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The Hard Problem of Consciousness & the Progressivism of Scientific Explanation

Abstract: *Several philosophers believe that with phenomenal consciousness and neural-biological properties, there will always be some kind of epistemic gap between the two that will lead to a corresponding ontological gap. In order to address those who espouse this hard line position, I will first briefly examine certain aspects of the history of scientific explanation. I will put forth a positive thesis that there is what I call a progressivism to scientific explanations in certain fields, where kinds of explanations tend to advance or progress, somewhat analogous to how overall scientific theories also significantly advance or progress. Given the progressivism of kinds of explanations, I provide a new contention that adherents to the hard line view are not justified in making their relevant claims. While progressivism and its use against hard line views may seem intuitively obvious to some readers, I offer its first articulation and attempt to illustrate the novel virtues it brings to the table of the phenomenal consciousness debate.*

1. The Progressivism of Scientific Explanation

Scientific theories may do various things such as postulate laws, make predictions, and posit the existence of theoretical entities. They also importantly provide explanations of natural phenomena. In other words, a primary aspect of science is that it tells us why things happen

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or why things just are the way they are and not some other way. Science may not only instruct us in descriptive matters as to what the world or the structure of the world is like, but it also provides an explanation or understanding of why certain phenomena occur. For example, science may attempt to explain numerous things such as why it rains, the motions of the planets, why a government failed, why an individual made one decision rather than another, and why penguins cannot fly.

When examining the nature and history of scientific explanations, I would like to introduce and adopt a *progressivism view*. This view simply states that just as it is generally conceived that scientific theories can progress or advance within a field and become closer approximations to the truth, kinds of scientific explanations within a field also may progress or advance in their ability to explain even more natural phenomena with at times even greater precision. Advancements in types of explanation may increase the explanatory power of the overall scientific theory to which the scientific explanation is tied.[1] Just as overall scientific theories that in part provide explanations of phenomena may significantly change and advance, there tend to also be advancements in kinds of explanations in particular fields.[2] Historically, types of scientific explanations within certain fields tend to advance and develop. Notice that progressivism does not simply make the statement that the ability of science to explain phenomena advances over time. Rather, progressivism makes the deeper point that *the kinds of frameworks that underlie scientific explanations* advances and progresses over time in particular fields which lead to a greater rather than a lesser or stagnant explanatory power for a given theory.

Since it may be the case that kinds of explanations within a field may progress and develop over time, there may be a moderate to strong relationship between such development and concurrent significant and even revolutionary-like progress of scientific theories within

[1] Kinds of explanation are not to be confused with theories of explanation, where theories of explanation posit the logical structure a correct scientific explanation must take. Our focus in this paper will only be on kinds of explanations. As understood here, differences in kinds of explanations are more fine-grained than differences in underlying theories of explanation. Kinds of explanations are not necessarily individuated by having different underlying theories of explanation. For example, historical explanations such as what brought about the first world war and functionalist explanations in the study of the mind both can be categorized under the umbrella of the causal theory of explanation. However, historical causal explanations are still a different kind of explanation than functional explanations.

[2] The phrase ‘in particular fields’ will be explained shortly.

a field. As we shall see, this may be the case as it does appear that new progressive kinds of explanations do take part in the significant advancement of scientific theories. The development of scientific theories generally allows for the explanation of ever more refined phenomena, and any new and more developed kinds of explanations being inextricably linked to a scientific theory itself must have necessarily played a role in the advancement of the overall scientific theory. Here, new kinds of explanations may in part be unfolded through advancements in the particular scientific field, such as through advancements in instrumentation, abstract theoretical reasoning, experimentation, or having increased observational capacities. This new type of explanation subsequently may play a role in the further advancement of the overall scientific theory itself as it is applied or used to explain diverse and previously unexplainable phenomena. Later we will explore the possibility that advancements in kinds of explanations for the mind–body problem may advance overall theories in this subject matter as well. As an additional point, it should not be wholly surprising if we find that in certain fields there is a progressivism due to the fact that, because overall scientific theories tend to progress closer to the truth and explanations are intricately related to overall scientific theories, then it may be the case that new advanced types of explanations develop as well in being more explanatorily powerful and precise.

Moreover, progressivism does not deny that previous kinds of explanations might still play some role in explanation within a field. Yet, it does say that even if this is the case, the more advanced kinds of explanations which arise are generally responsible for the greater explanatory power a scientific theory may have. Furthermore, it may be the case that there is no progression of kinds of explanations within a certain field. Therefore, progressivism claims that kinds of explanations *relative to a particular field* may develop over time. However, progressivism does contend that there are a number of fields of scientific enquiry in which historical progress in kinds of scientific explanations does take place.

