Nature of Mind and Consciousness

Is Consciousness Produced by the Brain?

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Most Western neuroscientists assume that consciousness is produced in some way by the brain, although no mechanism has been proposed by which physical processes could produce thoughts, feelings, or sensations. However, there is a large body of empirical evidence suggesting that consciousness sometimes occurs in the absence of any brain activity. For more than 40 years, scientists at the University of Virginia have been studying phenomena that challenge the belief that consciousness is produced by the brain, including memories of past lives and "near-death experiences," in which complex thoughts, perceptions, and feelings occur while the brain is severely impaired, and experiencers report encounters with deceased persons and accurate perceptions from a visual perspective outside the body.

Bruce Greyson: Yesterday, we focused on some very big questions: Is there consciousness in other galaxies? What is the origin of consciousness? What is it like to be a bat? Or an octopus? Or a tree? This morning I want to shift the focus to an easier question: What is it like to be a human being? Most Western scientists assume that consciousness is produced in some way by the brain. There is, of course, considerable evidence for such a position, common sense evidence from our everyday lives. When we drink too much alcohol,

when we get knocked hard on our head, our thinking suffers. We also have more sophisticated scientific evidence of the link between the brain and consciousness. We can measure electrical activity in the brain during certain kinds of mental tasks and identify correlations between different areas of the brain and different activities. We can stimulate parts of the brain and record what experiences result. And we can remove parts of the brain and observe the effects on behavior.

All of this evidence suggests that the brain is indeed *involved* in thinking, perception, and memory; but it does not necessarily suggest that the brain *causes* those thoughts, perceptions, and memories. As you are listening to me speak, there is electrical activity in the temporal lobe of your brain in a region called Brodmann's area. But does that electrical activity in your brain suggest that your temporal lobe is *producing* the sound of my voice? Not at all: the studies showing brain areas associated with different mental functions show only correlations, not causation. They are entirely consistent with the idea that thoughts, perceptions, and memories could take place in a consciousness somewhere *separate* from the brain, but are then received and processed by specific areas in the brain. It's much like a telephone or a radio or a television. The signal, the message, is created somewhere else, but the television set or radio or telephone is necessary to receive and process the message. If we were to measure the electrical activity inside a television set, or electrically excite certain parts of the TV, or remove certain vital parts of it, we could show that certain parts of the television were involved in viewing the show. But we would not be proving that the show originated within the television set, anymore than we can prove that our thoughts originate within our brains.

Western science is largely reductionist; that is, it breaks everything down into its component parts, which are much easier to study than the whole. But as Chris Impey said yesterday, the component parts sometimes do not act like the whole. The brain is composed of millions of nerve cells, or neurons; but a single neuron, as Chris told us, cannot formulate a thought. A single neuron cannot feel angry or

cold. It seems that we believe that brains can think and feel, but brain *cells* can't. We don't know how many neurons you need in order for them to collectively formulate a thought, and we don't know how that collection of neurons can think when a single neuron can't.

As Chris said yesterday, scientists get around this problem by saying that consciousness is an emergent property of brains, a property that emerges when a large enough mass of brain cells get together. What does that mean? We have no idea what that means. Saying that something is an emergent property is a way of saying that it is a mystery that we cannot explain. There is, in fact, no known mechanism by which physical processes in the brain, or anywhere else, can produce non-visible things like thoughts, perceptions, and memories. The materialistic understanding of the world fails to deal with just how an electrical impulse or a chemical trigger in the brain can produce a thought, or a feeling, or indeed anything that the mind does. And yet, despite having no idea how it could work, most neuroscientists continue to maintain this 19th century materialistic view that the brain, in some miraculous way we don't understand, produces consciousness. And they discount or ignore the evidence that consciousness in extreme circumstances can function very well without a brain.

Now this idea that the mind and the brain are separate things was what most people in the world believed until a couple of hundred years ago. But in the 19th century, at least in the West, neurologists and physiological psychologists started exploring the notion that the physical brain might be the source of all our thoughts and emotions—indeed, of all of consciousness. For the past century, psychologists have been moving toward the hardcore materialism that characterized 19th century physics, a physics based on classical Newtonian mechanics. They have been attempting to show that consciousness is nothing more than the working of the physical brain. This materialistic psychology was succinctly captured by the American psychologist John Watson, who wrote, "Psychology, as the behaviorist views it, is a

purely objective, experimental branch of natural science which needs consciousness as little as do the sciences of chemistry and physics."

It is ironic that while Watson was linking psychology to classical Newtonian mechanics, physicists, faced with compelling experimental evidence, were already moving away from that materialistic view of the Universe towards a quantum physics that could not be formulated without reference to consciousness playing an independent role in the Universe. As Harold Morowitz, a molecular biophysicist at Yale University, wrote, "It is as if the two disciplines (psychology and physics) were on fast-moving trains, going in opposite directions, and not noticing what is happening across the tracks."

Just as the materialistic idea that the brain produces the mind is a reasonably good model for our everyday lives, so, too, classical Newtonian physics was a reasonably good model for describing everyday objects moving at everyday speeds. It was only when physicists started investigating extraordinary circumstances about 100 years ago, involving objects approaching the speed of light, or the behavior of microscopic wave-particles, that we saw the limitations of the classical Newtonian model and the need for new paradigms. The result was the development of a quantum physics that explained the world in ways that classical Newtonian physics could not.

