

## **Near-Death Experiences: In or out of the body?**

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What is it like to die? Although most of us fear death to a greater or lesser extent, there are now more and more people who have "come back" from states close to death and have told stories of usually very pleasant and even joyful experiences at death's door.

For many experiencers, their adventures seem unquestionably to provide evidence for life after death, and the profound effects the experience can have on them is just added confirmation. By contrast, for many scientists these experiences are just hallucinations produced by the dying brain and of no more interest than an especially vivid dream.

So which is right? Are near-death experiences (NDEs) the prelude to our life after death or the very last experience we have before oblivion? I shall argue that neither is quite right: NDEs provide no evidence for life after death, and we can best understand them by looking at neurochemistry, physiology, and psychology; but they are much more interesting than any dream. They seem completely real and can transform people's lives. Any satisfactory theory has to understand that too—and that leads us to questions about minds, selves, and the nature of consciousness.

### **Deathbed Experiences**

Toward the end of the last century the physical sciences and the new theory of evolution were making great progress, but many people felt that science was forcing out the traditional ideas of the spirit and soul. Spiritualism began to flourish, and people flocked to mediums to get in contact with their dead friends and relatives "on the other side." Spiritualists claimed, and indeed still claim, to have found proof of survival.

In 1882, the Society for Psychical Research was founded, and serious research on the phenomena began; but convincing evidence for survival is still lacking over one hundred years later (Blackmore 1988). In 1926, a psychical researcher and Fellow of the Royal Society, Sir William Barrett (1926), published a little book on deathbed visions. The dying apparently saw other worlds before they died and even saw and spoke to the dead. There were cases of music heard at the time of death and reports of attendants actually seeing the spirit leave the body.

With modern medical techniques, deathbed visions like these have become far less common. In those days people died at home with little or no medication and surrounded by their family and friends. Today most people die in the hospital and all too often alone. Paradoxically it is also improved medicine that has led to an increase in quite a different kind of report— that of the near-death experience.

### **Close Brushes with Death**

Resuscitation from ever more serious heart failure has provided accounts of extraordinary experiences (although this is not the only cause of NDEs). These remained largely ignored until about 15 years ago, when Raymond Moody (1975), an American physician, published his best-selling *Life After Life*. He had talked with many people who had "come back from death," and he put together an account of a typical NDE. In this idealized experience a person hears himself pronounced dead. Then comes a loud buzzing or ringing noise and a long, dark tunnel. He can see his own body from a distance and watch what is happening. Soon he meets others and a "being of light" who shows him a playback of events from his life and helps him to evaluate it. At some point he gets to a barrier and knows that he has to go back. Even though he feels joy, love, and peace there, he returns to his body and life. Later he tries to tell others; but they don't understand, and he soon gives up. Nevertheless the experience deeply affects him, especially his views about life and death.

Many scientists reacted with disbelief. They assumed Moody was at least exaggerating, but he claimed that no one had noticed the experiences before because the patients were too frightened to talk about them. The matter was soon settled by further research. One cardiologist had talked to more than 2,000 people over a period of nearly 20 years and claimed that more than half reported Moody-type experiences (Schoonmaker 1979). In 1982, a Gallup poll found that about 1 in 7 adult Americans had been close to death and about 1 in 20 had had an NDE. It appeared that Moody, at least in outline, was right. In my own research I have come across numerous reports like this one, sent to me by a woman from Cyprus:

*An emergency gastrectomy was performed. On the 4th day following that operation I went into shock and became unconscious for several hours. . . Although thought to be unconscious, I remembered, for years afterwards, the entire, detailed conversation that passed between the surgeon and anaesthetist present.... I was lying above my own body, totally free of pain, and looking down at my own self with compassion for the agony I could see on the face; I was floating peacefully Then . . . I was going elsewhere, floating towards a dark, but not frightening, curtain-like area.... Then I felt total peace.*

*Suddenly it all changed—I was slammed back into my body again, very much aware of the agony again.*

Within a few years some of the basic questions were being answered. Kenneth Ring (1980), at the University of Connecticut, surveyed 102 people who had come close to death and found almost 50 percent had had what he called a "core experience." He broke this into five stages: peace, body separation, entering the darkness (which is like the tunnel), seeing the light, and entering the light. He found that the later stages were reached by fewer people, which seems to imply that there is an ordered set of experiences waiting to unfold.