For example, while Newton allowed for mechanical explanations, his overall scientific theory did stray from Galileo, Kepler, and Descartes in that it did do away with strict adherence to mechanistic explanations in that he allowed for non-mechanical interactions and action at a distance in his view on gravity and gravitational interaction. In fact, in his explanation of gravity he provided no causal mechanistic explanation, but rather gave a mathematical relationship. In part due to such development of this new kind of non-mechanistic

mathematical explanation, Newtonian physics during its heyday was the most explanatorily powerful physical theory of its time. Moreover, in the twentieth century, there were additional advancements in that the advent of quantum mechanics brought to the forefront in microphysics a novel and fundamentally probabilistic mathematical explanation. To date, quantum mechanics is the most explanatorily successful theory in the history of science. For instance, while classical physics cannot explain blackbody radiation, the photoelectric effect, the stability of atoms, and the discrete spectrum of hydrogen, quantum mechanics can. Quantum mechanics can explain a host of diverse phenomena such as tunnelling in transistors and electron orbital binding in chemistry.

While a complete and thorough investigation of the changes in kinds of scientific explanations in physics cannot be provided here, as we can begin to see, there is a progressivism in physics. Kinds of scientific explanations progress just as overall scientific theories also progress within this field. Types of scientific explanations that at times were never previously conceived before in the relevant field develop that lead to more precise explanations of even more phenomena. Such progression not only leads to greater explanatory power, but also to the general advancement of the scientific theory to which it is inextricably linked. The advancing theories in physics in each of these discussed periods was immensely more powerful and precise than its predecessors, and the new kinds of progressive explanations, in so far as being tied to physical theory itself, played a role in its advancement.

As another example, let us very quickly examine the theoretical developments concerning the nature of the mind or, in other words, the mind–body problem in the narrow time frame of the twentieth century. In the early part of this century, influenced by logical positivism and the psychologists J.B. Watson and B.F. Skinner, philosophical behaviourism was born; a view that was in part progressively instrumental in eliminating the ghost from the machine or, in other words, in undermining the explanation provided by a Cartesian substance dualism that posits and uses an immaterial substance. The philosophers U.T. Place, Herbert Feigl, and J.J.C. Smart are commonly thought to be the founders of the next development in theories concerning the nature of the mind, where they posited a type identity physicalism (Place, 1956; Feigl, 1958; Smart, 1959). This can be seen as an advancement in kinds of reductive explanation from philosophical behaviourism in that mental states are properly placed in the head such that there may be an inner psychological to neural-biological state explanation.

While identity physicalism's dominance as a theory of the mind is generally considered to be rather short, the next advancement in kinds of scientific explanation on the nature of the mind came from psychologists who began using a functionalist reduction in order to tackle the mind–body problem. While philosophers such as Hillary Putnam and Jerry Fodor gave an explicit articulation of functionalism of the mind years after it was already being used by psychologists (Putnam, 1967; Fodor, 1968), the intertwined scientific explanation that is a part of the scientific theory of functionalism is generally seen as an advancement on the nature of the mind so much so that, although it is highly contentious whether it can handle the issue of phenomenal consciousness (also known as qualia or the introspectively accessible 'what it is like' phenomenal aspect of our mental lives), David Chalmers labels the mind–body problem in relation to non-phenomenal mental states and processes as being the easy problem of consciousness (Chalmers, 1996; 2010). In so far as we may functionally define a number of relevant mental states and mental competences such as learning, categorization, and memory, such aspects of the mind–body problem are easy given a functionalist reductive explanation. An enormous swathe of what was previously seen as a daunting and nearly insurmountable mind–body problem laced with explanatory hurdles may now be seen as an easy problem that the sciences of the mind in principle may resolve given the progression of a functionalist scientific explanation within the discipline of the mind. Even though the easy problem may still be a difficult task for cognitive scientists, a functionalist explanation opens the gateway for a tractable and well-defined research programme for non-phenomenal mental states. A large chunk of the mind–body problem may be conceived as an issue for cognitive science. Historically within the subject matter of the mind in the twentieth century, we see a shifting field where there is a general progress made in kinds of scientific reductive explanation that allows for a greater explanatory power for theories of the nature of the mind.

2. The Problem of Phenomenal Consciousness

At this juncture, before discussing the applicability of progressivism to the problem of phenomenal consciousness, we will discuss those views that claim that there is some kind of epistemic gap and a resulting ontological gap between qualitative psychological and neural-biological properties. I label such theories as hard line views in that there is the more moderate option of allowing for an epistemic gap but denying that there is an ontological gap between mental and physical

properties. One such contention for the hard line position is the explanatory gap argument, which may also be viewed as being tied to Chalmers' notion of the hard problem of consciousness. It claims that there is a gap between phenomenal psychological properties that we may grasp subjectively through introspection and neural-biological properties that may be objectively studied from the third-person point of view (Levine, 1983; Chalmers, 1996). This epistemic gap questions whether there can be a reductive explanation of phenomenal properties to the neural-biological. For instance, if an itch arises from a certain neural-biological property, what makes it the case that the sensation of an itch arises from this physical property rather than some other sensation when this physical property occurs? Why is it the case that an itch does not arise from a different neural-biological state? Why do qualia arise from this physical state? These legitimate questions illustrate that there may be some gap in reductively explaining qualitative psychological properties to neural-biological ones. To positively answer the explanatory gap is to provide such a reductive explanation that closes this supposed gap. Along these lines, Chalmers labels phenomenal consciousness the hard problem in that qualia resist functional characterization. While the research programme is quite clear for non-phenomenal mental states and processes, the lack of a functional definition for the qualitative aspect of mental states makes the issue of phenomenal consciousness unruly and difficult. There is an explanatory gap that leads to a corresponding ontological gap, and the explanatory gap exists because of the absence of a complete functional account of phenomenal psychological states.

