

The Truth about Near-Death Experiences

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1. Introduction

Amongst the phenomena pointing to the survival of consciousness of bodily death, Near-Death Experiences (NDE) are possibly the most compelling. They are also, however, the best known by anybody interested in the subject of survival. Countless books have been written on the subject, several feature documentaries and even a couple of Hollywood movies have been produced. My readers, therefore, may wonder why I decided to initiate a mini-series of articles dealing with NDEs.

My motivation is that I feel that more clarity is needed. I would like to think that, like myself, the community who follows my writing is mostly composed of “rationalist believers” – individuals who are convinced of the survival hypothesis neither on the basis of faith nor even on the basis of a generic “desire to believe”. Rather, I think, most of us “believe” on the basis of empirical data. Facts are what matters here: following a true scientific approach, we feel compelled to follow the data, wherever that may take us. I also think that we all should be advocates for the truth as we have – always tentatively, provisionally – come to understand it. In the specific case of NDEs, there is one “truth” that is frequently challenged, at times even by open-minded and well-informed observers, and I think that we should be very clear about the arguments and the counter-arguments so that, if we want, we can play our advocates role.

I am talking here of the fact that, before strongly suggesting the survival of consciousness, NDEs are fundamentally at odds with the materialist theories of mind. If NDEs as we understand them are true, then mind and consciousness are not merely the product of the electrochemical activity of the brain. This may seem a secondary point, whilst I believe it is absolutely primordial. The fact that mind and consciousness are somehow independent of and more than the physical brain provides the foundation for a rational belief in life after life. One can open up to the idea of survival if one has, beforehand, understood that mind and brain are not the same thing.

As I follow debates and controversies, I am disconcerted to hear age-old “explanations” being regurgitated again and again, regardless of the fact that they were shown to be incompatible with the empirical data 10 or 20 years ago. I am incensed by the widespread intellectual and methodological mistake of ignoring anecdotal evidence. I am annoyed by the all-too-common promissory materialist explanations: “We don’t know yet, but we’re on the verge of understanding it all – the brain, after all, is much more complex than we think...”

If all this was coming from the sorry lot we call the skeptics, then I wouldn't worry too much. My problem is that, as I mentioned, you hear such arguments from philosophers of mind and other scholars who are not staunch materialists. These people are open – at least in principle – to the fact that mind could be more than neurons, but they still believe that data from NDE research can somehow be made to fit within the prevailing materialist paradigm. This incapacity of “taking the plunge” and accepting the extreme consequences of what the data seem to indicate makes the efforts of these educated and intelligent thinkers pointless.

In this mini-series of articles, therefore, I will attempt to build as a systematic, logical and compelling case as I can to argue that NDEs are fundamentally incompatible with the brain-generates-the-mind paradigm. I hope this will be of general interest to my readers, and possibly of use to those who may want to engage in discussions with open-minded critics.

After this introduction, we will start with the very basics, that is understanding what, according to the prevailing materialist theories of mind, is necessary to produce consciousness. That in itself, I believe, should be enough to make the entire house of cards fall in light of the NDE facts, but there will be much, much more.

