states. They change all the time, they can be very, truly alike each other, they can be very similar in content but connect to other mental states and they may *not* be a state after all. They may be essentially blurry to this kind of approach. Especially if one understands the brain as a very complex system that keeps changing all the time the focus of activations and doing parallel processes that fit together in an overall picture that one would call a mental state. The Standard View, then, makes the brain to appear a stage-by-stage mechanism and the mind to be built upon each of the

[59] In their chapter, the authors explore the phenomena I am indicating e.g. neural plasticity in the context of the nativist vs empiricist debate over the origin of concepts.

stages as a Lego piece being tied to another, by incredible fast children, I should add, but no matter how fast, that is not the best underlying description we have.

The best ontology for brains and minds is a processual ontology, I cannot draw it here, but it must base itself in the plasticity, continuous changes and enormous complexity of the existing systems not only considering brains, but the universe as a whole, or so much of it as possible. This process ontology must be entirely aware of its rupture to newtonian-cartesian paradigm on mechanics which is not to deny mechanism altogether.[60]

There is, and I will point to it in due time, a good account that coheres with the aforementioned ontology of brain function but I will keep it a mystery, for suspense[61].

The second critic comes from our next guest, that is, Andrew Melnyk. in 2003, he published his main work, by which he has been widely recognized as the most important defender of a non-modal formulation of physicalism[62] and we must start by a brief look on his standpoints and albeit his formulation of physicalism is to be sketched in the next chapter (MELNYK, 2003, p. 57) we will introduce some necessary aspects now so that we can explain his objection to physicalist formulations based on global supervenience which is our interest here.

He establishes that a physicalist position formulated in terms of global supervenience must be logically sufficient for physicalism and also have less problems than the position he himself advocates, i.e. realizationism. The first point is, obviously, to state the global supervenience thesis, which he takes to be:

> "*(GS) Any possible world indiscernible physically from the actual world is indiscernible simpliciter from the actual world.*" (MELNYK, 2003, pp. 58)

The strategy he undertakes is to show that GS is not sufficient for physicalism, that is, he shows that GS can be true whilst physicalism false. In what follows we will use Melnyks terminology in which "physical" is what is described in a current consensus theory in physics and "nonphysical" everything else, yet usually it

[60] Though I cannot follow the subject here, see: Seibt, 2012 In Stanford for an ontological view that promises something similar to what I take to be required.
[61] It's Reductive Emergence. That's it, I couldn't hold myself.
[62] See Stoljar 2017 in Stanford Encyclopedia: Physicalism.

is not meant by “nonphysical” things as souls. He usually takes to be any object, property or event that does not appear in a physical theory. So electrons are physical and stones are not. In next section we will see that this way of distinguishing things is not as weird as it seems at first glance.

With that in mind, we can proceed. Consider, then, a world were the way things are is necessitated by the physical. So the way physical things are is the only way everything is. Take the necessitation above to be logical necessitation, so every world physically identical to ours is identical *simpliciter*. (GS) The mere acceptance of GS should, were it to be logically sufficient for physicalism, allow its truth, so the modal fact stated by GS is taken to be *fundamentally primitive (*MELNYK, 2003, pp. 58), for if we add some further explanation GS would not be sufficient by itself. Now, this position is by itself seen as highly problematic for most, or all, nonreductive physicalists. However, Melnyk will explain further why he takes that to be a problem. He takes the following intuition, the Truthmaker Intuition, to hold for special sciences (every other science that is not physics in usual sense) in the physicalist picture:

> “*(TI) If physicalism is true, then there must be some sense in which all the true descriptions of the world framed in the proprietary vocabularies of the special- and honorary-sciences are made true by the distribution in the world of physical tokens (given the physical laws).*” (MELNYK, 2003, pp. 59)

Physical tokens are physical objects in his sense. His point is that if physicalism if correct, the world is just physical and that’s all. So without postulating some sort of compositional relation,(e.g realization) all there is is the physical, in his sense, and all other sciences are either wrong or describing allocations of physical things. There are no new truths for the special sciences that there couldn’t be found by physics. This physicalism would not be “retentive” (see introduction). But supervenience is not called up by eliminativist, who would embrace this conclusion with sophisticated remarks, but by nonreductive physicalists, who usually like retentiveness. So he takes that they will accept retentiveness and GS. Melnyk further thinks that they can’t have both.

The reason is simple. GS implies a fundamental primitive, that is, all things are physical or made of physical things, but there is no compositional structure in which we can depart from the nonphysical objects to the physical ones or the other way. So one that embraces GS cannot embrace TI and the nonreductive claim falls apart due to the fact that there is no sense in which the description of nonphysical special sciences (in Melnyk's sense) are made true in virtue of the physical. There lacks something in GS thesis that connect the physical truths to the nonphysical ones.

He adds a second intuition that GS does not satisfy by itself due to the very same problem: the primitiveness of the physical-nonphysical relations create an empty explanatory space. The Constitution Intuition is as follows:

"*(CI) If physicalism is true, then the nonphysical is somehow entirely constituted by the physical.*" (MELNYK, 2003, pp.60)

The idea behind this argument is that GS entails only that the existence of any special science object is necessitated by the physical facts, the necessitation does not explain how the constitution could be done.

Is important to see that GS is not alone against physicalism, nor entails problems for physicalism. All that have been said is that it doesn't provide sufficient conditions for establishing physicalism. If it is supplemented by something, as, Melnyk insists, realization, the problems would be gone.

His claims that physicalism would be false despite GS been true goes without proper arguments. It is just very implausible that it could be true just in terms of GS been true.

As it has been my methodological standpoint, I shall not counter argue the critics. Nevertheless, I must say that supervenience has much adherence in current philosophy. Mostly because it proposes a way in which nonreductiveness of sciences, or of mind, or of normative speech, or of aesthetics etc. can be stated. I will not pronunciate myself about those uses beyond the realms of philosophy of mind, yet, it is a widespread concept. I must, however add, that it is, in my view, a problem-raiser rather than a problem-solver in those realms. It allows us to have an

intuitive grip on mind-body matters, but perhaps intuitive isn't the best way to approach such discussion. Our intuitions about our own minds can be highly misleading in the cognitive research environment[63]. The skepticism I present here is by no means new (HEIL, 1998, pp. x). Many philosophers do not feel compelled into accepting it[64]. Mostly those who take that *a priori* reasoning has important limits, neglect its use. The context of its introduction and the high technicity involved cause many to go for another kinds of relations, in the following we will discuss two options, Realizationism and Emergence.

[63] Flanagan offers a good view on the utility of intuitions and introspection in cognitive sciences. Cf. Flanagan, 1991, pp.188-200. Leal-Toledo discusses the use of intuitions vs the use of argument (especially empirical ones) Cf. Leal-Toledo, 2006, pp. 123-132

[64]Wilson proposes important critical discussion on the supervenience formulations of physicalism, interested reader could go after it. Wilson, 2005, pp.426-459

7. Realizationist / Functionalist Physicalism

I suppose that starting by remembering how discussions are going so far is, arguably, the best way. There were the qualia problem, which many take to be decisive against reductionism. There is also the (above mentioned, but not discussed) interest in not taking reductionism too far, in the sense that one need to accept that all sciences are only talking indirectly about physical objects. The worry is that the methodology of physics is not adequate to deal with all the scientific objects. That is obviously true, by there is no clear reason to entail that the mere acceptance of a metaphysical and ontological view as physicalism would entail that epistemological point. For sure, physicalism rules out some methodological commitments, however many methods may survive perfectly well. Now, there is another nonreductive claim that is much stronger, that is, Multiple Realizationism. The argument is actually destined to fight identity theorist, who says, roughly, that a type of mental state is identical to a type of brain states. So imagine that a mental state is identical with a type of physical state. Than, it follows directly, anything that does not have this type of physical state also does not have that mental state. But it is very plausible that dogs feel pain as much as we do, but their brain is different enough from ours, for them not to have the same type of brain state as we have. So if dogs feel pain, there is no identity relation (HEIL, 1998, pp. 98). Perhaps dogs are not a good example, but if one wants to stress the point, we could imagine an alien being who took a shot and, very plausible by its behavior, feels pain. The position that would most strongly endorse this argument is the Functionalist view.[65] The point

[65] For more details on functionalism, see: Block,2004, pp. 183-200, Fodor, 2004, pp. 163-183 for original sources and Heil, 1998, pp. 89-127 for great critical discussion.

is that as I said earlier, most of the philosophical community stands in the functionalist position at least about most mental things[66].