But the price physicists paid in developing quantum physics was to acknowledge consciousness as a fundamental aspect of existence independent of matter. So, too, with the question of the mind–brain relationship: it is only when we look at extraordinary circumstances of mental function, such as what happens when we approach death, that we see the limitations of the materialistic model of mind–brain identity and the need for a different paradigm. Geshe Choeden said yesterday that, according to Buddhists teaching, consciousness can sustain itself without a brain, or indeed without any other physical form. Nineteenth-century reductionist science viewed consciousness as an emergent property that evolved with complex brains. But just as quantum physics now views consciousness as an irreducible

component in the Universe, so, too, scientific research in the past century has explored human experiences that suggest consciousness can function without a brain.

The data that I am going to discuss this morning are derived from scientific research, but I do not want to give you the impression that this evidence is widely accepted by Western scientists. In fact, most Western scientists are completely unaware that this evidence even exists. What then is this evidence that challenges the materialistic conception that consciousness is produced entirely by the brain?

For the past half century, the University of Virginia has had a research division dedicated solely to the scientific investigation of these human experiences that challenge the materialistic philosophy that brain and mind are the same, and suggest instead that mainstream ideas about the relationship between matter and consciousness may be incomplete. In the mid-1960s, Chester Carlson, a wealthy American inventor who invented the first photocopy machine, which he called the Xerox machine, started giving away his fortune. He told his wife that his one remaining ambition in life was "to die a poor man." His wife introduced him to Buddhism, and he went on to fund several Buddhist centers in New York, including the Rochester Zen Center, led by Philip Kapleau, and the Dai Bosatsu Zendo Kongoji Zen Monastery, led by Eido Tai Shimano. For his good works, Chester Carlson was given the Dharma name Daitokuin Zenshin Carlson Koji.

But Carlson was also trained as a physicist, and he wanted to support a bridge between Buddhism and Western science. He had heard about very young children in India who appeared to remember their past lives, and he searched for a Western neuroscientist interested in investigating these children.

He found an eager disciple in Ian Stevenson, the Chairman of the Department of Psychiatry at the University of Virginia. Carlson donated to the University the funds to establish our research division. With Carlson's financial and moral support, Professor Stevenson

resigned as Chairman of the Department to devote himself full-time to the scientific study of these children who seem to recall past lives, and to other human experiences that suggest that consciousness may at times function without the use of a physical brain.

As it happened, shortly thereafter His Holiness the Dalai Lama began periodic visits to the University of Virginia to visit Jeffrey Hopkins, a Professor of Tibetan Buddhist Studies who served as His Holiness' chief translator in English until 1989.

I worked with Professor Stevenson at the University of Virginia from the early 1970s, when I was training to be a psychiatrist at the University. Under his mentorship, I studied a variety of human experiences that suggested that consciousness can function separately from the brain. But I focused primarily on near-death experiences, the complex experiences that some people have on the threshold of death when the brain is shutting down. Ten years ago, Professor Stevenson retired, and I succeeded him as director of our research division.

So what are these experiences that challenge the prevailing materialistic paradigm that consciousness cannot exist without a functioning brain? There are four lines of evidence that I wish to discuss with you this morning. These are: first, the unexplained recovery of consciousness among people who have been unconscious for prolonged periods of time in the moments or days before their death; second, the complex consciousness among people who have minimal brain tissue; third, surprising complex consciousness in near-death experiences, including acquisition of new information, when the brain is functioning at a greatly diminished level; and finally, young children who recall accurate details of a past life.

The first challenging phenomenon I want to discuss is the surprising recovery on the deathbed of mental functions that had long been lost. This unexpected return of mental clarity and memory shortly before death in patients suffering from severe neurologic or psychiatric disorders has been reported in the Western medical literature over the

past two hundred and fifty years, but has received little attention. There are cases published in the medical literature of patients suffering from brain abscesses, tumors, strokes, meningitis, Alzheimer disease and other dementias, schizophrenia, and mood disorders, all of who had long ago lost the ability to think or communicate. In many of these patients, there was evidence from brain scans, or from autopsies, that their brains had deteriorated to an irreversible degree. And yet, in all of these cases, mental clarity returned in the last minutes, hours, or sometimes days before the patient's death.

We have identified 83 cases mentioned in the Western medical literature and have collected additional unpublished contemporary accounts. Complete recovery of consciousness just before death is not a common experience. In 1844, the German psychiatrist Julius estimated that it occurred in 13% of patients who had died in his institution. However, in a recent investigation of end-of-life experiences in the United Kingdom, 70% of caregivers in nursing homes reported that they had observed patients with dementia and confusion become completely lucid in their last hours before death.

In a case that we recently investigated, a 42-year-old man developed a malignant brain tumor that rapidly grew in size. He quickly became bedridden, blind in one eye, incontinent, and increasingly incoherent in his speech and bizarre in his behavior. He appeared to be unable to make sense of his surroundings, and when his family touched him, he would slap as if he were slapping at an insect. He eventually stopped sleeping, talking deliriously throughout the night. After several weeks of that, he suddenly one night appeared calm and started speaking coherently, and then slept peacefully. The following morning, he remained coherent and talked with his wife, discussing his imminent death for the first time. However, he stopped speaking later that day, and died soon thereafter.

