PHENOMENAL CONSCIOUSNESS IN CHALMERS

By

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Abstract

This essay is on ‘Phenomenal Consciousness’. By introducing the ‘hard problem’ of phenomenal consciousness, I will focus on Chalmers’ efforts on developing a theory of consciousness, which he believes is a project toward finding a solution to the hard problem.

As a result of focusing on the hard problem, this paper deals with the questions such as “how and why cognitive functioning is accompanied by conscious experience”, “how the physical systems or the physical brain processes give rise to conscious experience”, “why these processes do not take place ‘in the dark’ without any accompanying states of experience”, “what is the relation between the physical, the psychological and the phenomenal” and finally “what is the phenomenal experience or phenomenal feel”. There are two main streams trying to find a solution to (or dissolve) these kinds of questions about consciousness: the reductive doctrines (materialists) and the nonreductive doctrines.

Before exploring Chalmers’ answer to these questions, which is by his nonreductive theory of consciousness, I will explore some of the most important reductive (materialist) theories by focusing on Chalmers’ arguments against them and I will indicate his main objection to materialist theories by pointing out what he thinks is missing in these theories. This issue will be followed by the part in which I will argue that what makes Chalmers’ arguments against materialists views applicable, actually applies to his own theory of consciousness as well. I will argue that what is missing in all theories of
consciousness, (including Chalmers’) which could play a significant role in a theory of consciousness, is a ‘first person point of view’ and an ‘ability to have a first person point of view’, by which I mean an ability for a being to have a first person (subjective) access to the results of his own physical cognitive information processing system. As a result, I will argue that phenomenal consciousness is actually an epistemic phenomenon which is the result of being in a sort of epistemic relation to one’s own cognitive system.
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CHAPTER I

Introduction

What is consciousness? Why is consciousness evolutionarily useful? Is a causation of behavior accompanied by some sort of subjective inner life? Is consciousness something physical or is it something over and above the physical? Is consciousness anything other than the physical system? How could a physical system such as brain also be an *experiencer*? Does consciousness arise from physical systems such as brains? And if yes, how do they give rise to consciousness? Why should there be *something it is like to be* such a system, anyways? What is the relation between the physical system and consciousness? All these questions show us how mysterious consciousness is, in a way that Chalmers calls it one of the biggest mysteries in the world. But, because as Block claims, consciousness is a *mongrel* notion and every notion refers to a very different sort of mental property, (Block, 1994) we need to know to which of these many notions each of these hard questions refer. Consequently, the very first thing I will clarify is the notion of consciousness that I am trying to address in this paper, which is that of phenomenal consciousness. After that and in the second chapter, I will explore some of the most important materialist theories regarding the problems of phenomenal consciousness by focusing on Chalmers’ arguments against them; and in the third chapter I will explore Chalmers own theory of phenomenal consciousness and finally my own contribution to the issue of phenomenal consciousness with respect to Chalmers’ arguments.
Different Notions of Consciousness

The most important notions of consciousness that are mentioned by Block are: self-consciousness, access consciousness and phenomenal consciousness. In this part, I will explore them very briefly, with the aim of disentangling them from phenomenal consciousness.

1. Self-consciousness

Consciousness is typically defined as being the result of “building an internal model of the world that contains the self”, or “reflecting back on one’s own mode of understanding.” (Pinker, 1999) A simple example of this self-consciousness can be the ability to use a mirror: “If I can raise my arm and crane my neck to sight a hidden spot on my back, why couldn’t I learn to raise a mirror and look up at it to sight a hidden spot on my forehead?” (Pinker, 1999) The self can be one of these things that one can have understanding or information about. When one has the ability to have mental contents about other people or objects, then there will be nothing to prevent one from having mental contents about oneself. There are a number of notions of self-consciousness, but they all have one thing in common, which is the ability to think about oneself. One of these notions of self-consciousness is the minimal notion of self-consciousness. “Minimal self-knowledge requires thinking about oneself, but not in any particular way.” (Block, 1994) For example having the feelings such as ownership and deception can be signs of this minimal notion of self-consciousness. The other notions of self-consciousness are the non-federal and federal notions. (Block, 1994) Together, these notions give rise to a conceptual form of self-consciousness; and in both we face a sort of unity. According to
the federal notion of self-consciousness, the concept of self is a federation (group) of
different sub-selves; each of these sub-selves considers a particular aspect of the self. The
federal notion is the result of unifying different aspects that we know about ourselves.
The non-federal notion of the self is “a more intellectual notion of the self that does
presuppose that we are not such a federation” (Block, 1994). On this view, the concept of
self is not a simple sum of different aspects of our selves, but is a new unified concept of
self, which is different from all the sub-selves. As is obvious, the ability to think of
oneself in this way is very sophisticated and as Block maintains, is a product of culture.
(Block, 1994)

2. Access-consciousness

The next notion I want to explore here is access-consciousness, or in other words, access
to information. Let us begin with Block’s definition: “A state with a certain content is
access-consciousness if, in virtue of one’s having the state, a representation which has
that content is (1) poised to be used freely as a premise in reasoning, according to the
capabilities of the reasoner, (2) poised to be used freely for control of action…” (Block,
1994) The major symptom of access-consciousness in language-using organisms would
be reportability and in others, their ability to use perceptual contents in guiding their
actions and behavior. With respect to this definition, we can see that the paradigm access-
conscious states are thoughts, beliefs and desires. (Block, 1994)

Steven Pinker uses the phrase access to information instead of access-consciousness; by
that, he means the ability to have access to the mass of information processed in the
nervous system. He argues that, “ The mass of information processing in the nervous
system falls into two pools; one pool, which includes the products of vision and the contents of short-term memory, can be *accessed* by the system underlying verbal reports, rational thought, and deliberate decision making (this notion is compatible with Block’s access-consciousness). The other pool, which includes autonomic (gut-level) responses, the internal calculations behind vision, language, and movement, and repressed desires or memories (if there are any), cannot be accessed by those systems; (but) sometimes information can pass from the first pool to the second or vice versa (so in this way, they can or cannot be accessible).” (Pinker, 1999) Therefore the only accessible information, according to Pinker, exists in the first pool; but in special circumstances, if the information in the second pool transfers to the first pool, it will be accessible. For example, with intense concentration and biofeedback, we can focus on a hidden sensation like our heartbeat. It is also possible the other way around: that is, when the accessible information (in the first pool), because of various reasons, moves to the domain of autonomy (the second pool). For example, on the first days of learning bicycle, every motion and act has to be thought out (domain of access consciousness), but through practice, riding a bicycle becomes automatic and one can ride it without being conscious of what one is doing exactly. This distinction clearly shows that the content of accessible information (or consciousness) is subject to change and it depends on many factors and different situations. Moreover, “this sense of consciousness, of course, also embraces Freud’s distinction between conscious and unconscious mind.” (Pinker, 1999)

According to Chalmers, the notion of “awareness” corresponds to what Block calls access-consciousness and to Pinker’s notion of access to information. We will discuss Chalmers notion of awareness later.
3. Phenomenal consciousness

There is no generally agreed upon definition of phenomenal consciousness, which is the most puzzling and problematic notion. Phenomenal consciousness is found wherever there is experience and feeling. “Phenomenal conscious properties are the experiential properties of sensations, feelings and perceptions…” (Block, 1994) As Steven Pinker puts it, phenomenal consciousness is: “sentience: subjective experience, phenomenal awareness, raw feels, first person present tense, “what is it like” to be or to do something and, if you have to ask you’ll never know.” (Pinker, 1999) Michael Tye says: “Consciousness of this sort should be distinguished from higher-order consciousness; it attaches paradigmatically to perceptual experiences and images, bodily sensations, emotions, and felt moods.” (Tye, 1998)

Although it is a fact that how things look, sound, smell, etc, is related to basic biological features of whoever is experiencing them, some will argue that culture, situation, background knowledge or information (mental content) of the subject of experience also has a big impact on the way things look, sound, smell, etc. In Block’s words, “phenomenal properties are often representational; for example, what is it like to see something as a refrigerator is different from what is it like to see the same thing from the same angle as a big white thing of unknown purpose and design.” (Block, 1994)

What Nagel means by consciousness is subjectivity. He claims that if there is something it is like to be a bat, something for the bat itself, then that is evidence that the bat is conscious.
Chalmers believes that a being is conscious if there is *something it is like* to be that being. There is something *feels like* to be the cognitive agent. This *internal aspect* is consciousness. What is central in consciousness is *experience*, he says. Chalmers argues that conscious experience is central to a subjective viewpoint. He emphasizes that when he talks about consciousness he is actually talking only about the *subjective* quality of experience: what it is like to be the cognitive agent. “To be conscious” is synonym with “to have qualia (the ineffable subjective qualities of experience)”, and “to have subjective experience (the way things seem to me, as opposed to how they are objectively)”.

Similarly, he says, a mental state is conscious if there is something it is like to be in that mental state; to put it another way, “we can say that a mental state is conscious if it has a *qualitative feel*, an associated quality of experience; these qualitative feels are also known as phenomenal qualities, or *qualia* for short.” (Chalmers D. J., 1996, p. 4)

Chalmers claims that the terms and phrases such as “experience”, “qualia”, “phenomenology”, “phenomenal”, “subjective experience”, and “what it is like”, pick out approximately the same class of phenomena as “consciousness”.

To have a clearer understanding of Chalmers’ notion of phenomenal consciousness, we should consider his significant distinction between the two aspects or concepts of mind: ‘phenomenal’ and ‘psychological’ concepts of mind. The psychological concept of mind is a concept of mind as the causal or explanatory basis for behavior. It is related to those states of mind relevant to the causation and explanation of behavior. A mental state, in this sense, plays a causal role in the production of behavior. Such a mental state may or may not be conscious. Most nonphenomenal properties fall into this class. Chalmers believes that what cognitive science deals with is actually this concept of mind. In the
same way, the functionalist account of consciousness corresponds precisely to the
definition of what Chalmers calls psychological properties, so this is not what he means
by conscious experience. The phenomenal concept of mind is a concept of mind as
conscious experience, and of a mental state as a consciously experienced mental state.

“On the phenomenal concept, mind is characterized by the way it feels; on the
psychological concept, mind is characterized by what it does.” (Chalmers D. J., 1996, p. 11)
Moreover, “phenomenal concepts deal with the first-person aspects of mind whereas
psychological concepts deal with the third-person aspects.” (Chalmers D. J., 1996, p. 16)
This is what Chalmers calls “the double life of mental terms” which is the idea that
“every mental property is either a phenomenal property, psychological property, or some
combination of the two.” (Chalmers D. J., 1996, p. 16) However, Chalmers believes that
it is a fact about the human mind that whenever a phenomenal property is instantiated, a
Corresponding psychological property is instantiated and vice versa. So conscious
experience and cognitive processing are always tied together. This is an important point
in Chalmers’ theory of consciousness that we will explore further in related discussions.

In addition, Chalmers makes an important distinction between two concepts of
consciousness itself: he distinguishes phenomenal and psychological senses of
consciousness. To be conscious in a phenomenal sense is just to instantiate some
phenomenal quality or experience. This conscious state has a phenomenal character with
phenomenal properties (or qualia) characterizing what it is like to be in this state.
(Chalmers D. J., 2002) But by the psychological sense of consciousness, he means a
variety of psychological properties such as reportability or introspective accessibility of
information. There are various psychological notions, for which we use the term
‘consciousness’ such as, awakeness, introspection, reportability, self-consciousness, attention, voluntary control, and knowledge. Chalmers believes that the most general brand of psychological consciousness is “awareness”. “Awareness can be broadly analyzed as a state wherein we have access to some information and we can use that information in the control of behavior.” (Chalmers D. J., 1996) But the point is that he claims that any conscious experience (phenomenal consciousness) is accompanied by awareness, which is clear from the fact that phenomenal consciousness is reportable. As a result, wherever there is phenomenal consciousness, there seems to be awareness, but awareness does not need to be accompanied by phenomenal consciousness. Block’s notion of access consciousness corresponds to the notion of awareness in Chalmers. We can conclude that awareness (or psychological consciousness) is the functional notion of consciousness whereas phenomenal consciousness (or conscious experience) is the non-functional notion of consciousness.