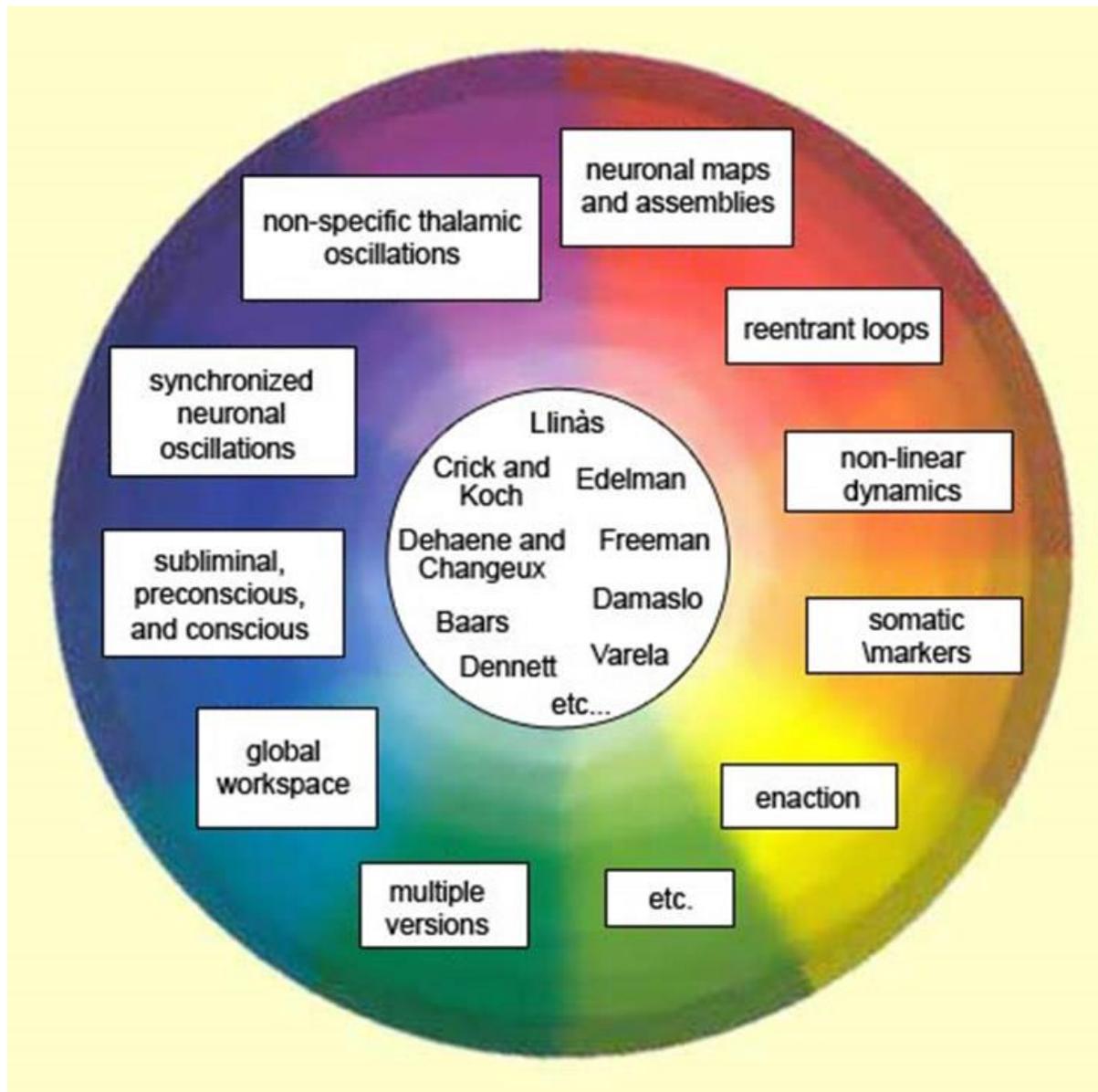
2 - Theories of Mind

I find it extraordinary how those of us who are not professional neuroscientists are made to feel – and, as a consequence, to some extent do feel – like complete idiots when discussing the nature of consciousness. “Oh, you don't know how consciousness is generated” asks The Scientist with raised eyebrows, “You poor dumbwit?” And then he proceeds to wave under your nose colourful images of functional MRI scans. “We know: consciousness is in the brain. And if you think otherwise, not only you are ignorant, you really are a complete idiot.”

Pay attention to how quick is the waving of the images under your nose, though. They don't want you to be able to take a good look, because their evidence is a lot less rock-solid than they claim it to be. And, especially, one thing is certain: they don't know. In fact, not only there is no commonly accepted definition of consciousness, but also, and critically for our discussion here, nobody can answer fundamental questions such as: When does consciousness start? When does it end? What is necessary and sufficient for its appearance?

You think I'm biased because of my “unscientific nomaterialist inclinations”? Think again. Writing in the *Journal of Consciousness Studies*, American philosopher John Searle says: “We don't know how it works and we need to try all kinds of different ideas.” Ken Paller, Ph.D., professor of psychology at Northwestern University clarifies: “The debate about the neural basis of consciousness rages because there is no widely accepted theory about what happens in the brain to make consciousness possible. Scientists and others acknowledge that damage to the brain can lead to systematic changes in consciousness. Yet, we don't know exactly what differentiates brain activity associated with conscious experience from brain activity that is instead associated with mental activity that remains unconscious.”