A second case involving Alzheimer's disease was reported by Erlendur Haraldsson, a psychologist in Iceland. An 81-year-old woman had been demented for a long time and was living in a

retirement home. Her family took turns visiting her, even though she had neither recognized any of them nor spoken to them for a year. On one occasion, her son Lydur was sitting at her bedside, working on a crossword puzzle. Suddenly, she sat up, looked at him directly in the face, and said, "My Lydur, I am going to recite a verse to you." She then recited a poem clearly and loudly. She then lay back on her pillow, and was again unresponsive, and remained so until she died.

There is no known physiological mechanism for this phenomenon. It is indeed rare, but the fact that it happens at all has no explanation in terms of how the brain functions. It suggests that the link between consciousness and the brain is more complex than traditionally thought. It is as if the damaged brain prevents the patient from thinking or communicating, but then as the brain finally begins to die, consciousness is released from the grasp of the degenerating brain.

Another challenging phenomenon is the presence of normal or even high intelligence in people who have very little brain tissue. There are again rare, but surprising, cases of people who seem to function normally in life, with normal intelligence and normal social function, despite having virtually no brain at all.

John Lorber, a British neurologist, specialized in children who have hydrocephalus, or "water in the brain." Children with this condition have an abnormal amount of cerebrospinal fluid built up in the cavities inside the brain, compressing the brain tissue and usually leading to blindness, seizures, mental retardation, paralysis, and, if not treated, to death. However, Lorber described dozens of children, and eventually some adults, who had severe hydrocephalus but seemed to lead normal lives. In fact, in a sample of children in whom the cerebrospinal fluid filled up 95% of their skull, leaving virtually no space for any brain tissue, *half* of them had IQs greater than 100.

Thirty years ago, Lorber published an article in the prestigious journal *Science* entitled, "Is Your Brain Really Necessary?" In that article, he described a graduate student in mathematics at Cambridge

University with an IQ of 126 and a normal social life, with hydrocephalus so severe that he had only a very thin ridge of brain tissue pressed against the skull, hardly enough to allow a person to live, let alone function normally, according to modern medical neuroscience.

Some of the best evidence of consciousness functioning independently of the brain comes from near-death experiences, profound experiences that some people report when they have been on the threshold of death. Of course, there is a Tibetan tradition of people called *delogs* who have returned from death to describe what they have experienced. Their experiences are in some ways similar to the near-death experiences that I am talking about, but the *delogs* typically leave their bodies for many days rather than just a few minutes, and their experiences usually include extensive travel to a realm beyond death.

The near-death experiences that I am talking about are the accounts of people who have been clinically dead but are then resuscitated or revived spontaneously after a brief interval with memories of what they experienced during that period. They typically report exceptional mental clarity, vivid sensory imagery, a clear memory of the experience, and an experience that is more real than their ordinary consciousness. All of this occurs under conditions of drastically altered brain function, under which the materialistic model would deem consciousness impossible.

These near-death experiences are reported by between 10% and 20% of people who are revived from clinical death. I have investigated 1,000 of these cases. The average age at the time of the near-death experience is 31 years, but there is a very wide range. One young girl reported an experience she had had when she was eight months old and undergoing kidney surgery. The oldest near-death experience I have studied was 81 at the time of his heart attack. About one third of these near-death experiences occur during surgical operations, one quarter in the course of serious illness, and one quarter from life threatening accidents. The common features of near-death experiences

can be categorized as changes in thinking, changes in emotional state, paranormal features, and otherworldly features.

Changes in thinking during the near-death experience include a sense of time being altered. Often people report that time stopped, or ceased to exist, during the experience. It also includes a sense of revelation or sudden understanding, in which everything in the Universe suddenly becomes crystal clear. There is a sense of the person's thoughts going much faster than usual and being much clearer than usual. And finally, there is a life review or panoramic memory in which the person's entire life seems to flash before them.

Typical emotions reported during the near-death experience include an overwhelming sense of peace and well-being, a sense of cosmic unity or being one with everything, a feeling of complete joy, and a sense of being loved unconditionally.

The paranormal features often reported in near-death experiences include a sense of leaving the physical body, sometimes called an "out-of-body experience"; an experience of the person's physical senses such as vision and hearing becoming more vivid than ever before, sometimes including seeing colors and hearing sounds that do not exist in this life; a sense of extrasensory perception, knowing things beyond the range of the physical senses, such as things that are happening at a remote location; and visions of the future.

Finally, many people report that in their near-death experiences they entered some other, unearthly world or realm of existence; many report that they came to a border that they could not cross, or a point of no return that, if they had crossed, they would not be allowed to return to life; many report encountering some kind of mystical or divine being; and some report seeing deceased spirits, often loved ones, who had died previously and who seemed to be welcoming them into the other realm, or in some cases, sending them back to life.