There also are numerous hard line contentions, mostly in the form of thought experiments, that arguably are ultimately based on or influenced by Descartes' objections against materialism. Even though they may have their differences in the type of epistemic gap formed, hypotheticals such as Chalmers' zombie conceivability argument (1996; 2010), inverted qualia (Block, 1990), absent qualia (Block, 1980), and Frank Jackson's knowledge argument (1982) all can be understood as claiming that there is some kind of epistemic gap between psychological and neural-biological truths, and thus there is an ontological gap between such truths, and materialism is false. With progressivism in hand, we only have the space to directly address Chalmers' conceivability argument. The conceivability argument has been selected because I take this contention to be perhaps the most intricately defended hard line position. Nevertheless, given the structural similarity amongst the group of thought experiments that take a hard line view, it may be understood that my objections to the con-

ceivability argument also hold *mutatis mutandis* for the remaining hypotheticals in this group. As we shall later see, Chalmers further buttresses the conceivability argument with the explanatory gap contention, so in objecting to the conceivability argument, arguments will also be put forth against the explanatory gap contention as well. Therefore, if my objections grounded in progressivism are correct, then they will purport to demonstrate that hard line contentions against materialism are not justified.

The conceivability argument basically states that it is epistemically conceivable that there is a being such as a zombie that is molecule-for-molecule identical to a conscious being, but this zombie lacks phenomenal consciousness. Despite being physically identical and behaviourally the same as some conscious person, it is conceivable that this zombie lacks first-personal qualitative states. There is nothing it is like to be a zombie. Given its conceivability, the existence of such a zombie is metaphysically possible. Metaphysical possibility in turn leads to the fact that materialism is false.

In its more sophisticated form, the argument brings in the framework of two-dimensional semantics. Several key concepts need to be introduced in order to fully comprehend this more nuanced claim. Chalmers is well aware that conceivability does not always entail possibility due to Kripke cases, where, for example, sentences such as 'water is not H_2O' are conceivable but not metaphysically possible given that water being H_2O is *a posteriori* necessary. In order to respond to this, Chalmers differentiates between two *senses* of conceivability. *Secondary conceivability* is the sense in which 'water is not H_2O' is not conceivable since water is H_2O in the actual world. In this sense, hypothetically if there were a nearly identical planet to our own called Twin Earth where it seems that water is not H_2O on this twin planet, it is really a situation in which water is H_2O, but there is some kind of watery stuff that fills up the oceans and lakes on Twin Earth that is not H_2O. In this sense, 'water is not H_2O' appears to initially be conceivable, but in fact it is not. As we can see, secondary conceivability provides an *a posteriori* link to metaphysical possibility.

On the other hand, *primary conceivability* is the sense in which 'water is not H_2O' can properly be said to be conceivable given that primary conceivability turns on matters of *a priori* reasoning. In the *a priori* domain, there is a sense in which it is conceivable and imaginable that there is a Twin Earth in which the watery stuff that fills up the oceans and lakes is made up of XYZ rather than H_2O. With the further assumption that this situation obtains in the subject's own environment, in this circumstance, the subject then should conclude that

water is XYZ rather than H_2O. In this sense, 'water is not H_2O' is primarily conceivable. However, primary conceivability does not seem to entail metaphysical possibility because although 'water is not H_2O' is primarily conceivable, it is not actually metaphysically possible given that water being H_2O is a *posteriori* necessary.

However, Chalmers clarifies the link between primary conceivability and metaphysical possibility. He notes that since we can primarily conceive of water not being H_2O on Twin Earth, it is metaphysically possible that water is not H_2O, where there is a sense in which we have access to such a possible world. While this possible world is not one in which water is not H_2O, this world still stands in a strong relation to the sentence 'water is not H_2O'. In two-dimensional terms, Twin Earth does not *satisfy* 'water is not H_2O' since this sentence is not true of that world considered as counterfactual. However, Twin Earth *verifies* 'water is not H_2O' given that 'water is not H_2O' is true of that world when the world is considered as actual. In other words, given the difference in the senses of the sentence, the *secondary intension* of 'water is not H_2O' is false for Twin Earth, but its *primary intension* is true for this world. Here, Chalmers states that a world *w* verifies a sentence *S*, where the primary intension of *S* is true at *w*, when we should endorse *S* if we accepted that our own world is qualitatively like *w*.

From here we may conclude that when the primary intension of *S* is true at some world *w* where *w* verifies *S*, *S* is primarily possible. Likewise, when the secondary intension of *S* is true at some *w* where *w* satisfies *S*, then *S* is secondarily possible. Therefore, sentences like 'water is not H_2O' are primarily conceivable but not secondarily possible. Primary conceivability does not entail secondary possibility. However, secondary conceivability does entail secondary possibility, and most importantly for Chalmers thus far, primary conceivability entails primary possibility.