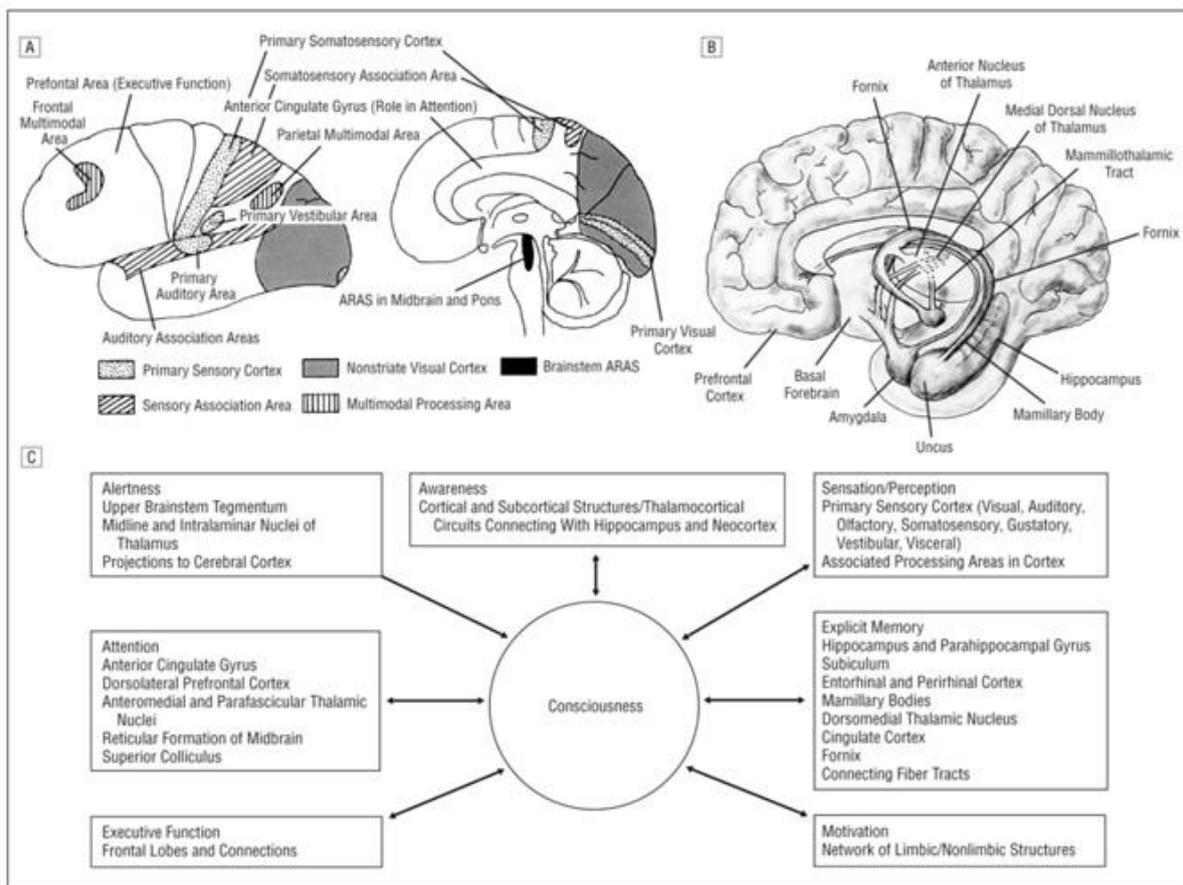
So, dear reader, it seems that after all you are not a dumbwit and are at least as confused as the professional neuroscientists who claim to have it all under control. The “state of the art” about knowledge and theories on the supposed neurological basis of consciousness is well captured by a series of articles produced by McGill University in Canada. From the point of view of a staunch materialist, it looks disheartening. The image below attempts to capture the currently fashionable theories (authors’ names in the centre) and the systems/processes that are thought to be involved.



However, we are not concerned here with proving the disarray of the materialist attempts to provide a unified, consensual and working theory of consciousness. Instead, I would like to focus on what brings such theories together, rather than on what drives them apart. This is essential for our discussion of NDEs and how they are fundamentally incompatible with the brain-generates-mind assumption.

Different theories may be based on different and incompatible models, but they have one premise in common: the emergence of consciousness, awareness, self-awareness, cognition and the production of long-term memories require the coordinated functioning of many different areas of the brain. Critically, most of these areas belong to the cortex, the outer, evolutionarily most recently developed layer of the brain. Especially critical, it would appear, are the frontal lobes, so prominently developed in humans. Researchers Young and Piggot write, “The frontal lobes are believed to organize input, devise retrieval strategies, verify output, and place it in the proper historic context. Prefrontal regions then use this information to provide further mnemonic searches and to direct and plan further action. Aspects of cognitive awareness are probably not diffusely and homogeneously distributed throughout the brain. Lesions of the frontal, inferior parietal, and superior temporal regions disturb the integration of cognitive and affective components of awareness.”

The following picture summarises the anatomical functional units of the brain with their suggested relevance to consciousness.



I would like to end this first substantive article in the NDE mini-series with the first of a series of conclusions, or statements, on which I will base my case. Throughout the next articles I will provide more of these, and they are essential. I would therefore like to ask you to pay particular attention to them and if possible make a note for future reference.

Statement 1: According to the prevailing theories in neuroscience, any conscious experience – notably including a highly complex experience such as an NDE, involving the formation of detailed, long-lasting memories and resulting in significant psychological and behavioural changes – requires the full functionality and coordination of several anatomical functional units of the brain, most of which are located in the cerebral cortex.