One of the things about near-death experiences that has interested

me most as a psychiatrist has been the profound after-effects. People reliably report a consistent pattern of changes in attitude, beliefs, and values that do not seem to fade over time. Near-death experiencers report overwhelmingly that they are more spiritual after the experience, that they have more compassion for others and a greater desire to help others, a greater appreciation of life, and a stronger sense of meaning or purpose. An overwhelming majority of near-death experiencers report that they have a stronger belief that we survive bodily death, and just as many report that they no longer have any fear of death. About half report that they have lost interest in material possessions, and many report that they no longer have any interest in personal prestige or status or in competition.

Now, some of you may be thinking that these people are now following the Buddha; they show more compassion, they tend to try to help others, and they are less attached to material possessions and status. But as His Holiness pointed out yesterday, these values are not uniquely Buddhist. These are universal values. Almost all spiritual traditions teach compassion and the transience of worldly rewards. Near-death experiencers do not become more Buddhist; they become more spiritual.

I want to highlight three particular features of near-death experiences that are particularly suggestive that the brain does not produce consciousness. These three features of near-death experiences are: first, clear thinking, perception, and memory while the brain is incapacitated; second, accurate perceptions from a visual perspective outside the physical body; and third, encounters with deceased persons who convey accurate information that no one else could have known, including, in some cases, encounters with deceased persons who were not known at the time to have died, or were not known by the experiencer at all. Perhaps the most important of these features, simply because it is the most common, is the first.

Among several hundred near-death experiencers I have studied, 47% described their thinking during the experience as clearer than

it is in their normal waking state. In addition, 38% described their thinking as faster than usual, 29% described their thinking as more logical than usual, and 17% described their control over their thoughts as more control than usual. Furthermore, an analysis of their medical records shows that mental functioning was significantly better in those people who come closest to death. Moreover, many experiencers report that during their near-death experience, they had a panoramic life review—not just the single brief images that can be evoked by electrical stimulation of the brain, but elaborate events, sometimes from the entirety of that person's life.

Let me give you an example of clear thinking during a near-death experience. A 25-year-old nurse had become deeply depressed, and decided to end his life by taking a suicidal overdose of medication that he had taken from the hospital where he worked. After taking the overdose, he lay down on his bed expecting to die. Instead, he became ill with nausea and painful stomach cramps. He then decided to telephone for help, so he got up out of bed and tried to walk to the telephone. However, by now he was quite sedated and confused from the overdose, and he had great difficulty standing and walking. In addition, he was having hallucinations of many small people in his apartment who were stopping him from getting to the telephone. In that confused state, he suddenly felt himself leave his physical body, and he found himself standing about ten feet behind his body and above it.

From that new visual perspective he watched his body sway unsteadily, and he could see his body looking around in confusion at the imaginary people. He remembered having seen the hallucinations when he was in his body, and he could see his body still appearing confused. But he himself, from his position ten feet behind the body, was thinking very clearly and could not see the imaginary people. So his center of consciousness that had left his body was thinking very clearly, while his brain was still hallucinating and confused.

Another important feature that challenges the materialistic

model of consciousness and the brain is being "out of the body" and accurately perceiving things that could not be perceived normally. Among several hundred near-death experiences I have studied, 48% reported accurate "out-of-body" vision.

In 1982, the American cardiologist Michael Sabom published a study in which he asked near-death experiencers who had reported leaving their bodies during cardiopulmonary resuscitation to describe in detail what they had seen. He also asked a matched group of seasoned cardiac patients to imagine watching their resuscitations and to try to describe it from a third-person perspective. Eighty percent of the matched group of cardiac patients who did not have near-death experiences made major errors in their descriptions. *None* of the near-death experiencers made any errors, and 19% of them described specific idiosyncratic and unexpected events that happened during their resuscitation.

A few years ago, the Welsh health care nurse Penny Sartori published a five-year study in which she replicated Sabom's findings. She found that *all* the near-death experiencers who claimed to have left their bodies described accurate resuscitation scenarios, whereas all of the cardiac arresters who did not have near-death experiences gave incorrect description of the equipment and the procedures.

The American psychologist Kenneth Ring reported a study of 31 blind near-death experiencers, many of them blind from birth, who were able to describe the scene around them while they were out of their bodies. In some cases, they even included accurate descriptions of the colors of some objects.

In a recent review of 93 published reports of potentially verifiable "out-of-body" perceptions during the near-death experience, the American psychologist Jan Holden found that 92% were completely accurate, 6% contained some minor error, and only 1% were completely wrong. Even in cases in which the "out-of-body" perceptions were reported to an independent witness before they were verified, greater

than 90% of the descriptions were accurate.

Let me give you an example of an accurate "out-of-body" perception. A 56-year-old van driver had an acute heart arrhythmia due to blockage of his coronary arteries, and he underwent emergency coronary artery bypass surgery. During the procedure, while he was fully anesthetized, he left his body, and was able to look down and see his body on the operating table. To his surprise, he also saw the cardiac surgeon standing by the operating table appearing to flap his wings, as if he were trying to fly.

