Consciousness, motivation, and free will

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ABSTRACT

It is argued that the exercise of free will plays a part in the production of behaviour, with the argument focusing primarily on the implied roles of the various contents of consciousness, including, in particular, motivational states. Some additional considerations are also discussed which provide either support for or count against the argument.

INTRODUCTION

In this paper it will be assumed, without question, that the constituents of human beings include physical processes. Physical processes are processes which are open to test by observation, either directly by the eye or indirectly by measuring instruments, the readings of which are observed by the eye. It will be assumed also, that human beings have a conscious experience of what they observe, therefore the constituents include consciousness (in *addition* to physical processes). This is consistent with the work of Chalmers (1995, 1996) who has argued extensively that human beings are conscious.

Given the above, the argument to be advanced here is as follows:

1. With notable exceptions (sleep, injury) human beings have consciousness. That is, they are aware of various events in the world. (No attempt will be made to account for such events as dreaming, Wilton & Harley, 2017.)
2. The adaptive exercise of free will accounts for behaviour and, in doing so, accounts for consciousness and much of its content; whereas a solely causal account of behaviour does not.
3. Therefore, the claim that human beings exercise free will is differentially supported¹.

The major contents of the paper fall roughly into two parts. In Part 1 some basic concepts are examined and discussed. These concepts will be employed in Part 2. Part 2 consists largely of a description of the exercise of

free will in action, with persons being disposed (but not causally) to make their decisions in such a way that, ordinarily, the behaviours they choose to enact are adaptive with respect to survival. The remaining part of the paper consists of a variety of comments pertaining to what has been said in the first two parts. Overall, our conclusion will be that *the hypothesis that we have free will can account for the occurrence of consciousness, and that consciousness has a role in decision making.*

PART 1: THE CONTRAST BETWEEN SOLELY CAUSAL ACCOUNTS OF BEHAVIOUR AND ACCOUNTS WHICH INVOLVE THE ADAPTIVE EXERCISE OF FREE WILL

Suppose the development of artificial intelligence has advanced to such a degree that there are robots which drive motor cars. Presumably, the behaviour of a car is determined by a sequence of causes and effects, beginning with the environment causing some effect within the robot, and ending with the movement of the car. Now suppose that the car approaches a T junction, such that it can turn either left or right. Suppose it turns left. How is this to be explained? The explanation would state that information from the environment concerning the two alternatives (left and right) causes some effect within the robot, for example the switching of an electrically activated switch to register “left”, with the result that this causes the car to turn left.

Now suppose that human beings have free will and that a human being is driving the car. Following Campbell (1951; see also Wilton, 2000, and, Wilton & Harley, 2018), a person can be defined as having free will if, in any given situation, he or she could have done other than what they actually do. Given

this definition it follows that whichever way the driver turns at the junction, he or she could have done otherwise.

Now, how could information given by the driver's perception of the junction play a part in the making of the driver's decision? Since he or she has free will, the answer cannot be that the relevant information *causes* some change in the driver (equivalent to the click of a switch), such that the driver then takes the turn to the left. Therefore, if the notion "*could have done otherwise*" is to have any meaning, there must be some means by which the information from the environment can be *taken into account* by the driver in making a decision, rather than *causing* the operation of a switch (say) internal to the driver. As we work through this paper, it will be argued that the essential difference between physical, wholly causal, explanations of behaviour and ones which assume a taking account of information in the making of a decision is that the latter explanations invoke a role for consciousness. We begin by considering what the differences are between physical and conscious states.

The contrast between physical events and the events of which we are conscious.

It is useful to start with a description of the characteristics of solely physical events and then, by contrast, events of which we are conscious. Consider first the physical events that take place in the robot described earlier. Suppose that the robot-driven car is approaching a set of traffic lights and that the visual capabilities of the robot include the detection of the wavelength of any light which strikes the retina of its eye (a physical detector within the robot).