In the next article we will briefly discuss what happens to the brain during a cardiac arrest, and we'll consider whether the phenomenology of an NDE during such an event is compatible with Statement 1.

3. What happens after a cardiac arrest

In this mini-series of articles, I set out to “build as a systematic, logical and compelling case as I can to argue that NDEs are fundamentally incompatible with the brain-generates-the-mind paradigm”. In the previous article I briefly reviewed the failure of the current attempts to provide a comprehensive model of how consciousness might – according to materialist neuroscience – be generated by the brain. I concluded the article by stressing that, notwithstanding differences and mutual incompatibilities, all such theories agree that:

“Any conscious experience – notably including a highly complex experience such as an NDE, involving the formation of detailed, long-lasting memories and resulting in significant psychological and behavioural changes – requires the full functionality and coordination of several anatomical functional units of the brain, most of which are located in the cerebral cortex.”

I presented this as “statement one” in my building my case and asked my readers to make a good mental note of it.

Now it is time to look at what happens to the brain immediately after a cardiac arrest. We do so not because NDEs are reported only following such events, but rather because a wealth of studies tell us rather exactly what physiological and functional changes occur in the central nervous system (CNS) after the supply of blood (and therefore oxygen and glucose) to the brain has stopped.

The chain of event is dramatically quick, and utterly catastrophic. Within one to one and a half seconds after the heart stopped beating, lights go out. We abruptly lose any consciousness, awareness, cognition. If perception still takes place, sensory stimuli are not converted into a conscious experience. Memory formation simply does not take place. The patient goes from full waking consciousness to deep coma in an instant.

As I write these words, I realise that I might as well just stop here. These very initial stages of the collapse of the functions of the CNS would already be enough: whatever is claimed to be necessary for the emergence of consciousness, awareness, cognition and memory formation is quite simply not there anymore within two seconds from a cardiac arrest.

However, we are told that “the brain is infinitely more complex than we think” and “it does not shut down at once” and “whilst there is no consciousness, many deeper functions may still be going on”. So, let’s see how the chain of events proceeds.

Within another 10 seconds, breathing stops. This is a crucial sign, not only because the absence of heartbeat and breathing typically denotes death, but also – and especially, for my case – because of what breathing depends on. Breathing is controlled by a respiratory control centre located deep into the brain stem. This is the oldest part of our brain, the most fundamental for our very survival. Please understand this clearly: the fact that an absolutely vital part of the brain stem stops working means that – inside 10 seconds from heart failure – the brain is completely shut down. All the brain, from the highest cortical centres all the way down to the deepest structures – everything is not functional.

And not only that. Within 20 seconds even the simplest autonomic functions such as the gagging and corneal reflexes are gone. Physiologically, these are brutally simple “reflex arcs”: a sensory receptor receives an environmental stimulus, such as objects reaching nerves in the back of the throat, and sends a message via an afferent nerve to the CNS. The CNS receives this message and sends an appropriate response via an efferent nerve (also known as a motor neuron) to effector cells located in the same initial area that can then carry out the appropriate response. In the case of the gagging reflex, the sensory limb is mediated predominantly by the glossopharyngeal nerve and the motor limb by the vagus nerve.

In my opinion, claiming that there may be parts of the brain still functioning (and capable of supporting consciousness!) whilst most basic, elemental features such as arc reflexes are absent is an insult to intelligence and common sense. But, you know, I am not a neuroscientist myself...

Let’s hear from a neuroscientist, then. You will have noticed that I stayed away from the electroencephalogram (EEG) debate. I did so because I think that the absence of fundamental activities in the brainstem such as respiratory regulation and arc reflexes is a much better indication of brain inactivity than a flat EEG. However, it is now interesting to see what an academic neurologist (and the author of an acclaimed textbook on the clinical interpretation of EEG) has to say. According to John Greenfield, Professor of Neurology at the University of Toledo, College of Medicine, “When the brain is not getting much blood, it pretty much shuts down. And whether that ends up being permanent depends on how long the blood flow is shut off. But in that time when it’s not getting very much, there’s really very little activity going on and it would be very unlikely that somebody could have a complex sort of dream-like state as described for most near-death experiences, at least during that time. Furthermore, there are studies that look at blood flow to the brain or glucose utilization in the brain. There are also a few radio isotope kind of tracer studies that let you look at those questions and very often they show very little brain activity. So a flat EEG typically correlates with a very inactive brain.”