The day after the operation, he asked the surgeon why he had been flapping his arms during the procedure. The surgeon seemed embarrassed and he angrily asked the patient who had told him about that. The patient responded that no one had told him, but that he had seen it himself from above the operating table. When he eventually got over his embarrassment, the surgeon explained that he was watching his assistants begin the operation and that he was supervising the procedure. In order to ensure that his hands, which were in sterilized gloves, did not touch anything that might contaminate them, he put them somewhere he knew they would not touch anything, flat against his chest, and instructed his assistants in the operation by motioning with his elbows, which looked to the patient as if he were trying to fly.

Finally, among several hundred near-death experiencers I have studied, 42% reported meeting recognizable deceased acquaintances in their near-death experiences. These encounters were more likely to be reported the closer the person has come to death. In 33% of these cases, the person was not someone that the experiencer wanted to see or expected to see, but was instead someone else. These unexpected encounters would be surprising if these visions were hallucinations caused by expectation and wishful thinking. Most impressively, some of these deceased persons seen in near-death experiences were people who were not known to be dead at the time. Let me give you an example.

An American pediatrician, Dr. K.M Dale, treated a nine-year-old boy with meningitis, who hovered near death for 36 hours before his fever finally broke. During those 36 hours, he was surrounded by his anxious parents, who never left his hospital bed during that vigil. When his fever finally broke, and as soon as he opened his eyes, the boy described having gone to Heaven, where he saw several of his deceased relatives. And then he added that he had also seen his sister, Teresa, who told him that he had to go back to his body. The boy's father got agitated when he heard this, because his daughter was at college 1,500 km away in another state and was perfectly healthy. But the boy insisted that Teresa had sent him back and told him that she had to stay there. His father then left the hospital, promising his wife that he would call their daughter as soon as he got home. But when he tried to telephone Teresa, he learned that college officials had been trying unsuccessfully all night to reach the family to tell them the tragic news that Teresa had, in fact, been killed around midnight in an automobile accident.

Even more impressively, sometimes the deceased person seen in the near-death experience was someone the experiencer had not known even existed. The Swiss-American physician, Elisabeth Kübler-Ross, published the account of a girl who had a near-death experience during heart surgery and later said she had met her brother, although as far as she knew, she never had a brother. Her father, moved by her vivid account, acknowledged that her parents had, in fact, had a son who had died before she had been born, and they had never mentioned him to her.

The Dutch cardiologist, Pim van Lommel, reported the near-death experience of a man who, during a cardiac arrest, saw an apparently deceased man he did not know, but who looked at him lovingly. Some years later, his mother, on her deathbed, confessed to him that he had been born out of wedlock, and that the man who had raised him was not his biological father. His biological father was a Jewish man who had been deported and killed when the Germans invaded Holland in World War II. She showed her son a photograph of his biological

father, whom he immediately recognized as the man who had looked lovingly at him in his near-death experience.

The final phenomenon I want to discuss with you are those cases that my mentor Ian Stevenson investigated of very young children who claimed to remember their past lives. The majority of these children live in societies that have some cultural belief in rebirth, and a great many of those live here in India. To study these children, Stevenson traveled many times to remote villages throughout India to interview these children and their families.

Our group at the University of Virginia has studied more than 2,000 cases of these very young children who spontaneously start talking about their past life. About half of these children live in Asia, most of them in India, Burma, Sri Lanka, and Thailand. They usually begin speaking about these past-life memories between the ages of two and five years, and in most cases, these memories tend to fade between the ages of six and nine years. The child gives enough detailed information that we can identify the past life in 60% of these cases. However, that percentage varies greatly from one country to another. For example, in India, Burma, Thailand, and Lebanon we can identify the past life in about 80% of the cases, whereas in the United States the children often give far fewer details and we can identify the past in only 20% of cases.

The average age of death in the past life is 33 years, but that also varies from country to country. In places like the United States and Europe, where there may be less violence in the culture and where health care is more available, the age of death tends to be higher. In 60% of our cases of apparent past-life memories, the past life remembered ended violently, either in a tragic accident or by intentional wounding. The average time that passes between the death in the past life and the birth in the present life is 12 years, but that, too, varies in keeping with cultural beliefs. For example, among the Druse in Lebanon, the children who claim to remember past lives tend to be born immediately upon the death of the past life, which is in keeping

with their cultural beliefs.

As you might expect, these cases are not easy to investigate. These children often live in remote villages that are hard to reach and they often require Western researchers to interview the children through an interpreter.

There are several features of these cases that challenge the assumption that all our thoughts and memories are produced by the brain. First, these children often have detailed and specific memories that correspond to the life of someone who had lived and died in a distant location, of whom they could have had no knowledge by normal means. They will mention the names and occupation of relatives and friends from the past life, and often the specific details of how that person's past life ended. In some cases, we have been able to take the child to the remote village where he or she claimed to have lived previously, and the child is able to identify people and places he or she had never seen before in this life.

Second, these children sometimes exhibit unusual personality traits, likes, and dislikes that are incompatible with their present lives. For example, some of these children recall a past life of the opposite gender, and they want to dress and play like someone of the opposite gender. A child born to a Hindu family may recall a past life as a Muslim and reject the food his mother cooks because it was not prepared in the Muslim manner. Several young Burmese children claimed to remember lives as Japanese pilots who were shot down over Burma in World War II. They rejected the spicy Burmese food and requested Japanese cuisine, such as raw fish, and they rejected the traditional Burmese clothing and wanted pants as worn by the Japanese. Many of these children have phobias that they relate to their past lives. For example, a child who recalls having been drowned in a well may have an unusual fear of water.

