

## CHAPTER FIVE

# 'FEAR OF THE MYSTERY': MUSIC, FAITH AND THE BRAIN

Where words leave off, music begins.<sup>1</sup>

Music plays a crucial role in social bonding, and the continued importance of community in promoting mental health and well-being within a cohesive society. Robin Dunbar and others have demonstrated that music, and especially singing, is a fundamental part of who we are as human beings. Boethius asserted, many centuries ago: 'Music is so naturally united with us that we cannot be free from it even if we so desired.'<sup>2</sup> Likewise, as Anthony Storr declares today: 'No culture so far discovered lacks music. Making music appears to be one of the fundamental activities of mankind.'<sup>3</sup>

Music is one of the most effective means of bringing people together in order to encounter something numinous, immanent or mysterious (without trying to define these terms too rigidly). Such experience does not separate body and spirit (secular and sacred, corporeal and incorporeal), as in a dualist ideology, but combines the physical and the embodied with the communal. This experiential quality of music is both disclosive and affective, Pythagorean and Orphic, to use Brown and Hopps's terms: 'Music brings about similar physical responses in different people at the same time. This is why it is able to draw groups together and create a sense of unity.'<sup>4</sup> It is no surprise, then, that music also has a remarkable effect on brain activity, including the easing of symptoms of neurological diseases or, conversely, provoking epileptic fits ('musicogenic epilepsy'). Many scientists, psychiatrists and psychologists have charted music's effects on the brain.<sup>5</sup> Oliver Sacks, for instance, analysed

how music can affect those who suffer with neurological problems, such as Parkinson's disease, aphasia, dementia, epilepsy or melancholia. He writes, 'Our auditory systems, our nervous systems, are indeed exquisitely tuned for music.' However, physiological reasons for such fine tuning have not yet been discovered:

How much this is due to the intrinsic characteristics of music itself ... and how much to special resonances, synchronizations, oscillations, mutual excitations, or feedbacks in the immensely complex, multilevel neural circuitry that underlies musical perception and replay, we do not yet know.<sup>6</sup>

However, one explanation posited for the highly influential role of music on the brain has been the notion of possession. In attempting to demonstrate that music leads us from sound, to tone, to melody, to harmony, to rhythm, to composition, to performance, to listening, to understanding and, finally, to ecstasy, Robert Jourdain has argued:<sup>7</sup> 'Music seems to be the most immediate of all the arts, and so the most ecstatic.'<sup>8</sup> Drawing upon Sack's work with Parkinson's patients to demonstrate how music 'possesses' us,<sup>9</sup> Jourdain attempts to articulate the nature of this 'possession' by using the language of encounter, relationship and experience:

By providing the brain with an artificial environment, and forcing it through that environment in controlled ways, music imparts the means of experiencing relations far deeper than we encounter in our everyday lives ... Thus, however briefly, we attain a greater grasp of the world ... It's for this reason that music can be transcendent. For a few moments it makes us larger than we really are, and the world more orderly than it really is.<sup>10</sup>

Such a definition of transcendence would not please many a reformed theologian, but this explanation places musical experience within the realm of deep relationship and expansive existence:

We respond not just to the beauty of the sustained deep relations that are revealed, but also to the fact of our perceiving them. As our brains are thrown into overdrive, we feel our very existence expand and realize that we can be more than we normally are, and that the world is more than it seems. That is cause enough for ecstasy.<sup>11</sup>

Jourdain is not alone in giving a scientific basis to expansive transcendental experience. The neurologist Macdonald Critchley acknowledges that

'Music can bring about a veritable perceptual spectrum ranging from the simple reception of auditory sense-data to impressions which ... well-nigh baffle description. So evocative, overwhelming and transcendental may these be as to defy description.'<sup>12</sup>