Let me therefore conclude with a simple and unequivocal statement, which then becomes the second in my series:

Statement 2: Immediately following a cardiac arrest, the “full functionality and coordination of several anatomical functional units of the brain, mostly located in the cerebral cortex” which is commonly believed to support the emergence of consciousness, awareness, cognition and the formation of memories cease to exist.

Faced with this conundrum, the response by “NDE negationists” points to the timing of events. We will discuss that in due course. Beforehand, however, we have to amuse ourselves looking at a number of “explanations” which have been put forward in the past and are frequently regurgitated, in blatant contrast with Statements 1 and 2.

4. Materialist explanations do not account for the facts

As promised, we will now briefly review the main mechanisms proposed in order to explain the Near-Death Experience within a materialist paradigm.

First and foremost, critics say that NDEs are inventions. People just fantasise. And they imagine such things because nowadays almost everybody has heard of such experiences, as there are tons of books on the subject and even a couple of Hollywood movies. Data say otherwise: NDE reports are not limited to the modern world. In fact, descriptions of this experience – often using exactly the same words as we hear today – can be found in the literature of ancient Greece and Mesopotamia, some 25 centuries ago. Furthermore, children as young as three or four report experiences which are essentially identical to the ones reported by adults. That in itself invalidates the “fantasy” explanation.

The bottom line question, however, is: how would people fantasise anything at all when their brains are out?

Ignoring the key question, the skeptics march on and claim that NDEs are projections of what people expect to see in a hypothetical afterlife, or what they want to see. Here again, research shows that NDEs are not correlated with age, race, sexual orientation or economic status. The likelihood, depth and content of the NDE are not correlated with pre-existing religious beliefs. Religious beliefs only appear to influence how one component of the experience (meeting superior/spiritual beings) is described. Although there certainly are individual differences amongst experiencers, globally NDEs truly appear as a universal experience.

The point remains, however, again: how would people project anything at all when their brains are out?

More ignoring of the bottom line question, and more “explanations” by the skeptics: NDEs are just hallucinations produced by a dying brain. Looking at the evidence, we discover that:

Hallucinations are usually illogical, fleeting, bizarre, and/or distorted, whereas the vast majority of NDEs are logical, orderly, clear, and comprehensible.

People tend to forget their hallucinations, whereas most NDEs remain vivid for decades.

NDEs often lead to profound and permanent transformations in personality, attitudes, beliefs and values, something that is never seen following hallucinations.

People looking back on hallucinations typically recognize them as unreal, as fantasies, whereas, people often describe their NDEs as “more real than real.”

Finally, people who have experienced both hallucinations and an NDE describe them as being quite different.

And... how could people hallucinate anything at all when their brains are out?

The next most popular skeptic explanation is that the phenomenon is caused by falling levels of oxygen in the brain – what is technically known as hypoxia. In reality, this is a daft explanation, as the symptoms of hypoxia have nothing to do with the content of a near death experience. Secondly, and most importantly, physicians have compared oxygen levels of cardiac arrest survivors who did and did not have NDEs and their findings discredit the anoxia hypothesis. In fact, in one study, the NDErs had higher oxygen levels than non-NDErs.

I know you’re getting tired of the key question by now, but let me ask again: how would people experience symptoms of hypoxia when their brains are out?

Another explanation looks at the blood levels of another gas, carbon dioxide. As breathing stops and oxygen levels go down, carbon dioxide levels go up. This is called hypercarbia. There are several problems with this hypothesis:

- 1) Some symptoms of hypercarbia are very similar to a near-death experience, but others are absolutely not.
- 2) Carbon dioxide levels in the blood of patients under resuscitation are closely monitored. No ICU team would allow a significant build-up. In one study, whilst having an NDE, a patient had even a lower than normal concentration of CO₂ in his blood.

The eternal question remains: how would people experience hypercarbia symptoms when they have no functioning brain?

A more sophisticated tentative explanation says that the NDE is similar to a seizure – an epileptic fit – particularly of the temporal lobe. In this respect, let’s see what Ernst Rodin, professor of neurology at Wayne State University in the US had to say: “The hallmarks and nuclear components of NDEs are a sensation of peace and even bliss, the knowledge of having died and, as a result, being no longer limited to the physical body. In spite of having seen hundreds of patients with temporal lobe seizures during three decades of professional life, I have never come across that symptomatology as part of seizure.”

I am not asking the key question again...

Let me then draw conclusions from this brief review of the attempts to provide a materialist explanation of the NDE, and formulate the third key statement of my logical argument.

Statement 3: Each and every one of the mechanisms proposed so far to explain Near-Death Experiences (fantasy, projections, hallucinations, hypoxia, hypercarbia and temporal lobe seizures) is incompatible with empirical data. More fundamentally, all of them would require a functioning brain in order to produce the experience.