**Introducing the hard problem**

This distinction of mental properties leads Chalmers to consider the mind-body problem as two distinct problems: the “easy problem” and the “hard problem”. The questions related to the psychological aspect of mind are the easy problems, that is, although they might have the character of puzzles, they are not mysterious. In other words, we know how to find a solution for them even if we have not yet done so. What makes the easy problem easy is that for these problems the task is to explain certain behavioral, functional and cognitive processes, to explain how certain causal roles are played in the cognitive system. To explain these processes, “one needs only to specify a mechanism
that plays the relevant role. And there is good reason to believe that neural or computational mechanisms can play those roles.” (Chalmers D. J., 2002) Chalmers maintains that “the psychological aspects of mind pose many technical problems for cognitive science and a number of interesting puzzles for philosophical analysis, but they pose no metaphysical enigmas.” (Chalmers D. J., 2002) Chalmers believes that cognitive models are well suited to explaining psychological aspects of consciousness.

But on the other hand, there is the problem related to the phenomenal aspect of mind, which is called the ‘hard problem’ by Chalmers. The hard problem includes questions such as “why and how these psychological properties are accompanied by phenomenal properties”, “how and why cognitive functioning is accompanied by conscious experience”, “how physical systems or physical processes give rise to conscious experience”, “why these processes do not take place ‘in the dark’ without any accompanying states of experience”, “what is the relation between the physical, the psychological and the phenomenal”.

What makes the hard problem hard? The task here is not to explain behavioral and cognitive functions, even if we had all these explanations in hand; there is still a further question to be answered: why is the performance of these functions accompanied by experience? This hard problem is the central mystery of consciousness.

Here I should mention that actually not everyone agrees with Chalmers. Some claim that the hard problem does not exist, that it depends on a false conception of consciousness. P. Churchland calls it a ‘hornswoggle problem’. She believes that we cannot decide in advance which problems will turn out to be the really hard ones. She claims that this
arises from the false intuition that if we explained perception, memory, attention, and all the other details, there would still be something left out which is “consciousness itself”.

Others agree with the existence of the hard problem but consider it as an unsolvable problem. Nagel argues that there is a ‘what it is like to be…’ question in which we must deal with subjectivity, but we can never know anything about it, and so he concludes that the problem is insoluble.

Pinker agrees that we may be able to understand most of the details of how the mind works, yet consciousness itself may remain forever beyond our reach.

Consequently, we can conclude that in addition to the questions of “how the physical gives rise to the phenomenal consciousness” and “why the physical cognitive processes are accompanied with the phenomenal experience”, there is another major problem which deals with the very existence of such a phenomenal consciousness: “Is consciousness an extra phenomenon in addition to the physical functional or cognitive processes, or is it an intrinsic part of them?” So by believing in the idea that consciousness is intrinsic to complex brain processes and not an extra and separate phenomenon (functionalism, eliminativism, behaviorism and etc.), there is no place for the hard problem at all.

Moreover, according to these views, there would be no sense in talking about ‘consciousness itself” or about ‘qualia’ and ‘conscious experience itself”, because there is nothing extra that exists apart from the processes of intelligence, perception, memory, emotions, etc (all the psychological concepts of mind).

It is the belief that conscious experience is something extra and apart from all these psychological senses of mind, as Chalmers believes, which raises the hard problem. That
is to say, as soon as one believes in consciousness as a phenomenon apart from all the physical functional and cognitive processes, one will face with the questions of “how these processes give rise to this extra phenomenon”, “why these processes are accompanied with this extra phenomenon” and “what is the intrinsic nature of this extra phenomenon”.
CHAPTER II

Chalmers’ Arguments against the Reducibility of Consciousness

A solution to the hard problem would involve an account of the relation between the physical processes and consciousness. The hard problem confronts us with questions such as: “What is the place of consciousness in the natural order?” “Is consciousness physical?” “Can consciousness be explained just in physical terms?”

Supervenience

In order to deal with these questions, Chalmers feels a need to introduce the notion of supervenience, which he defines in this way: “the notion of supervenience formalizes the intuitive idea that one set of facts can fully determine another set of facts.” (Chalmers D. J., 1996) Or to put it another way: “supervenience is a relation between two sets of properties: $B$ properties-intuitively, the high level properties-and $A$ properties, which are the more basic low-level properties.” (Chalmers D. J., 1996, p. 33) In this way “$B$-properties supervene on $A$-properties if no two possible situations are identical with respect to their $A$-properties while differing in their $B$-properties.” (Chalmers D. J., 1996, p. 33)

At this point I should refer to Chalmers’ important distinction between two different types of supervenience relation. He claims that every supervenience relation upon the physical is either logical supervenience or natural supervenience:

When $B$-properties supervene logically on $A$-properties it means that $A$-facts entail the $B$-facts so that it is logically impossible for the first to hold without the second.
When B-properties supervene *naturally* on A-properties it means that B-facts *arise* from A-facts so that any two naturally possible situations (situations that could actually occur without violating any *natural laws*) with the same A-properties have the same B-properties. Natural possibility is what we think of as actual *empirical* possibility. So it holds when there is *lawful* correlation between two properties.

Consequently, when B-properties supervene logically on A-properties, in any possible world with certain A-facts, the B-facts will come along for free as an automatic consequence. But when B-properties supervene naturally on A-properties, the mere existence of A-facts is not enough for the occurrence of B-facts; in order to have the B-facts in addition to A-facts, we need a natural law to relate A-facts and B-facts.

*Reductive Explanation (Materialism)*

A *Reductive explanation* tries to explain consciousness wholly on the basis of physical principles. A *materialist* (or physicalist) solution to the hard problem will be a solution according to which consciousness is itself seen as a physical process. Materialism (or physicalism) is a doctrine which holds that everything in the world is physical and there is nothing over and above the physical. Materialism is the idea that everything is *logically* supervenient on the physical facts. As a result “a natural phenomenon is reductively explainable in terms of some low-level properties when it is logically supervenient on those properties. It is reductively explainable in terms of physical properties--or simply ‘reductively explainable’--when it is logically supervenient on the physical.” (Chalmers D. J., 1996, p. 48) A Reductive explanation requires a logical supervenience relation, so believing that phenomenal consciousness can be explained reductively is equivalent to the idea that conscious experience is logically supervenient on the physical. Various
doctrines uphold the reductive explanation of conscious experience under the title of materialism, as opposed to dualism, such as: reductive explanation in functional analysis, cognitive science, neurobiological explanation, evolutionary explanation, new physics, etc. These doctrines hold not only that consciousness supervenes naturally on the physical, but also that it supervenes logically. Philosophers such as Dennett and Churchland believe that the existence of such a creature who is physically identical with conscious beings but who is not conscious (zombie) is impossible. They agree that any system that is physically identical to us and behaves exactly like us would necessarily have to be conscious. Consciousness, they believe, is something that necessarily comes along with all those evolved skills of perceiving, thinking, feeling and functional and cognitive processes of the physical system.

Chalmers argues that although it seems very likely that consciousness is naturally supervenient on physical properties (as long as we are talking about the natural world) so that any two physically identical creatures will have identical phenomenal experiences, it is not clear that consciousness is logically supervenient on physical properties. He continues that it seems logically possible that a creature physically identical to a conscious creature lacks conscious experience (i.e. that zombies are logically possible) and if this is true then it shows that conscious experience supervenes naturally but not logically on the physical. To summarize, Chalmers believes that “the necessary connection between physical structure and experience is ensured only by the laws of nature, and not by any logical or conceptual force.” (Chalmers D. J., 1996) Chalmers believes that even if it is true that appropriate functional organization always gives rise to consciousness (i.e. is naturally supervenient), it does not entail consciousness (i.e. is not
logically supervenient). When consciousness fails to supervene logically on some physical lower-level properties, then given any physical lower-level account to explain consciousness, there will still remain an unanswered question: why is this lower level process accompanied by the phenomenon?

To conclude, Chalmers wants to argue against materialism and a reductive explanation of consciousness by holding that conscious experience does not supervene *logically* on the physical although he agrees that “modulo conscious experience, all phenomena is logically supervenient on the physical”, that is, all high level facts--according to Chalmers conscious experience is not a high level fact--are in principle derivable from microphysical facts and reductively explainable in terms of physical facts (with the exception of indexicality and negative existential facts).

In order to make a case against a reductive explanation, Chalmers proposes some arguments to prove that consciousness is not logically supervenient on the physical; that is, all the microphysical facts in the world do not *entail* the facts about consciousness. In this part I will explore some of these arguments briefly.

The conceivableability of a situation in which the physical facts are the same but the facts about experience are different, leads us to the first two arguments against logical supervenience: (A) The logical possibility of zombies, and (B) the inverted spectrum. These arguments are the *conceivability* arguments, both of which are based on these premises:

1. “In our world, there are conscious experiences.
2. There is a logically possible world physically identical to ours, in which all the positive facts about consciousness in our world do not hold.

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

4. So materialism is false.” (Chalmers D. J., 1996, p. 123)

(A) The logical possibility of zombies:

The specific question here is whether it is logically possible for someone or something physically identical to me (or any conscious being), to lack conscious experience. Or to put it in another way: “Is the idea of a zombie logically coherent?” To clarify the question, let us make clearer the notion of zombie. My zombie twin is a creature, which is molecule by molecule identical to me, and identical in all the low-level properties; she is also identical to me functionally (in functional organization, that is in the pattern of causal organization embodied in the mechanisms responsible for the production of behavior) and psychologically, with the same behavior and reactions. She is also conscious in all other senses of consciousness (e.g. the psychological senses) except for phenomenal consciousness; she lacks phenomenal feel and experience. So my zombie twin is physically, functionally, cognitively and psychologically identical to me, but lacks phenomenal experience. Now the question is whether the notion of such a creature (zombie) is conceptually coherent, that is, whether it is logically possible. Chalmers emphasizes the idea that “if no reasonable analysis of the terms in question points toward a contradiction, or even makes the existence of a contradiction plausible, then there is a natural assumption in favor of logical possibility.” (Chalmers D. J., 1996, p. 96) He
argues that because there is no contradiction in the description of a zombie, then almost everybody is capable of conceiving this possibility. Consequently, a zombie is logically possible and logically conceivable. This is the first argument on which Chalmers relies, in order to reject the logical supervenience of consciousness on the physical: 1. If a zombie is logically conceivable (and so logically possible), then phenomenal consciousness is not logically supervenient on the physical. 2. A zombie is logically conceivable (and so logically possible). 3. Phenomenal consciousness is not logically supervenient on the physical.

(B) The inverted spectrum:

The main question of this argument is whether it is logically possible (coherent) to imagine a world physically identical to ours, but in which the facts about conscious experience are different from the ones in our world (without conscious experience being absent entirely).

Chalmers argues that “as long as some positive fact about experience in our world does not hold in a physically identical world, then consciousness does not logically supervene.” (Chalmers D. J., 1996, p. 99) He continues that, as a logical possibility, it seems entirely coherent that experiences could be inverted while physical structure remains unchanged. Chalmers uses this argument as further evidence against the idea of consciousness being logically supervenient on the physical.

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1 Some might say that conceivability is an imperfect guide to possibility. Although this is true for a posteriori necessity, it does not apply to a priori entailment to which we aim to refer by the notion of logical supervenience.

2 Even many materialists, such as Shoemaker, have agreed that it is coherent that one’s experiences can be inverted while one’s functional organization stays constant.
So far Chalmers claims that by showing the logical possibility of zombies and inverted spectra, he has succeeded to prove that consciousness fails to supervene logically on the physical. Actually we can say that by the first argument--the logical possibility of zombies--he has tried to show that the existence of consciousness cannot be reductively explained, whereas by the second argument--the logical possibility of an inverted spectrum--he has demonstrated that the specific character of particular conscious experience could not be reductively explained. Consequently, either way, if consciousness does not supervene logically on the physical, then materialism is false.

The second two arguments are the epistemic arguments:

(C) From epistemic asymmetry:

Conscious experience is a first person experience and my knowledge of it derives primarily from my own case, and not from any external observation. Chalmers emphasizes the idea that “our grounds for belief in consciousness derive solely from our own experience of it.” (Chalmers D. J., 1996, p. 101) As a result, even if we know everything about the physics of the universe or everything physical about other creatures, we still do not know whether they are conscious or not. Moreover, even if we know all about our own physical properties and its structure and functional organization, all this information would not lead us to the knowledge of our own conscious experience. This shows an epistemic asymmetry in our knowledge of consciousness which is not true in our knowledge of other phenomena. By presenting this epistemic asymmetry in our knowledge of consciousness, Chalmers tries to make it clearer that consciousness does not supervene logically on the physical, because a logically supervenient property can
completely be detected on the basis of external evidence and the first person case does not play any special role. This epistemic argument takes this form: 1. there is an epistemic gap between the physical evidence and the evidence of phenomenal experience. 2. If consciousness were logically supervenient on the physical, there would be no such epistemic gap 3. As a result consciousness is not logically supervenient on the physical, so materialism is false.