This experiential approach to the power of music upon the brain, leading to the explanatory analyses of 'ecstasy', 'transcendence' and the revelation of 'deep relations', is the starting point for my own explorations into the relationship between music, faith, religious ritual and altered state. As David Aldridge has observed, 'Many religions identify the ideal state as an altered state of consciousness: losing one's body and one's self, uniting with some sort of Divine Being.'<sup>13</sup> Likewise, and in keeping with the thesis of this book, Aldridge argues that the experiential nature of musical performance within religious ritual brings an intuitive understanding of spirituality, which words alone cannot create: 'That is why many religious forms feel redundant or restrictive because they have achieved a verbal dogma that fails to encourage the intuitive wisdom of current performances.'<sup>14</sup> It is in this context that I wish to explore the nature of 'trance'. Again, we have heard the word being used by Robin Dunbar to describe the endorphin-induced sense of well-being when experiencing music, but let us now explore this phenomenon in more detail by considering scientific research on music and the brain. Firstly, we must concur with Rouget that 'trance' and 'ecstasy' (as mentioned by Jourdain) are not the same:

Trance is always associated with a greater or lesser degree of sensory overstimulation - noises, music, smells, agitation - ecstasy, on the contrary, is most often tied to sensorial deprivation - silence, fasting, darkness.<sup>15</sup>

Thus, trance-inducing music within a religious ritual such as shamanism, which uses the body to make contact with the divine, or spirit world, through singing and dancing, is specific to the multi-sensory experience of the communal activity. In this context, scholars have concluded that music must possess certain characteristics in order to induce a trance. As John Pilch has shown based upon Kartomi's research, music must be mesmeric if it is to induce a trance: 'Music that best assists in inducing trance has regular pulsation and repetitive tonal patterns based on a restricted number of pitch levels.'<sup>16</sup> However, such trance-inducing music need not be shamanic. The calm, meditative chanting of the French Taizé community may equally assist:

Just as the Javanese in trance believe that they are in contact with their deities and spirits ... so too do modern devotees of Taizé prayer believe this music is most capable of bringing a person into the presence of the Deity.<sup>17</sup>

In either situation the resultant experience (of trance) is through both music and ritual: 'Music has become one with ritual and is not a separate aesthetic category.'<sup>18</sup> In wishing to explore this close relationship between music, trance and the brain, I met a neuropsychiatrist whose research is at the forefront of scientific explorations into how music and religious ritual interact: Quinton Deeley.

Quinton is a Consultant Psychiatrist and a Senior Lecturer in Developmental Neuropsychiatry at the Institute of Psychiatry, Psychology and Neuroscience at King's College London. He writes of himself: 'I conduct research into developmental psychiatry and related fields, and have ongoing research and publications on the relations between mind, brain and culture. This is an area that I have started pursuing since my dual qualifications, first in Theology and Religious Studies from Cambridge University, and later in medicine from Guy's and St Thomas' Medical School.'<sup>19</sup> When I met him at the Maudsley Hospital in London, I asked him to explain a little about his research.

**QD:** I'm a psychiatrist and senior lecturer in social behaviour and neuro-development. Before I started medical training I read theology and religious studies at Cambridge, where I was supervised very closely by John Bowker [Dean of Trinity College at the time].

**JA:** A great man.

**QD:** A great man. He had very broad-ranging interests, but had a particular interest in the relationship between genes, brain and culture, especially in its application to understanding religion. This encouraged my interest in this topic. I had an interest in Jungian theory of religion, within the broader context of psychological and anthropological accounts of religion. And, of course, Jung had this concept of archetypes of the collective unconscious. At one point I was set an essay question about the extent to which Jung's theory represented intuitive proposals about the structure of the mind which have been validated by subsequent discoveries. This pointed towards theories addressing the relationship between genes, brain, cognition and culture. So I went on and eventually wrote an undergraduate dissertation on the biogenetic structural theory of myth and ritual. Biogenetic structuralism was a theory in the 1970s and early 1980s predominantly, which sought to synthesise structuralist anthropology with what was known about the brain. It was part of the project of neuro-anthropology – in other words, the attempt to identify universal, or near-universal, aspects of

human experience and behaviour; and to understand whether they were motivated by features of brain structure and function as part of our characteristic endowment as a species. After that dissertation, I considered doing a PhD in biological anthropology at the University of Pennsylvania in order to pursue these questions further. However, I decided to undertake medical training, because I felt that it would allow me, through neuropsychiatry and cross-cultural psychiatry, to approach many of the same sorts of questions. I retained those interests during medical training.