In this nonreductionist friendly environment, supervenience grew and got enfatted, but the problems above mentioned and many others made a call for new ideas on which to embed physicalism and, for that reason, Andrew Melnyk made his attempt to save the doctrine. His position is called "Retentive realizationist physicalism" and can summarized as the view on which everything either is physical or is realized by physical tokens. Physical tokens as we have said above are physical objects in Melnyk's sense (which, now on, util it it obviously be denied, will be the sense I will mean for physical and nonphysical). Realization is to perform a function. So the idea is that either the objects exists as themselves or they exist because those objects that exist as themselves perform the functions in suitably arranged ways and this function performing allows for new things to exist. His appeal to precise definitions of "physical kind and token", "realization", "functional token" and of his own view as a whole, is determined in parts by his wish of obtaining an *a posteriori* account for the arrangement of the world.

Let's proceed in order, he takes physical *kinds* to be those entities mentioned in highly accepted theories in current physics (MELNYK, 2003, p.18), so we can have physical property kinds, physical object kinds and physical event kinds. Beyond that, a physical token is the instantiation of a physical type, either properties, objects or events. He proceed over detailing his definition, but because it will be a major point for critique I shall develop his view in the next section, in order to maintain the reading less dense[67].

After defining "physical" he goes after the notion of "realization". The first thing we must know about it is that realization is a relations between two tokens of different types. Remember that the types are physical and functional and both are subdivided in properties, objects and events kinds. So there are a lot of different possible tokens available to compose the natural world. So, functional types are high-level types, they can only be instantiated by a low-level token that will meet the

[66] Chalmers (1996) and Kim (2008) offers two views on which the functionalism is true for most of mental states, but not for phenomenal states as qualia.
[67] Because I desire the best for my readers.

associated conditions, that is, physical tokens must behave adequately to meet the associated conditions of instantiating the functional token. His full definition is:

> "*Token x realizes token y iff (i) y is a token of some functional type, F, such that, necessarily, F is tokened iff there is a token of some or other type that meets condition, C; (ii) x is a token of some type that in fact meets C; and (iii) the token of F whose existence is logically guaranteed by the holding of condition (ii) is numerically identical with y*" (MELNYK, 2003, pp. 21)

It is important to remark that in the above quotation, x and y are from different types. The rest resumes, in a more precise way, what we already discussed.The best I can do may be to give a less abstract view on the elements of the definition, so here it goes: F is a functional type, for example, being a molecule of hydrogen. y is functional token and would be something as, being that, particular, molecule of hydrogen. x is a physical token and would be the atoms of hydrogen that perform the role of being a molecule of hydrogen. Condition C may be something like the temperature, the pressure, gravitational and electrical fields, or any other aspect that is relevant for allowing two atoms of hydrogen to join in a molecule

Another important thing to say is that I had chosen a very simple example, but his theory hopes to be omniabranget, it can cope with more complex arrangements introducing more and more functional and physical types and tokens. The definition would hold for every one of the instantiations. Hopefully the definition holds for these complex cases. We can, now, move to present his thesis

> "*(R) Every property instance is either an instance of a physical property or a physically realized instance of some functional property; every object is either an object of some physical object kind or a physically realized object of some functional object kind; every event is either an event of some physical event kind or a physically realized event of some functional event kind.*" (MELNYK, 2003, pp.26)

The notion of physically realized deserve special attention, according to Melnyk, than, being physically realized is:

> "*A token x of a functional type, F, is physically realized iff (i) x is realized by a token of some physical type, T, and (ii) T meets the associated condition for F solely as a logical consequence of the distribution in the world of physical tokens and the holding of physical laws.*" (MELNYK, 2003, pp. 23)

The idea is to stress the point concerning laws of nature and the actuality of the tokens. For, without this addition, one may take a functional type F to be realized by a physical token that to meet C must behave in absolutely miraculous ways, that is, against laws of nature, if this care is not taken, than Melnyk's definition would allow for such miracles to exist. He adds a second case that stimulated that detailed account on being physically realized, but I will not undertake the task of describing it for it wouldn't enhance much of our understanding of the situation.

We are almost getting to the more interesting parts, hold on. Before we get there, however, I must add some important aspects on the criterias for the existence of physical tokens and their importance to refutate realizationist physicalism. They must be causally effective or contingent (the "or" is inclusive) and also either be physical or physically realized the first criteria puts this view as a exponent of Weak Physicalism (see introduction). If there exist something that is causally effective and neither physical nor physically realized, as it would be the case of cartesian souls, realizationist physicalism is wrong, it is expected to rule out all possible adversaries of physicalism and leave the path very open for objections. The clever trick, though, is that we cannot detect causally ineffective objects, so we cannot prove their existence *a posteriori* so there cannot be found any important evidence against his view following what he takes to count as a counterexample. He has not argued that only *a posteriori* evidence is acceptable, but that is a possibility, if one forces him to accept that, his position will be epistemologically undefeatable, which usually is a bad thing for anyone with scientific desires. But the objection is not there yet, so let's move on.

There is an important point to be made about this theory, that is, how much reductive (or nonreductive) it is (MELNYK, 2003, p. 71). The relevance is because in the second chapter, Melnyk shows that his theory implies a form of global supervenience that is sufficiently strong for Kim's causal trap to hold. Of course that, as Kim himself acknowledges, all reductive positions are immune to the mental causation problem. So depending on how reductive realizationist physicalism is it may or may not avoid the mental causation problems.

He starts his third chapter by evaluating many different accounts of reductionism and accepting that his position is committed to some and rejects its commitments to others. He frequently reminds that there lack a good argument to show that reductionism is as problematic as most philosophers of mind think it to be. He also discusses if his position is reductionist in Nagel's sense and takes it not to be, which by its turn is a relief from the most prominently non-accepted form of reductionism. I don't want to get in details about this long parts,[68] because the author himself does not see those as very interesting. After discussing all that he states that there is a very important sense to which his position is reductive. He calls it the "core sense of reduction" that is, in his opinion the real strong *spirit* of reductionism and, therefore, it is the main source of our interest in this discussion. The principle of reduction is thus stated

> "*(CR) All nomic special- and honorary-scientific facts, and all positive nonnomic special- and honorary-scientific facts, have an explanation that appeals only to (i) physical facts and (ii) necessary (i.e., entirely noncontingent) truths*." (MELNYK, 2003, pp. 83)

We are talking about facts because he takes that only truths of upper-level sciences can be reduced to other theories, but he does not take it to be a strong requirement, it could be the case that approximate truth could do the job. The special and honorary- scientific facts are those formulated in appropriate languages for such sciences. The laws he talks about are every strong regularity found in special sciences, there have no strong metaphysical requirements for such laws. The

[68] However the interested reader can have a blast seeing Melnyk, 2003, pp. 71-81

requirement for positiveness is given due to the desire to rule out negative instantiations of special scientific functional types facts like “there are no zebras in my bedroom”. The last clarification is that “nomic” means “described as a law” and the “nonnomic” means “described by appeal to bare, contingent objects”, if we talk about physical nomic or nonnomic, we are also meaning things described in the the language of physics, the other way around also holds.