One interesting question is whether NDEs are culture specific. What little research there is suggests that in other cultures NDEs have basically the same structure, although religious background seems to influence the way it is interpreted. A few NDEs have even been recorded in children. It is interesting to note that nowadays children are more likely to see living friends than those who have died, presumably because their playmates only rarely die of diseases like scarlet fever or smallpox (Morse et al. 1986).

Perhaps more important is whether you have to be nearly dead to have an NDE. The answer is clearly no (e.g., Morse et al. 1989). Many very similar experiences are recorded of people who have taken certain drugs, were extremely tired, or, occasionally, were just carrying on their ordinary activities.

I must emphasize that these experiences seem completely real—even more real (whatever that may mean) than everyday life. The tunnel experience is not like just imagining going along a tunnel. The view from out of the body seems completely realistic, not like a dream, but as though you really are up there and looking down. Few people experience such profound emotions and insight again during their lifetimes. They do not say, "I've been hallucinating," "I imagined I went to heaven," or "Can I tell you about my lovely dream?" They are more likely to say, "I have been out of my body" or "I saw Grandma in heaven."

Since not everyone who comes close to death has an NDE, it is interesting to ask what sort of people are more likely to have them. Certainly you don't need to be mentally unstable. NDEers do not differ from others in terms of their psychological health or background. Moreover, the NDE does seem to produce profound and positive personality changes (Ring 1984). After this extraordinary experience people claim that they are no longer so motivated by greed and material achievement but are more concerned about other people and their needs. Any theory of the NDE needs to account for this effect.

### **Explanations of the NDE**

**Astral Projection and the Next World:** Could we have another body that is the vehicle of consciousness and leaves the physical body at death to go on to another world? This, essentially, is the doctrine of astral projection. In various forms it is very popular and appears in a great deal of New Age and occult literature.

One reason may be that out-of-body experiences (OBEs) are quite common, quite apart from their role in NDEs. Surveys have shown that anywhere from 8 percent (in Iceland) to as much as 50 percent (in special groups, such as marijuana users) have had OBEs at some time during their lives. In my own survey of residents of Bristol I found 12 percent. Typically these people had been resting or lying down and suddenly felt they had left their bodies, usually for no more than a minute or two (Blackmore 1984).

A survey of more than 50 different cultures showed that almost all of them believe in a spirit or soul that could leave the body (Shells 1978). So both the OBE and the belief in another body are common, but what does this mean? Is it just that we cannot bring ourselves to believe that we are nothing more than a mortal body and that death is the end? Or is there really another body?

You might think that such a theory has no place in science and ought to be ignored. I disagree. The only ideas that science can do nothing with are the purely metaphysical ones—ideas that have no measurable consequences and no testable predictions. But if a theory makes predictions, however bizarre, then it can be tested.

The theory of astral projection is, at least in some forms, testable. In the earliest experiments mediums claimed they were able to project their astral bodies to distant rooms and see what was happening. They claimed not to taste bitter aloes on their real tongues, but immediately screwed up their faces in disgust when the substance was placed on their (invisible) astral tongues. Unfortunately these experiments were not properly controlled (Blackmore 1982~).

In other experiments, dying people were weighed to try to detect the astral body as it left. Early this century a weight of about one ounce was claimed, but as the apparatus became more sensitive the weight dropped, implying that it was not a real effect. More recent experiments have used sophisticated detectors of ultraviolet and infrared, magnetic flux or field strength, temperature, or weight to try to capture the astral body of someone having an out-of-body experience. They have even used animals and human "detectors," but no one has yet succeeded in detecting anything reliably (Morris et al. 1978).

If something really leaves the body in OBEs, then you might expect it to be able to see at a distance, in other words to have extrasensory perception (ESP). There have been several experiments with concealed targets. One success was Tart's subject, who lay on a bed with a five-digit number on a shelf above it (Tart 1968). During the night she had an OBE and correctly reported the number, but critics argued that she could have climbed out of the bed to look. Apart from this one, the experiments tend, like so many in parapsychology, to provide equivocal results and no clear signs of any ESP.

So, this theory has been tested but seems to have failed its tests. If there really were astral bodies I would have expected us to have found something out about them by now—other than how hard it is to track them down!