(D) The knowledge argument:

As mentioned in the previous argument, conscious experience is a first person case and a subjective experience. Consequently, by knowing all the physical facts about a creature, we still have no idea what it is like to be that creature and what her experiences are like. For example as Nagel mentions, we can never know what it is like to be a bat; we could never know what it is like for a bat to experience a rose or the color red. So Chalmers finds another epistemic argument to assert that physical facts do not logically entail facts about conscious experience. The form of this argument is: 1. there are truths about consciousness that are not deducible from physical truths. 2. So materialism is false.

To summarize, since a reductive explanation of phenomena in terms of the physical requires logical supervenience (an *a priori* implication from the physical facts to the relevant high level facts), when this connection does not hold, there will always remain a question of why the physical processes give rise to consciousness. The failure of this connection i.e. logical supervenience shows us that no reductive explanation of consciousness can succeed. Chalmers emphasizes the fact that physical explanation is well suited to the explanation of *structure* and of *function*, so that these can be entailed by
low level physical properties; but he believes consciousness itself is not functional or structural. Notice that he is not saying that physical facts are irrelevant to the explanation of consciousness; we can still expect physical accounts to play a significant role in the theory of consciousness, giving information about the physical basis of consciousness.

Accordingly Chalmers argues that “once we have explained all the physical structure in the vicinity of the brain, and we have explained how all the various brain functions are performed, there is a further sort of explanandum: consciousness itself. Why should all this structure and function give rise to experience?” (Chalmers D. J., 2002) This leads us to another argument by Chalmers:

(E) The explanatory argument: (Chalmers D. J., 2002)

1. All physical accounts explain at most structure and function (causal roles). 2. Conscious experience itself is not structural or functional (3) so explaining structure and function does not suffice to explain consciousness. 4. No physical account can explain consciousness.

This problem is what Levine calls the *explanatory gap* between the physical level and conscious experience. Faced with this gap, Chalmers proposes that we need some bridging principles that link the physical facts to consciousness, but these principles will not be reductive ones.

**Different Types of Materialism, Against Which Chalmers Argues**

In this part of the paper, first, I will take a brief look at Chalmers’ arguments against different types of materialism, and after that, I will explore more extensively two of the
main materialist theories i.e. cognitive modeling and neurobiological explanation of consciousness and Chalmers’ criticisms against them.

Chalmers believes that each of the materialist theories are, in a sense, the results of denying one (or more) of the premises of his argument against materialism. Basically, Chalmers’ argument against materialism consists of four premises:

1. Conscious experience exists.

2. Conscious experience is not logically supervenient on the physical.

3. So if there are phenomena that are not logically supervenient on the physical facts, then materialism is false.

4. The physical domain is causally closed.

Chalmers argues that premises 1, 2 and 3 are enough to imply the falsity of materialism. But adding these three premises to premise 4 and the plausible assumption that ‘physically identical beings will have identical conscious experiences’, imply what Chalmers has called natural supervenience: “conscious experience arises from the physical according to some laws of nature, but is not itself physical.” Now let us see the alternative positions as the results of denying each premise.

Denying premise (1), denying the very existence of consciousness, yields Elimativism: there are no positive facts about conscious experience; nobody is conscious in the phenomenal sense.
Chalmers believes this view is manifestly false because the existence of consciousness is attested by every individual’s intuition. He claims that “Consciousness is at the very centre of our epistemic universe” (Chalmers D. J., 1996, p. 169).

Denying premise (2) yields “reductive materialism”: the belief that physical properties entail conscious experience. These doctrines vary depending on what sort of physical properties they hold to be centrally responsible for entailing consciousness. Some of these doctrines are:

A. Reductive functionalism. “This view takes consciousness to be conceptually entailed by the physical in virtue of functional or dispositional properties; on this view what it means for a state to be conscious is for it to play a central causal role.” (Chalmers D. J., 1996, p. 161) As a result the zombie world is logically impossible.

This view is the most serious materialist option. If materialism is true, that is, if consciousness supervenes logically on the physical, then the reasonable way for it to supervene logically is via a functional analysis. On this view, Chalmers believes, “all it means for something to be a conscious experience is for it to play a certain causal role in a system” (Chalmers D. J., 2002). But the problem is that the view does not allow for a difference between phenomenal and psychological properties. As a result of this confusion, this view actually misrepresents what it means to be a conscious experience, or to be conscious. In this way, it seems that reductive functionalism does not differ much from eliminativism, because both views simply ignore the difference between phenomenal and psychological properties, and they both believe that there is nothing else
except accessibility, reportability, categorization and the other psychological properties, 
that is in need of explanation (as Dennett believes).

B. Nonfunctionalist reductive materialism: Consciousness is entailed by the physical 
in virtue of nonfunctional properties, such as biochemical and quantum properties. 

Chalmers believes that the views (A) and (B) rely on false analyses of the notion of 
consciousness and therefore change the subject.

C. New-physics materialism. According to this view, we have no current idea on 
how physical facts could explain consciousness, and that is because our current 
knowledge of physics is too narrow, but a new physics, where the entities are 
considered in a radically different theoretical framework, might be sufficient to 
entail and explain consciousness. 

Chalmers believes that this view “place large and implausible bets on the way that 
physics turn out, and also have fatal conceptual problems”. Any transformation in 
physics, should any happen, as long as it is physics, ultimately deals in structural and 
dynamical properties. So whatever the physical entails is bound to be structural and 
dynamical, but as long as we are talking about phenomenal conscious properties, we are 
not talking about the structural or the dynamical. Consequently, regardless of kind, 
physics will never entail the existence of experience. 

Some would deny premise (3), agreeing with the idea that there is no logical entailment 
from physical facts to consciousness, but believing that consciousness is physical 
anyway. Those who hold such a position, believe that physical facts ‘metaphysically
necessitate the facts about consciousness. As a result, although the idea of a zombie world is coherent (logically possible), such a world is *metaphysically* impossible. This is the ‘nonreductive materialist’ view. Chalmers argues that this view, which is advocated by Searle, “either makes an invalid appeal to Kripkean a posteriori necessity or relies on a bizarre metaphysics”. (Chalmers D. J., 2002) This issue is not the agenda for this paper so I am not about to explore this issue.

Some deny premise (4): the idea that the physical domain is causally closed. They can be called ‘interactionist dualists’. According to this view, even though consciousness is nonphysical, it can play an autonomous causal role (against epiphenomenalism) because the physical world is not causally closed.

Chalmers claims that this view is unlikely given current evidence in physics, because it implies that physics has gaps that must be filled by the actions of a nonphysical mind.

Finally there is Chalmers’ view which is *naturalistic dualism*; he accepts all four of the above premises. Chalmers argues that “consciousness supervenes naturally on the physical, without supervening logically or metaphysically.” (Chalmers D. J., 2002) He believes that “this view gives us a coherent, naturalistic, unmysterious view of consciousness and its place in the nature order”. Although he acknowledges that the biggest worry about this view is that it implies a certain irrelevance of phenomenal properties in the explanation of behavior, and may lead to *epiphenomenalism*; we will

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3 Epiphenomenalism is the idea that if consciousness is merely naturally supervenient on the physical and if the physical world is more or less causally closed and there is no room for nonphysical properties to do any independent work, then it seems that the nonphysical consciousness lacks causal efficacy.
deal with this problem in the later parts. So we can summarize the above views about conscious experience into three main groups:

_Type-A, Reductive materialisms:_

These views hold that consciousness supervenes logically on the physical for functionalist or eliminative reasons. Reductive materialists believe that everything there is to be explained about consciousness can be explained by explaining the performance of various _functions_. There is nothing more than the physical and the functional. This view is mostly held by Armstrong, Dennett, Lewis, Ryle, Rosenthal, Smart and others.

_Type-B, Nonreductive materialisms:_

Metaphysical necessity has a crucial role on this view. Consciousness is physical but it cannot be reductively explained because it does not logically supervene on the physical, although it does supervene metaphysically on the physical. Zombies and inverted spectra are logically possible but metaphysically impossible. This view’s theorists are mainly Searle, Levine, Loar and others.

_Type-C, Property dualism:_

Phenomenal properties are irreducible. Zombies and inverted spectra are logically and metaphysically possible. Consciousness can be explained by further laws of nature which are nonphysical. This view is endorsed by Chalmers, Campbell, Honderich and others. Chalmers argues that if we take consciousness seriously, we must admit some properties other than physical, that is, phenomenal properties, as fundamental; in this way property

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4 There are also some other views such as biological materialism, physicalist-functionalism, anomalous monism, representationalism, mysterianism and others.
dualism is the only reasonable option. “Once we reject reductive functionalism and eliminativism, it follows inexorably that consciousness is not logically supervenient on the physical. And once we reject logical supervenience, the path to property dualism is unswerving.” (Chalmers D. J., 2002) One cannot take consciousness seriously and remain materialist, Chalmers maintains.

**Reductive Materialism (Type-A)**

In the following part I will explore Chalmers’ criticism of two main reductive materialist doctrines and their accounts of consciousness.

1. **Cognitive Modeling:**

Cognitive modeling works well for most problems of cognitive science. The researcher in this discipline tries to explain the causation of behavior in a cognitive agent by constructing a model of the causal dynamics involved in cognitive processes. Chalmers believes that this kind of explanation is useful for explaining psychological phenomena and consciousness in the psychological senses which we mentioned earlier, such as learning, memory, perception, introspection, control of action, attention, categorization, linguistic behavior etc. He claims that this kind of explanation deals with awareness instead of consciousness, so that none of them give us an explanation of “why these processes should be accompanied by conscious experience” or “how consciousness arises from cognitive processing” or “what is the intrinsic nature of conscious experience”.

One of the most famous cognitive models for consciousness is the one proposed by Daniel Dennett. The model is a “box-and-lines” model, which is actually an account of the flow of information between various modules. (Blackmore, 2005) The most central
modules are: a perceptual module, a short term memory store (that receives information from the perceptual module), and a control system, which interacts with the memory store by a question and answer process, and a public relations unit which receives and converts speech act commands into public language utterances. (Blackmore, 2005) Chalmers argues that what this model provides is an explanation of reportability, which is our ability to report the contents of our internal states and it is “an explanation of our ability to bring perceptual information to bear on the control of behavior, to introspect our internal states and so on; but it tells us nothing about why there should be something it is like to be a system undergoing these processes.” (Chalmers D. J., 1996, p. 114) So it seems consciousness according to Chalmers is different from Dennett’s account of consciousness. Dennett believes that his models explain everything that there is to be explained (or everything that we are able to explain) about consciousness. Dennett also suggests a more sophisticated model which is essentially a “pandemonium” model consisting in many small agents competing for attention. “On this model there is no central ‘headquarters’ of control, but multiple channels exerting simultaneous influence.” (Chalmers D. J., 1996, p. 114) He develops this idea in his famous article “multiple drafts versus the Cartesian theater”. In this article, Dennett argues against the idea which he calls ‘Cartesian materialism’, “the view you arrive at when you discard Descartes’ dualism but fail to discard the imagery of a central (but material) Theater where ‘it all comes together’.” (Dennett, 1991) By the notion of ‘Cartesian theater’, Dennett tries to show that while most people are happy to reject the idea of Cartesian dualism, they still retain strong vestiges of dualist thinking in the form of what he calls the Cartesian theater, by which he means that they believe that somewhere in the mind or brain there
must be a place and time at which everything comes together and ‘consciousness happens’; that is, there is some kind of finish line in the brain’s activities, after which things mysteriously become conscious or ‘enter consciousness.’ Dennett calls those committed to such a picture ‘Cartesian materialists’. He claims that they are wrong because there is no centre in the brain which could correspond to the Cartesian theatre, for the brain is a radically parallel processing system with no central headquarters.

Information comes in through the senses and is distributed all over the place for different purposes. In all of this activity there is no central place in which ‘I’ sit and watch the show as thoughts and perceptions pass through my consciousness. There is no place in which the arrival of thoughts and perceptions become conscious. He argues that there is no single point in the brain in which all information funnels and where all the information come together and through which all the causal trains must pass in order to deposit their content ‘in consciousness’. There is no place or process or anything else, he claims, that corresponds to the conscious bit of the brain’s activities, leaving all the rest unconscious. There is no sense in which the input is brought together to be displayed ‘in consciousness’ for someone to see, hear etc. The brain is not organized this way. There is no reason, he says, to believe that the brain itself has any deeper headquarters, any inner sanctum, arrival at which is the necessary or sufficient condition for conscious experience; in short there is no observer inside the brain. We have to understand how this feeling of being a conscious self having a stream of experiences comes about in a brain that really has no inner theatre, no show, and no audience.