Suppose also that the present wavelength of light emitted by the traffic light indicates “go” by the emission of light having a wavelength of 5100 angstrom (the same wavelength as the light which is reflected by the leaf of a tree in springtime). The light strikes the detector, thereby causing an effect within it which constitutes a measure of 5100 angstroms, which then causes an effect on the next stage of the system. Hence, under ideal circumstances, it is this value of 5100 angstroms which determines all the subsequent events within the robot, terminating in the car moving forward. This process is depicted in Figure 1.

Figure 1

Visual observation as a means of measurement

Note, however, that, as in any physical measuring system, the reading on the measuring instrument may be subject to error. This is so because other events may also have an effect upon the detector. For example, perhaps oil falls into a crack within the detector, and this has some effect upon it, thereby

increasing or decreasing the reading. As a consequence, the oil and the light from the traffic light together would cause a false reading of, say 6500 angstrom (the same wavelength as the colour red), to be fed into the later components of the system causing the car to come to a halt. The vertical arrow in Figure 1 depicts such a possible effect of some variable, other than light, upon the detector. The possibility of this kind of error is inherent in the reading of *any* measuring device that can be deconstructed into a sequence of causes and effects.

To reinforce the point that the measure may be incorrect, consider another example. Consider a thermometer which measures temperature by the expansion of mercury in a tube. If the thermometer is partially immersed in water, in order to measure its temperature, the heat of the water may cause the tube itself to expand, thereby reducing the level of mercury in it, yielding a reading on the thermometer which is lower than the actual temperature of the water. Fortunately, in practice, the effects of such variables are rare in both robots and thermometers. However, in the present paper what we are interested in is not the prevalence of such effects – our interest lies solely in the implication that it is *conceptually possible* that such effects *could* occur in any causal system.

The same sort of cause and effect sequence occurs also in the human eye. In essence, any perceptual system is an instrument; such that what is being measured is identified by means of its effect on that system. In other words, the entity being measured (say the wavelength of the light impinging upon the retina) is measured by means of changes that the input from the external

environment causes in the system. And, being a cause and effect mechanism, the involvement of other variables, for example a clouding of the lens, may play a part in the determination of the registered measurement.

For further clarification, note that what has been said above is true even if a “switch” is the first component of the entire causal chain of events within the eye of the person (or robot). The switch in a robot or the first light sensitive element in the eye could be responsive to variables having nothing to do with the state of the traffic, for example, the buzzing of a fly in the car. And, similarly, at any point in a cause and effect chain the identification of a preceding cause by an effect is always subject to error as a result of other possible causal contributions to the effect.

In summary, there is *always* uncertainty concerning what an effect is an effect of, and by implication the identification of a cause by an effect always involves a fallible inference.

The characteristics of sensations

A person may be aware of and identify many sensations within their lifetime (e.g., the sensation of greenness). Two characteristics of such an identification will be discussed. These characteristics allow us to make a contrast between such identifications and those which occur in any solely physical system. Critically, it will be shown that a sensation could influence what a person does but not in such a way that the sensation causes some effect. Hence, it is open to argument that a person can exercise free will in the determination of their behaviour.

Direct apprehension

It is characteristic of any sensation, for example the sensation of green, that it is experienced *directly* – where the word ‘*directly*’ means that (unlike a cause) it is not identified by virtue of the effect it produces. Russell (2001, Ch. 5) used the apt expression “knowledge by acquaintance” to describe such direct experience. However, in preference to Russell’s description, the expression ‘*direct apprehension*’ will be used instead. It should be appreciated that sensations have no part to play in a solely causal account of behaviour².

How can the claim that sensations are apprehended *directly* be substantiated -- other than by noting that our intuitions about the sensations we experience are consonant with the claim? It can be substantiated by showing that errors of identification of the sort possible in identifying a cause cannot occur in the identification of sensations. This should become apparent as we now consider the second characteristic of sensations that distinguishes them from causes.