Understanding P to be the conjunction of all microphysical truths about the universe, including the features of microphysical entities as well as the fundamental microphysical laws, while Q represents an arbitrary phenomenal truth such as that everyone is phenomenally conscious, as a first pass, we now may view Chalmers' (2010, p. 142) two-dimensional argument as:

1. P & ~Q is primarily conceivable.
2. If P & ~Q is primarily conceivable, then P & ~Q is primarily possible.

3. If P & ~Q is primarily possible, then P & ~Q is secondarily possible.
4. If P & ~Q is secondarily possible, then materialism is false.

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5. Materialism is false.

The first premise states that it is primarily conceivable that everything is microphysically the same as in our world, but no one is phenomenally conscious. In other words, P & ~Q claims that it is primarily conceivable that the world is a zombie world. The second premise comes from our previous discussion that primary conceivability entails primary possibility. Notice that the primary possibility of 'P & ~Q' alone is not sufficient to get Chalmers his refutation of physicalism since physicalism hinges upon a secondary possibility claim. Chalmers writes, 'materialism requires not the 1-impossibility of P & ~Q but the 2-impossibility of P & ~Q. That is materialism requires that it *could not have been the case* that P is true without Q also being true. This is a subjunctive claim about ordinary metaphysical possibility and so invokes 2-impossibility rather than 1-impossibility' (*ibid.*, p. 149).

The third premise requires that P and Q must have primary and secondary intensions that coincide in order to garner secondary possibility from primary possibility. Chalmers supports an altered version of the third premise by first granting that P and Q do not have primary and secondary intentions that coincide. Just as 'water is not H_2O' does not have the same primary and secondary intensions, for P, there probably are microphysical terms such as 'mass' and 'charge' that for similar reasons also do not have the same primary and secondary intensions. Thus, it may be the case that a world *w* verifies P without satisfying P. For example, the primary intension of 'mass' is tied to a certain theoretical role, where the primary intension picks out whatever plays the mass role in some world *w*. However, the secondary intension of 'mass' is tied to the property that actually plays the role. Here, *w* may verify 'mass' but it may not satisfy 'mass'. Assuming that *w* verifies but does not satisfy P, Chalmers claims that the physics of *w* has the same *structural* profile as the physics in the actual world, but it has a different *intrinsic* profile in that *w* has different intrinsic properties that fill the structural profile of *w* as compared to the actual world. Thus, in order to verify P, a world must have the correct structural profile, but in order to satisfy P, a world must both have the correct structural and intrinsic profiles. All in all, up to this point, the third premise is not guaranteed to be true since the primary and sec-

ondary intensions may not be the same for P. Even though we as of yet have not stated anything in particular about the primary and secondary intensions of Q and their relationship to one another (Chalmers does understand Q's intensions to be the same for Kripkean reasons although he does not believe that this sameness is required for his argument to work), since the primary and secondary intensions may not be the same for P, the third premise requirement that the conjunction P and Q must have primary and secondary intensions that coincide may not be met.

However, Chalmers attempts to resolve this problem by first noting that for the third premise to be false it must be the case that the structural profile of physics in the actual world does not necessitate Q but that the structural and intrinsic profiles of physics in the actual world do necessitate Q. Yet, if this is the case, this leads to the view of *Russellian monism*. For Russellian monism, Bertrand Russell in *The Analysis of Matter* (1927) claimed that the intrinsic properties that are the bases of microphysical entities may themselves be phenomenal properties, where the nature of such properties are not revealed to us by science or by perception. As physics is silent about the intrinsic nature of microphysical entities and there is the question of how phenomenal consciousness can be integrated in the physical world, Russell attempted to kill two birds with one stone by stating that phenomenal consciousness is constituted by the intrinsic properties of microphysical dispositions. While this view has ties to materialism in that phenomenal properties may be considered to be physical properties that are the intrinsic properties to microphysical entities, Russellian monism is a property dualism in that phenomenal properties are ontologically fundamental, and they are ontologically disparate from the structural-dispositional properties characterized in physical theory. Given Russellian monism, with the third premise, if P & ~Q is primarily possible, then Chalmers believes the only options are that it is the case that P & ~Q is either secondarily possible or Russellian monism is true. Either end of the disjunction embedded in premise three inevitably will lead to an ontological gap that Chalmers desires. The above is how Chalmers defends a revised version of the third premise. With Chalmers' defence in mind, we may now restate the two-dimensional argument as:

1. P & ~Q is primarily conceivable.
2. If P & ~Q is primarily conceivable, then P & ~Q is primarily possible.

3. If P & ~Q is primarily possible, then P & ~Q is secondarily possible or Russellian monism is true.
4. If P & ~Q is secondarily possible, then materialism is false.

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5. Materialism is false or Russellian monism is true (Chalmers, 2010, p. 152).

Continuing with the discussion of the premises, with the fourth premise, the secondary possibility of P & ~Q straightforwardly leads to the fact that materialism is false given that materialism generally entails a modal thesis. Instantiating a Kripkean metaphor, if it is possible that there is a physically identical world to ours that is phenomenally different, then after God fixed the physical facts, he had to do extra work to fix the phenomenal facts. Materialists generally maintain that once the physical facts are fixed, the phenomenal facts are fixed as well. From this valid two-dimensional argument, Chalmers' journey from epistemic conceivability to the modal to the ontological is complete by concluding that it is either the case that materialism is false or Russellian monism is true.