Instead, the many different parts of the brain just get on with their own jobs, communicating with each other, with no central control. He asserts that at any point in
time, contents of information arise, get revised, and contribute to the interpretation of other or previous contents or to the modulation of behavior, by multiple drafts of narrative fragments at various stages of editing in various places in the brain. (Dennett, 1991) So he actually claims that there are various editors and narratives in the brain which affect the content of information. He says we don’t directly experience what happens in our different senses such as in our eyes, in our ears, on the surface of our skin; “what we actually experience is a product of many processes of interpretation--editorial processes, in effect” (Dennett, 1991). Dennett asserts that “When a portion of the world comes in this way to compose a skein of narratives, that portion of the world is an observer. That is what it is for there to be an observer in the world, a something it is like something to be.” (Dennett, 1991) In this way, Dennett claims that, “the multiple draft model avoids the tempting mistake of supposing that there must be a single narrative (the ‘final’ or ‘published’ draft, you might say) that is canonical--that is the actual stream of consciousness of the subject, whether or not the experimenter (or even the subject) can gain access to it.” (Dennett, 1991) He supplements this account with appeals to neuroscience, evolutionary biology, and connectionist models and production systems in artificial intelligence. Dennett classifies his Multiple Drafts model, “as first-person operationalism, for it brusquely denies the possibility in principle of consciousness of a stimulus in the absence of the subject’s belief in that consciousness.” (Dennett, 1991) In this way he emphasizes the significant role of first-person’s belief (in one’s own consciousness), on the existence of consciousness.

The point which is important to mention here is that Dennett claims that his models are able to explain everything about experience that needs to be explained. He believes that
functional phenomena such as reportability and control are the only stuffs that need to be explained in explaining consciousness. In Chalmers words, Dennett “seems to take it as a basic premise that once one has explained the various functions, one has explained everything.” (Chalmers D. J., 1996, p. 114)

This is because Dennett believes that his models explain everything that can be explained about consciousness, but Chalmers thinks that these models are not able to explain the intrinsic nature of conscious experience.

Chalmers once more emphasizes that what these models at best provide is an explanation of reportability, of the influence of various sorts of information on the control of behavior, and of the focus of attention. Although these models may give accounts of some of our cognitive capacities, they do not provide any answer to the questions of “why there should be conscious experience in the vicinity of these capacities” and “what is the conscious experience itself”.

Chalmers believes that these cognitive models are all functional analyses, which actually analyze awareness rather than conscious experience. These functional analyses “collapse the two notions of consciousness and awareness into one”. Although these functional analyses can tell us about the functional processes correlated with consciousness, they do not give us any information regarding the phenomenal feel of consciousness; this is because conscious experience is not something that can be functionally defined away. It is entirely conceivable that one could explain all these without explaining a thing about consciousness itself; that is without explaining the experience that accompanies them. Chalmers asserts that to analyze consciousness in terms of these functional and cognitive
models is “either to change the subject or to define away the problem”. He continues that “the main intuition at work is that *there is something to be explained*, some phenomenon associated with *first-person* experience that presents a problem not presented by observation of cognition from the *third-person* point of view.” (Chalmers D. J., 1996) Chalmers believes that the same sort of criticism is applicable to the cognitive model approaches to consciousness of Churchland and of many others. He says they “all provide intriguing accounts of the performance of cognitive functions, but all leave the really hard questions untouched.” (Chalmers D. J., 1996, p. 114)

2. **Neurobiological explanation:**

Neurobiological approaches to consciousness, Chalmers believes, give us information about the brain processes that are *correlated* with consciousness, and like cognitive models, they explain psychological phenomena such as varieties of awareness, but they do not offer us any explanation of *why* and *how* brain processes should give rise to experience at all. Neurobiological theories usually implicitly rely on some psychological criterion for consciousness such as control of behavior, focus of attention, ability to make verbal reports about internal states and so on; and try to explain the related brain processes. Chalmers says that explaining the mere complexity among neurons and their causal relations could not entail any explanation for conscious experience. Consciousness could not be analyzed in terms of some sort of biochemical structure because that is not what “consciousness” means. So actually neurobiological theories are able to explain why the relevant *psychological* property is instantiated, but the question of why the psychological property is accompanied by conscious experience remains unanswered.
The reason is that these theories actually assume the link between psychological properties and conscious experience.

Chalmers argues that what ultimately can be explained by both cognitive models and neurobiological theories is awareness, psychological phenomenon or psychological consciousness.

**Property Dualism or Naturalistic Dualism (Type-C)**

At the beginning of this paper I mentioned that there are two main questions about consciousness: on the one hand, there is the explanatory question--can consciousness be explained by physical theories?--according to which there are reductive and nonreductive theories. On the other hand, there is the ontological question: is consciousness itself physical? In this part we aim to have a brief look at the way Chalmers himself faces these questions. For this purpose, let us once more have a quick look at the core of his arguments against materialism:

1. On the one hand, according to everyone’s first person intuition, there is conscious experience in our world.

2. On the other hand, a world is logically possible such that it is physically identical to ours, but the positive facts about consciousness in our world do not hold in it.

3. Therefore, facts about consciousness are further facts about our world, over and above the physical facts.
4. So materialism is false.

If the zombie world or the inverted world are logically possible, then physical facts do not entail all the positive facts in our world, and it also follows that consciousness is an extra fact in our world, not guaranteed by the physical facts alone; so materialism is false. (Chalmers D. J., 1996)

This failure of logical supervenience and materialism implies that experience is fundamentally different in kind from any physical feature; this leads Chalmers to a kind of dualism: there are both physical and nonphysical features of the world. Now the question is: what kind of dualism does Chalmers want to establish? And what exactly are the nonphysical features of the world?

As mentioned before, Chalmers argues that consciousness does not supervene logically on the physical, but he does not say that consciousness does not supervene at all; so it remains plausible that consciousness supervenes naturally on the physical. The view Chalmers is trying to develop is actually natural supervenience without logical supervenience. By natural supervenience he means that A-properties supervene on B-properties according to some natural laws. Moreover, by dualism, he does not mean Cartesian dualism; the dualism implied here is instead a property dualism. He argues that the properties of individuals in this world are not only physical properties but that there are also phenomenal properties; however, this is not to say that these properties are separate substances. These phenomenal properties of an individual, which are involved in conscious experience, are not entailed by the physical properties of that individual (not logically supervenient), although they may depend lawfully on those properties (natural
supervenience). So this idea implies that consciousness is a feature of the world over and above the physical features of the world. This feature, Chalmers claims, is a fundamentally new feature of the world since it is not even logically supervenient on the microphysical properties.

We can summarize the natural dualism view, in Chalmers words, in this way:

“consciousness arises from a physical basis, even though it is not entailed by that basis. …consciousness arises from a physical substrate in virtue of certain contingent laws of nature, which are not themselves implied by physical laws.” (Chalmers D. J., 1996, p. 125) By emphasizing the concept ‘arise’, as opposed to the concept ‘entail’, he aims to call attention to the idea that consciousness is not physical; rather it is something extra, over and above the physical. So in order to bring consciousness within the scope of a fundamental theory, we need to introduce new fundamental properties and laws, in addition to fundamental physical properties and laws. As opposed to microphysical properties, which entail physical properties, Chalmers suggests protophenomenal properties as fundamental properties; these entail phenomenal properties, that is, phenomenal properties are logically supervenient on them; and the fundamental laws which govern the phenomenal properties are the psychological laws, which also specify how phenomenal (or protophenomenal) properties depend on physical properties (the relation between physical and phenomenal). These psychological laws are actually the supervenience laws, which are supposed to explain how the phenomenal experience arises from physical processes. These laws will not interfere with physical laws because the latter already form a closed system (according to contemporary science, the physical world is more or less causally closed). But we have good reason to believe that there is a
lawful relationship between physical processes and conscious experience, and this lawful relationship must be supported by some fundamental laws, which are the ones Chalmers calls the supervenience laws. Accordingly, a physical theory is a theory of physical processes and a psychophysical theory is one that explains how those physical processes give rise to phenomenal experience.

Chalmers calls his theory natural dualism. By emphasizing “natural”, he wants to call attention to the idea that consciousness is explainable in terms of basic natural laws and there is no need for something especially transcendental or trans-natural for explaining consciousness; consciousness is just another natural phenomenon. So Chalmers claims that this type of dualism (natural dualism) is closer to materialism than to other sorts of dualism: “this is partly because of its avoidance of any transcendental element and its commitment to natural explanation, and partly because of its commitment to the physical causation of behavior”. (Chalmers D. J., 1996, p. 128) That is why Chalmers believes that it is possible that his idea could turn out to be a kind of monism, perhaps the physical and the phenomenal could be two different aspects of a single encompassing kind; but this monism in any way cannot be a materialist monism, it must be something broader. We will discuss this issue in the parts on Chalmers’ fundamental theory of consciousness.

**Important Objections against Property Dualism and Chalmers’ Replies**

I. Dennett argues that “Given the way that dualism wallows in mystery, accepting dualism is giving up” (Dennett, 1991). That is, to accept dualism would be to give up on explanation for consciousness.

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5 In a way that matter and energy turn out to be two aspects of a single kind.
Chalmers indicates that, although some dualist views have this feature, that is not true of naturalistic dualism. This view is not mysterious because according to naturalistic dualism, consciousness is governed by *natural* laws, and there may eventually be a reasonable scientific theory of it. It is not mysterious because there is no need for any transcendental property over and above natural properties and laws, and “there is no a priori principle that says that all natural laws will be physical laws; to deny materialism is not to deny naturalism” (Chalmers D. J., 1996, p. 170).

II. Churchland claims that “Dualism is inconsistent with evolutionary biology and modern physics and chemistry.” (Chalmers D. J., 1996, p. 169)

Chalmers replies that on his dualist view, the causal closure of the physical is preserved; physics, chemistry, neuroscience, and cognitive science can proceed as usual. They are successful in explaining physical phenomena (and psychological phenomena); but they simply fail to explain conscious experience.

III. Churchland suggests a number of other reasons to reject dualism: “(a) the systematic dependence of mental phenomena on neurobiological phenomena, (b) modern computational results that suggest that complex results can be achieved without a nonphysical homunculus and (c) a lack of evidence, explanation, or methodology for dualism.” (Chalmers D. J., 1996, p. 170)

Chalmers replies that with regard to previous arguments these reasons offer no evidence against his view; he believes although these physical processes including neurobiological processes are *necessary* for the existence of conscious experience, they are not *sufficient*. 
IV. The last objection I want to mention here is that dualism cannot explain how the physical and nonphysical interact. This is the most famous problem of consciousness (the mind-body problem).

Chalmers argues that although answering this question was hard for other types of dualism, it is simple on the natural supervenience framework: “they interact by virtue of psychophysical laws.” There is a system of laws that ensures that a given physical configuration will be accompanied by a given experience…” (Chalmers D. J., 1996, p. 170) (It is important to point out here that psychophysical laws, just as physical laws, are natural laws). Chalmers acknowledges that this does not explain what the connection is, or how the physical gives rise to experience. But even with the fundamental physical laws, we cannot find a ‘connection’ that does the work; so the search for such a connection is misguided. “Things simply happen in accordance with the law; beyond a certain point, there is no asking how.” But wasn’t this inability to answer the question of how, Chalmers’ main objection against materialist views such as Dennett’s models? Why doesn’t the same criticism apply to Chalmers, here? So what is the significance of adding the extra ontological layer of the psychophysical laws, if not answering the question of how?

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6 We will discuss this solution further next parts.
7 Chalmers says: ‘As Hume showed, in the search for ultimate connection is fruitless. Such connections are entirely mysterious in both the physical and psychological cases, so there no special problem at issue here.’ But isn’t it true that according to Hume, there is no connection and all there is, is just constant conjunction? Wouldn’t Hume deny the existence of laws of exactly the sort Chalmers is arguing for?
CHAPTER III

Evaluating Chalmers’ Theory of Consciousness

In this chapter I will focus on the central and the main point of Chalmers’ objection against materialist views of consciousness, such as cognitive modeling and neurobiological explanations of consciousness. I will try to clarify what is missing in such accounts of consciousness that makes Chalmers’ objection applicable. After that I will look at how Chalmers’ theory of consciousness tries to solve the problems faced by materialist theories. This will be followed by my criticism of Chalmers’ theory: his main objection to materialist theories applies to his own theory of consciousness. I will argue that what is missing in all theories of consciousness, (including Chalmers’) which could play a significant role in a theory of consciousness, is a ‘first person point of view’ and an ‘ability to have a first person point of view’.