Not subject to error

It is important to appreciate that this characteristic of sensations elucidates the concept of direct apprehension. A person who has a sensation cannot, in identifying that sensation, make *errors* of the same kind as were discussed in the case of observation (where cause and effect is involved). Consider having a sensation of blue. Could one make an error by identifying that sensation as red, yellow, orange, or any other colour? Well, one could certainly mis-label the presence of blue by calling it “red”. However, this is not the kind of error that is of interest here. Suppose the driver of a car is looking at a traffic light

which is emitting light of the same wavelength as that of a leaf at the onset of spring (5100 angstrom) and reports “The traffic light is green” and “I am having a sensation of green”. But now suppose, to give a crude example, that a chemical is injected into the driver’s eyes which changes the output of the eye to the rest of the system in response to the light emitted by the traffic light – just as it did in the case of the robot depicted in Figure 1 (vertical arrow). Then the driver might report “The light is red” and “I am having a sensation of redness”. In this case there is an error in identifying the (so called) colour of the light but still no error in identifying the sensation. More generally, a person *cannot* make an error with respect to the identification of the sensation they are experiencing – in contrast, errors of this kind can be made in any causally determined measuring device.

Before we draw this part of the paper to a close, it is worth stating that, so far, our primary aim has been to establish that, with respect to the identification (measurement) of entities, a system which includes consciousness is one that differs *fundamentally* from a system which operates solely by means of cause and effect.

Predicting future Sensations

A person may have an image of a sensation (Shepard & Metzler, 1971; Shepard & Cooper, 1982; for some classic studies on imagery), or have thoughts about a sensation³. For example, in approaching a traffic light a driver who has observed an amber light may predict that the light is about to turn red or have an image of red, but does not actually have a sensation of red. Similarly, a person sitting close to the household fire may, by the use of

imagination or thought, predict the pain and distress it would cause if they moved closer. Again however, the person does not thereby actually experience the quality of pain or the distress that normally characterises the actual occurrence of the sensation. (This is explored further in the next section). Finally, we make no assumption as to whether it is imagery, thought, or both that apply in any particular case.

Motivational States

Among the multitude of possible sensations there are some which are accompanied by a feeling of distress or pleasure. For example, persons feel distress when they apprehend the sensation of pain, and a state of well-being upon experiencing the taste of their favourite food. In such cases, we would say that the person is motivated to eliminate the pain and prolong the pleasurable taste. Here we shall focus only on cases in which the person is disposed to eliminate sensation-distress associations, such as the distress caused by a pain or an ache. Similar arguments can also be made regarding the motivation to pursue pleasurable states.

Typically, when a person is experiencing pain and the distress that accompanies it, they do not discriminate between the two entities. Ordinarily, the sensation and distress which motivates the desire to eliminate the combination are so closely associated that intuitively it is difficult to comprehend that there is a distinction between the two. And, presumably, that is why the person who is experiencing pain typically believes that eliminating the sensation is, essentially, the same as eliminating the state of distress. However, there are drugs, such as meperidine, which reduce or

eliminate the distress, whilst leaving the sensory component untouched. Hence patients then report that they feel the pain without feeling any distress - the pain does not bother them. As Grahek (2007, p.139) states, in an extensive empirical and conceptual analysis of the phenomenon, such patients “no longer experience pain as unpleasant or something that is disliked per se” (see also, Melzack, 1961, and Marini, 2008, for an excellent review of Grahek’s work).

The sensation component of a motivational state is, like all sensations, a correlate of some present aspect of the physical world – typically, tissue damage in the case of either a pain or an ache. The distinction between these two sensations (i.e., pain and ache) may be related to the kind of tissue damage with which they are correlated. However, the feeling of distress that accompanies the two sensations is qualitatively the same when it accompanies the one sensation as when it accompanies the other. (Of course, in each case it may vary in intensity.) But how should we intrinsically characterise the feeling of distress given that this is different from apprehending a sensation? The quality of a sensation is arbitrary except in so far as it must preserve its relationship to other sensations of the same type, as illustrated by the possibility of an inverted spectrum in the case of colour (Palmer, 1999). By contrast, in the case of distress it is the thing *in itself* (i.e., the feeling of distress, promoting a dislike of that state) that is of importance (see also Jackson, 1982).