So, if all these explanations don't work, then perhaps it is just a matter of timing? Stay tuned, as we will discuss this interesting hypothesis in the next article.

5. A matter of timing?

In the previous articles of this mini-series, we have discussed the impossibility of reconciling the brain-generates-mind paradigm with the fact that people seem to have fully conscious experiences and generate long lasting, detailed memories when their brains are not functioning following a cardiac arrest. We have made allowance for the fact that perhaps some deep structures in the brain may remain functional for a limited time (although this is difficult to believe, given the disappearance of the most fundamental autonomic reflexes like gagging), but it is plainly apparent that the "full functionality and coordination of several anatomical functional units of the brain, mostly located in the cerebral cortex" which is commonly believed to support the emergence of consciousness, awareness, cognition and the formation of memories is quite simply not there.

Materialists are then cornered into raising the issue of timing. The Near-Death Experience, they say, is produced either before the loss of functioning of the brain or after, as the brain gradually recovers its functioning. This is a crucially important point, and we will use this article and the next to delve with it in some depth.

First of all, let me remind you of a very important phenomenological ("what happens") aspect of the NDE. This experience, as commonly described by survivors of cardiac arrest, is perfectly logical and sequential: I felt sick, then I fell on the ground, then I left my body, then I saw my body lying about, then I saw people coming, then I saw the ambulance arrive. Etcetera, throughout the whole experience up to the point of return into the body. We define this feature of the NDE as continuity of experience. Please remember this.

Now, let's look at the "before" hypothesis and consider the process of fainting, which is a much-smaller-scale version of what happens in case of a cardiac arrest. In the case of fainting, the supply of blood to the brain is not interrupted altogether, it simply diminishes because our blood pressure drops a little. And that is enough to make us lose consciousness. Anybody who's ever fainted knows that the process is practically instantaneous: we go from full waking consciousness to blackout in a fraction of a second.

Question: how can the continuity of experience be maintained if the experience is had in that fraction of a second? Second question: how can an experience which is subjectively perceived as lasting five, ten, sometimes twenty minutes be had in that fraction of a second? Third question: how can an experience that is remembered in vivid, minute details some 20 or 25 years later – and which determines well documented, life-transforming psychological and behavioural changes in the experiencer – be had in that fraction of a second?

As far as the “after” hypothesis is concerned, it should suffice to note that, whilst the recovery from unconsciousness typically happens through a period of disorientation and confusion, as we said several times already, the NDE is logical, coherent, lucid, generally described as “more real than real”. Moreover, the formation of extremely detailed, long-lasting memories is in itself a most puzzling aspect. Imagine for a second that the NDE was an elaborate dream. Think about what you remember about your own last night’s dreams, and reflect on the fact that you are not recovering from unconsciousness, and your brain is functioning perfectly. Think about what you will remember about last night’s dreams 20 years from now. Finally, think how likely is it that a “dream” a patient has waking up from a period of unconsciousness following cardiac arrest (a particularly realistic dream, mind you, and one which is very similar across very different patients...) is remembered 20 years later in precise details, even if the patient was disoriented and confused at the moment and his/her brain was not yet functioning properly.

From this most superficial review we can draw another conclusion, which I will capture with my statement number four.

Statement 4: The most basic phenomenological aspects of the NDE (including the continuity of experience, the patient’s lucidity and orientation during the experience and the formation of long-lasting, detailed memories) are incompatible with the hypothesis that the experience is had immediately before or immediately after the period of unconsciousness caused by cardiac arrest.

“Aha! – the materialists say – You see how ignorant you are? You don’t know anything about the way people reconstruct memories, mixing stray pieces of information with fantasy and misperceptions, and conjuring up an experience which is then placed in a timeline that makes it appear as if it were had during the period of unconsciousness.”

Fair enough. It is true that perception and memory forming studies do show that, many times, what we think we perceive and remember does not correspond to reality. The idea that the NDE is some sort of fantasy reconstructed post-facto (by everybody, in the same manner, with the same features and details) and precisely placed in time (by everybody, at the same point in time) may sound as an excessively complicated theory – one which requires too many assumptions in order to be true. And, it will certainly sound as an insult to the experiencers themselves.

However, I am attempting to construct a logical case, based on evidence – one that would hold up in a court of law. Therefore, we have to look at the facts again, and look for evidence for the fact that the experience is actually had at the moment the patients say they have it,

that is, crucially, during the period in which the parts of the brain commonly believed to generate consciousness are not functioning.

Such evidence comes from the reported content of the OBE (Out of Body Experience) which is frequently part of the NDE. Although – and this is very important for the strength of my argument – there are a number of independently replicated scientific studies that strongly suggest that NDErs indeed have veridical perceptions during the period in which their brain was not functioning (we will review them in the next article), it is true that most of the evidence for such veridical perceptions during the OBE part of an NDE is anecdotal.