Chalmers’ Main Objection against Materialism

In his objection to cognitive theories, Chalmers emphasizes the idea that all cognitive models such as those proposed by Dennett are ‘functional analyses’, which tell us about the functional processes correlated with consciousness; they explain ‘awareness’ instead of conscious experience; so they do not give us any information regarding the ‘certain phenomenal feel of consciousness’. Chalmers believes that what needs to be explained, to explain consciousness, is some phenomenon present in first-person experience which is not present in observation of cognition from the third-person point of view. Chalmers
believes that with all the other theories the really hard questions, which are “how and why
cognitive processes are accompanied by conscious experience” and “what conscious
experience is” remains untouched.

Chalmers also argues that the same objection can be applied against neurobiological
explanations of consciousness. These theories try to explain the brain processes that are
correlated with consciousness, but not the conscious experience itself. They explain the
brain processes related to awareness; that is to say that they rely on some psychological
criterion for consciousness such as control of behavior, focus of attention, ability to make
verbal reports about internal states, and try to explain the related brain processes.
Chalmers believes that explaining the mere complexity among neurons and their
biochemical structure and their causal relations could not entail any explanation of
conscious experience. These theories, just as cognitive theories, fail to address the main
questions, which are “why these brain processes are accompanied by conscious
experience” and “what the intrinsic nature of this conscious experience is”.

Chalmers argues that what ultimately can be explained by both cognitive models and
neurobiological theories are awareness, psychological phenomenon or psychological
consciousness and not conscious experience or the phenomenal feel.

The two main points in Chalmers’ objections against these theories can be summarized in
this way:

1) These theories fail to answer the ‘hard problem’, they are unable to explain: “why
and how these cognitive and brain processes (the processes related to awareness)
are accompanied with conscious experience?” The reason is that these theories actually assume the link between awareness and conscious experience.

2) They also fail to explain the intrinsic nature of conscious experience itself, because they confuse the two notions of conscious experience and awareness. (This point is central to Chalmers’ criticism against Dennett, who denies that there is confusion, precisely because Dennett thinks that the distinction is an illusion.)

These two are actually the two important problems of consciousness, which can be addressed this way as well:

1) The explanatory (or epistemic) questions: “can consciousness be explained by physical theories?” Or ‘how and why does consciousness arise from physical processes, such as cognitive, functional and neural processes?’ These are questions about the relation between physical processes and conscious experience.

2) The ontological question: ‘is consciousness itself physical? This is the problem of explaining the intrinsic nature of conscious experience.

All the above arguments show that the central point of Chalmers’ objections against materialist theories is that these theories are actually unable to explain the ‘intrinsic nature of conscious experience’ or ‘certain phenomenal feel of consciousness’, which is, by definition, the ‘first-person experience’ or the ‘first-person feel’. If this is true, it makes us expect an explanation of the intrinsic nature of conscious experience in
Chalmers’ own theory. So in the next step, we will see how Chalmers tries to explain this phenomenal feel and the ‘hard problem’ by his own theory of consciousness.

**Explaining and Evaluating Chalmers’ Nonreductive Theory of Consciousness**

A theory of consciousness is of course more difficult to get a grip on than any other theory (theories in physics, etc.). Because the only access we have to the data on conscious experience is a first person access, we each have access to a rich source of data only in our own case. But this is not enough to establish a theory, we need to know about others’ conscious experiences as well, but we cannot poke inside others’ minds to measure their conscious experiences. As a result, “this reliance on first-person data on plausibility constraints means that a theory of consciousness will have a speculative character not shared by theories in most scientific domains.” (Chalmers D. J., 1996, p. 218) When intersubjective testing is impossible, we will never be quite certain that our theories are right. We should always bear this in mind when developing a theory of phenomenal consciousness.

Chalmers sets forth his *nonreductive* theory of consciousness in two levels: ‘high-level’ and ‘fundamental level’.

1. **High Level Theory of Consciousness**

   1.1. **Explaining consciousness by high level properties:**
   Chalmers argues that there are two different kinds of property in the natural world: physical properties and phenomenal properties (consciousness); phenomenal properties are *not* physical, rather they are something extra, over and above the physical properties; however this is not to say that they are separate *substances* from the physical, rather it is just to say that they are two kinds of *properties*, and this is the reason why he calls his
theory, ‘property dualism’. Phenomenal properties (consciousness) *arise* from physical properties in virtue of certain laws of nature; these laws are not implied by physical laws, however, they are natural laws; by emphasizing the natural, Chalmers tries to show that he is actually explaining consciousness in terms of basic natural laws and there is no need for something especially transcendental or trans-natural, for explaining consciousness, and this is why another title for this theory is ‘natural dualism’ theory. These laws, which are the ‘psychophysical laws’, Chalmers believes govern the phenomenal properties; moreover they are also supposed to explain how the phenomenal experience arises from physical processes and how the former depend on the latter, that is, how the phenomenal supervenes on the physical, so he calls them ‘supervenience laws’. They are there to explain the relation between physical properties and phenomenal properties.

The best way of starting a theory of consciousness, is by a set of laws which govern the relation between consciousness and physical system, that is, the *psychophysical laws* which connect the consciousness to the physical system. Since Chalmers has already argued that consciousness supervenes naturally (not logically) on the physical, in order to give an explanation on how the physical gives rise to consciousness and how consciousness depends on physical processes, we need to have an account of these psychophysical laws. But the point is these laws are *natural* laws and there need be nothing supernatural about them. Consequently, while the laws of physics will explain the physical processes, these psychological laws will provide an explanation about the conscious experiences that are associated. In order to explain the relation between physical properties and phenomenal properties (consciousness) by means of these laws,

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8 Another reason for this title which is related to the first reason mentioned above, is that he argues that consciousness supervenes on the physical only *naturally* (natural supervenience), but not logically.
Chalmers introduces the notion of ‘awareness’ to mediate between the physical and the phenomenal. Awareness is physical and the psychological correlate of consciousness. I will explain more about this notion in the following discussions.

*Psychophysical Laws in Chalmers’ Theory of Consciousness*

1. Principle of Coherence

This principle focuses on the *coherence* between conscious experience and cognitive structure. It is based on the idea that the phenomenology and the psychology of the mind do not float free of each other, but are systematically related by many lawful relations.

The most fundamental coherence principle between consciousness and cognition concerns the relation between consciousness and first-order judgments\(^9\), that is, the coherence between consciousness and *awareness*. Recall that awareness is the psychological correlate of consciousness. “The contents of awareness correspond to the contents of first-order phenomenal judgments…; where there is consciousness, there is awareness.” (Chalmers D. J., 1996, p. 221) By this coherence between first-order judgments and awareness he does not mean that whenever we have a conscious experience we are aware of the experience, but this principle is that when we have an experience, we are aware of the *contents* of the experience. For example, when we experience a pain, we are aware of something hurtful, or when we experience a thought, we are not aware of the thought, only we are aware of whatever that thought is about.

We can summarize the principle of coherence in this way: “where there is consciousness, there is awareness, and where there is (the right kind of) awareness, there is

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\(^9\) The internal states, which carry contents of information, are first-order phenomenal judgments.
consciousness” (Chalmers D. J., 1996, p. 222). By the coherence principle, Chalmers
tries to emphasize that there is a direct link between consciousness and awareness, and an
indirect link between consciousness and the physical (cognitive processes) through
mediation by awareness. Consequently we could say that this principle focuses on the
coherence between conscious experience and cognitive structure.

2. The principle of structural coherence

This principle focuses on the idea that in particular, various structural features of
consciousness correspond directly to structural features that are represented in awareness.
In this way someone with complete knowledge of my cognitive processes would be able
to recover all of these structural details. According to this principle, the structure of
consciousness is mirrored in the structure of awareness. And if we add the general
principle to it, which is that where there is consciousness, there is awareness and vice
versa, we would have a more specific principle which Chalmers call the principle of
structural coherence: “the structure of consciousness is mirrored by the structure of
awareness and the structure of awareness is mirrored with the structure of consciousness”
(Chalmers D. J., 1996, p. 223). So basically, by the principle of structural coherence,
Chalmers tries to show that various structural features of consciousness correspond
directly to structural features that are represented in awareness. Chalmers emphasize that
“This is a central and systematic relation between phenomenology and psychology, and
ultimately can be cashed out into a relation between phenomenology and underlying
physical processes.” (Chalmers D. J., 1996, p. 225)
To summarize, these principles of coherence show us that what *directly* give rise to consciousness are not physical cognitive processes, but the process of direct availability for global control, i.e. awareness; so physical cognitive processes give rise to consciousness *indirectly* namely, by the mediation of awareness. The basic processing correlate of consciousness is awareness or global availability, and the empirical results (neural, cognitive and information-processing) provide us the physical states that play a role in awareness; consequently by mediation of awareness and these bridging principles, we can say that X is a physical correlate of specific consciousness.

Before looking through the third principle, it is worth noting a few things about the notion of awareness concerning these two principles of consciousness. Previously I mentioned that Chalmers defines awareness as the state wherein some information is accessible for ‘verbal report’ and the ‘deliberate control of behavior’. The issue is that this availability for verbal report is not strictly required for conscious experience because it is true only in the cases where language is present and not in the cases of other animals. So to keep the coherence principles applicable to all the cases where we have consciousness and awareness, we need to modify the definition of awareness to something like ‘direct availability for global control’. “That is, a subject is aware of some information when that information is directly available to bring to bear in the direction of a wide range of behavioral processes.” (Chalmers D. J., 1996, p. 225) So the coherence between consciousness and this notion of awareness is compatible with “first-person data” in human cases and with “natural reasoning” concerning nonhuman cases. Chalmers claims this notion of awareness corresponds to Block’s account of ‘access-consciousness’ which I mentioned at the very beginning of this paper, although Chalmers
believes that his definition of awareness gives less of a role to rationality than Block’s account of this notion. Recall that according to Block a state is access-conscious if its content is poised to be used as a premise in reasoning, poised for rational control of action and speech.

Now that we know more about the notion of awareness, we can get back to the psychophysical laws. Earlier, we discussed the two principles of coherence; at this point the question which comes to mind about them is what exactly the explanatory roles of these principles are in Chalmers theory of consciousness. There are at least three main projects in which these principles might play an explanatory role:

First, the principle of structural coherence can help us explain the structure of specific sorts of experience by using the facts about the structure of physical processes. For example we can shed light on structural features of experience by using empirical discoveries about neurological and cognitive processes. “In essence this principle is being used as a background assumption, to provide a bridge from features of physical processes to features of experience.” (Chalmers D. J., 1996, p. 234) Consequently, in order to explain some specific features of experience we need to explain the corresponding aspects of awareness (which is a reductive explanation) and the bridging principles will handle the rest. As a result, some would suggest that in this way, we will have all we need for explaining consciousness and they would think that these principles would close the ’explanatory gap’; but Chalmers argues that these claims are too strong, and continues that this method does not explain the intrinsic nature of experience; at best they explain the relational structure between experiences. And even more important, no account of the structure of awareness explains Chalmers central concern, which is why there is any
accompanying experience at all. It cannot explain why the principle of coherence holds in the first place. By taking these principles as background assumptions, we have actually moved beyond reductive explanation, because they simply assume the existence of consciousness, so it does nothing to explain it. This is why Chalmers claims that this is a nonreductive explanation of experience, although it tries to explain some of the properties of conscious experience. By taking advantage of cognitive science and neuroscience, we can have an account of all the objectively communicable features of experience. Communicability means that the features are mirrored in physical features of the system, and actually in features of awareness. But note that finally we will not know everything about “what is it like to be” a system of this sort, nor will we understand the intrinsic nature of experience, Chalmers argues.

Second, the principle of coherence (the coherence between awareness and consciousness), acts as a kind of epistemic lever that will help us to infer conclusions about experience from third-person data. By acting as a kind of epistemic lever, Chalmers means that this principle leads us from knowledge about physical processes to knowledge about experience. Note that this principle does not conflict with his ‘knowledge argument’ against materialism because by this principle he is actually referring to the knowledge of the structure of consciousness and not the conscious experience itself, to which we can have access as a result of complete knowledge of the structure of awareness.