In addition there are major theoretical objections to the idea of astral bodies. If you imagine that the person has gone to another world, perhaps along some "real" tunnel, then you have to ask what relationship there is between this world and the other one. If the other world is an extension of the physical, then it ought to be observable and measurable. The astral body, astral world, and tunnel ought to be detectable in some way, and we ought to be able to say where exactly the tunnel is going. The fact that we can't, leads many people to say the astral world is "on another plane," at a "higher level of vibration," and the like. But unless you can specify just what these mean the ideas are completely empty, even though they may sound appealing. Of course we can never prove that astral bodies don't exist, but my guess is that they probably don't and that this theory is not a useful way to understand OBEs.

### **Birth and the NDE:**

Another popular theory makes dying analogous with being born: that the out-of-body experience is literally just that—reliving the moment when you emerged from your mother's body. The tunnel is the

birth canal and the white light is the light of the world into which you were born. Even the being of light can be "explained" as an attendant at the birth.

This theory was proposed by Stanislav Grof and Joan Halifax (1977) and popularized by the astronomer Carl Sagan (1979), but it is pitifully inadequate to explain the NDE. For a start the newborn infant would not see anything like a tunnel as it was being born. The birth canal is stretched and compressed and the baby usually forced through it with the top of its head, not with its eyes (which are closed anyway) pointing forward. Also it does not have the mental skills to recognize the people around, and these capacities change so much during growing that adults cannot reconstruct what it was like to be an infant.

*"Hypnotic regression to past lives" is another popular claim. In fact much research shows that people who have been hypnotically regressed give the appearance of acting like a baby or a child, but it is no more than acting. For example, they don't make drawings like a real five-year-old would do but like an adult imagines children do. Their vocabulary is too large and in general they overestimate the abilities of children at any given age. There is no evidence (even if the idea made sense) of their "really" going back in time.*

Of course the most important question is whether this theory could be tested, and to some extent it can. For example, it predicts that people born by Caesarean section should not have the same tunnel experiences and OBEs. I conducted a survey of people born normally and those born by Caesarean (190 and 36 people, respectively). Almost exactly equal percentages of both groups had had tunnel experiences (36 percent) and OBEs (29 percent). I have not compared the type of birth of people coming close to death, but this would provide further evidence (Blackmore 1982b).

In response to these findings some people have argued that it is not one's own birth that is relived but the idea of birth in general. However, this just reduces the theory to complete vacuousness.

### **Just Hallucinations:**

Perhaps we should give up and conclude that all the experiences are "just imagination" or "nothing but hallucinations." However, this is the weakest theory of all. The experiences must, in some sense, be hallucinations, but this is not, on its own, any explanation. We have to ask why are they these kinds of hallucinations? Why tunnels?

Some say the tunnel is a symbolic representation of the gateway to another world. But then why always a tunnel and not, say, a gate, doorway, or even the great River Styx? Why the light at the end of the tunnel? And why always above the body, not below it? I have no objection to the theory that the experiences are hallucinations. I only object to the idea that you can explain them by saying, "They are just hallucinations." This explains nothing. A viable theory would answer these questions without dismissing the experiences. That, even if only in tentative form, is what I shall try to provide.

### **The Physiology of the Tunnel:**

Tunnels do not only occur near death. They are also experienced in epilepsy and migraine, when falling asleep, meditating, or just relaxing, with pressure on both eyeballs, and with certain drugs, such as LSD, psilocybin, and mescaline. I have experienced them many times myself. It is as though the whole world becomes a rushing, roaring tunnel and you are flying along it toward a bright light at the end. No doubt many readers have also been there, for surveys show that about a third of people have—like this terrified man of 28 who had just had the anesthetic for a circumcision.

*I seemed to be hauled at "lightning speed" in a direct line tunnel into outer space; (not a floating sensation . . .) but like a rocket at a terrific speed. I appeared to have left my body.*

In the 1930s, Heinrich Klüver, at the University of Chicago, noted four form constants in hallucinations: the tunnel, the spiral, the lattice or grating, and the cobweb. Their origin probably lies in the structure of the visual cortex, the part of the brain that processes visual information. Imagine that the outside world is

mapped onto the back of the eye (on the retina), and then again in the cortex. The mathematics of this mapping (at least to a reasonable approximation) is well known.