That is, for the skeptics this evidence simply does not exist. It does not matter that anecdotes number in the hundreds: “The plural of anecdotes is not data”, they say. As pointed out by thinkers and scholars immensely more learned than myself, disregarding anecdotal information when trying to build a picture of reality is a major intellectual and methodological mistake. Anecdotes (the stories people tell) are the foundation of our legal system, for instance. Imagine what legal proceedings would be if we automatically disregarded the testimony of witnesses in court. Imagine what the work of a GP would be if he or she was to automatically classify as “inaccurate, unreliable, flawed” anything a patient says during a consultation. And, the fact that this morning I had coffee in the kitchen with my wife and one of our two cats has not appeared in a peer-reviewed scientific journal. Nevertheless, it is a fact.

In concluding this article, I would like to point my readers to a well-known example of such anecdotes (I am sure most will already know the story). As you watch this 10-minute excerpt from a documentary, ask yourself – How can anybody in their right mind completely reject a story like this – with its complex network of coherent and consistent information coming from such diverse sources – as one of the sources that must be used in building a picture of reality?

(copy this and paste it into your browser)

<https://www.youtube.com/watch?v=Bu1ErDeQ0Zw>

Then, in the next article we’ll review the “proper” scientific evidence for veridical perceptions.

6. Veridical perceptions during NDEs

This is the second-last article of a relatively long mini-series dedicated to discussing why I consider Near-Death Experiences an absolutely major challenge to the currently fashionable theory that mind is exclusively generated by the brain. Here we will review additional evidence suggesting that the “hyper-lucid” experience described by NDErs is had not before or after, but rather at the time when the person is deeply unconscious. Such evidence, in general, comes from the content of the Out Of Body Experience (OBE) many NDErs report to have during an NDE. During this phase of the experience, NDErs have clear visual and

auditory perceptions, including of their body, the medical staff going about resuscitation, the equipment used, and sometimes of very peculiar details which are later checked and found correct.

Before delving further into this particular subject, we have to further discredit the skeptics/materialists' claim that the NDEs are just fantasies. A recent study at the University of Liège (Belgium) compared the characteristics of memories of near-death experience with those of memories after coma without NDE, and after both actual and imagined events. Although the samples were small, the findings are surprisingly strong. The memories of NDEs included significantly more detail, a greater sense of personal involvement, and far higher emotional content than any of the other memories, including those of actual events (!). The researchers observe that NDEs have too many vivid characteristics to be considered imagined events; they acknowledge the NDEs as real perceptions. Prof Caroline Watts of the Koestler parapsychology Unit in Edinburgh (a staunch sceptic claiming, among other things, that NDEs are "fantasies") please take note.

Now, we have briefly discussed in the last article the fact that the evidence about veridical perceptions during the OBE part of the NDE is mostly anecdotal, and I insisted that discarding anecdotes as irrelevant whilst trying to understand a phenomenon is a major intellectual and methodological mistake. The question is - Is there evidence about such veridical perceptions that is not anecdotal?

The answer is yes, but. Such evidence is there, primarily from investigations and to a small extent from controlled experiments, but admittedly it is not of such extraordinary strength as to silence the critics. Let's look at some of the data, then, and then I will explain my thinking.

First of all, there have been a number of investigations. NDErs claim that they can see details about surroundings, staff, procedures, equipment, and many other details. Can these perceptions be corroborated through in-depth verification? Yes they can. Writing in the Handbook of Near-Death Experiences, author J. Holden reports how - following exceedingly exacting criteria which led her to exclude thousands of cases - she identified 93 reports of out-of-body perceptions during NDEs, of which 80 were corroborated by an independent informant, 92% were completely accurate, 6% contained some error, and only 1% was completely erroneous.

American cardiologist Dr Michael Sabom went further, in order to disprove the theory that the NDErs' perceptions are fabricated based on knowledge from TV medical drama. He identified two similar-size groups of cardiac arrest patients, one group having had an NDE and the other one not having had an NDE. Both groups were asked to describe their resuscitation. The NDE group was uniformly accurate, including correctly recalling readings on medical machines outside their potential line of vision. Twenty of the twenty-three patients who did not have an NDE were highly inaccurate in describing their resuscitation. This certainly looks like verifiable and potentially reproducible validation of the OBE component of the NDE.