Third, some of these children exhibit unusual skills that they have not been taught, and in some cases, that no one in their village knows.

For example, a child may be able to play a musical instrument without being taught, or may have skills related to their occupation in the past life. We have studied children in Sri Lanka in villages where only the Tamil language is spoken, and yet the child can converse coherently in Sinhalese.

Finally, some of these children have very unusual and unexplained birthmarks or birth defects that they attribute to their death in a past life. These birthmarks and birth defects that are said to correspond to the death wounds in the past life occur in about a third of the children we have investigated. Sometimes, the birthmark fades as the child grows up, but in other cases it does not; and of course birth defects persist throughout the life of the child. In 18% of these cases, we can confirm through medical records or autopsy reports that the death wounds from the past life do indeed correspond to the birthmarks or birth defects in the present child.

Let me give you a few short examples of these unusual birth defects. Myint Thein, a Burmese girl born in 1956, remembered the life of a man who was riding home on his bicycle when he was stopped by a gang who had been hired to kill him. They made him get down on his knees and prepared to cut his head off with a sword. At the last moment of his life, as he was on his knees facing the swordsman, he suddenly raised his hands to plead for mercy, and perhaps to protect his head from the swing of the sword. The fingertips of both his hands were cut off by the sword. Myint Thein was born with just small stubs of fingers on both hands. As a child, the girl insisted on wearing boy's clothes and referred to her actions with masculine verb forms.

Lekh Pal, an Indian boy born in 1971 in Uttar Pradesh, remembered the life of another boy named Hukum Singh, who lived in a distant village. Hukum Singh had gotten his right hand caught in an automatic fodder chopping machine when he was three years old, and lost the fingers of that hand. Lekh Pal was born with no fingers on his right hand, but with a normal left hand. When Lekh Pal was eventually

taken to the village where Hukum Singh had lived, he identified the correct location where the accident had taken place, and also correctly identified the man who was operating the fodder chopper machine when the three-year-old Hukum Singh caught his fingers in it.

Jacinta Agbo, a little girl born in Nigeria in 1980, was born with an unexplained three-centimeter-wide hairless birthmark that went completely around her head. There is no embryological mechanism that could explain a birthmark like this, where no hair will grow. She remembered the life of a man who had been hit on the head with a club in a quarrel ten years before she was born, and had surgery to drain the blood from his brain and reconstruct the broken skull bones. This photo was taken when she was two years old. When she was interviewed several years later, she showed definite masculine traits and habits.

Although many of the strongest cases of children who remember past lives come from cultures where there is a belief in rebirth, we also have some very impressive cases from Christian families in the United States, in which there was no prior knowledge of rebirth, and certainly no interest or belief in it. For example, a two-year-old boy named James Leininger, who was born in Louisiana, seemed to remember being shot down in the Pacific Ocean in World War II, nearly 60 years earlier. The boy would often play with airplanes and wake up screaming from nightmares about being trapped in an airplane that was on fire. When he was three years old, his mother bought him a toy airplane and pointed out what she thought were bombs under the wings. Three-year-old James corrected her, saying they were not in fact bombs but drop tanks, something she had never heard of. He eventually gave more details of his past life, saying that he flew an airplane called a Corsair that used to get flat tires frequently, something that military historians confirm is often true of Corsairs. He also gave the name of the aircraft carrier he flew from as the Natoma, said that he was killed flying over Iwo Jima, and that he flew with a man named Jack Larson.

James' father, a policeman and a devout Baptist who was quite

opposed to the idea of rebirth, researched the story in an effort to discredit it. He found that there *was* an aircraft carrier called the Natoma Bay at the battle of Iwo Jima in 1945, and that only one American pilot was killed in that battle, a man named James Huston, when his Corsair was shot down and caught on fire. James Leininger's parents tried to find the family of this pilot, James Huston, and they eventually found his sister, who lived in California more than 3,000 km away. She confirmed that her dead brother James Huston did have a friend named Jack Larson, and the little boy spontaneously identified some objects in her home that had belonged to her dead brother. She is convinced that this little boy is indeed the rebirth of her brother.

In summary, there is abundant evidence both from our daily lives and from scientific research that seems to link consciousness to brain function in everyday life. And yet there is also abundant evidence both from life and from scientific research that, under extraordinary circumstances, consciousness seems to come unlinked from brain function, and in fact appears to operate better without the mediation of the brain. Again, I want to note that this evidence is not accepted by most Western scientists, and in fact is not even known to many Western scientists. Nevertheless, it is there, and it is reliable and reproducible evidence.

First, there are exceptional cases in which people whose brains have been deteriorating for years, and who have been unable to think or communicate, suddenly regain full consciousness in the moments or hours or days before death; a phenomenon that should be impossible if consciousness is produced solely by the brain.

Second, there are exceptional cases of people with normal or even high intelligence, but whose brain scans demonstrate that they have virtually no cerebral cortex, the part of the brain that is thought to produce complex consciousness.