Jack Cowan, a neurobiologist at the University of Chicago, has used this mapping to account for the tunnel (Cowan 1982). Brain activity is normally kept stable by some cells inhibiting others. Disinhibition (the reduction of this inhibitory activity) produces too much activity in the brain. This can occur near death (because of lack of oxygen) or with drugs like LSD, which interfere with inhibition. Cowan uses an analogy with fluid mechanics to argue that disinhibition will induce stripes of activity that move across the cortex. Using the mapping it can easily be shown that stripes in the cortex would appear like concentric rings or spirals in the visual world. In other words, if you have stripes in the cortex you will seem to see a tunnel-like pattern of spirals or rings.

This theory is important in showing how the structure of the brain could produce the same hallucination for everyone. However, I was dubious about the idea of these moving stripes, and also Cowan's theory doesn't readily explain the bright light at the center. So Tom Troscianko and I, at the University of Bristol, tried to develop a simpler theory (Blackmore and Troscianko 1989). The most obvious thing about the representation in the cortex is that there are lots of cells representing the center of the visual field but very few for the edges. This means that you can see small things very clearly in the center, but if they are out at the edges you cannot. We took just this simple fact as a starting point and used a computer to simulate what would happen when you have gradually increasing electrical noise in the visual cortex.

The computer program starts with thinly spread dots of light, mapped in the same way as the cortex, with more toward the middle and very few at the edges. Gradually the number of dots increases, mimicking the increasing noise. Now the center begins to look like a white blob and the outer edges gradually get more and more dots. And so it expands until eventually the whole screen is filled with light. The appearance is just like a dark speckly tunnel with a white light at the end, and the light grows bigger and bigger (or nearer and nearer) until it fills the whole screen. (See Figure 1.)

If it seems odd that such a simple picture can give the impression that you are moving, consider two points. First, it is known that random movements in the periphery of the visual field are more likely to be interpreted by the brain as outward than inward movements (Georgeson and Harris 1978). Second, the brain infers our own movement to a great extent from what we see. Therefore, presented with an apparently growing patch of flickering white light your brain will easily interpret it as yourself moving forward into a tunnel.

The theory also makes a prediction about NDEs in the blind. If they are blind because of problems in the eye but have a normal cortex, then they too should see tunnels. But if their blindness stems from a faulty or damaged cortex, they should not. These predictions have yet to be tested.

According to this kind of theory there is, of course, no real tunnel. Nevertheless there is a real physical cause of the tunnel experience. It is noise in the visual cortex. This way we can explain the origin of the tunnel without just dismissing the experiences and without needing to invent other bodies or other worlds.

### **Out of the body experiences:**

Like tunnels, OBEs are not confined to near death. They too can occur when just relaxing and falling asleep, with meditation, and in epilepsy and migraine. They can also, at least by a few people, be induced at will. I have been interested in OBEs since I had a long and dramatic experience myself (Blackmore 1982a).

It is important to remember that these experiences seem quite real. People don't describe them as dreams or fantasies but as events that actually happened. This is, I presume, why they seek explanations in terms of other bodies or other worlds.

However, we have seen how poorly the astral projection and birth theories cope with OBEs. What we need is a theory that involves no unmeasurable entities or untestable other worlds but explains why the experiences happen; and why they seem so real.

I would start by asking why anything seems real. You might think this is obvious—after all, the things we see out there are real aren't they? Well no, in a sense they aren't. As perceiving creatures all we know is what our senses tell us. And our senses tell us what is "out there" by constructing models of the world with ourselves in it. The whole of the world "out there" and our own bodies are really constructions of our minds. Yet we are sure, all the time, that this construction—if you like, this "model of reality"—is "real" while the other fleeting thoughts we have are unreal. We call the rest of them daydreams, imagination, fantasies, and so on. Our brains have no trouble distinguishing "reality" from "imagination." But this distinction is not given. It is one the brain has to make for itself by deciding which of its own models represents the world "out there." I suggest it does this by comparing all the models it has at any time and choosing the most stable one as "reality."