3. The Tutelage of Progressivism — Chalmers' First Premise

Progressivism provides two objections to the two-dimensional conceivability argument. While there are numerous and various responses to Chalmers in the literature, here we focus only on the kinds of objections that can be made by progressivism. As we will see, the first counter is in line with the general spirit of arguments made by a number of philosophers. However, I discuss the following authors in order to eventually illustrate the contrast between their views and progressivism. This will help to demonstrate the important novel virtues of progressivism. Thomas Nagel's agnosticism states that it seems that it is impossible that the subjective phenomenal feel from a specific point of view can be given a physicalist account because any objective physical theory will abandon the subjective point of view (Nagel, 1974). While he is initially doubtful of the possibility of physicalism, he is agnostic on the problem of phenomenal consciousness in that he allows for the possibility of some kind of future conceptual revolution that may allow for a future physicalist understanding. Colin McGinn writes that, from a third-person perspective, what we perceptually observe of another's brain are physical entities and properties, not the person's phenomenal properties (McGinn, 1989). Likewise, through introspection and self-awareness we can

know what is going on within us mentally, but such introspection does not allow us to see the link between the mental and the physical. Thus, the ability to link phenomenal psychological states to neural-biological states is cognitively closed to us, and human beings are not suited to conceptually understand the nature of the psycho-neural link. However, McGinn notes that in principle there is a solution to this problem even though we cannot solve it. Robert Van Gulick claims that although zombies and the like may be *prima facie* conceivable, they may not be *ideally* conceivable or conceivable under idealized rational reflection due to future scientific discoveries and novel types of reasoning (Van Gulick, 1993; 1999). Patricia Churchland argues that even though we currently may not be able to grasp how the epistemic gap may be closed, it may be possible that future scientific discoveries somehow may be able to close the gap (Churchland, 1997).

The above views are similar in that they grant that there is a *prima facie* epistemic gap between qualitative psychological properties and neural-biological ones, but they leave open the possibility that, in principle, such a gap is closable. Moreover, some of these views rely vaguely on the advancement of science to demonstrate in the future that there is indeed a way to close the epistemic gap. Notice that none of the above views explicitly adopt the notion of progressivism that is introduced here. As Chalmers sees it, all of these views, with the exception of McGinn's, may be seen as being an attack on the first premise of Chalmers' argument. However, Chalmers has a ready response to these views. To counter these views, Chalmers explicitly brings in the explanatory gap argument to buttress his first premise. He claims that, despite the possibility of future advancements, there always will still be a gap because the felt aspect of conscious states lacks spatio-temporal structure and a complete functional description. He notes that, at most, scientific theories explain things with physical structure and dynamical properties, but explaining things with structural and dynamical properties does not suffice to explain consciousness because the felt aspect of consciousness lacks physical spatio-temporal structure. Moreover, felt mental states also lack a complete functional description. This makes them unruly. Without such a description, there is an explanatory gap and there is no reductive explanation.

Concerning the fact that qualia lack physical structure, he provides what I shall call *the structural argument*:

> First, physical descriptions of the world characterize the world in terms of structure and dynamics. Second, from truths about structure and

> dynamics, one can deduce only further truths about structure and dynamics. Third, truths about consciousness are not truths about structure and dynamics. (Chalmers, 2010, p. 120)

Chalmers' first premise is that microphysics only provides descriptions of things that have physical spatio-temporal structure. Moreover, such things may have dynamical properties in which certain laws may govern their change over time. Second, as we work our way up levels from physics to chemistry to biology, etc. the low-level microphysical structural and dynamic descriptions only entail more structural and dynamic descriptions at the higher levels, such as in chemistry and biology. The third premise is that phenomenal consciousness does not have spatio-temporal structure. While Chalmers admits that qualia may have some kind of phenomenal structure, this structure is not in-and-of-itself physical structure. From these premises he concludes that even if there may be some vaguely stated notion of a conceptual revolution in science, science will still never be able to reductively explain qualia because science only reductively explains things with structural and dynamical properties, but qualia do not have physical structure.

The problem with the structural argument is with the second premise. Once we get to the higher levels of the social sciences, such as with psychology and economics, it does appear that structural descriptions do entail non-structural descriptions. For example, consider easy problems of the mind–body problem such as with non-phenomenal psychological states and processes that are multiply realized at the neural-biological level. Here, certain structural neural-biological states entail certain non-phenomenal psychological states, where such psychological states are non-structural, distinct, and higher-order states as compared to the physical structural neural-biological states in question. Likewise, in economics, there are higher-order properties such as *the economies of scale*[3] that are non-reductively and multiply realized at the bio-sociological levels. Spatio-temporally structured biological human beings and certain complex stories of their social interactions explain the economies of scale at the lower bio-sociological levels. As the economies of scale is a distinct and higher-level property from the bio-sociological levels, the economies of scale does not have spatio-temporal structure even though what reductively explains and entails it does.