Third, there are near-death experiences, in which people on the threshold of death describe heightened levels of consciousness when

their brains are functioning at a greatly reduced level, if at all; accurate perception from a visual perspective outside the physical body; and apparent encounters with deceased people who convey accurate information not known to anyone else, including encounters with deceased people who were not known to have died, or indeed were not known to the experiencers at all.

And fourth, there are very young children who seem to remember a past life. They have accurate memories that correspond to a past life; personality traits, likes, and dislikes that are surprising in the context of their current family but consistent with the past life; unlearned skills that seem to have carried over from the past life; and unexplained birthmarks and birth defects that seem to correspond to death wounds from the past life.

These phenomena, all well investigated by modern scientific methodologies and building upon decades or centuries of prior research, strongly suggest that consciousness can be produced and can function without the intercession of a physical brain. Thank you.

Discussion

Chris Impey (Moderator): Thanks very much Bruce. It was an extremely fascinating and provocative talk, and I am sure we'll have lots to talk about, so I encourage the audience to start to formulate questions and we'll gather them and fold them into the discussion. I am going to take my moderator prerogative and ask a sociological question. We now have a correlation, rather than a causative testable physical theory, explaining why mind and brain should be linked, and data that you need to explain. In the field of gravity, the advancing perihelion of mercury—a small effect perhaps, but persistent data that had to be explained—led to the downfall of Newtonian gravity and the rise of general relativity, a completely new paradigm. Why, in your view, has no analogous progress been made in neuroscience?

Bruce Greyson: That's an excellent question, Chris. Why has no new paradigm come up to explain these data?

Chris Impey (Moderator): Associated with that of course, why has the resistance been so relentless?

Bruce Greyson: There is tremendous resistance among Western scientists to the idea that consciousness and the brain are separate, because most of Western science is built on the materialistic model. The scientific method has produced much good for our society. The problem is that many scientists confuse the scientific method with the materialistic philosophy that usually accompanies it. The modern technology we enjoy is the result of the scientific method,

not necessarily of the materialistic philosophy. But the two have been linked so tightly together for the past several hundred years that it is hard for scientists to think of science without materialism. That has changed in the last century among theoretical physicists. They study things that can't be seen or felt or measured directly—particles that are so small and last such a short period of time that they cannot be seen, and cannot be measured directly. Instead, physicists shoot these particles through what's called a bubble chamber, a box full of liquid, and as the particles go through the liquid, they leave trails of bubbles. Physicists can then measure the effects of shooting the particle, but they can't measure the particle itself. They assume that there was a particle there to produce the bubbles, and from the trail of bubbles they can learn a lot about these particles that can't be seen.

In the same way, the thing that we are talking about, consciousness, cannot be seen, but it does leave effects. Consciousness does affect the body, leaving a metaphoric trail of bubbles that we can follow, and through these effects we can make inferences about consciousness. I think the reason we don't yet have a good model to rival materialism is that the question is very complex. We'll get a satisfactory model eventually, but we're not there yet. As His Holiness said yesterday, Western science is geared towards studying physical phenomenon. It has not even thought about how to approach mental phenomenon, and maybe, when we can bind it to the 2,000-year-old tradition of meditation and introspection, we will find some way of merging science and consciousness research.

Chris Impey (Moderator): I would like to ask the *geshes* if they have any questions at this point.

Monastic Graduate: It seems that most modern neuroscientists believe that consciousness is produced by the brain, or the functions of the brain. Since we have different types of consciousness, such as the happy state or the sad state, can we identify physical entities or physical particles that are responsible for these different mental states? And, if so, is there a way that we can produce those respective entities

or particles?

Bruce Greyson: The problem comes in saying that these physical entities are responsible for these states or produce these states. We can find some physical phenomena that are *associated* with those states, but they are not necessarily causing them. For example, when people are severely depressed there are changes in the neurochemicals in the brain, but it's not clear whether those changes in the neurotransmitters are causing the depression, or are the result of depression. They are what we call "biological markers." We can associate the mental state with the biological changes, but we can't say which one is the cause and which one is the effect.

Chris Impey (Moderator): A question from the audience. There seems to be some significant parallelism between the research you've done, the phenomena you described, and things that seem to happen in dreams—enhanced mental functions, paranormal phenomena, hyper-realization of senses. Is there any deliberate attempt to make connections there, or to use dream research in a way that illuminates what you're talking about?

Bruce Greyson: We have not done that, but other scholars have tried to associate the phenomena in near-death experiences with the phenomena in a variety of states, not only dreams, but drug induced states, meditative states, etc. There are certainly some experiences that are common to all altered states of consciousness, and there are some people who argue that it doesn't matter how you get to that altered state, whether you do it through sleep, through lucid dreams, through drugs, through hypnosis, or through electrical stimulation. But we do find that there are some differences between spontaneous near-death experiences and these induced states. For example, almost everyone who has a near-death experience will be profoundly affected by that change and will be transformed in their attitudes, beliefs, and values. People who have a similar experience in a dream do not necessarily change their lives, and, in fact, if you ask them ten years later, they may not remember the dream. But people who have near-death experiences

will remember their near-death experience.