He takes four important conclusions on the definition above quoted (MELNYK, 2003, pp.84-9). The first is that special sciences must not switch vocabulary with physics even if reduction of this kind proves to hold. For the only thing realizationist physicalism requires is the existence of an explanation in pure physical terms of the phenomena, not that only such explanations are true. So he is perfectly happy in accepting special scientific explanations for phenomena and only must maintain that there is also a physical explanation. The second comment is on the requirement on the necessity of laws to be physical, he takes that the model of reductionism he undertake does not require physical laws, only physical objects and whatever kind of law you wish. The third comment goes on the nature of the necessary truths required for reduction. He insist that his reduction calls for something weaker than all pure *a posteriori* necessity statements, that connects all the predicates of the reducing science to the predicates to the reduced science. That, indeed, would require a type identity among the sciences, and as said in the beginning, multiple realizability does not play well with type identity. So in this point we can see clearly why he takes so much effort to reject the old notion of reduction. He is embedding his view on multiple realizability. The fourth and last comment is that the necessity meant in the definition is metaphysical, not only nomological, for otherwise the reduction would not achieve our intuitive expectations. The idea is that contingent bridge laws would allow for physical explanations of upper-level sciences, but would not permit us to take that special step toward reduction. He takes that only the physical tokens and facts can be contingent, if reductionism is to be done, and as the laws connect special sciences to physical they are not pure physical facts, for they are a mixed. That mean that if the bridge laws hold in terms of mere nomological necessity, they would be a mixture of physical and nonphysical facts and could not support reduction for themselves would not be reductive. I must comment that this argument seems

very circular to me, for it claims that exist a distinction of explanation that is reductive in weak sense and in the special sense. The first allows for nomological necessity and the other requires metaphysical necessity. Why does it requires such strong claims? because, intuitively, the only things that can be contingent in reduction are physical things and nomological laws are not purely physical. The apparent circularity goes because the two most important claims are pretty much the same and none are argued for that moment e.g. that the only contingent facts acceptable are the physical ones and that the nomological contingency would imply a non-physical character for the bridging principles. He offers defense for the first right below.

The first claim is that reduction means or implies less ontological commitment, for if before accepting reduction, one had two different kinds in her ontology after accepting it one have one kind of stuff behaving in two different ways. The point that follows from it is that the bridging principles must allow for logical reduction, in other words, once given the basic facts we have the reduced facts directly. That must be the case in all worlds otherwise there would be something of the reducible x that is not entirely due to the reducer y. Hence there would be more about x than y alone. This is the very point that David Chalmers aroused (CHALMERS, 1996, p. 39-44) and based on which he constructs his Zombie Argument. It is important to highlight that this claim may not be perfectly established. For if x is reduced not only to a thing y but to complex ground of interrelations that are based on the laws of nature ruling the world in question, than, changing such laws x may not be reduced to the system y. If you change enough no one knows how crazy the world would became. In the just mentioned case, reductionism would not require a stronger necessity than nomological and there would not be more to x than there is to y system (not thing). So a possible way out both dualistic trap and Melnyk's very strong requirements for reduction would be a developed idea of the case above, that is, a reductive notion that shows how nomological regularities are enough for reduction.

He, however, keeps his position and necessity in metaphysical sense is maintained. He accepts that his position embrace such reductionism as CR. We have skipped a very technical discussion that proved that his physicalism is retentive. We will develop that view ahead when we are to criticize it. So for this brief

section we just need to know that retentiveness is required and defended throughout the book. Recalling that retentiveness is the capacity of developing a physicalist view in which the special sciences maintain their explicative value and, perhaps, causal powers. All this is defended at length and we won't be able to sketch all details here. He takes that his retentiveness imply the thesis of CR and thus that the reductive notion he assumes is a very different than most philosophers would take it to be, because, usually they use reduction as similar to elimination, or reduction as a explicatory tendency is the aim of all science and that, for reductionists, we should seek to reduce everything to physics and talk about biology using physical operations. Thus, in preserving retentiveness while also preserving reduction, he shows an important possibility: new causal powers and uprising true descriptions for higher-level entities.

Is this reduction enough for defeating Kim's Supervenience Argument? We must remember that Melnyk accepts his physicalism entailing a form of supervenience

"*(GS) Any R-world that is physically indiscernible from the actual world is indiscernible from it simpliciter*." (MELNYK, 2003, pp. 56)

R-worlds are worlds where realizationist physicalism is true. That means that every world in which everything either is a physical token or are realized by physical tokens and that the same physical tokens hold will be completely identical to our world. All special sciences tokens are functional tokens that should be realized by the physical, giving the truth of the doctrine in view. The new causal powers are, thus, reducible to the arrangement of physical tokens and, hence, it is reduction enough. Kim's argument only work if new causal powers are irreducible to the physical constituents in a strong sense, e.g. new properties arising, that by themselves, have new powers. Melnyk, on the other hand, requires only arrangements that meets a condition C of realization of functional tokens will acquire those new causal powers. There is no new properties, there is only realization of functional tokens.

He further develops all his positions on causation in the fourth chapter of the book, however this discussion is lengthy and deviates from our propurses. I want only to show how different positions on physicalism can escape ordinary critiques especially those that Kim took to be decisive e.g mental causation and qualia reduction.

I have just summarized how his doctrine deals with causation, now let's proceed to the end of the sketch of his theory by explaining how it can deal with mentality, specially its phenomenal aspects i.e consciousness.

Unfortunately, he doesn't deal with that. After all his position is taken to be a scientific hypothesis and as such cannot be defused *a priori*. He positively rejects conceivability arguments and after that rejects the very few cases of empirical findings that are behind dualism. His defense of the first will take us further in rejecting dualism, if it prevails, which sadly I don't think it do in face of more recent formulations of the Conceivability Thesis.

The second kind of objection he defuses will not be discussed here, for they are very specific and also futile attempts (MELNYK, 2003, p.180) by futile I don't mean poorly thought, but all they claim are possible inference to the best explanation that favor dualism, Melnyk's strategy is purely based in pointing for another, physicalist, candidate that does the same job with equally acceptable justification. This kind of dispute rarely do other thing than beg the question each side against the other. Those with dualist inclinations take the dualist interpretation to be the best option, the physicalists take the other to be victorious and we are stuck the argument being dependent on our positions on the debate other than the contrary[69]. So I will mercifully spare my dear reader of another dead end in philosophy and proceed to the response to the conceivability thesis (CPT).