Thus, I take it that the structural argument alone is false, and it alone cannot be used against, for example, the above philosophers who

[3] Economies of scale are the cost advantages one may receive from business expansion.

think that a future conceptual revolution may show that there is not an epistemic gap. Requiring the explanandum be something that has physical structure and dynamics has, by itself, got nothing to do with shaping the limits of scientific explanation. The structural argument by itself is debunked. Now, Chalmers may be read as having anticipated this move in that he acknowledges that non-structural psychological beliefs are entailed by a structural-dynamic system. He writes:

> [T]here are some truths that are not themselves structural-dynamic but are nevertheless implied by a structural-dynamic description. It might be argued, perhaps, that truths about *representation* or *belief* have this character. As we saw earlier, however, it seems clear that any sense in which these truths are implied by a structural-dynamic description involves a tacitly functional sense of representation or belief. (Chalmers, 2010, p. 121)[4]

Here, Chalmers may be read as now hinging his objection to those who believe in a future conceptual revolution on the fact that phenomenal consciousness lacks a complete functional description. In science, only functionalism can provide a reductive explanation of non-structural states to structural ones. Assuming that a behaviourist explanation is misguided, and a type identity explanation is also false, although we will discuss the general idea of an identity reduction and its plausibility given progressivism in further detail in the next section, the only remotely tenable hope to explain non-structural qualia is with functionalism, but functionalism still leaves an explanatory gap for qualia. Chalmers writes:

> The basic problem… is that epistemic implication from A to B requires some sort of *conceptual hook* by virtue of which the condition described in A can satisfy the conceptual requirements for the truth of B. When a physical account implies truths about life, for example, it does so in virtue of implying information about the macroscopic functioning of physical systems of the sort required for life. Here, broadly functional notions provide the conceptual hook. In the case of consciousness, by contrast, no such conceptual hook is available… (*Ibid.*, p. 123)

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[4] Chalmers immediately continues this quote with: 'This is what we would expect: if claims involving these can be seen (on conceptual grounds) to be true *in virtue* of structural-dynamic description[s] holding, then the notions involved must themselves be structural-dynamic at some level' (*ibid.*, pp. 121–2). Here, he seems to be saying that since representational truths are truths due to functionalism and lower-level structural-dynamic descriptions, then representational truths are structural and dynamic at a lower level. Notice that representations are still non-structural at the psychological level. Hence, Chalmers' statement is all well and good, but the second premise of the structural argument still is false because from truths about structure we may deduce truths about things that do not have physical structure at the psychological level.

However, while this response may be adequate to reply to the likes of those who allow for the possibility that future advancements, vaguely stated, may close the gap, progressivism in specifically and precisely allowing for the future development of kinds of explanations in the sciences of the mind can respond to Chalmers' counter whereas the others initially cannot. For the other views do not explicitly use the new notion of progressivism that is introduced here, although they certainly could adopt progressivism upon learning about it. Recall that progressivism does not simply say that, over time, science tends to gain a greater explanatory power. It states that the kinds of frameworks that underlie scientific explanations used in certain fields changes and progresses over time. In other words, based on the history of the philosophy of science, progressivism makes a deeper and more underlying point that the types of frameworks of explanations used in particular fields do advance, which then leads to a greater rather than a lesser or stagnant explanatory power for a given theory. This new thesis is certainly not articulated by the above philosophers who vaguely rely on future advancements in science. Therefore, such philosophers may be susceptible to the explanatory gap objection, whereas, as we shall see, progressivism provides a clear and explicit theoretical response to the objection.

For the sake of argument, let us grant Chalmers his premises that a zombie world is *prima facie* conceivable and that a functionalist conceptual hook is not adequate or available for explaining phenomenal consciousness. In granting Chalmers' vital premise that a functionalist theory of phenomenal consciousness is not feasible, progressivism can still demonstrate that such a functionalist requirement may not be ultimately necessary for a materialist and that Chalmers still is not justified in reaching his conclusion that materialism is false. For, given the progressivism of explanations within the subject of the mind, it very well could be the case that a new kind of explanation may arise that can provide the requisite conceptual hook and close the gap. A new kind of explanation may be theorized that can explain non-structural qualitative properties in terms of structural ones. Therefore, it may be the case that a zombie world is not *ideally* conceivable. Progressivism provides a novel substantive justification for this claim. It is important to remember that a functional explanation of the mind–body problem has not been around forever and has only been instantiated rather recently. Moreover, the sciences of the mind are only in their nascent stages. The tutelage of progressivism shows that the progression of kinds of explanations of certain (in-and-of-itself) non-structural psychological properties has occurred in the past in the

study of the nature of the mind and very well may occur in the future. Notice the inherent and sheer power of progressivism as the utilization of it does not even require or demand painting even a remotely nebulous picture of what the new kind of explanation may look like. The history of science demonstrates that the progression of kinds of explanations in certain fields can provide or underwrite new types of explanations within that field that can overcome previous explanatory obstacles and augment a theory's explanatory power; types of explanations some of which were not even previously imagined before within the field.