Chris Impey (Moderator) A connected question from an audience member: What is it about the quality of compassion of a near-death experience? It sounds like what we really want is near-death in a pill, so we can just all take the pill and be more compassionate and have all these benefits of the near death experience.

Bruce Greyson: Well, that's the American attitude; we want it in a pill.

Chris Impey (Moderator): Do you get the experience?

Bruce Greyson: I think anyone who comes close to death may be changed by that experience. Most people who almost die tend to value their life more highly, but there are many differences between just coming close to death and having a near-death experience. For example, if you just come close to death but don't have a near-death experience, you usually become more frightened of dying and you become much more cautious. If your doctor tells you to stop drinking, you will stop drinking. If you have a near-death experience, you are not afraid of dying anymore, and paradoxically that makes you not afraid of living to the fullest. You take more risks, you become much more joyful in your life, and that also makes you a less cooperative patient, because if the doctor tells you to stop drinking, you won't necessarily stop drinking, because you are not afraid of dying.

Chris Impey (Moderator): Any other questions from our guests?

Monastic Graduate: Whether the brain produces consciousness, or consciousness is something else, what is obvious is that consciousness can have effects on our body. In the contemplative traditions, we have methods to deal with minor brain problems and for reducing physical discomfort. In addition to contemplative methods, what scientific methods should we adopt to solve this mind–body problem, or reduce physical discomfort?

Bruce Greyson: That's an excellent question. I am hoping that we'll get the answer from this conference. I think most Westerners are aware that there's a long tradition of consciousness research in Eastern cultures that they know nothing about, and they've been reluctant to learn more about it because they are so wedded to their own way of thinking. I understand that consciousness does have strong effects on the body and on health. The problem in getting Western medicine interested is that there is no financial profit in consciousness. If you produce a pill or a procedure or a device to affect the body, you can make a lot of money with it, and you can make a lot of money doing research into it. But if you're talking about a contemplative discipline, there is no product to manufacture that you can make financially profitable. We are fighting an uphill battle trying to get the attention of people who fund research to look into this question. But this is a direction in which Western medicine must go, and it is becoming increasingly popular on the fringes of Western medicine. I think it's only a matter of time before people see the power of some of the meditative techniques.

Chris Impey (Moderator): Another question from the audience: Could you speculate on why it is that the clarity and incidence of the rebirth experience plays out particularly in the very early childhood stages and then fades? And do you know if it's a universal, general phenomenon? Is there anything special about those people?

Bruce Greyson: That's a very good question. We don't really know why some people remember a past life, whereas most people do not. If you assume, as Buddhists do, that everybody is reborn, then obviously the normal procedure is to forget your past life, because most of us do not remember. So why do a few people remember? Is it something that has gone wrong that allows them to remember? Children who do remember a past life don't seem to have any advantage, and it does not seem that people who are particularly virtuous remember their past lives. The few cases we have suggest that a strong attachment to the past life is one factor in remembering it. For example, people who were killed prematurely or violently tend to remember their past

lives. Seventy percent of these cases in some cultures ended the past life in a violent manner. In other cases, people have some other strong attachments to the past life. For example, people who were monks in the past life and seem to be reborn into a non-spiritual home may remember the past life as a monk.

The children tend to remember their past life at very early ages, two or three, and often when they are in some altered states, when they're sleepy, when they are being given a bath, when they are not engaged in normal activities. Then they will start to remember more things and the memories come up sporadically during the day. As these children get to be the age to go to school and get more involved in this life, they tend to forget the past life, and by the time they are six, seven, eight, nine years old, they tend to forget. We have done some psychological testing with these children in Sri Lanka, in Lebanon, and in the United States, and if you test these children when they are two, three, four, five years old, they have higher IQs than their peers. They have much better verbal skills than their peers. You'd think that would make them more successful in life, but the advantage doesn't continue. If you test them again when they are teenagers and have forgotten their past lives, they are just like everybody else, and their IQs are the same as their peers. We don't know why they remember at all, and we don't know why they don't continue to remember. There are some cases, a very few cases, where we have identified the family the child claimed to have been in in the past life, and the family has accepted the child and they continue to see the child year after year. And in those cases the memories may persist because of the continuing contact with the past family. But those are unusual.

Chris Impey (Moderator): A postscript question on this from the panel: What is your personal view on rebirth?

Bruce Greyson: What is my personal view of rebirth? Many of the cases that we have are unexplainable in terms of Western medicine, but they are also unexplainable in terms of the reincarnation hypothesis. Sometimes we'll see two children who seem to remember

the same past life; sometimes we'll see a child remembering a past life of someone who died when the child was six months old, so the two lives overlapped. It does not fit into a clear model that we can follow. When I talk to near-death experiencers, they always say, "Words cannot explain my experience. I cannot describe it for you." Then I say, "That's great; tell me all about it." We force them to tell us what they experienced. They are putting into words things that don't fit into words, and I think the same is true of these rebirth memories. What actually happens is something that our brains cannot understand, so the models that we could come up with do not really approach the reality. If you ask me what I believe, I say that what happens after death is something that I can't possibly understand while I am in this brain.