CPT is the claim that given adequate conditions (that vary from author to author) the conceivability of P (being P a proposition or state of affairs or whatever it is you want to consider as possible) entails the possibility of P, in the current

[69] There is, however a different empirical position on which the mentality may be nonphysical, it involves a lot of neurosciences and quantum mechanics (it was proposed by *sir* John Eccles, Nobel laureate that worked with *sir* Karl Popper). Melnyk shows a *non sequitur* in his claims and offers different interpretations to the responses, despite this debate being far more attention-deserving than the others, it would require a long digression into the specific details of such sciences and I cannot afford, neither am qualified to do justice to, such a rich position.

interpretation of possibility, there is a possible world where P is the case. Melnyk attacks not the conceivability itself but the underlying assumption it requires in the context of the Zombie Argument, that we can know the primary intensions (in Chalmers' terms) *a priori*, hence if we can conceive of P there is a world in which P is the case and we are justified *a priori* in going from the conceivability of P to its possibility. Melnyk rejects exactly that. He claims that we are not able to determine *a priori* the primary intensions so we are not justified in going from the conceivability to the possibility that P without *a posteriori* additional evidence. He suggests (MELNYK, 2001, pp. 331-349) that those *a posteriori* justifications would plausible come from a theory of concepts. He shows two possibilities: fodorian concepts and dispositional concepts. The first are primitive symbols of a language of thought and have their meaning attached to objects in an analogous of the causal theory of reference presented by Kripke. In this position the meaning of a concept is attributed by causal relations that happened to occur given contingent facts, so going from the meaning of terms in this world to their meaning in other worlds wouldn't be justified for the other worlds could turn out to enable very different meanings for the concepts.

The second option is more promising, for it already entertains the modal claims in its concerns. The dispositional account says that being competent in using a concept is to have a disposition to apply correctly the concept in this world and to counterfactual possibilities. He claims that these would not help because there is a difference between the way one says she would apply the concept in counterfactual ways and the way it actually would, had that world turned out to be the case, that is, given primary intensions. Given that these two accounts on the nature of concepts could apply to phenomenal concepts and both entails some *a posteriority* to the primary intentions, Chalmers and others defense of the CPT on *a priory* grounds are not guaranteed[70].

[70] I said above, in the zombie argument sections that I would not address the substantial issues of conceivability in this work and I maintain that idea. All I say here is the main strategy Melnyk used to dismiss such arguments. Those interested in these matters can go after the reference given in note 112 and those suggested in the Zombie Argument section.

finishing, then, my sketch on realizationist physicalism[71] we shall see, as before, how Melnyk answers to all five questions.

Realizationist Physicalism Thesis (RPT): Every contingent causally effective referent on the domain of reference of a language, special science or physics either doesn't exist, or it is realized by the physical, or is physical in the strict sense.

It is easy to see that this position is far more detailed than SP above, it answers all the five questions. The "every" is applied to existent, contingent and causally effective things. The objects are the referents of theoretical or natural languages that obey the above description. The relation is realizations as the title suggests. Physical objects are those that take part on the literature of physics and, of course, Melnyk takes his position in such formulation to be true. Answering all five questions.

Not everything is a rose in philosophy, however, and this position also has its problems. To show some of them, the very first thing we must remember about his doctrine is that he takes it to be a scientific hypothesis as much as a metaphysical claim. His definition of "physical object" is of overwhelming importance and if it crumbles most of his claims will go with it. I will start by one criticism that I do not take to be completely pervasive, yet inaceptable nonetheless. He claims (MELNYK, 2003, p. 10-11) that the *scope* of retentive physicalism are "objects that are causal or contingent" that are described in any current physical theory or realized by something that does. That is, only such objects that have causal powers or are contingent or both and that are not physical nor realized by the physical could count as an counter-example of physicalism. But that drives us to a bizarre consequence: Haecceities are not a counter-example for realizationist physicalism. They, if exist, are neither causally effective nor contingent. Not effective because they are only to be a metaphysical criteria for identity of an object. It is what allow an object to "count as one" and also to be the same as itself. Those are intrinsic properties so they do

[71] Obviously, one should not reject or embrace the view only by my exposition. There are a lot of substantial issues that Melnyk deals with in his book that I have skipped for brevity or due to the heavy technicality involved.

not require any kind of relation much less causal ones. They are not contingent because, if one take identity to be necessary, than so it is its grounding, the underlying haecceity. Of course that none of the considerations are very strong but they could be made to work with some detailing. But the important point is that Melnyk can grant to me the point is he wants, because by definition, his theory is immune to the existence of haecceities. Yet, isn't this kind of entities the exact enemy of physicalists? Of course that their existence would not change anything to us, but I think that physicalists are, or ought to be, in-principle against such medieval epiphenomenal monsters. How to take seriously a claim as "I am a physicalist, very much converted indeed, also I maintain the existence of haecceities, because I proved them with an ontological *a priori* argument" could be taken?

The above critique is much more aesthetic than metaphysical, I must concede, but the next one, based on the same restrictions, is somewhat more damaging. Take the desire that his theory is a scientific hypothesis. It must be falsifiable, or at least, it cannot state an undefeatable truth. Otherwise it is merely metaphysical. But remember above both the restriction just mentioned and the rejection, taken as a principle not by arguments, of *a priori* arguments to provide ontological evidences. So his physicalism is armored against dualistic claims by definition. For either the dualist must find a contingent object that have no causal power, or a causally powerful object that is noncontingent and both attempts must be made *a posteriori*. Well, it is highly unlikely that one can find by empirical methods something that do not react to anything or something that does not exist in time or know *a posteriori* that something is necessary.

Of course that because it is so hard to do, I am a physicalist. But an *argument* should be given for such restrictions. His position ultimately begs the question against dualism and provides scientific irrefutability by definition, at least regarding its physicalist part. He proposes ways by which one could refute his view, however his definition of realization:

"*Token x realizes token y iff (i) y is a token of some functional type, F, such that, necessarily, F is tokened iff there is a token of some or other type that meets condition, C; (ii) x is a token of some type that in fact meets C; and (iii) the token of F*

whose existence is logically guaranteed by the holding of condition (ii) is numerically identical with y" (MELNYK, 2003, pp. 21)

Makes it very hard for us to develop an experimental result against it. First because I don't think we can find Types out there in nature in another way than by our own abstract reasonings. Logical guarantee do not enter the laboratory either. It does seem the kind of proposal metaphysicians would do and so I will take it to be. Functional types and tokens seem to be a description of a system, not some part of its nature, so nothing that comes from these lines would be empirical.

To conclude this critique, it must be said that his position is not a scientific hypothesis and it totally begs the question against the dualist, because instead of using the obvious inaptitude of that position in providing good empirical evidence of its claims into an argument, he uses the idea of scientific empirical evidence as the only acceptable positive evidence available to refute physicalism. But that is to take physicalism for granted. Only physical objects can be physically described[72]. That is a mutual position between physicalism and dualism. Physicalism adds that there is nothing more than that, dualism that there are. So dualism cannot use physical evidence for its point otherwise its counterexample would not be a counterexample. I think I made my point clear, so let's move to another criticism, as before, delivered by our next guest, this time: Gabriel Mograbi. Mograbi's strongly criticise all of the first chapter of Melnyk's book. His most critical attack is against the definition of physical.

Melnyk puts that a definition of "physical Object" must attend to three criteria: i) it must not be obviously false; ii) It must not be trivial; iii) It must be determinable by us now (MELNYK, 2003, pp. 11-12). His strategy, as we said, is to appeal to the current consensus available in physical theories, that is, "physical" is what the physicist is taking for "physical" in this moment in their textbooks. He claims that there is a huge agreement on such books. Mograbi couldn't disagree more (MOGRABI, 2008, p.44) First there is no consensus. Second, going after all the books and mapping all the current physical (in the scientific sense) positions is an indescribably lengthy work. Mograbi highlights that there had been time and time

[72] Jacksons argument Mary's room takes this as an implicit premise, for example.

again many different consensus on what is physical in the last 40 years. The amount of publications of textbooks in physics had also greatly increased, how could Melnyk hope to us to go after a definition of physical object this way? Very likely he does not. Mograbi's guess is that Melnyk wanted a large and flexible definition of physical object without great commitment to any of such consensus. He takes that these considerations are enough to dishonour the third criteria. I add one further comment. This strategy, even if feasible, is absolutely anti-philosophical. if physics could provide by consensus any sort of adequate concept, why would there be a philosophy of physics? The level of conceptual analysis, or even only careful conceptual usage, that philosopher work with is not the same as the physicist[73].