Now, of course, in the meantime neuroscience and the human sciences evolved, so that by 1999 or 2000, when I started to do psychiatric research, functional neuroimaging was available, which hadn't been available at all in the '80s except in extremely rudimentary forms. I became involved in two broad lines of research, both of which are relevant to understanding cultural behaviour and cognitive and neuro-cognitive constraints on culturally variable behaviour. One line of research was into disorders of social cognition and social understanding, such as neuroimaging research into autism and criminal psychopathy. Psychopaths in this sense are people who engage in persistently antisocial behaviour without guilt or empathy for victims. Research on psychopathy is important in that it provides insights into how moral socialisation and the development of empathy can go awry. People with autism have difficulties with social understanding and social imagination, which again provides insights into quite basic mechanisms supporting social behaviour.

That was one line of research. But there was another line of research which really came out of my interest in neuropsychiatry and the broad category of what are now called 'functional neurological disorders'. That is to say, there is a very wide range of common symptoms and conditions whereby people present with or experience neurological-type symptoms in the absence of any underlying organic abnormality. For example, people with so-called conversion paralysis, where they have the experience of being unable to voluntarily move a limb, but there is no underlying neurological abnormality. These symptoms and conditions show the influence of implicit beliefs and expectancies, and point towards what we might term the 'power of belief' in symptom formation.

In the nineteenth century, there had been a very considerable interest in this topic by neurologists and psychiatrists, the period when the whole

field of neurology and psychiatry as we now understand it was forming. The dominant form of explanation inherited from that period was the 'lesion-deficit method': a very powerful and successful method of delineating organic causes of illnesses by correlating symptoms and signs of disease with an organic lesion. Modern neurology and other medical disciplines are founded on that model. But, at the same time, there was a recognition that 'morbid ideation' could affect symptom formation. There was a great French nineteenth-century neurologist, Charcot, who became very interested in what he called hystero-epilepsy – what we now call non-epileptic seizures (those occurring in the absence of epileptic brain activity) – and other so-called hysterical phenomena, what we now call functional disorders. Charcot applied the method of hypnotism and suggestion to treat these conditions, but also experimentally to investigate or model them. Suggestion in hypnosis was therefore recognised as both a therapeutic and experimental tool for producing alterations in experience and behaviour, which are essentially involuntary from the point of view of the subject. Charcot and others' recognition in the nineteenth century of the link between functional symptoms and the power of ideas conveyed through suggestion was revived towards the end of the twentieth century by psychologists and cognitive neuroscientists.

So I started research in this area with David Oakley, who was a professor of psychology at University College London; Peter Halligan, a professor of cognitive neuropsychiatry in Cardiff; and Brian Toone, a neuropsychiatrist at the Maudsley Hospital, and essentially we started to use 'suggestions' combined with functional magnetic resonance image scanning to produce an experimental model of 'dissociative limb paralysis'; in other words, what previously had been called 'conversion limb paralysis' or 'hysterical limb paralysis'. What we could now do, which was not available at the end of the nineteenth century, was measure brain activity during the formation of these symptoms, and therefore provide insight into how ideas, beliefs and expectancies can produce changes in experience *via* effects on brain function. Not only was this research opportunity novel, but it was also from a conceptual or philosophical point of view very important as an alternative way of understanding the contribution of the brain to changes in experience and behaviour – not only to disease processes, but also non-pathological processes. This might include ordinary everyday characteristics of human experience and behaviour, but also what are often called altered

states of consciousness. 'Alterations' in this sense are departures from more typical modes of experience of the self or other components of experience.