We can summarize the main point of these bridging principles in this way (this argument uses reportability in language-using systems and ability to control behavior in non-language-using systems, as criteria for the existence of experience.): When a system is
aware of some information then by definition that information is directly available for
global control, which means the information is conscious. Or to put it in another way we
could say: It is generally held that information is conscious if it is reportable (and has the
ability to control behavior); we know that reportability is a version of awareness, so when
information is reportable, it is available for global control and so it is aware. So this
criterion squares with the coherence principle.

Third, the same principle can help us in the search for the physical correlates of
consciousness. So here the question is: what are the neural, cognitive and information-
processing correlates of consciousness? We can use the coherence principle as a
background assumption for this purpose. The coherence between consciousness and
awareness provides a natural way to make sense of much of this work. The basic
processing correlate of consciousness is awareness or global availability, and on the other
hand these empirical results (neural, cognitive and information-processing) provide us
with the physical states that play a role in awareness; consequently by mediation of
awareness and this bridging principle, we can say that X is a physical correlate of specific
consciousness. So “it seems natural to say that the central correlation between physical
processing and experience is the coherence between consciousness and awareness.”
(Chalmers D. J., 1996, p. 240). What give rise directly to consciousness are not these
physical processes, but the process of direct availability for global control, that is
awareness; so physical processes give rise to consciousness indirectly (by the mediation
of awareness).

Some important points about these bridging principles are worth mentioning:
I. Chalmers claims that “anyone empirically investigating consciousness will need a nonempirical bridging principle to interpret physical results in terms of conscious experience.” (Chalmers D. J., 1996, p. 240) These pre-experimental coherence principles play a central role in holding up the bridge from physical processes to conscious experience, but we should not expect the search for these correlations of consciousness to lead to a universal theory, rather they help us to understand consciousness in specific cases such as the human case.

II. It is important to state that Chalmers admits that these bridging coherence principles are not themselves experimentally testable, at least from the third-person point of view. They are not experimental conclusions. They actually act as a kind of priori background assumption. Such principles must be based on considerations from the first-person case, and on general principles of plausibility. The basic evidence for accepting the coherence principles as laws comes from the correlations in familiar cases: ultimately, for me, from my own case.

III. These coherence principles are laws of nature, which tell us that consciousness arises in virtue of the functional organization associated with awareness. But note that these coherence laws are not fundamental psychophysical laws, because a fundamental law would connect properties at a more basic level than a high level property such as awareness and would be more clearly defined than the undetermined nature of the
concept of awareness. Moreover coherence principles may not be strict laws in a sense that there may be some exceptions around the edges.

3. The Principle of Organizational Invariance:

The question at issue here is: Given that consciousness arises from the physical, in virtue of what sort of physical properties does it arise? Chalmers’ answer to this question is: “I claim that conscious experience arises from fine-grained functional organization. More specifically, I will argue for a principle of organizational invariance holding that given any system that has conscious experiences, then any system that has the same fine-grained functional organization will have qualitatively identical experience.” (Chalmers D. J., 1996, p. 248)

By functional organization he means the ‘abstract pattern of causal interaction’ between various parts of a system, and perhaps between these parts and external inputs and outputs. According to this principle, “consciousness is an organization invariant: a property that remains constant over all functional isomorphs of a given system.” (Chalmers D. J., 1996, p. 249) Two systems are functional isomorphs when they share their functional organization in the strict sense, that is, their functional organization must be in corresponding states at the relevant times. In accordance with this principle, as long as functional organizations are identical, no matter whether the systems be neuron based, silicon chip based, metallic based, etc, their conscious experience will be identical. But note that this is by no means equivalent to the idea that consciousness is identical to the functional state; just as one can believe that consciousness arises from a physical state but is not itself a physical state, one can also believe that consciousness arises from
functional organization but is not itself a functional state. Moreover, although the invariance principle holds that functional organization determines conscious experience by some lawful link in the actual world, it need not be reducible to functional organization; so the idea that functional organization entails conscious experience and matters of logical possibility are irrelevant here (although a zombie is logically possible, it is naturally—according to natural laws—impossible).\(^\text{10}\) Chalmers argues in favor of this issue by means of the logical possibility and natural (or empirical) impossibility of absent qualia (having two functional isomorphic systems, one having conscious experience and the other system not having conscious experience), and inverted qualia (having two functional isomorphic systems which have two different or opposite conscious experiences). So that is the reason Chalmers calls this view nonreductive functionalism (it is in a sense combination of functionalism and property dualism). Functional organization suffices for conscious experience with natural (not logical) necessity, as opposed to reductive functionalism, where functional organization is constitutive of conscious experience (a matter of logical necessity).

According to nonreductive functionalism, not only does consciousness supervene naturally on the physical, but it also supervenes on the organizational. Moreover, by the organizational invariance principle, “for every physical system that gives rise to conscious experience, there is some functional organization F realized by the system, such that it is naturally necessary that any system that realizes F will have identical

\(^{10}\) Some may say, as Dennett says, that if we take the definition of a zombie—a creature identical to us without conscious experience—then how can it be possible? But note that Chalmers agrees that naturally—according to this principle—a zombie is not possible, because consciousness arises from the physical functional organizations according to these psychophysical natural laws; but logically it is possible (maybe in a possible world without these natural laws), because the physical functional organizations does not entail conscious experience.
conscious experience.” (Chalmers D. J., 1996, p. 275) Note that “F needs to be fine-grained enough to fix the mechanisms responsible for the production of behavior and to fix behavioral dispositions.” (Chalmers D. J., 1996, p. 275) It is therefore a law of organizational invariance that “…for certain functional organizations F, that realization of F will be accompanied by a specific kind of conscious experience.” (Chalmers D. J., 1996, p. 275) So basically this principle tells us that consciousness arises in virtue of the fine-grained functional organization associated with awareness. As for the laws of coherence, this law also is not a fundamental law.

1.2. Evaluating Chalmers’ high-level theory

Some think that these principles are all we need for explaining consciousness and that by means of them we could close the ‘explanatory gap’; but as Chalmers points out, this method does not explain the intrinsic nature of experience and at best it explains the relational structure between experiences. More importantly, by means of the psychological principles, at the end of the day, all that we know and are able to explain is the coherence between the structure of awareness, functional organization and the structure of cognitive processes with the structure of consciousness; but because there is no account in this theory of why these principles hold in the first place, we cannot be sure even of being able to explain this coherence. Moreover, by having a complete knowledge of the structure of awareness, we can only have access to knowledge of the structure of consciousness and not of the conscious experience (the phenomenal feel).

The fact is that no account of the structure of awareness explains Chalmers’ central concerns, which are the ‘intrinsic nature of consciousness’ and the explanatory problem:
“why there is any accompanying experience at all?” So note that with this theory of consciousness, we will not get to know everything about ‘what is it like to be’ i.e. the intrinsic nature of the experience. Recall that failing to explain these issues was Chalmers’ objection to materialist (reductive) theories, and now it is likely that his objection is somehow applicable to his own theory. In this case, it seems that Chalmers’ high-level theory has failed to explain his two main concerns. This theory tries to argue that conscious experience is not physical and is not logically supervenient on the physical (the physical does not entail consciousness), but it has not explained the nature of consciousness, the intrinsic nature of phenomenal (or protophenomenal) properties, what the phenomenal feel is, or what the nature of experience is. Chalmers claims that awareness is necessary for consciousness; but is it also sufficient? Given that Chalmers claims that it is a basic intuition that consciousness is something over and above functional organization, no functional organization (physical properties) is logically sufficient for consciousness. As a result, awareness will be a necessary but not a sufficient condition for consciousness. So we will need an underlying law which is of the form: “awareness plus something give rise to consciousness”. (Chalmers D. J., 1996, p. 244) Then the main task for a theory of consciousness (that searches for the intrinsic nature of conscious experience) will be to search for the extra thing. Let us call this extra something the X-factor. Chalmers mentions that once we accept that materialism is false, we should confirm that this X-factor must be something over and above the physical. So far we can all agree that, according to Chalmers, a theory cannot claim to have an explanation for the intrinsic nature of consciousness, unless it has explained this X-factor. Chalmers believes we can find such an X-factor in the postulation of irreducible
psychological laws. But what are the postulations of psychological laws? Does he mean we should look for the crucial factor for consciousness in postulations of psychological laws, which are themselves based on considerations from the first-person case and on the general principles of plausibility?! Finally, this theory does not provide us with any clear explanation of this X-factor (that is over and above the physical), which is crucial in explaining the intrinsic nature of consciousness. So this theory seems to fail to explain the ontological question of consciousness.

In a search for this X-factor we can pay more attention to the factor that we all agree to be crucial in conscious experience, i.e. the ‘first-person point of view’. Not only is the existence of the first-person point of view crucial to the intrinsic nature of phenomenal feels (according to the definition of conscious experience and to the fact that the only way we have access to conscious experience is a first-person access), but also, as Chalmers claims, it is crucial for admitting psychological laws (because such principles are based on considerations from the first-person case and are not testable from the third-person point of view). We will discuss this issue more in the later parts.

Moreover, regarding the explanatory questions (the questions of why and how) of consciousness, by the supervenience laws, Chalmers has tried to explain the way consciousness arises from physical processes (thereby explaining the question of how) and to show some relations of coherence between physical processes, awareness, and consciousness. But the problem with these laws, which Chalmers himself admits, is that they are not experimentally testable, at least from the third-person point of view. Such principles are based on considerations from the first-person case, and on general principles of plausibility (?!). Chalmers admits that the only evidence for these principles
comes from the correlations in familiar cases: ultimately, for me, from my own case. On the other hand, these bridging principles which try to explain the relation between two sides, are useful when we have knowledge of both sides of a relation, but in the case of the relation between consciousness and physical processes (and awareness), we have no knowledge of one side of the relation; we know nothing about the intrinsic nature of consciousness. All these refer to the idea that there is no strong evidence for the bridging principles, so not only does this theory not explain the ontological question, but it is also not very successful in explaining why and how the physical processes and awareness are accompanied by conscious experience (the explanatory questions).

2. Fundamental Theory of Consciousness

So far we have discussed three psychophysical laws that Chalmers proposes for explaining the connections between consciousness and physical processes. These laws were:

1. The coherence principle connecting consciousness to awareness (or global availability).

2. The principle of structural coherence, connecting the structure of consciousness to the structure of awareness.

3. The principle of organization invariance, by which any two systems that have the same fine-grained functional organization will have qualitatively identical experience.
Chalmers does not find the high-level theory sufficient for explaining consciousness; the problem is that none of these principles are plausible candidates to be fundamental laws in a theory of consciousness.

2.1. Explaining Consciousness by Fundamental Properties

For a final theory, we need a set of psychological laws analogous to fundamental laws in physics. “These fundamental (or basic) laws will be cast at a level connecting basic properties of experience with simple features of the physical world.” (Chalmers D. J., 1996, p. 277) These basic laws about consciousness should entail and explain the non-basic laws. In search of the fundamental laws and finally a fundamental theory, Chalmers deals with the basic notion of information, and so with the notions of ‘information space and information state’\(^{11}\). Chalmers says that “An information space is an *abstract* space consisting of a number of states, which I will call *information states*, and a basic structure of *difference relations* between those states.” This information space is fully characterized by its difference structure, in other words; “information is a *difference that makes a difference*”\(^{12}\). Information spaces are *abstract* spaces, and information states are also *abstract* states, so they are not part of the concrete physical or phenomenal world, but they can be found in both the physical and the phenomenal world. In order to be able to find information spaces and states, we need to discuss the various ways in which they can be *realized* in the world. Since information can be found in both the physical and the

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\(^{11}\) Just as he used the notion of awareness which mediated between phenomenal and physical in his high-level theory; with this difference that awareness was actually physical, but information spaces and information states are *abstract* spaces and *abstract* states, so they are not part of the concrete physical or phenomenal world.

\(^{12}\) Chalmers uses it due to Bateson (1972)
phenomenal world, we consider both physical and phenomenal realizations of information.

Physically realized information: “an information space associated with a physical object will always be defined with respect to a causal pathway and a space of possible effects at the end of the pathway” (Chalmers D. J., 1996, p. 281). So physical states will correspond to information states according to their effects on the causal pathway.

Phenomenally realized information: we can also find information realized in our phenomenology. States of experience fall directly into information spaces in a natural way, and since any experience will bear natural relations of similarity and difference with other experiences, so we will always be able to find information spaces into which experiences fall. “To find information spaces phenomenally, we do not rely on the causal principle that we used to find information spaces realized physically. Rather, we rely on the intrinsic qualities of experiences and the structure among them--the similarity and difference relations that they bear to each other, and their intrinsic combinatorial structure.” (Chalmers D. J., 1996, p. 284) There are natural patterns of similarity and difference between phenomenal states, and these patterns yield the difference in structure of an information space. For example a specific red experience is one phenomenally realized information state and a specific blue experience is another phenomenally realized information state; and more complex experiences fall into information spaces with more complex combinatorial structure.