Despite those and other objections we have seen a very interesting doctrine. Its desires are to be a general account of the structure of the world. In a single book, Melnyk tries to solve many different problems concerning physicalism and related aspects. His ideas, to my view, deserve improvement not rejection. The notion of realizations is good as far as it goes, but is by far not enough for a full formulation of physicalism. There appears to be lacking a well-developed proposal of how exactly the physical objects compose and perform the role. Claiming that there is a "C" that they "meet" is not a great answer. However the notion of realization can, indeed, shed some light to reductionism. The next (and last) position we will see could be chosen instead of this one or with it, in the last case, I think, we would have a increasingly strong position that could join retentiveness, reduction, explanation and multi-level descriptions in a scientifically acceptable way, and yet, being honestly metaphysical .

[73] for a critical discussion concerning a definition of physical object see: Cf. Mograbi, 2016, p.97-126.

8. Emergence physicalism

Emergence have a long history in philosophy of sciences and a shorter one in the philosophy of mind. We, however, are interested to the renewed vision it had received in the 90's and early 2000's. Emergence came back to philosophical debates from the texts of scientists of complexity, especially in computer sciences and in biology. The new emergentists, or at least those we are concerned here are hardcore physicalists, the property dualism that accompanied their history has been left behind. In what follows I will present the Emergence thesis of physicalism based on the presentations of Mark Bedau (BEDAU, 2002, pp. 5) and Gabriel Mograbi[74] to try to grasp how the Supervenience Argument fails these positions and show some of their merits.

[74] Presented in his doctoral thesis: Emergência, Mente e Decisão. A relevância causal de diversos níveis (2008)

Bedau provides two very broad hallmarks in order to start to define a emergentist position. He says that they must answer how “i) Emergent phenomena are *dependent* on underlying processes” and ii) “Emergent phenomena are *autonomous* from their underlying process”. (Bedau, 2002, pp.6) answering this two is the very least an emergence thesis must do and the way they respond to that gives their proper characteristics. Gabriel presents by his turn three thesis that are constitutive of weak emergence, weak here is in the sense of minimal emergence, that is, the set of thesis one must have in order to be a new-age emergentist or, better, a reductive emergentist (MOGRABI, 2008, pp.112). The thesis are the Physical Monism (PM), the Organizational, Systemic, or Collective Properties Thesis (SPT) and the Synchronic Determination Thesis (SDT). We will follow the latter author in explaining them. Before that, to calm the anxious reader that is familiar to some discussions on emergence that thinks that reductive emergence is a contradiction, I shall remember that in introduction we made a distinction on three kinds of reduction. Thus, our next guest is reductive on the ontological sense as will be made clear soon bellow and not reductionist on the epistemological sense. We have not dealt with epistemological reductions, further details will be provided as we advance, but I can bring about a heuristic slogan that might help. X is epistemologically reductive to Y iif complete knowledge of Y determines complete knowledge of X. Is in this sense that Mograbi and Bedau are emergentist. Despite everything being physical, a complete knowledge of the ground level will not allow for complete knowledge of the higher level in actuality or in principle. This point of view attacks an absent premise on the Knowledge Argument, that is, the claim that epistemological reduction implies ontological reduction and the opposite (see chapter 3). One can see this assumption on the very upshot of the argument: if she had *learned* something (high level) even if she knew all (lower level) things, then *there are* non-physical higher level facts. From epistemology to ontology, in just the way that fallible creatures shouldn't do. The emergentist will deny the implication between ontological reduction and epistemological reduction. So even if all X is Y, it doesn’t follow that knowing everything about Y would be to know all about X. Some things must be said in order to make sense of that underpinning claim. The first is that “knowing everything about Y” should specify whether we mean “everything a

human can know about Y" or "everything that could be known about Y". The first is very plausible. even if we exploit human cognitive capacities at full, it is very likely that much would be left off. Complete *human* knowledge wouldn't be complete knowledge *tout cour*. By the way, if a defender of Mary's argument accepts this very plausible limitation she would have to concede that Mary is not human in an ordinary sense what weakens the plausibility of the premises. On what grounds should the materialist accept that superhumans offer good example on which to base conclusions about normal humans? Anyway, back to the more general case, it appears that an emergentist must argue for an *in principle* breach between epistemological reduction and ontological reduction and that is what they try to offer, to my view, plausibly enough.

Developing the Mograbi's emergence, he start by PM that claims that there is no object, event, property or process that is not constituted by the physical, or in its positive form, everything existent in this universe is constituted by the physical. Emergent properties are emergent from purely physical systems and are, by their own turn, physical. Of course that this claim is vacuous without an determined sense for what is taken to be physical. We must note that it is not an ontological requirement, but an epistemological one. Its job will be only to, given an object, allow us to determine now whether it is physical or not. His attempt to fulfil such requirement appears in more fine-grained terms in his (2016) (MOGRABI, 2016, p. 121-125) It states that a physical object is (known to us now as) all objects that react to (at least one of the) four fundamental forces of the Standard Model and General Relativity. The forces are Weak, Strong, Electromagnetic (coming from the Standard Model) and Gravity (coming from General Relativity). There is no necessity that these forces exactly operate, the only requirement is their fundamentality. If physicists found out that the Weak and the Strong, for example are two instances of one force, his definition would not be broken, for we will now have only two forces in the Standard Model but that is not a problem, actually it would make his position even more precise. But, for now, there are four fundamental forces. No object reacts to all of them at the same time, so the definition is disjunctive. Nonetheless this disjunction is a positive fact. We can categorize in some sense which objects, or at least about which level, we are talking about if we take in consideration which forces

are operating on them in the most significant way. For example, we know we are talking about quarks, protons and neutron if they are more importantly reacting to the Strong force than the others. We know we are talking about macroscopic objects if they react to gravity more than, say, Weak force and so on. This distinction only enhances the epistemological precision of the definition, but if it turn out to give dubious conclusions the definition still stand.

Given all that, Mograbi's position on PM is thus stated:

(PM)- everything that exists react or is composed of things that react, to at least one of the fundamental forces of the Standard Model and General Relativity (the "or" is inclusive).

SPT claims that there are properties of a system that are not possessed by any of the parts of the system, only by the system as a whole. Mograbi takes "collective", "organizational" and "systemic" to be three words for the same concept (MOGRABI, 2008, pp. 122) so I will only use the word "systemic". The idea behind SPT is that given the arrangement of parts, the way they relate with each other and other outside objects or processes, the whole system would acquire properties that none of its parts have or could have. An example of a merely compositional property could illustrate what I mean, by contrast. Imagine a bucket of water that weighs 5kg. Having a mass of 5kg is a mere sum of the masses of the parts of the system, all parts have some mass, hence, the property "having a mass of 5kg" is not a systemic property. On the other hand, being liquid is not something that we can attribute to the molecules of water because liquidity is a characteristic of the organization of molecules, and in this case, liquidity is a systemic property (MOGRABI, 2008, p.123).