**This research is interesting in its own right, but I asked Quinton how it specifically relates to the brain's response to religious ritual, faith and musical expression.**

**QD:** We have conducted a series of experiments in recent years also with my colleagues Mitul Mehta and Eamonn Walsh at the Institute of Psychiatry, Psychology and Neuroscience at King's College London, in which we have been using suggestion to model a range of alterations in experience that occur both in pathological settings, such as psychiatric and neurological symptoms, but also altered states of consciousness as they occur within religious and other kinds of cultural setting.

So, for example, we have had a particular interest in the control, ownership and awareness of different components of normal experience, especially regarding action or movement, but also thought. Within psychiatric phenomenology, for example, it is recognised that there is a class of experiences called 'alien control phenomena'. So, a patient with schizophrenia may have the delusional experience that their hand is being remotely controlled by a maleficent agent, such as the CIA in the building opposite. They feel somewhat like a puppet and not in control of themselves. It is a very distressing experience. Similarly, there exists the phenomenon of 'thought insertion', where a person is aware of thoughts coming into their mind, but they're not their thoughts, and they don't feel in control of them. The patient will interpret them, or experience them, as belonging to somebody else, a maleficent agent typically, who is inserting these thoughts into their mind. So thought insertion and alien control of movement are different kinds of 'alien control phenomena', but there are also others, which relate not just to thought and movement but to other components of experience, such as speech or emotion.

### **RITUAL, DISSOCIATION AND ALTERED STATES**

**QD:** From a phenomenological point of view, experiential changes occurring in spirit possession and shamanism, as well as some modalities of mystical experience, are what we could describe as 'dissociations' or 'alterations' of the normal experience of selfhood. In such phenomena,

people may experience their thought, speech or movement as being controlled by a supernatural force; for example, in experiences of revelation. Therefore, both in pathological and non-pathological settings, you can see a category of experiences or variations in experience which involve these dissociations of selfhood. In our research we were very interested in creating experimental models and measuring brain activity to provide insight into fundamental brain mechanisms underpinning these types of experience. Essentially, we did a series of experiments on highly suggestible individuals – people who respond well to suggestions. About 10 per cent of the population are highly hypnotically responsive. One of the experiments was like this: imagine yourself lying on a scanner. You have a joystick that you move with your right hand, and you receive instructions periodically. Every three seconds you receive an instruction to move, for thirty seconds in total: so ten commands in a row. Then there's a rest period for another thirty seconds, followed by more move instructions, then rest instructions, and they alternate. So you're lying in the scanner, you're in your normal alert state, and you're moving the joystick ...

**JA:** The commands are right, left, up, down?

**QD:** Move the joystick forwards and backwards, and it's just the right hand. After the initial experience of being in control of the joystick, we then perform an induction procedure for hypnosis (remember we are using highly suggestible people). So then we repeat the experiment: you still have the normal experience of moving the joystick, but you happen to be hypnotised, so you're in a very relaxed and focused state. Then we make a suggestion that when you hear a command, your hand will move by itself. It's not you moving your hand, it will move by itself. We measure brain activity during this experience of involuntary movement. Then we make another suggestion that the hand moves by itself but you're not aware of this movement. This is important because during non-epileptic seizures, people produce involuntary movement with reduced awareness – about half of those who have non-epileptic seizures lose awareness during the seizure. Also, in mediumship or other possession states some people have no recollection of their movements during these episodes. It's therefore important to understand brain systems that can be involved in mediating this loss of awareness. Then we go on to make a suggestion that an engineer is conducting the experiments, and that they're using a machine to remotely control your hand movements. This is modelling a delusion



of control in the schizophrenic sense, but is also comparable to some religious or cultural phenomena where people might feel their actions are being remotely controlled by a spirit, for example.