The same kind of investigation was carried out more recently by British researcher Penny Sartori as part of her PhD dissertation. She asked eight patients who reported 'material plane' OBEs to describe the resuscitation procedures they underwent, and found them to be highly accurate. When she asked a control group of 33 patients who reported no consciousness during cardiac arrest, or had an NDE without a 'material plane' OBE component, to imagine how they were resuscitated, she found that 28 could not even hazard a guess. The narratives of the five who would attempt it contained many errors about the equipment used and the procedures employed.

Moreover, in-depth, detailed research by Dr Kenneth Ring and his associates indicates that blind people - many of them blind from birth - experience what appears as normal vision during an OBE component of an NDE.

Data such as these should put any discussion to rest. And, in my personal view, they do, especially when not taken in isolation: we have a vast body of anecdotal evidence fully corroborated by investigations carried out by trained scientists.

However, for the sake of honesty and transparency, I have to point out that several experiments under controlled conditions aiming at proving beyond doubt that NDErs perceive things they definitely could not during an OBE have basically drawn a huge zero. There are no cases in literature in which NDErs have reported seeing decoy targets placed by the experimenters in locations (e.g. on top of cabinets) where they could not have been seen by normal means. And, the recently published AWARE study contains only one "certain" case of verified (auditory) perception at the moment when the patient's brain was positively not working.

Does the lack of experimental evidence invalidate the data from anecdotes and investigations? No, in my opinion it doesn't. There are two orders of reasons which go a long way in explaining why the experiments have so far failed, but discussing them goes beyond the scope of this article. My bottom line is that we have to accept the lack of 100 percent "watertight" experimental evidence as another maddening element of the puzzle.

I can therefore formulate the last statement in my logical argument.

Statement 5: Although conclusive experimental proof is still missing, both a vast body of anecdotal evidence and in-depth investigations carried out by trained scientists indicate that NDErs do perceive veridical details (and form long-lasting memories about them) as they are undergoing resuscitation, i.e. when all the cerebral functions commonly believed to support consciousness and memory formation are absent.

In the next and final article of the mini-series I will draw my conclusions.

7. Bringing it all together

Throughout the previous sections, I have taken my readers through a relatively superficial but as all-encompassing as I could ride exploring the science of Near-Death Experiences.

Those who have been following me since the beginning of this mini-series will remember that I set out to “build as a systematic, logical and compelling case as I can to argue that NDEs are fundamentally incompatible with the brain-generates-the-mind paradigm”.

I did not set out to build a case for the fact that NDEs provide further evidence of the survival of human consciousness to bodily death. I am personally convinced of that, but that was not the point. The survival hypothesis is the next logical step, and would raise the bar of criticism and skeptic fury even higher.

I simply set out to demonstrate that what we are constantly told to be a fact (the brain-generates-mind paradigm) is simply not true. Please review with me the five statements I have formulated throughout these articles:

1. According to the prevailing theories in neuroscience, any conscious experience – notably including a highly complex experience such as an NDE, involving the formation of detailed, long-lasting memories and resulting in significant psychological and behavioural changes – requires the full functionality and coordination of several anatomical functional units of the brain, most of which are located in the cerebral cortex.
2. Immediately following a cardiac arrest, the “full functionality and coordination of several anatomical functional units of the brain, mostly located in the cerebral cortex” which is commonly believed to support the emergence of consciousness, awareness, cognition and the formation of memories cease to exist.
3. Each and every one of the mechanisms proposed so far to explain Near-Death Experiences (fantasy, projections, hallucinations, hypoxia, hypercarbia and temporal lobe seizures) is incompatible with empirical data. More fundamentally, all of them would require a functioning brain in order to produce the experience.
4. The most basic phenomenological aspects of the NDE (including the continuity of experience, the patient’s lucidity and orientation during the experience and the formation of long-lasting, detailed memories) are incompatible with the hypothesis that the experience is had immediately before or immediately after the period of unconsciousness caused by cardiac arrest.
5. Although conclusive experimental proof is still missing, both a vast body of anecdotal evidence and in-depth investigations carried out by trained scientists indicate that NDErs do perceive veridical details (and form long-lasting memories about them) as they are undergoing resuscitation, i.e. when all the cerebral functions commonly believed to support consciousness and memory formation are absent.

The prevailing theories in neuroscience concerning the emergence of consciousness are therefore wrong. Alternative number one: a “hyper-conscious” experience with its associated detailed memories and life-transforming psychological changes can be produced

by the poorly organised activity of groups of neurons which might still be functioning when the rest of the brain is shut down. Alternative number two: consciousness is not generated by the brain - it is a more fundamental component of reality, which a functioning brain "tunes into" but which exists independently.

At the beginning of this mini-series I also said that I was providing this as an "aid" to those who would like to take on skeptics and materialists. In my view, a critical review of the evidence we have leaves only the two alternatives mentioned above, both of which invalidate current theories.