This will normally work very well. The model created by the senses is the best and most stable the system has. It is obviously "reality," while that image I have of the bar I'm going to go to later is unstable and brief. The choice is easy. By comparison, when you are almost asleep, very frightened, or nearly dying, the model from the senses will be confused and unstable. If you are under terrible stress or suffering oxygen deprivation, then the choice won't be so easy. All the models will be unstable.

So what will happen now? Possibly the tunnel being created by noise in the visual cortex will be the most stable model and so, according to my supposition, this will seem real. Fantasies and imagery might become more stable than the sensory model, and so seem real. The system will have lost input control.

What then should a sensible biological system do to get back to normal? I would suggest that it could try to ask itself—as it were—"Where am I? What is happening?" Even a person under severe stress will have some memory left. They might recall the accident, or know that they were in hospital for an operation, or remember the pain of the heart attack. So they will try to reconstruct, from what little they can remember, what is happening.

Now we know something very interesting about memory models. Often they are constructed in a bird's-eye view. That is, the events or scenes are seen as though from above. If you find this strange, try to remember the last time you went to a pub or the last time you walked along the seashore. Where are "you" looking from in this recalled scene? If you are looking from above you will see what I mean.

So my explanation of the OBE becomes clear. A memory model in bird's-eye view has taken over from the sensory model. It seems perfectly real because it is the best model the system has got at the time. Indeed, it seems real for just the same reason anything ever seems real.

This theory of the OBE leads to many testable predictions, for example, that people who habitually use bird's-eye views should be more likely to have OBEs. Both Harvey Irwin (1986), an Australian psychologist, and myself (Blackmore 1987) have found that people who dream as though they were spectators have more OBEs, although there seems to be no difference for the waking use of different viewpoints. I have also found that people who can more easily switch viewpoints in their imagination are also more likely to report OBEs.

Of course this theory says that the OBE world is only a memory model. It should only match the real world when the person has already known about something or can deduce it from available information. This presents a big challenge for research on near death. Some researchers claim that people near death can actually see things that they couldn't possibly have known about. For example, the American cardiologist Michael Sabom (1982) claims that patients reported the exact behavior of needles on monitoring apparatus when they had their eyes closed and appeared to be unconscious. Further, he compared these descriptions with those of people imagining they were being resuscitated and found that the real patients gave far more accurate and detailed descriptions.

There are problems with this comparison. Most important, the people really being resuscitated could probably feel some of the manipulations being done on them and hear what was going on. Hearing is the last sense to be lost and, as you will realize if you ever listen to radio plays or news, you can imagine a very clear visual image when you can only hear something. So the dying person could build up a fairly accurate picture this way. Of course hearing doesn't allow you to see the behavior of needles, and so if Sabom is right I am wrong. We can only await further research to find out.

### **The Life Review:**

The experience of seeing excerpts from your life flash before you is not really as mysterious as it first seems. It has long been known that stimulation of cells in the temporal lobe of the brain can produce instant experiences that seem like the reliving of memories. Also, temporal-lobe epilepsy can produce similar experiences, and such seizures can involve other limbic structures in the brain, such as the amygdala and hippocampus, which are also associated with memory.

Imagine that the noise in the dying brain stimulates cells like this. The memories will be aroused and, according to my hypothesis, if they are the most stable model the system has at that time they will seem real. For the dying person they may well be more stable than the confused and noisy sensory model.

The link between temporal-lobe epilepsy and the NDE has formed the basis of a thorough neurobiological model of the NDE (Saavedra-Aguilar and Gomez-Jeria 1989). They suggest that the brain stress consequent on the near-death episode leads to the release of neuropeptides and neurotransmitters (in particular the endogenous endorphins). These then stimulate the limbic system and other connected areas. In addition, the effect of the endorphins could account the blissful and other positive emotional states so often associated with the NDE.

Morse provided evidence that some children deprived of oxygen treated with opiates did not have NDE-like hallucinations, and he and his colleagues (Morse et al. 1986) have developed a theory based on the role of the neurotransmitter serotonin, rather than the endorphins. Research on the neurochemistry of the NDE is just beginning and should provide us with much more detailed understanding of the life review.

Of course there is more to the review than just memories. The person feels as though she or he is judging these life events, being shown their significance and meaning. But this too, I suggest, is not so very strange. When the normal world of the senses is gone and memories seem real, our perspective on our life changes. We can no longer be attached to our plans, hopes, ambitions, and fears, which fade away and become unimportant, while the past comes to life again. We can only accept it as it is, and there is no one to judge it but ourselves. This is, I think, why so many NDEers say they faced their past life with acceptance and equanimity.