SDT is somewhat more technical, but hugely important. Mograbi presents Achim Stephen's definition of synchronic determination:

"Synchronic determination. A system's properties and dispositions to behave depend nomologically on its micro-structure, that is to say, on its parts' properties and their arrangement. There can be no difference in the systemic properties without

there being some differences in the properties of the system's parts or their arrangement." (STEPHEN, 1999, pp. 50-1)

A usual approach to this thesis is to compare it with the mereological supervenience above seen[75]. However, it is strictly stronger than that. For as we have seen, supervenience states mere covariation and SDT claims also assumes dependence. For our purposes it is important to see that SDT entails mereological supervenience[76] and for now it is accepting the first tenet of Kim's Supervenience Argument. The nomological dependence is also a distinctive aspect of this view. By proposing weak modality it is restraining the scope of every emergence instance to the laws of nature that rule the world in question. That is much more plausible that Kim's metaphysical necessity. The point is that if different laws of nature operates in a world the very same system may not instantiate the higher level property. This much is already a more scientifically respectable position to take concerning, for example, the mind-body problem.

Mograbi also maintain that without a principle such as SDT or similars one cannot be a naturalist physicalist. I take his reasons for that to be similar to this: if one accepts that upper-level properties of a system could vary without changes in the physical microproperties, and accepting that everything have a cause, there must have been a cause that made the upper property to change without changing the microstructure. That means that there would be something other about the upper-level property than its physical constituents and their arrangement. But that is to say that there is something other than the physical to which the upper-level property depends on. That would clearly state a dualism about the upper-level property[77].

Those three thesis together assert what Mograbi calls weak emergence and are a commitment he takes that every emergentist must make. Bedau, adds an important comment to the micro-macro distinction. It is not given by definition what would be the micro or the macro. Every system in consideration would have its own

[75] See section on supervenience physicalism

[76] The covariation expressed by mereological supervenience asserts that the upper-level properties supervene on the total microstructural property, hence, changes in the former require changes in the later, which is exactly what is said in the last part of Stephen's definition.

[77] I am not sure whether that is what Mograbi meant, but those is enough reasons, to my view, to agree with him.

distinction that is relevant to its study. So, if one takes a biological system, the micro-properties could be the cells, or the proteins, or the tissues and so on, depending on the objective of the researcher. An emergence theory must be able to provide explanation to all this levels. It cannot, or at least should not, restrict itself to a single, or to few, micro-macro relations (BEDAU, 2002, p.8).

Mograbi takes the weak emergence to be too broad to count as an explanatory position in itself concerning the metaphysical status of the emergence relation, but he takes that it could be epistemically useful to use it in describing some systems of emergence. Yet, he agrees that there must be more to emergence if it is to explains the highly sophisticated complex systems with which science, in particular neuroscience, deals with.

Bedau presents what he calls strong emergence as a thesis of emergence that respond to the first point above, i.e. how emergent phenomena are dependent on the underlying process by saying that it *arises* from them and it is autonomous over the underlying processes because it has irreducible new causal powers that operates in systems that are either of higher, lower or same complexity. Strong emergents could even act causally upon their own underlying process leading to the highly implausibility of downward causation.(BEDAU, 2002, pp.10) He says also that there is no evidence for such strong version and that the irreducibility of the new properties makes the whole position scientifically irrelevant for the new emergents are brute facts, that cannot be explained. I point, because of that, that this position is more similar to a dualism of properties than to a physicalism.

Mograbi's notion of emergence is very different from that and, from now on, we will investigate his view. The first thing he does is to avoid the strong emergence in the sense above. There is no downward causation, only determination. That means that the only thing that the systemic properties can do is to restrain the microparts not to ignite them toward new possibilities (MOGRABI, 2008, p. 173).

His attempt to define emergent properties starts by considering weak emergence,in his terms: *quasi-emergents*. A quasi-emergent system have properties that are not determinable by us now when only considering its parts and exterior conditions, but with further development of the measurement methods it could, at least in principle, be fully determinable by the mere characteristics of its parts and

exterior conditions. From this reducibility we cannot conclude the elimination of the property, it still operates influence over the system parts.

The *diachronic weak emergent properties* are the second ones taken to analysis. They are quasi-emergent with the additional Thesis from Novelty that states that the already existent parts will organize themselves in new ways producing new emergent properties. Given the combinatorial characteristics of the parts and the weak requirements of quasi-emergents, the diachronic weak emergent properties are predictable given complete knowledge of initial conditions. Nonetheless, this knowledge is very hard to obtain in nature, if obtainable. This kind of emergent properties is more commonly taken to be found in connectionist systems

The *synchronic emergent properties* are those that cannot, in principle, be predicted by the analysis of the parts or subsystems of lesser complexity. The arrangement of the parts is not, also predictable by mere analysis of the properties of the parts. These emergent properties restrain the basal structure, they have no causal relations, but the downward determination allows for the emergent properties in this sense to control the others given the characteristics of the space and time where the system can be found. If a system as these is a part of a larger, more complex one, the full knowledge of the later could explain completely the former (MOGRABI, 2008, pp. 177)

The diachronic emergent properties takes the synchronic emergents and add the novelty theses. the systems must be considered as occurring in space and time for such properties to obtain. These properties can be predicted, but to do so it would require a full knowledge of the properties of the parts, exterior conditions and a perfect scientific knowledge.

The last kind of emergent properties Mograbi presents are the *structural diachronic properties.* Take the above and add that they are unpredictable *in principle*, which Mograbi takes to mean not that they are in any sense over and above the physical world, neither that they are due to chaos, but only that they are described in terms of aperiodic mathematical laws. Described or studied, not governed. There is no sense in which non-deterministic laws rules their behavior. Every law operating on, are by their turn, deterministic, yet there are just so many variables that even the mathematical models provide mere approximation, for a

deterministic account of such systems in order to predict the emergent properties would require computate infinite digits in a finite time which is taken to be logically contradictory or, at least, decidedly nomologically impossible. The reason for that is given by a clever example involving aperiodic functions, because these functions have the peculiar property of not evolve in patterns, that is, if the argument of the function changes a little the image changes drastically in such a way that the graphic of the function does not allow pattern simplifications. Given that such functions actually are used to describe some natural phenomena one could say that any laplacian calculator would fail, *in principle*, determine perfectly the positions of all particles, hence, we have reasons to believe that some emergent phenomena are unpredictable from their bases alone.

Such emergent systems, could be closed, semi-opened and open, that is, for diachronic emergents the environment where they are to be found is highly relevant to their instantiation. These properties can also be novel, in the above sense, the novelty is unpredictable before its first instantiation, due the reasons just mentioned, yet it allows that with increasingly better measurement apparatus and method we can get closer to predict the properties, determination however is off limits. As before, there are downward determination even though the new properties do not exert new causal powers, that makes his position much less metaphysically heavy and much more scientifically acceptable (MOGRABI, 2008, pp. 177-8)[78].

In this moment we can take Mograbi's last definition and see it given Bedau's two hallmarks. How are the emergent properties dependent on the underlying process? To my view, Mograbi would say that they are reducible to the systems in ontological sense, although, even in principle, not in an epistemological sense, besides emergent properties determine the overall behavior of the system and in this sense, albeit its reduction there can be no elimination. The answer to the second hallmark, (i.e how is the emergent property autonomous from the underlying process?) would be that the emergent properties are epistemically irreducible, given this fact, it appears to be reasonable that the new properties allow for new possible

[78] For brevity I have skipped the detailed discussions made in order to elaborate the principles taken to compose the definitions. The complete discussion is very interesting and one can find it in Cf. Mograbi, 2008, pp.124-171

true descriptions. Also, the recombination of the parts allows for novel properties and that is also a sense in which the emergent properties are autonomous.

