

MINDSCAPES Cotard's syndrome

The man who believes he is dead

Helen Thomson

NINE years ago, Graham woke up and discovered he was dead.

Graham was in the grip of Cotard's syndrome, a condition characterised by the belief that the body or parts of it no longer exist. Now a positron emission tomography (PET) scan of his brain – the first of its kind in someone with this disorder – has revealed unique information about how the brain constructs consciousness.

Suffering from severe depression, Graham had tried to commit suicide by getting into the bath with a live electrical appliance. Eight months later, he told his doctor that his brain had died or was, at best, missing. "It's really hard to explain," he says. "I just felt like my brain didn't exist any more. I'd fried it in the bath."

Doctors found trying to rationalise with Graham was impossible. Even as he sat talking, breathing – living – he could not accept that his brain was alive. "I didn't know how I could speak or do anything with no brain, but as far as I was concerned I hadn't got one," he says.

Baffled, they put him in touch with Adam Zeman at the University of Exeter, UK, and Steven Laureys at the University of Liège in Belgium. "It's the first and only time my secretary has said to me: 'It's really important for you to come and speak to this patient because he's telling me he's dead'," says Laureys.

Graham tries to explain. "My mind was blank. I couldn't hold any information in it. I took no pleasure from anything. I lost my sense of smell, and my sense of taste. There was no point in eating

because I was dead. It was a waste of time speaking. I didn't even really have any thoughts. Everything was meaningless."

No one knows how common Cotard's syndrome may be. But because rapid treatments for mental states such as depression – from which Cotard's most often seems to develop – are readily available, researchers suspect the syndrome is exceptionally rare.

To find out more, Zeman, Laureys and colleagues used PET to monitor metabolic activity across Graham's brain. They found that it was so low across large areas of the frontal and parietal regions it resembled that

of someone in a vegetative state (*Cortex*, doi.org/mmt).

Some of these areas form what is known as the "default mode network", a complex system thought to be vital to core consciousness, and to theory of mind – the ability to understand what others might be thinking. This network is responsible for our ability to recollect the past and create a sense of self, and it

"I didn't know how I could speak or do anything with no brain, but as far as I was concerned I hadn't got one"

allows us to realise that we are the agent carrying out an action.

"I've been analysing PET scans for 15 years and I've never seen anyone who was on his feet with such an abnormal result," says Laureys. "Graham's brain function resembles that of

someone during anaesthesia or sleep. Seeing this pattern in someone who is awake is quite unique, to my knowledge."

Graham's scans could have been affected by the antidepressants he was taking and, as Zeman points out, it is unwise to draw too many conclusions from one person's scans. Even so, Zeman says, "It seems plausible that the reduced metabolism was giving him this altered experience of the world."

At the very least, says Laureys, these unusual cases add to our understanding of which networks in the brain help create the perception of self.

The results have intrigued neuroscientists contacted by *New Scientist*. "These scans fit neatly with evidence that reduction in activity in regions associated with consciousness is associated with psychiatric symptoms," says Daniel Bor at the University of Sussex.

"However, given that this is the first study of its kind, on a single patient, replications would be very welcome before firmer conclusions can be established."

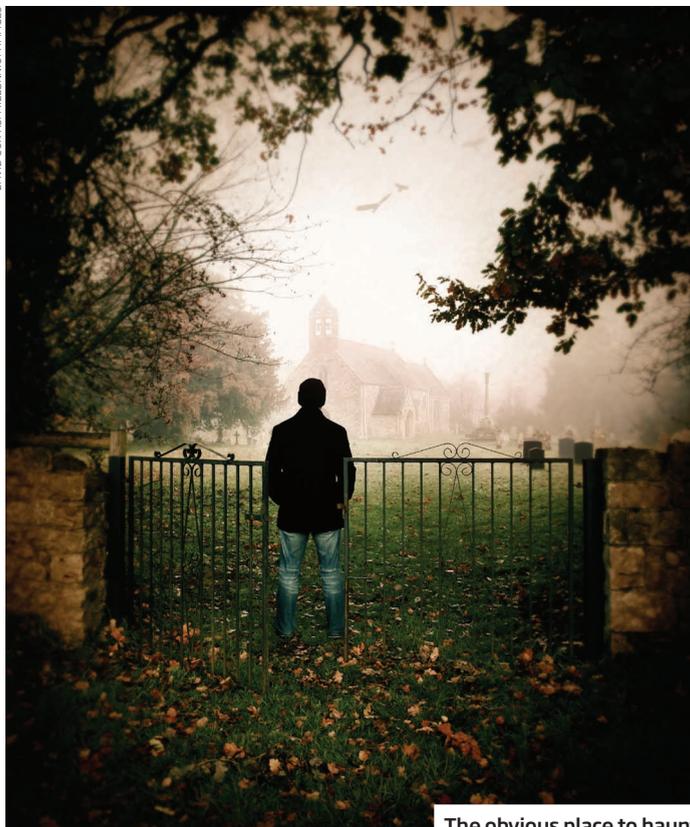
Other researchers said that comparing Graham's brain with those of people who are depressed or in a vegetative state – rather than people who are healthy – might provide more insight into how his reduction in metabolic levels can lead to such symptoms.

For Graham, the brain scans didn't mean a lot. He felt low enough on occasion to visit the local graveyard. "I just felt I might as well stay there. It was the closest I could get to death."

Thankfully, over time and with a lot of psychotherapy, Graham has gradually improved. Although not fully recovered, he is now able to live independently. "I couldn't say I'm really back to normal, but I go out and do things around the house," he says. "Things just feel a bit bizarre sometimes." ■

For more Mindscapes, go to bit.ly/mscape

DAVID CURTIS/MILLENNIUMIMAGES



The obvious place to haunt