The theory that we have free will, exercised adaptively, *clearly predicts* that we shall experience motivational states. Given that a person has free will,

there appears to be no other way, in which adaptive behaviour could be brought about. Such adaptive behaviour results from the nature of motivational states in that a motivational state disposes a person to choose one course of action rather than another, rather than choosing an action randomly.

It may be noted here that not only are motivational states predicted by the theory that we have free will, but it is also critical to note that *there is no role for such states in a solely causal system*. In a causal system, each state (say state *X*) has some particular character which, according to the laws of nature *must* bring about another state (say state *Y*). In this respect state *X* is conceptually different from a state of distress which merely *disposes* a person who exercises free will adaptively to act in one way or another. Moreover, the conceptual difference becomes obvious if we note that in an entirely causal system the identity of *X* is arbitrary in that it just happens to be the entity which yields *Y* according to the laws of our universe. If the laws differed from what they are (say in another universe) the identity of *X* might be different. By contrast, a person who has free will would experience distress as a motivator of behaviour in any universe. It is the thing in itself (distress), independently of other considerations, that is of importance.

In summary, it has been argued above that a motivational state consists of two distinct components: one of these is sensations, which are correlated with the present state of the environment; the other is an affective state (such as distress) that accompanies these sensations. In the case of pain, the distress disposes the person to behave in a particular way so as to eliminate the

accompanying sensation and therefore the distress. For example, a person may apply ointment to itchy skin, in order to eliminate the itch and the distress which accompanies it.

PART 2: FREE WILL IN ACTION: SOME ILLUSTRATIVE CASES

We shall now describe three illustrative cases of how the entire system works, given the hypothesis of an adaptive free will. The cases illustrate different aspects of the system, the first involving pain, the second and third involving the *fear of pain* (a concept not previously discussed in this paper and one which we shall discuss below). The first two cases are somewhat banal and are included primarily for comparison with the third.

Case 1: The occurrence of pain

Suppose Tom is riding his bicycle, enjoying the scenery. Suddenly he pulls a muscle in his leg and as a result feels pain in the muscle, with its accompanying distress. He has the option of continuing to cycle. Realising that it is the muscle that is causing the pain, he exclaims “I cannot stand this pain any longer” and dismounts, with the anticipation that what follows will no longer include pain. Tom could have carried on cycling but chose not to, and that is all there is to this simple case of exercising free will.

Case 2: Fear of pain.

Bill is riding his bicycle, enjoying the scenery. He notices that his handlebars seem rather loose. So, fearing the possibility of falling from the bicycle and subsequent pain, he dismounts, and, being an ardent walker, as well as being

a cyclist, he chooses to walk, with his bicycle, along a track which also provides a view of the scenery.

Case 3: Fear of the devil and fear of the deep blue sea”

Suppose Jane has her own aeroplane and is flying to an interview for a job. She hears the engine stuttering and as a result experiences the *fear of a crash*. Without any clear deliberation to do so, she imagines much wreckage, and injury to herself, or possibly her death. (Note, however, that she would not feel the sensation of pain and distress which she would be feeling if she were in an actual crash. She does feel distress – but, of course, the distress that she feels is caused by her prediction of a possible crash.) What does she do? She can decide, motivated by the distress caused by the possibility of a crash, to head for the nearest place where she can land safely, thereby being relieved of her fear of crashing but missing the interview; or she can carry on flying (fearfully) thereby getting to the interview if there is no crash.