Chalmers claims that despite future progress in science, there can be no conceptual hook to explain phenomenal consciousness due to the failure of functionalism and other previous conceptual explanatory hooks. Thus, science and its numerous potential types of explanations cannot reductively explain non-structural qualia in terms of structural neural-biological properties. Recalling his two-dimensional argument, he boldly concludes that materialism is false or Russellian monism is true. However, Chalmers does not specifically account for the thesis of progressivism. Chalmers' problem is that he understands science's explanatory methods and frameworks to be stagnant. However, given progressivism, it does not immediately follow that there absolutely cannot be a conceptual hook. Remember how we have previously discussed how the study of fields such as physics and the nature of the mind have produced new types of explanations within their respective fields that allowed for overcoming previous explanatory hurdles and also allowed for a greater explanatory power and success. Therefore, given the wisdom of progressivism, Chalmers' first premise that 'P & ~Q is primarily conceivable' is not warranted since there is a reasonable and legitimate likelihood that P & ~Q is not ideally conceivable due to potential future ideal reflection and theoretical rationalization that is influenced by the discovery of a new kind of explanation. Although the premise 'P & ~Q is primarily conceivable' has not absolutely been ruled out, we are not justified in making the strong claim that this premise is true. Just as we would not be justified in believing that a five-year-old boy will never grow up to be a good soccer player given the poor way in which he currently plays, we likewise would not be justified in wholly believing Chalmers' first premise either.[5] Here is a legitimate warranted possibility that it is not the case that P & ~Q is primarily conceivable.

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[5] I understand this particular response to Chalmers to also be a sufficient response to McGinn, *mutatis mutandis*.

At this point one may object that what is required of progressivism is an assessment of the balance of probabilities (this objection may also apply to progressivism's next attack on Chalmers' third premise). For, even though progressivism may be true, Chalmers' argument inevitably may provide us with stronger reasons to think that physicalism is false and that we should pursue a property dualism project. On which side do the scales actually tip? Does the balance lie in favour of a property dualism or the pursuit of a reductive explanation of phenomenal consciousness? Given that 1) there has been a rapid progressivism on the study of the nature of the mind in the twentieth century with a large swathe of the mind–body problem already being listed as an easy problem; 2) modern psychology and neuroscience are still young developing fields; and 3) linked to the idea of progressivism, there is the general and overwhelmingly successful track record of science and its ability to explain worldly phenomena, I take it that the default view should be that it is more likely that a reductive explanation will be found. Now, although I am by no means stating that it absolutely will be the case that such an explanation will be found, the balance of reasons lies in favour of physicalism, and we should proceed with some justified optimism that a physicalist explanation may eventually be found. At such an early stage of the mind sciences, in claiming that the scales tip in favour of property dualism, one would almost have to deny and be blind to the very existence of progressivism. In science's eyes, with a stable full of thoroughbreds, to claim at this point that the probabilities for the balance of success lies in favour of property dualism is to call the winner almost before the race has even begun.

4. The Tutelage of Progressivism — Chalmers' Third Premise

Progressivism may also be used to attack the third premise: 'If P & ~Q is primarily possible, then P & ~Q is secondarily possible or Russellian monism is true.' For the sake of argument, let us assume the antecedent that 'P & ~Q is primarily possible' and that Russellian monism is a legitimate possibility. However, the disjunction contained within the consequent of the conditional is not complete. For it very well could be the case that in the future progressivism provides a new kind of materialistic means of reductively explaining phenomenal psychological states to neural-biological ones such that phenomenal states are identified with *x*, where *x* will be left as an open and unspecified variable. Progressivism provides a unique content and justification to the notion that we might be able to explain consciousness in the

future. Similar to the fact that water is H_2O, such a reasonable possibility may lead to an *a posteriori* necessity claim that phenomenal consciousness is *x* (although for qualia it need not be a type identity reduction to the physical). P & ~Q may not be secondarily conceivable, although it may be primarily conceivable. Thus, even though P & ~Q is primarily conceivable and thus, primarily possible, it may be that it is not the case that P & ~Q is secondarily possible, where Russellian monism also is not true. If there is a physicalist *a posteriori* necessity, a warranted possibility that progressivism legitimately allows for, then the consequent of Chalmers' third premise must allow for this possibility of physicalism, and this renders the third premise as false or incomplete. Here, I do not claim that a materialist *a posteriori* necessity will in fact be discovered, but as I have previously argued, I do believe that there is a reasonably strong probability that this may occur. Hence, this leads to an altered conclusion for the two-dimensional conceivability argument that allows for the possibility of a materialist picture. No strong conclusion for dualism may be drawn. On this objection, Chalmers' argument now appears as:

1. P & ~Q is primarily conceivable.
2. If P & ~Q is primarily conceivable, then P & ~Q is primarily possible.
3. If P & ~Q is primarily possible, then P & ~Q is secondarily possible, or Russellian monism is true, or it is not the case that P & ~Q is secondarily possible where Russellian monism is also false.
4. If P & ~Q is secondarily possible, then materialism is false.
5. If it is not the case that P& ~Q is secondarily possible where Russellian monism is also false, then materialism is true.