### **Other Worlds:**

Now we come to what might seem the most extraordinary parts of the NDE; the worlds beyond the tunnel and OBE. But I think you can now see that they are not so extraordinary at all. In this state the outside world is no longer real, and inner worlds are. Whatever we can imagine clearly enough will seem real. And what will we imagine when we know we are dying? I am sure for many people it is the world they expect or hope to see. Their minds may turn to people they have known who have died before them or to the world they hope to enter next. Like the other images we have been considering, these will seem perfectly real.

Finally, there are those aspects of the NDE that are ineffable—they cannot be put into words. I suspect that this is because some people take yet another step, a step into nonbeing. I shall try to explain this by asking another question. What is consciousness? If you say it is a thing, another body, a substance, you will only get into the kinds of difficulty we got into with OBEs. I prefer to say that consciousness is just what it is like being a mental model. In other words, all the mental models in any person's mind are all conscious, but only one is a model of "me." This is the one that I think of as myself and to which I relate everything else. It gives a core to my life. It allows me to think that I am a person, something that lives on

all the time. It allows me to ignore the fact that "I" change from moment to moment and even disappear every night in sleep.

Now when the brain comes close to death, this model of self may simply fall apart. Now there is no self. It is a strange and dramatic experience. For there is no longer an experiencer—yet there is experience.

This state is obviously hard to describe, for the "you" who is trying to describe it cannot imagine not being. Yet this profound experience leaves its mark. The self never seems quite the same again.

### **The After Effects:**

I think we can now see why an essentially physiological event can change people's lives so profoundly. The experience has jolted their usual (and erroneous) view of the relationship between themselves and the world. We all too easily assume that we are some kind of persistent entity inhabiting a perishable body. But, as the Buddha taught we have to see through that illusion. The world is only a construction of an information-processing system, and the self is too. I believe that the NDE gives people a glimpse into the nature of their own minds that is hard to get any other way. Drugs can produce it temporarily, mystical experiences can do it for rare people, and long years of practice in meditation or mindfulness can do it. But the NDE can out of the blue strike anyone and show them what they never knew before, that their body is only that— a lump of flesh—that they are not so very important after all. And that is a very freeing and enlightening experience.

### **And Afterwards?**

If my analysis of the NDE is correct, we can extrapolate to the next stage. Lack of oxygen first produces increased activity through disinhibition, but eventually it all stops. Since it is this activity that produces the mental models that give rise to consciousness, then all this will cease. There will be no more experience, no more self, and so that, as far as my constructed self is concerned, is the end.

So, are NDEs in or out of the body? I should say neither, for neither experiences nor selves have any location. It is finally death that dissolves the illusion that we are a solid self inside a body.

### **Note**

In November 1990 I visited the Netherlands to give two lectures. The first, on parapsychology, was part of a series organized by the Studium Generale of the University of Utrecht and titled "Science Confronts the Paranormal." The second was at the Skepsis Conference. Skepsis refers to the very active Dutch skeptics organization called Stichting Skepsis, which means "skeptical foundation." Cornelis de Jager, professor emeritus in astronomy, is the Chair. Skepsis was established in 1987 and publishes the journal *Skepter*. Stichting Skepsis also publishes conference proceedings and monographs on subjects like reincarnation, spiritism, and homeopathy. As its purpose is to educate the public, Skepsis received a starting grant from the government but is now self-supporting, thanks to many generous donations. This is the lecture I presented at the organization's 1990 conference, on "Belief in the Paranormal."

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An out-of-body experience is only one of the 16 possible elements of a near-death experience on the Greyson scale, and the proportion of experiencers who report having had one varies widely from one study to another.Â The machine confirmed that for a number of minutes Reynolds was effectively dead in both brain and body. Yet after the surgery she reported having had a powerful NDE, including an out-of-body experience, and accurately recalled several details about what was going on in the operating room, such as the shape of the bone saw used on her skull, snatches of conversations between the medical staff, and the staff listeningâ€”rather inappropriately, she remembered thinkingâ€”to â€œHotel Californiaâ€ (â€œYou.