Given the above, the important factor for our purposes is that Jane feels some motivational distress in relation to either of her options. Some readers, noting the difficulty of running empirically controlled studies in the present cases, may reject the claims we make here. But, let us recall that 'desire for' has a motivational effect analogous to 'fear of', and, if the 'fear of' and 'desire for' occasions were reversed, so that, for example, we loved falling off cliffs and we hated eating, we should be dead within a week. Thus, we see that the power of the motivational states 'fear of' and 'desire for' far outweigh any other factors.

As should be obvious, any number of other factors may come into play which could influence the choice. But, nevertheless, without the benefit of motivational states any choosing of what to do (given the assumption of free will) would, essentially, be a randomly chosen one with respect to the well-being of the person making the choice.

In order to avoid possible misunderstanding (concerning the above examples), it may be noted that we are not suggesting that a system involving the evolution of human beings making choices based on consciousness, motivation, and free will is better adapted to the environment than a causal one (indeed it may be less so). All that is being claimed, as in every case of evolution, is that chance mutations have happened to favour such a system of adaptive choice, and hence that is the system which has passed the test of survival and reproduction of the fittest. Cases of the kind where the most efficient system does not happen to have been selected are not unusual in the course of evolution.

Now let us now consider some more cases involving the same sort of choice:

- A person discovers that they may have cancer and have a fear of dying, but they also have a fear of the treatment and its possible side effects. They then have to make a decision as to whether to secure treatment or not.
- Another case is one where one plans to visit a foreign country, the customs of which are very different from one's own. The visit may have great appeal but there may be many unknowns bringing about the

mental exploration of a variety of unwanted experiences, and with it a fear of entry. A decision is required.

- Similarly, planning to enter some neighbourhoods within one's own country may generate fear. For, example in the 1950's certain areas in some British cities, were dominated by "Teddy Boys", often carrying knives. This would be likely to cause anxiety about visiting a friend who lived in such an area.
- Another case is that in which youths are planning to jump from a clifftop into an unknown sea, as an act of bravado. What stops them (or some of them) is not something they specifically know, for example the depth of the water, the occurrence of rocks, and the possibility of sharks; rather it is the possibility of these things that they fear.

Cases which involve conflicting goals, such as those described above ('Fear of X') are however not the norm. Most people live lives which are familiar to them, as a consequence of generally taking routine adaptive decisions in a more or less constant familiar environment. For example, if they usually go to work in their car and the car will not start they can catch the bus, perhaps phoning in to say they will be late. Even the circus tightrope walker has a routine to do if something goes amiss, with which she or he is familiar. Moreover, a person may be in a position to change their mind, even with respect to what they want to do, without any fear of serious consequences. Of course, a person is motivated to make their choices in these cases but there is no involvement of 'Fear of' or 'Desire for'.

It should be noted here that the immediately preceding cases can be analysed much as Tolman (1948) claimed. Although, in some respects, Tolman's analysis is *radically* different from the overall analysis given here, we follow Tolman in that we assume that a person has a cognitive map, based on his or her experience in their local environment, which shows what-leads-to-what. That is, given some present environmental situation a "map" makes available to the person a representation of one or more immediately alternative steps to take at each choice point, thereby permitting the selection of one of these rather than the another. Therefore, typically, the person is typically is able to use the capability of choice to get to the next choice point most effectively. In summary, in the cases described immediately above the person is usually not exposed to some conflict but, rather, is motivated to reach some goal effectively.

We shall now summarise and make some additional comments about the concept of 'Fear of'. 'Fear of' is not a sensation, and it does not accompany a sensation. There is no physical event which has caused an injury, yielding a painful sensation. Having a fear of something is a state, which although generated physically within the body, does not reflect an injury to the body or any of its parts. Rather, it is caused by the prediction of possible pain from some future *possible* sensation, such as that caused by an injury. It would seem odd if someone were to say I am in constant fear and I do not know what it is a fear of. Such a case might prompt a physician to think that there is something awry with the physical structure in the person's body which "generates" the non-physical corresponding condition. (Similarly, it would

seem odd, if, in the case of the pleasurable appetites, a person were to say they have a constant desire, but do not know what it is a desire for.)