There is, as I said above, a possible entailment from the SDT to a form of supervenience and, hence, the shadow of Kim's dilemma is maintained. But the notion of downward determination given by Mograbi deals with the problem. There is, indeed, ontological reduction and epistemological genuine emergence as much as genuine novel properties. Putting it all together, the emergence here proposed deny the epiphenomenalism by switching the genuine novelty from an ontological to an epistemological ground from which no one would expect new causal powers, for there had not been postulated any new entity that should cause something. The downward determination go even further in denying epiphenomenalism because the systemic properties do matter to the overall system. Concerning irreducibility, again, the passage from ontological irreducibility such as that rejected by Bedau to an epistemological one offers plausibility to the genuine emergence without proposing non-physical entities. Hence, to my view[79] Mograbi managed to present a very appealing and explanatory account of emergence.

To conclude our sketch, as before, let's see how we can use the reductive emergentist view to answer to all five questions.

> EPT: Every referent of a denotational terms of a language either doesn't exist or is a basic constituent of the world or is emergent in a system composed of basic constituents of the world, and everything that exists reacts to at least one of the four forces of the Standard Model and Relativity.

The texts I am using are not often cited, so I could not find any particular objection to Mograbi's thesis on emergentism, as I myself agree with him, mostly I could not provide any such arguments as well. The best I can do is to point to some lacking explanations. The most important one is related to how emergents allow for functional descriptions. That is, how to cope multi realizability with emergentism or, if that is not possible, some explanations on that matter as well. Beyond that the only

[79] And to Mograbi as well. In the section 2.8 of his work, we can find a long and rough criticism to Kim's recent work. Cf. Mograbi, 2008, pp. 185-215

actual objections I could find are against his definition of physical objects. One of the problems is that appealing to physical objects (the four forces mentioned) in order to define physical objects is obviously circular. If he is not appealing to physical things in this context, but to place holders in a theory, his definition is based on a realism on theories which by their turn cannot be physical or it would be circular as well.

Other objection is that we could imagine a possible world in which we have only one electron. In that world the electron would not be reacting to any forces so it would be outside the scope of the definition even though, as we know it is a physical object.

The objections above are easily handle. The first is to remember that to a physicalist, there is nothing other than the physical, actually, there is nothing but physical objects. So, asking for a definition of “physical” object that is reductive is to beg the question against the physicalist for this request already presupposes the existence of non-physical things. If the definition allows for a good grasp on what is meant by “physical” it is enough, I myself don’t know if I the other horn of the dilemma holds, much less if it stands after the above counter argument. The second one is a little trickier, but one can deal with it by remembering that an electron in this world do react to forces and in this world we can know whether it is physical or not, and as Mograbi’s theory is epistemological we do not need any further points. It determines in this world what we are dealing with and that is enough.

As I said above, the Emergence thesis is the one I take to be the best. It allows for a great variety of scientific enquiry concerning its implications (MOGRABI, 2008, p.216-236) and differently from Melnyk’s account it is not only not refuted in light of science, something that most metaphysical assumptions could proudly claim because metaphysics hardly ever can be refuted by sciences, but it was made based on science. The basis of Mograbi’s premises are chosen deliberately to fit the current scientific view of the world.

Emergence, coming from the complex sciences, is much more illuminating when applied to the mind-body problem than all the others specifically because it do not forces us to oversimplify the matters at issue, as I hope to have shown that supervenience does. The view here explored also allows for retentiveness, albeit more development must be done to draw us from abstraction to truth conditions for

special sciences. The ontology underlying the terms used is apparently a processual ontology where brain states can be seen as a hugely complex intercommunication of neurons, the proper background process ontology is yet to be developed and investigated. All and all, Emergence is, in my view, the most promising position in contemporary philosophy of mind and sciences, with due improvements and further clarifications.

9- Conclusion.

We had walked very far until now. In the first part of this work we have investigated major problems of the philosophy of mind concerning the physicalist doctrine. In the second one we investigated some varieties that are taken to provide wide responses to those problems and to many others. I hope that I have convinced my readers to go after the physicalist literature without taking it as false, in principle. I hope I have also shown that the philosophy of mind can gains much support from sciences, actually, to my view, it can only proceed further if it go after hard science and work with it. The objections presented to Supervenience Physicalism and to the Knowledge Argument (chapter 6 and 3, respectively) are supposed to have given support to this hope. We have seen that the Knowledge Argument cannot provide sufficient evidence for its claims, that the possibility of zombies may overthrow dualism and that mental causation can be avoided rejecting the presupposed

background ontology. We saw how supervenience is used, the existence of realizationism and some of its flows and how sciences and philosophy can entertain important responses to deep questions as a whole.

Physicalism greatest enemy is, definitely, reductionism if poorly developed or understood. Explanatory reduction is usually taken to be requested, but as I have said, this request is unfounded. Descriptive reductionism is better. It is closer related to physicalism, and yet, it must be further explained. Descriptions in human language do not exhaust all kinds of descriptions. Ultimate descriptions with complete metaphysical truth are not understandable by humans. Epistemological reduction is also differentiated in similar ways. Ontological reduction is related to all previous, but independent of all mankind's cognitive limitations. If this work wasn't too long as it stands, a chapter on reductions should definitely be included.

I take the problems posed to physicalism to be mostly genuine, but also that they have been very well responded, not decisively, perhaps. The Qualia Problem can be further analysed if a better account of reduction comes up. The zombies could be banished to their own world if we get a better grasp on such questions. Taking our phenomenal states as brute fact is, in fact, to renounce the chance to learn more about ourselves in the most intimate level. If the physicalist are right, my sensation of happiness would be, in a important sense, a part of the universe; it would depend on stars and evolution as much as every other thing. That is no argument, of course, but is to me, a fascinating thought that would justify even more Carl Sagan's famous phrase: "We are a way to the Cosmos to know it self". I do not feel I could sustain a position only because I want it to be true, other than because I take it to be true. But given physicalism, both points are present within me.

References:

ARENHART, J. R. B., *O*ntological Frameworks for Scientific Theories. *Foundations of Science, 17(4), 339–356.*doi:10.1007/s10699-012-9288-5, 2012.

ASIMOV, I. *A Short History of Biology,* New York, Greenwood Press, 1964.

BERGLUND, A. *"From Conceivability to Possibility: An Essay in Modal Epistemology* Umea: Umae studies. 2005

BLOCK, N. *What is Functionalism?* in HEIL, J. (Org.) *Philosophy of Mind: a Guide and Anthology*, Oxford: Oxford University Press, 2004. p. 183-211.

CHALMERS, D. Does Conceivability Entails Possibility? In: GENDLER, T.S & HOWTHORNE, J. (orgs), Conceivability and Possibility, Claridon: Oxford University Press, 2002 p. 145-200

_____ The Conscious Mind. In Search of a Fundamental Theory, Oxford: Oxford University Press,1996

CHURCHLAND, P.M. *Matter and Consciousness* Cambridge (MA): MIT Press, 1989

_____ *A Neurocomputational Perspective:The Nature of Mind and the Structure of Science*, Cambridge: The MIT Press 1989

CHURCHLAND, P. S. *Neurophilosophy: Toward a unified science of the mind-brain*. Cambridge (MA): MIT press, 1989.

DENNETT, D. C. On What RobotMary Knows. In: Alter,T e Walter, S (Orgs.) Phenomenal Concepts and Phenomenal Knowledge. New Essays on Knowledge and Physicalism. Oxford: Oxford University Press (2007)

_____ *Consciousness explained. Boston: Little & Brown, 1991.*

DAVIDSON, D. Mental Events. In: *Action, Reasons and Causes. Essays on Action and Events.* Oxford: Oxford University Press, pp. 207-227, 1970

FLANAGAN, O. *Consciousness Reconsidered,* Cambridge:MIT Press,1993

_____*The Science of Mind*, MIT Press,1991

FRANKISH, K. the Anti-Zombie Argument. *The Philosophical Quarterly* Vol.57 , No. 229 October 2007 ISSN 0031 8094.