The Double-Aspect Principle
By treating information in this way, he wants to show that information, which is abstract (neither physical nor phenomenal), has actually two aspects: physical and phenomenal aspects, or two realizations: physical and phenomenal realizations. This double life of information spaces corresponds to a duality at a deep level; moreover, this double realization of information is the key to the fundamental connection and crucial link between physical processes and conscious experience. Chalmers explains this fundamental link by means of the double-aspect principle (so this principle plays the same role as the psychophysical laws in the high-level theory).

According to this principle, “whenever we find an information space realized phenomenally, we find the same information space realized physically. And when an experience realizes an information state, the same information state is realized in the experience’s physical substrate.” (Chalmers D. J., 1996, p. 284) For example a simple experience such as a color experience, which phenomenally speaking is realizing an information state within a three-dimensional information state, is simultaneous with the same space realized in the brain processes, that is, the three-dimensional space of neutrally coded representations in the visual cortex. The same goes for more complex experiences; by having an experience that is realizing information space phenomenally, the same space must be physically realized in the underlying brain process.

To sum up, basically Chalmers argues that since we need some sort of construct to make the link between the physical and the phenomenal, information seems as good a construct as any; he says that “It may be that principles concerning the double realization of information could be fleshed out into a system of basic laws connecting the physical and the phenomenal domains” (Chalmers D. J., 1996, p. 286). The reason for choosing
information is that, Chalmers believes, ‘information, in the actual world, has two aspects, that is, a physical and a phenomenal aspect’; and by the dual aspect principle, wherever there is a phenomenal state that realizes an information state, an information state is also realized in the cognitive and neural state of brain.

*How Basic Laws Entail Non-Basic Laws*

So far Chalmers has claimed that the double-aspect principle, in which information plays a central role, is the fundamental law according to the relation between the physical and the phenomenal domains. In addition, he asserts that “…the double-aspect view of information is compatible with psychophysical principles developed earlier: in particular, the principle of structural coherence and the principle of organizational invariance.”

(Chalmers D. J., 1996, p. 287) It is compatible in the sense that “The structure of experience is just the structure of a phenomenally realized information space, and the structure of awareness is just the structure of a physically realized information space.”

(Chalmers D. J., 1996, p. 287) To clarify this claim, Chalmers argues that the *implicit* structure of an experience corresponds to the relational structure of an information space, and the *explicit* structure of an experience corresponds to the combinatorial structure of the space. And the various details in the structure of awareness, which is by definition differences that make differences in later processing, as they are directly available for global control, correspond to the physical realization of an information space. Given that these two phenomenal and physical realizations of information are in fact realizations of the same information state, the principle of structural coherence follows. On the other hand, ‘when a system realizes an information space, it actually does it in virtue of its *functional organization*,’ so any other system functionally isomorphic at fine grain will
realize the same information space; as a result “if my experiences arise in virtue of
information spaces realized in functional isomorphs, then the same experiences will arise,
as the invariance principle predicts.” (Chalmers D. J., 1996, p. 288) This is how the
fundamental double-aspect law is compatible with the principle of structural coherence
and the principle of organizational invariance.

*Is experience ubiquitous?*

The double-aspect principle gives rise to an important question about experience: ‘Is
experience *ubiquitous*?’ or ‘Is this *panpsychism* (the view that everything has a mind)?’
Because: (1) we find information everywhere we find causation (physically realized
information); and (2) according to the double-aspect principle, wherever there is
physically realized information, there is also phenomenally realized information and so
there is experience; since (3) we find causation everywhere, so (4) we should be able to
find information everywhere, and as a result of all these we should be able to find
experience everywhere! But is this true? Or should some of our premises be
reconsidered? If we consider the double-aspect principle *unrestricted*, then there should
be experience everywhere. Chalmers believes that “Only a small amount of the
information in human cognitive processing seems to correspond to the information in
conscious experience. Is it not simply a fact that most of our information processing is
unconscious?”So if the unrestricted double-aspect principle is correct, then we should
accept that all that unconscious information is also realized in experience; but since it is
unconscious information and so not available for a certain sort of global control and
report, it must have been realized *not in my* experience, so I should not expect it to be part
of *my* experience any more than I expect myself to have access to the experiences of
other humans. Moreover Chalmers acknowledges that not all information processing systems in the world qualify as conscious individuals with complex experiences, for the reason that not all these systems have something like the coherent cognitive structures that we have. So even if they have experiences, there is no reason to think that these experiences correspond to the sort of the thing we think of as a mind. “The sorts of experiences that we have will only arise when information-processing systems have been shaped by evolution to have complex, coherent cognitive structures reflecting a rich representation of the outside world. It is likely that only a very restricted group of subjects of experience would have the psychological structure required to truly qualify as agents or as persons.” (Chalmers D. J., 1996, p. 300)

Chalmers suggests two possible ways to constrain the double-aspect principle so that we can narrow down the class of physically information spaces that have phenomenal counterparts:

(a) Chalmers believes that the view that there is experience wherever there is causal interaction (and so information), is counterintuitive and there is an intuition that some sort of activity is required for experience. We could restrict the kind of causation involved in a system: only a certain sort of causation counts in individuating the information spaces underlying experience’. “Perhaps only certain sort of ‘active’ causation relations are relevant, or perhaps certain sorts of ‘natural’ causal relations are required.” (Chalmers D. J., 1996) Not any information processing system that is sitting in a constant state and causing an output without really doing anything can have a phenomenal experience; rather in order to have experience in an information processing system, there is an intuition
that some sort of *activity* is required (some sort of *active* causation is required).

(Chalmers D. J., 1996, p. 298) There is a possibility, Chalmers believes, that the information processing systems, which do not have active causation, have *protophenomenal*\(^\text{13}\) properties (if there are indeed such properties) instead of phenomenal properties and so they will have a sort of protoexperience instead of experience.

But what kind of *activity* is needed for an information processing system to be able to have conscious experience? This activity will actually play a significant role in the existence and explanation of consciousness.

(b) The other possibility suggested by Chalmers is that *amplification* of information is crucial. “Physically realized information is also realized in experience only if the information is *amplified* in certain ways, becoming available to make a large difference along certain causal pathways.” In this way perhaps we could relate the intensity of experience to the degree of amplification. But the problem is that the notion of amplification is not precise and it is not obvious how it is to be made precise.

These two criteria are suggested by Chalmers as possibly playing a crucial role in his fundamental double-aspect principle.

With respect to the question of whether Chalmers’ view leads him to panpsychism, he mentions three reasons to deny that it does: (1) he thinks that having experience may fall

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\(^{13}\) Protophenomenal properties are properties more fundamental than phenomenal properties from which the latter are constituted.
short of what we usually think of as having a mind, (2) protophenomenal properties might not be exactly the same as what we mean by experience, so even further away from the usual concept of mind and (3) he does not think it is accurate to say that rocks, for example, have experience. Consequently Chalmers says that: “panpsychism is not at the metaphysical foundation of my view; what is rather at the foundation is naturalistic dualism with psychophysical laws.” (Chalmers D. J., 1996, p. 299)

The Metaphysics of Information

To have a fundamental theory of consciousness, there are still some more questions to be answered, such as: “Is information primary, or is it really the physical and the phenomenal that are primary, with information merely providing a useful link?” How do we understand the ontology of the double-aspect view of information? Are informational spaces and informational states just useful constructs, or are they ontologically fundamental? Chalmers suggests three possible ways of answering these questions:

1. We can take both physical and phenomenal realizations of information to be wholly separate features, with no ontological links over and above a lawful connection and a sort of structural isomorphism. With this view the ontology remains the ontology of property dualism, that is, physical properties being separate from phenomenal properties with a lawful connection between the two. In this way the double-aspect is all about two different sorts of correlate properties with a similar structure and there would be no fundamental link between these two properties. In this way, “information is simply a useful tool in characterizing this common structure; it does not correspond to anything
ontologically ‘deep’.” (Chalmers D. J., 1996, p. 302) This view, does not take the role of information as important as the next two views, and it is more dualistic.

(2) Another suggestion is to take information to be fundamental to the physics of the universe, in a way that physical properties and physical laws are derivations from informational properties and laws. This is the view so called “it from bit” put forward by Wheeler (1989, 1990) and Fredkin (1990) and Matzke (1992, 1994). It is closely related to the “Russellian” neutral monism idea. On this view, “specific states of mass or charge are pure information states: all that matters is their location within an information space” (Chalmers D. J., 1996). This view leads us to a picture of the world as a world of pure information and so there is nothing more to say other than information. “The world is simply a world of primitive differences, and of causal and dynamic relations among those differences.” (Chalmers D. J., 1996, p. 303) Chalmers sees two main problems in this picture of the world. The first is about consciousness itself, which is something over and above a pure information space. “Phenomenal properties have an intrinsic nature, one that is not exhausted by their location in an information space, and it seems that a purely informational view of the world leaves no room for these intrinsic qualities.” (Chalmers D. J., 1996, p. 304) Second, the notion of pure informational flux is not coherent in an obvious way. It might be felt that this view lacks a substance which makes it be a world, that more primitive differences might be needed which are not grounded in differences in

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14 Russell’s neutral monism, which argues that the basic properties of the world are neither physical nor phenomenal, but the physical and the phenomenal are constructed out of them. From their intrinsic natures in combination, the phenomenal is constructed; and from their extrinsic relations, the physical is constructed.
any underlying quality; as Chalmers says, “One might find it plausible that every concrete difference in the world must (itself) be grounded: that is, that it must be a difference in something”. The first problem is a problem because Chalmers believes that we have direct knowledge of some intrinsic nature in the world, over and above pure information, that is, of phenomenal properties; and the second problem points to the fact that there has to be some intrinsic nature in the world to ground the differences, that is, we need some intrinsic nature in the world to ground the information itself, and perhaps it is this intrinsic nature which is closely related to the intrinsic nature present in phenomenology. So again this is closely related to the Russellian suggestion of unknown intrinsic properties of the world (these intrinsic properties might be taken to be phenomenal or protophenomenal properties). Both of these objections have this idea in common that we need some intrinsic properties to make sense of the physical world, and we need to find a place for the intrinsic properties revealed in phenomenology.

But we can ask Chalmers, why information is not capable of being that intrinsic nature of the world that grounds all the differences and why phenomenal properties are more intrinsic than information. Didn’t Chalmers claim that information is more fundamental than phenomenal properties in a way that the latter are realizations of the former?

(3) The third suggestion is that “the information spaces required by the physics are themselves grounded in phenomenal or protophenomenal properties.” (Chalmers D. J., 1996, p. 305) “In this way we will have a set of basic ‘microphenomenal spaces’, one for each fundamental physical property, and it is these spaces that
will ground the information spaces that physics require.” (Chalmers D. J., 1996)

This view is close to the idea of panpsychism; moreover, this view leads us to the truly so called double-aspect ontology in a way that “Physics requires information states but it cares only about their relations, not their intrinsic nature; phenomenology requires information states, but cares only about the intrinsic nature.” (Chalmers D. J., 1996, p. 305) It might be true to say that, with respect to this view, the single basic set of these information states unifies the phenomenal and the physical in a way that internal aspects of these sets of information states are phenomenal and the external aspects are physical. The problem with this view is that the double aspect principle here applies in a way that microscopic physically realized information has a phenomenal realization, but for the purpose of a theory of consciousness, we need macroscopic physically realized information to have a phenomenal realization also. But the question is how this sort of “macrophysical phenomenology” can be derived from that “microphysical phenomenology.” Chalmers mentions three ways that one might be able to handle this problem:

First, one might argue that the double aspect ontology applies at both levels of microscopic and macroscopic levels; as a result, physical information spaces at both microscopic and macroscopic levels are grounded in a phenomenal realization of information. But it is not clear how the “grounding” approach to the double aspect ontology can also apply at the macroscopic level. Because what Chalmers has explained so far was about the way physical information is
grounded in a phenomenal realization of information at the *microscopic* level, so we need a further explanation about the macrophysical level.