SOME ADDITIONAL FACTORS PERTAINING TO THE PRECEDING ANALYSIS

We shall now consider a number of additional factors pertaining to the analysis in general.

The information that enters consciousness is limited, but adaptive.

The human body registers an enormous amount of information at each waking moment. Most of this information does not enter consciousness. For example, consider the overwhelming sensory feedback one experiences from each action that one takes when learning to change gear manually in driving a car. But when changing gear becomes routine, such that no unusual input occurs, it all becomes “automatic” and is accompanied by little awareness of acting and no awareness of feedback from the action. This course of events is consistent with consciousness being selectively associated with novelty or uncertainty – occasions when a person is faced with a choice which lies outside the routine application of some adaptive response.

In passing, it may be noted here that although many reseachers accept that we may experience consciousness (see e.g., Chalmers, 1995, 1996; McGuinn, 1991), others do not (notably, Dennet, 1991). Readers who doubt the occurrence of consciousness may consider the following. In front of you now is a picture of a red circle.

We submit that most readers will agree that they are conscious of seeing a red circle. Why it is that we experience consciousness may remain a mystery that will never be satisfactorily resolved! (see Hill, 1991; McGinn, 1991).

Purpose

In our preceding attempt to give a detailed analysis of the two cases in which Tom and Jane made decisions as to how they will behave, it should have been apparent, even if only implicitly, that their behaviour was, in the strongest sense, goal directed (purposeful). The governing of behaviour by purpose is perhaps the most basic implication of any claim that a person's free will is exercised adaptively. The hard question that remains, concerns the means by which a directed purposeful choice interacts with the nervous system to yield behaviour. We have no idea how this could be; but what has been said in this paper implies that it is so.

The relevance of quantum mechanics

The following seemingly damning objection might be made to the claim that we adaptively exercise free will. This is that the laws of physics (if X then Y) are so restrictive in their action that they permit no violation of regularity (e.g. if X then not Y). However, a branch of physics called quantum mechanics implies that given the state of the entire universe at any one time, any one of a number of possible alternative states of the universe *could* be the next state to follow. This can be illustrated by the classic hypothetical case of

Schrodinger's cat. In principle, an experiment could be carried out in which given some particular antecedent event *X* a subsequent event could be *either* the poisoning of the cat or not – leaving therefore either a dead cat or a cat still alive. Thus, the universe includes an inherent degree of uncertainty; and so it can be argued that the structure of the physical world may *leave room* for the possibility of an exercise of free will, and to that extent may be consonant with the claims of the present paper (for more on this see, Cox & Forshaw, 2011, Feynman, 1992, Gribbin, 2011, Rae, 2004).

Upon thinking further about quantum mechanics, it might appear that *it* can explain the operation of free will without any reference to consciousness. But do not forget that what is required is an account of the *adaptive* exercise of free will – we do not believe that quantum mechanics alone can provide this. Something else is also required, and what that something else is, or so we have tried to argue in this paper, is consciousness.

A problem: who or what has free will?

In the previous pages we have written as though it is a person (e.g., Tom/Jane) who has sensations, anticipates future events (perhaps sometimes incorrectly), and chooses what to do next. Some readers may react against such a description, arguing that it includes nothing about the constitution of these persons other than that they consist of a physical body with a homunculus (little man or woman) in their head. Our response is to admit that there is something to such a comment, but that it is too extreme -- for we have spelled out much of the relevant physical and non-physical constituents of a person who has free will and is able to exercise it adaptively.