FETZER, J. *Scientific Knowledge: Causation, Explanation, and Corroboration,* Boston, D. Reidel Publishing Company, 1981

FODOR, J. *The Mind-Body Problem* in HEIL, J. (Org.) *Philosophy of Mind: a Guide and Anthology*, Oxford: Oxford University Press, 2004. p. 168-183.

GARBER, D *Physics and Foundations* in: PARK, K e DASTON, L (edits.) *The Cambridge History of Science volume 3: Early Modern Science*. Cambridge (UK): Cambridge University Press. 2008. p 21-69.

GENDLER, T. S, HOWTHORNE, J. (orgs), Conceivability and Possibility, Claridon: Oxford University Press, 2002. (introduction)

'HEIL, J., *On an Ontological Point of View*, Oxford: Oxford University Press, 2003

_____*Philosophy of Mind: a Contemporary Introduction*, Cornwall: Routledge Press, 1998

HICKOK, G. *The Myth of Mirror-Neurons: the real neuroscience of communication and cognition,* New york-London: W. W. Norton & Company, 2014

JACKSON, F. The Knowledge Argument, Diaphanousness, Representationalism In: ALTER,T & WALTER, S (Orgs.) *Phenomenal Concepts and Phenomenal*

Knowledge: *New Essays on Knowledge and Physicalism*. Oxford: Oxford University Press (2007) Pág. 52-65

_____What Mary Didn't Know, *The Journal of Philosophy*, Vol. 83, No. 5. (May, 1986), pp. 291-295

_____Epiphenomenal Qualia, *The Philosophical Quarterly*, Vol. 32, No. 127. (Apr., 1982), pp. 127-136.

KIM, J. *Physicalism, or Something Near Enough*. Princeton: Princeton University Press, 2° ed. 2005

_____ Making Sense of Emergence. *Philosophical Studies* 95, p. 3-36, 1999

_____*Mind in a Physical World: An Essay on the Mind-Body Problem and Mental Causation*. Cambridge: The MIT Press, 1998

KIRK, R, "*Zombies*", *The Stanford Encyclopedia of Philosophy* (Spring 2019 Edition), Edward N. Zalta (ed.),

KOLK, H "*Disorders of Syntax in Aphasia: Linguistic-Descriptive and Processing Approaches*" in STEMMER, B. & WHITAKER, H. (eds.) A. *Handbook of Neurolinguistics*. San Diego: Academic Press. 1998 p.250-260

KRAUSE, D. *Tópicos em ontologia analítica*, São Paulo: Editora Unesp. 2017

KRIPKE, S. *Identity and Necessity*, in HEIL, J. (Org.) *Philosophy of Mind: a Guide and Anthology*, Oxford: Oxford University Press, 2004. p. 128-133.

LEAL-TOLEDO, G.Neurônios-espelho e o Representacionalismo. *Rev. Filos., Aurora*, Curitiba, v. 22, n. 30, p. 179-194, jan./jun. 2010

_____ *O Argumento dos Zumbis na Filosofia da Mente: são zumbis físicos logicamente possíveis?* 2005. MA Dissertation – Philosophy Department –Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro. 2005

_____ & TEIXEIRA, J. de F. 'Dualism and the Zombie Argument in 20th Century Philosophy of Mind'. *Análise*, II, 2, 2005 pp. 35 –52

_____ Paradoxo de Chalmers. *Trans/Form/Ação,* 2009, vol.32, no.2, p.159-173.

_____ Dennett e Chalmers: argumentos e intuição. Trans/Form/Ação, São Paulo, 29(2): 123-132, 2006

LENT, R. *100 Bilhões de Neurônios?*. Rio de Janeiro: Editora Atheneu, 2010.

LYCAN, W. G. (2009) Giving Dualism its Due, *Australasian Journal of Philosophy,* 87:4, 551-563, DOI: 10.1080/00048400802340642

LOCKWOOD, M. *Mind, Brain and the Quantum*. Oxford: Basil Blackwell, 1989.

MARGOLIS, E. & LAURENCE, S. *Concept Nativism and Neural Plasticity* in MARGOLIS, E. & LAURENCE, S (Orgs.), *The Conceptual Mind: new directions on the study of concepts.* Cambridge (MA): MIT Press, 2015. p. 117-150.

MELNYK, A. *A Physicalist Manifesto: Thoroughly Modern Materialism*. Cambridge: Cambridge University Press, 2003

_____*Physicalism Unfalsified: Chalmers' inconclusive conceivability argument* in GILLET, C. & LOEWER, B. (eds) *Physicalism and Its Discontents,* Cambridge (UK): Cambridge University Press, 2001, p. 331-350.

MOGRABI, G.J.C, *Emergência, Mente e Decisão. A relevância causal de diversos níveis*, tese (doutorado em filosofia), Rio de Janeiro, 2008 --Programa de Pós-Graduação em Filosofia da Universidade Federal do Rio de Janeiro.

_____O Monismo Físico e a Opção Dinâmica --ou, por um Fisicalismo de Forças ou Interações como Melhor Opção na Lida com o "Dilema de Hempel", *Princípios*, Natal, v.23, n.40 jan~abr. 2016, p.97-126.

NAGEL, T. *What is like to be a bat? Philosophical Review*, v. 53, n. 4, p. 435-450, Outubro, 1974

NIDA-RÜMELIN, Martine, "Qualia: The Knowledge Argument", *The Stanford Encyclopedia of Philosophy* (Summer 2015 Edition), Edward N. Zalta (ed.)

PAPINEAU, D. *The Rise of Physicalism*, in GILLET, C. & LOEWER, B. (eds) *Physicalism and Its Discontents,* Cambridge (UK): Cambridge University Press, 2001,p. 3-36

PUTNAM, H. *The Nature of Mental States,* in CHALMERS, D., *Philosophy of Mind: Classical and Contemporary Readings,* New York: Oxford University Press, 2002. p.73-79.

QUINE, O. W. V. *On a Logical Point of View.* 2ª ed. New York: Harper Torchbook. 1963.

RODRIGUES, J. There are no Good Objections to Substance Dualism. *Philosophy, 89*(2), 2014. pp.199-222. doi:10.1017/S0031819114000060

SEIBT, J., "Process Philosophy", *The Stanford Encyclopedia of Philosophy (Winter 2018 Edition),* Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2018/entries/process-philosophy/>.

SMULLYAN, R.M. 'An Unfortunate Dualist'. In: Hofstadter, D.R. & Dennett, D.C. The Minds I, New York, Basic Books, 1981, p. 383

STOLJAR, D., "Physicalism", *The Stanford Encyclopedia of Philosophy* (Winter 2017 Edition), Edward N. Zalta (ed.).

SERAFINI, A. *The Epic History of Biology,* New York, Springer Sciences, 1993

STEPHEN, A. Varieties of Emergentism, *Evolution and Cognition,* v. 5, n. 1, p. 49-59,

1999.

SZABÓ, L. E. Formal Systems as Physical Objects: a physicalist account of mathematical truth, *International Studies in the Philosophy of Science*, 17:2,117-125, 2003

TEIXEIRA, J de F. *Mente, Cérebro e Cognição*.4ª ed. - Petrópolis, RJ: Vozes, 2011.

WILSON, J. Supervenience-based Formulations of Physicalism, *NOUS* 39:3 (2005) 426–459

WEBER, E., VAN BOUWEL, J., DE VREESE, L., *Scientific Explanation,* New York-London, Springer, 2013.

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