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6. Materialism is false, or Russellian monism is true, or materialism is true.

Chalmers may respond that, based on his argument, materialism cannot be true because if it is not the case that P & ~Q is secondarily possible, then the only option is for Russellian monism. Recall that Chalmers states that if the structural and intrinsic properties of physics do necessitate the existence of phenomenal consciousness, then the intrinsic properties of microphysical entities must be phenomenal properties. This is Russellian monism. However, the issue with this is that the problem of phenomenal consciousness asks for a reductive explanation of the psychological to the neural-biological, not to the microphysical. It is the structural and intrinsic profiles of the neural-biological level that is important here. As a legitimate possibility,

progressivism in the future may help to provide a materialist explanation to the question of what are the intrinsic profiles of neural-biological properties that are in some way connected to phenomenal consciousness. This would be analogous to how scientists have provided the intrinsic profile of water at the chemical as contrasted with the microphysical level (once again, for qualia, it need not be a type identity reduction to the physical). Here, on this *a posteriori* necessity materialist framework, the intrinsic profiles of microphysical entities that non-reductively realize the chemical and biological levels need not be phenomenal properties themselves any more than the intrinsic profiles of the relevant microphysical entities need to be the property of *being water* in order to account for the *a posteriori* necessity claim that water is H_2O. Just as water has the intrinsic profile of being H_2O at the chemical level in which the corresponding identity is an *a posteriori* necessity even though the intrinsic profile at the relevant microphysical level is not constituted by the property of *being water*, the intrinsic profile at the microphysical level for phenomenal consciousness need not be constituted by phenomenal properties. There may still be a materialistic *a posteriori* necessity from the phenomenal to the neural-biological levels that allows for it to not be the case that P & ~Q is secondary possible where Russellian monism is also false. What matters for the intrinsic profiles that are a crucial element of *a posteriori* necessity claims is the relevant scientific level of reductive explanation that one is seeking. For the problem of phenomenal consciousness, this scientific level is the neural-biological. Therefore, progressivism allows for the possibility that even if P & ~Q is primarily possible, then it is not the case that P & ~Q is secondarily possible where Russellian monism is also false. Hence, Chalmers' argument allows for the serious possibility of materialism, and his contention cannot make the strong claim that some kind of property dualism is true.

Notice that if one questions how there can be a conceptual hook from the psychological to the neural-biological level when neural-biology currently only deals with explaining functions, then progressivism may swiftly respond that even if neural-biology currently only concerns itself with functional explanations, this is perfectly fine with progressivism. For progressivism demonstrates that there is a reasonably strong probability that a new type of explanation may arise in neural-biology that can reductively explain phenomenal consciousness. Assuming that a functional explanation of qualia is not viable, progressivism shows that in the future there is a reasonably strong

likelihood that neural-biology will develop another kind of explanation in its arsenal that can explain phenomenal consciousness.[6]

One may also object that even if in the future we can reductively explain phenomenal consciousness to the neural-biological, would there not still be a problem in being able to reductively explain the neural-biological to the level of microphysics? However, even though the primary focus of the subject matter of phenomenal consciousness currently is on the relationship between psychological and neural-biological properties, here once again progressivism may make the same move for this neural-biological to microphysical issue as well. Even if there currently is no account of such a reductive explanation, a general progressivism in the sciences of the mind and physics allows for the reasonably strong probability that the requisite kind of microphysical explanation may develop in the future.

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[6] Chalmers will also object that an *a posteriori* necessity in relation to phenomenal consciousness is unlike cases such as water = H_2O because the former involves necessities that are epistemically primitive whereas the latter do not. In other words, cases like water = H_2O can be deduced from a complete physical description of the world given structural and/or functional properties, but the connection between the neural-biological and the phenomenal cannot given the lack of structure and a complete functional description of the phenomenal. Without a complete functional description of the phenomenal, we cannot simply find the physical realizers of the functional role in order to find the *a posteriori* necessity. Chalmers states that this makes epistemically primitive necessities mysterious and *ad hoc*. Rather, we should posit the connection as being a fundamental law of nature in which there are the two distinct properties of the neural-biological and the phenomenal. However, the lack of a functional description of qualia which leads to the supposed corresponding epistemically primitive necessities is not sufficient to stop progressivism. For progressivism allows for the legitimate warranted possibility that the *a posteriori* necessity in relation to phenomenal consciousness may be shown to not be epistemically primitive given future advancements in explanation. The *a posteriori* necessity may be able to be deduced from a complete physical description of the world. In other words, the new conceptual explanatory hook will allow us to deduce the *a posteriori* necessity relationship by examining the physical world without there being any kind of gaps. In continuation of this point, progressivism does not necessarily claim that the *a posteriori* necessity will be made in terms of the mental to the physical. All I have said is that phenomenal consciousness may be *x*. For example, *x* may be something that allows for a previously unimagined conceptual hook; a hook that in some way also allows for multiple realizability. This identity of phenomenal consciousness to *x* may allow the *a posteriori* relation to not be epistemically primitive in that it may be deduced from a complete physical description of the world regardless of the lack of a complete functional description for qualia.

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