Second, one could try to understand a way in which macroscopic phenomenology might be *constituted* by these microphenomenal properties, by analogy with the way in which microphysics ‘add up’ to macrophysics. But the problem is that this may be the wrong way to think about phenomenology and perhaps phenomenology is constituted in an entirely different way. So we actually lack an accurate conception of the way in which low-level microphenomenal properties ‘add up’ to yield high-level phenomenology.

The third option is to link macrophenomenology to microphenomenology by *laws*. “It could simply be the law that when microphenomenal states realize an information state of a certain sort by virtue of the causal relations between them, then a direct phenomenal realization of the same state will arise.” (Chalmers D. J., 1996, p. 307)

Another problem that I see with this idea is that, if phenomenal or protophenomenal properties ground the information spaces which themselves ground physical properties, then why do these physical properties not entail those phenomenal properties which ground them? In my opinion, the only possible answer to this question could be that only some types of physical properties are grounded by phenomenal properties; the question will be what kind of physical properties are grounded by phenomenal properties?
Unless we solve these problems, we will have to retreat from the Russellian view in favor of the other two previously mentioned: a metaphysics of pure information as a way of understanding the physical world, with lawful connections which hook phenomenology up; or an ontology of separate physical and phenomenal realms with their own intrinsic nature, tied together by lawful connections in accordance with the information principle.

2.2. Evaluating the Fundamental Theory

An important point regarding the fundamental theory, which Chalmers points out by restricting the double-aspect principle, is that not all information processing systems in the world qualify as conscious individuals. It is not the case that wherever we find causation, and so physically realized information, we find phenomenally realized information as well. Because it is not the case that wherever there is causation there is that kind of information which underlies experience, rather a certain sort of active causation is required for individuating the kind of information spaces underlying experience. So the information, in those information processing systems that cause an output in a constant state without really doing something, cannot be phenomenally realized and as a result these processing systems cannot have phenomenal experience. In order to have experience in an information processing system, some sort of activity in the form of active causation is required. Moreover, to have active causation which causes the kinds of experiences that organisms such as ourselves have, a sort of information processing system is required which has been shaped by evolution to have complex, coherent cognitive structures reflecting a rich representation of the outside world. Even in human cognitive processing, only a small amount of the information corresponds to the information that results in conscious experience (we are not conscious of all the
information processing systems in our brains; there is only one of these information processing systems that makes some information available for a certain sort of global control and report). (Chalmers D. J., 1996, p. 300)

As the above notes shows, the existence of a kind of activity in an information processing system will play a crucial role in the existence and explanation of consciousness. So in order to explain consciousness, the key point will be the answer to the question of what kind of activity is required for an information processing system to be able to have conscious experience. Unless we answer this question, we cannot claim that we have succeeded in explaining conscious experience. As we can see here, we face the same problem we faced in Chalmers’ high-level theory: just as awareness was not sufficient for having consciousness and an X-factor was required to make it sufficient, in his fundamental theory a kind of unknown activity is required (active causation) for having phenomenally realized information and so for having conscious experience. If Chalmers’ theory of consciousness does not provide the sufficient conditions for having conscious experience, then what is the significant difference between his theory and other theories to which he has objected?(apart from his arguments that consciousness is not physical.) I am trying to show that Chalmers’ theory does not provide sufficient explanations for the two main questions about consciousness. It fails to explain the intrinsic nature of conscious experience as long as we have no theory of the activity or the factor which has a crucial role in giving rise to conscious experience. Chalmers’ objection to materialist theories, namely that these theories do not explain the two main problems of consciousness, applies to his own theory. Recall Chalmers claims that materialist theories fail to provide any explanation for the two main questions of consciousness, which were:
1. The ontological question: *what* is the intrinsic nature of conscious experience?

2. The explanatory (or epistemic) question: *how* and *why* does consciousness arise from physical processes, such as cognitive, functional and neural processes?

These questions are questions about the relation between physical processes and conscious experience.

Now the question is whether Chalmers has succeeded in answering these questions by his theory of consciousness.

The intrinsic nature of consciousness is, by Chalmers’ own arguments, is something over and above awareness or information, and it is related to the crucial role of the X-factor and the unknown activity. But as long as his theory lacks a clear explanation of the intrinsic nature of conscious experience, his objection will be applicable to his own theory; and in a sense, he has not provided a theory of consciousness at all, even if other puzzling questions have been answered and even if he has proved that consciousness is not physical.

Any attempt to explain the intrinsic nature of conscious experience (the phenomenal feel), must explain the *first person data*. Conscious experience (or the phenomenal feel) is by definition a *first person experience*. Conscious experience is what is experienced by an experiencer, and its being thus experienced is what makes consciousness what it is (it makes first-person data). So to explain the intrinsic nature of conscious experience is to explain a first-person experience. On the other hand the only access to this phenomenal feel (conscious experience) is from the first-person point of view. But any explanation (even if one tries to explain one’s own feeling and experiences) is from the third-person point of view.
point of view. So any explanation of conscious experience fails to explain the intrinsic nature of it. Recall that Chalmers himself believes that by conscious experience we mean ‘a first-person experience’, so any knowledge of it derives primarily from my own case (first-person point of view), and not from any external observation (third-person point of view).

Even a materialist such as Dennett also believes that consciousness is nonsense in the absence of the subject’s point of view; he claims that wherever there is a conscious mind, there is a point of view of that mind, that is, if there is no first-person point of view (subject’s point of view) there is no consciousness; that is why he classifies his multiple drafts theory as first-person operationalism. But there is significant difference between Chalmers and Dennett with respect to this issue: although Chalmers believes that the intrinsic nature of consciousness is first-person experience, the only thing he concludes from this fact is that “…this reliance on first-person data on plausibility constraints means that a theory of consciousness will have a ‘speculative character’ not shared by theories in most scientific domains.” (Chalmers D. J., 1996) That means, although speculatively, a theory of consciousness is supposed to explain such first-person experience (the nature of conscious experience); and that other theories lack this explanation is his objection to them. But it is not a question of speculation; rather it is an epistemic matter that any explanation is from the third-person point of view. So by explaining conscious experience (from the third-person point of view), we have not actually explained the intrinsic nature of experience (first-person nature).

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15 Explaining the phenomenal feel or conscious experience is a kind of reflection on that feeling, but not the feeling (the experience) itself, even if this reflection is performed by the same person who is trying to explain his own feeling (or experience).

16 Including one’s own reflection on his phenomenal feelings and experiences.
But in the case of Dennett, his believing in the idea that conscious experience is first-person experience allows him to say that his “…models are able to explain *everything* about experience that *needs to be explained.*” (Dennett, 1991) I agree with Dennett that the only *possible* explanation of consciousness consists in explaining whatever is related to conscious experience that can be explained from the third-person point of view; but we should bear in mind that, this is not *everything* about conscious experience (this is not the nature of conscious experience), rather this is *everything* that it is *possible to explain* about conscious experience. It is impossible to *explain* the intrinsic nature of consciousness; we can only *experience and feel* the intrinsic nature of our own conscious experiences. We cannot explain the first-person point of view from the third-person point of view and claim that we have explained the intrinsic nature of it. Conscious experience is necessarily a subjective feel and any explanation is necessarily objective; we cannot have an objective explanation of a subjective phenomenon and claim that we have explained the nature of that subjective phenomenon. This claim will be *logically incoherent.* *Metaphysically* speaking, we will never be able to explain the intrinsic nature of experience because third-person explanation (objective) has a different nature from the first-person (subjective) data.

So far I have argued that not only is Chalmers’ theory unable to *explain* the intrinsic nature of conscious experience (phenomenal feel), but also the idea of *explaining* the intrinsic nature of this subjective phenomenon is logically incoherent and metaphysically impossible. We can explain the neural and cognitive processes that give rise to this phenomenal consciousness, but we can only *feel* and *experience* the intrinsic nature of this subjective phenomenon. I agree with Chalmers that conscious experience is not
identical with these neural and cognitive processes, but what I am adding to it is: we cannot explain what it is; we can only feel it and experience it.

These are important reasons for paying more attention to the role of the first-person point of view in the intrinsic nature of conscious experience. In my opinion what is missing in these theories is the significant role of the “first-person point of view’ and ‘the ability to have a first person view’ in the existence of conscious experience. I am suggesting that there is a possibility that the X-factor, which Chalmers believes that by adding it to awareness will make conscious experience arise\textsuperscript{17}, is having a first-person access to awareness. Or the sort of activity\textsuperscript{18} that makes information be realized phenomenally\textsuperscript{19} might be the subject’s activity in accessing from the first-person, to its own information processing system; so maybe having a first-person point of view is what a subject needs to be doing as an activity on their information processing systems in order to have phenomenal experience. Or the kind of first-person operation\textsuperscript{20} in Dennett’s models, without which there is no conscious experience, might be the subject’s first-person access to his own cognitive processing system. By this suggestion, I am not trying to explain the nature of conscious experience, rather I am calling attention to the significant role of the ability to have first person access to one’s own cognitive processing systems in the existence of conscious experience (in giving rise to consciousness).

\textsuperscript{17} “awareness plus something give rise to consciousness”
\textsuperscript{18} “Perhaps only certain sort of ‘active’ causation relations are relevant; need really doing anything can have a phenomenal experience, rather in order to have experience in an information processing system, active causation is required”
\textsuperscript{19} because as I said before Chalmers believes that phenomenal properties have an intrinsic nature and it seems that a purely informational view of the world leaves no room for these intrinsic qualities
\textsuperscript{20} Dennett classifies his Multiple Drafts model, “as first-person operationalism, for it brusquely denies the possibility in principle of consciousness of a stimulus in the absence of the subject’s belief in that consciousness.”
By ‘ability to have a first-person view’ I mean for a subject to be able to have first-person access to whatever has been provided by his cognitive, neural or information processing system, to whatever has been processed by his information processing system. In other words, a conscious mind is an observer of the outcomes of its own cognitive and information processing system. Consequently any creature that has the ability to have a first-person (subjective) access to its own cognitive or information system, which results in a first-person point of view, can have a phenomenal experience. And the level of their phenomenal experience will be determined by the level of cognitive or information processing systems to which they have first-person access, or by the level of their ability to have such a first-person access. Consequently, although consciousness is not logically supervenient on all kinds of physical information processing systems, it is logically supervenient on those physical information processing systems that have the ability to have first-person (subjective) accesses to the results of their own cognitive processes, i.e. they have a first-person point of view.

The implication of this way of seeing consciousness will be that ‘the intrinsic nature of conscious experience is actually in its epistemic nature’\(^{21}\); to have conscious experience is to be in some sort of relation (first-person relation) to our own cognitive and information processing system. Conscious experience is actually an epistemic situation; the ontology of consciousness can be found in its epistemology. In this case even though we believe that conscious experience is something over and above the physical (over and above the cognitive and information processing systems), there is no need to introduce a different substance (dualism) or different kinds of property (property dualism) in order to

\(^{21}\) Conscious experience exists at the center of our epistemic universe.
justify the existence of consciousness, and there will be no ‘gap’ left to be explained. Consciousness is over and above the physical in the sense that it is being in a sort of epistemic relation to the physical (first person relation or first person access).

If we do not consider phenomenal experience (consciousness) as an ontologically separate substance that needs to be explained, rather considering it as epistemic phenomena that is the result of having a first-person access to the outcomes of one’s own information processing systems (being in such a relation), will dissolve the problem of explaining the intrinsic nature of consciousness.

But there will still remain an important question to be answered, i.e. ‘What determines whether a creature has the ability to have a first-person access to its own information processing system?’ Or ‘What kind of cognitive processing systems are able to have a first-person access to themselves?’ Or ‘What makes a physical system to be able to have a first-person point of view?’ Maybe we could say that the complexity and coherency of the cognitive or information processing systems involved, determines whether the system is able to have a first-person access to itself or not. But this is just one possible answer that needs to be proved, so the answer to this question is open. Note that it is still impossible to explain the first-person relation or the first person access, for the same reasons I mentioned above regarding the impossibility of explaining the intrinsic nature of conscious experience.

According to the second problem of consciousness—the explanatory question-- i.e. ‘how and why does consciousness arise from physical processes, such as cognitive, functional and neural processes?’, although Chalmers tries to explain the relation between the
physical information processes and the phenomenal experience by introducing the psychophysical laws and more fundamentally the double aspect principle, it is not clear ‘how we know of these laws’. It is not clear that on which base we should accept the existence of these laws; what justifies the existence of such laws in nature? Moreover, it is not clear when we have not yet provide an explanation for one of the two sides of the relation, i.e. the phenomenal consciousness, how we are able to explain about the laws which relates these two sides of the relation—the physical and the phenomenal—to each other.
Bibliography