Moreover, an albeit minor clarification can usefully be made which sheds additional light on the characteristics of the decision maker (be it termed either “the self” or Tom/Jane). Hume (1739 – see Ayer, 1980) noted that he had searched for his inner self among his sensations and was unable to find it anywhere. But, given the assumption that the decision making “apparatus” is the self, one additional point to be made about the present account of behaviour is that it actually *predicts* that a person would fail to find his or her self among their sensations. An awareness of the self would not assist that self in coming to a decision, and therefore would have no adaptive value. Thus, it seems to us that the failure to find a self provides further evidence for the theory proposed in this paper.

Libet’s experiments

In 1985, Benjamin Libet (1985) reported the results of some experiments in which participants were required to make a simple decision to select one of two alternative courses of action. The results showed that, during the task, there were changes in the brains of the participants which appeared to show that their decisions were being made before they became consciously aware of those decisions. These results justifiably aroused great interest and were confirmed by the work of others. Clearly, if the conclusion drawn by Libet was correct, the experiment would show that the arguments of the present paper are fundamentally unsound.

However, Trevena and Miller (2002), using a variation in the set-up used by Libet (1985), later showed that Libet’s results were the product of processes

other than those involved in making the decision. Further work and discussion confirmed this conclusion (see Kihlstrom, 2017; Schurger, Mylopoulos, & Rosenthal, 2016). For example, Kihlstrom (2017) states, “Because Libet’s results appear to be wholly an artefact of his method, his experiment should be discounted in future discussions of the problem of free will.” (p. 324). Given this later work, we do not believe that Libet’s findings provide any evidence against the arguments of the present paper.

CONCLUSION

In the present paper, it has been proposed that human beings have free will, which they exercise in such a way that any decisions made will typically be adapted to the environment. Most basically, the proposal focuses on the consequences of assuming that human beings are motivated to bring about desired events, and eliminate present or future events that include distress.

The occurrence of motivation is the key to understanding the system. Clearly, the present account of behaviour is inadequate in some respects, but it seems to us that, given the theory of evolution, states of motivation could provide the basic means by which adaptive behaviour may, in general, be realised.

Of course, no matter how many predictions (deductions) any theory makes within its own domain, be it one of physics or biology for example, that theory can never be shown to be true. There is always the logical possibility that some alternative theory might also predict the same effects (see Poincare, 1952) – and that the alternative theory may be the correct theory. However, for all its inadequacies, it seems to us that, at present, no theory other than

one which includes the hypothesis that we have free will, which we are disposed to exercise adaptively, comes even close to explaining the existence of consciousness. And until it does, we suggest that further work, either empirical or conceptual, concerning the implications which follow from such a theory may be fruitful.

And, what is the alternative? Perhaps as McGinn (1991) suggests, human beings are constitutionally unable to address adequately the problem of consciousness – a bleak prospect, but a possible one. So, you pays your money and you takes your choice!

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Footnotes.

1: First, however, a disclaimer! Much will be said in this paper that concerns consciousness. However, nothing will be said as to *how* conscious states, are generated – for the simple reason that we have nothing helpful to say in this regard. We can suggest only, as supposed by those who assume that states of consciousness are epiphenomenal (Huxley, 1874), that they are correlates of physical events such as the firing of neurones. The difference between epiphenomenalism and what is argued here is that we assume that present sensations, the prediction of future sensations, and motivational states, all of which enter consciousness, serve a practical function (in the adaptive exercise of free will) as opposed to the absence of any function in the case of epiphenomenalism.

2. A philosopher might point out that part of the meaning of the term ‘sensation’ is that the sensation is apprehended -- so why say that the sensation is apprehended, as if to suggest that there are two independent states, the existence of a sensation and its apprehension? Nevertheless, be that as it may, it seems to us that the most important fact about sensations is that they *are* apprehended, just as the most important fact about husbands is that they are married (see also, Strawson, 1989, p. 5-6.)

3. We offer no definition of thinking here. However, we believe it is unlikely that it consists of the formulation of an idea in some natural language (e.g., English). We believe that natural language has arisen primarily for communication between individuals and is predicated on the prior evolution of other perceptual and cognitive systems.