The experiment continues (still with the volunteer under hypnosis) with the suggestion to the participant that the engineer has gone away and that the machine is now malfunctioning. So the movements become random, impersonal: there is no internal or external agent in control of the movements. Then we make a suggestion that the engineer has found a way to enter your mind and body from within. So you're aware of the thoughts and feelings of the engineer, but you're a hapless witness to the fact that your movements are being controlled by another agent. By that stage, we are modelling a type of spirit possession called 'lucid possession' in which you retain awareness of the possessing agent, as opposed to complete loss of awareness of the possessing agent. By contrasting brain activity during personal control (when the engineer is controlling hand movement either remotely or through possession) and impersonal control (the machine malfunctioning), we can identify brain regions which support representations of a controlling agent (in this case, the engineer).<sup>20</sup>

The key point about this experiment is that it provides insights into the type of brain changes that accompany different sorts of dissociation of control. More fundamentally, this perspective demonstrates how ideas can produce radical alterations in subjective experience through effects on brain function. Medical research has tended to examine the brain as an organ system that is somewhat extracted from social context. The change in behaviour (the symptom), it is assumed, arises from a physiological disturbance as the primary cause. That is a lesion-deficit model, and rests on a patho-physiological conception of disease. But what we're doing in this kind of research is re-embedding the brain within culture as an environment in which the exchange of meanings organises brain activity to influence experience and behaviour. In practice, communication occurs not only through language, but also through many non-verbal and non-linguistic communicative components within our culturally organised environments. What we're starting to experimentally demonstrate is how those processes modulate brain activity to produce changes in experience. That's very important, to understand the huge burden of illness which has previously been off the radar of physiological explanation, but also to understand how human beings' subjectivity, agency and cognition more generally are culturally

embedded. By virtue of that cultural embeddedness, the brain, located within this larger system of relationships, can be influenced and modulated in order to produce characteristic forms of experience. That, of course, has implications for anthropology and for understanding religion in general, and for understanding potential mechanisms through which religions and religious contexts can have such powerful effects on people. So we could say that this research has drawn attention to the power of belief and expectancy, the power of symbolic representation, as well as symbolic action in a broad sense.

### **HUMAN SUBJECTIVITY, CULTURAL CONTEXT AND MUSIC**

**QD:** So far our experiments have been in people who are highly suggestible, and we're using verbal suggestions, whereas in practice, and particularly in cultural contexts, many constraints or cues within the environment are non-verbal. Of course, that would include musical content as well. The verbal suggestions we use in our experiments can be classed as 'cognitive-symbolic' – that is to say, verbally encoded in language, evoking attributions of meaning, memories or expectancies. Cognitive-symbolic communication is clearly important in differentiating experience into the forms which are typical of a particular culture and context, or indeed influencing symptom formation in illness. But there are many other ways in which cognition and brain function can be influenced by cultural practice or by the features of the environment. In addition to these cognitive-symbolic forms, which primarily involve attributions or meaningful representations of one kind or another, there are sensory and affective components of cultural forms and practices which are also cognitively and experientially very evocative and constraining. So a general analytic framework for thinking about cultural processes can point to components which we could understand as predominantly cognitive and symbolic, and those which are sensory and affective.

And we should bear in mind others which are primarily motoric or movement-based, when we're thinking about the place of the body in culture, and the effects that that can have on experience. But, of course, cultural practices and forms such as ceremonial ritual typically draw together all of these different modalities and components of experience.<sup>21</sup>

Quinton's research clearly contributes to our understanding of how cultural contexts, such as religious music or experience, might affect the brain, but he also points out that, in a real context, there are many aspects of a religious service, for instance, that might affect brain activity on multiple levels at the same time:

**QD:** One of the explanatory fallacies of the application of psychological or cognitive theories of human behaviour is that there is a tendency to a rather atomistic conception of the effects that particular components of the environment might have. Thus, you might ask what the effect of smell on cognition is, for instance, incense in a church? Or what's the effect of rhythm? Or what's the effect of repetitive movement? Or what is the effect of religious icons? But, of course, none of these phenomena typically occur in isolation. They're orchestrated together and work together. So the interactions are synergic: they work with one another to produce effects which are probably not simply additive, but multiplicative. Moreover, from the point of view of the experiencing subject, the effects occur pre-consciously. In other words, experience emerges as a kind of late product of processing, which is multiply constrained, and we don't in general have conscious insight into the many processes that precede the emergence of experience. So as sensing and moving subjects we experience the world as a kind of rich totality. I think that's very important as a general observation, providing insight into how cultural practices can be so profoundly affecting. But I also think it demonstrates the limitations of reductionist approaches of laboratory-based research, which simplify the world in order to explain it – in other words, experiments are carefully controlled to allow inferences about causal processes which are not hopelessly confounded. However, when you take those conclusions and try to apply them to a human subject embedded in the world, it requires different methods to understand how the processes that have been isolated in the laboratory context then contribute to sensibility in complex real-world situations.

From a scientific point of view, we are still confronted with this problem of so-called 'ecological validity'. That is why cultural neuroscience, social neuroscience or neuro-anthropology are still at a relatively preliminary stage. We are at the point where we are identifying processes that are involved in the formation of altered or exalted forms of experience of various kinds, but we must be careful that we don't over-interpret those findings: a certain humility at this point is required.

Thus, there arises the question of relevance and what the value of this kind of research is in terms of our self-understanding. Is it just to alleviate the suffering of those with mental illness, or are there wider implications for the understanding of human experiences, such as religious music?

**QD:** In the medical case, I think the relevance is fairly plain, because we want to understand what causes suffering and disability and distress, in order to do something about it. In the case of understanding religious or aesthetic experience, or attributions of ultimate meaning, this kind of research has a potential bearing upon the interpretation that one places upon experience, but the direct relevance is not always as obvious as it is in the medical case. The wider conclusions might be more in the realm of general anthropology, that is, our account of ourselves as human beings – what used to be called the doctrine of man in theology. The findings also raise philosophical and theological questions as to what sense we make of these essentially naturalistic accounts of forms of experience that have arisen, for example, within religious settings. But not just religious settings: similar challenges or questions arise concerning attributions of meaning and value that occur within secular settings as well. For example, does the value of aesthetic experience change if we know what evokes it at a mechanistic level? So I think that's a different category of questions or set of considerations.

**At this point I am fascinated about what we can see happening in the brain during religious ritual, so I ask a lay question about the experimentation and what one is looking at in the neuro-imaging of the brain and what changes one observes.**

**QD:** I can probably answer that question best by describing another experiment we conducted using automatic writing as a research paradigm. Automatic writing, where the hand writes 'by itself' without conscious direction by or in some cases even awareness of the person holding the pen, is a phenomenon that was of great interest, particularly in the nineteenth century, within the context of spiritualism and mediumship. From our point of view, it was interesting because when people write automatically, there is a motor component – the hand moves by itself when the writing occurs. But there can also be a component of thought insertion – the thoughts that you write down are not your own thoughts, they're introduced by an external agent. There

are instances of automatic writing as being a religiously interpreted modality of revelation, but I think in broader terms it points to a class of dissociations of complex thought and movement which provide insights into revelatory experience as a category of psychological processes.

We conducted an automatic writing experiment in highly hypnotically responsive individuals who were required to think of a sentence ending to a prompt, and then write it down.<sup>22</sup> During the automatic writing experiment it was suggested that an engineer either i) inserted a thought of a sentence ending into the mind of the participant; or ii) remotely controlled hand movements when a sentence ending was written down; or iii) made the participant lose awareness for automatic writing in which both thought insertion and alien control of movement occurred (this latter condition modelled classic mediumship, in which the medium has no recollection of the message they have written down during control by a spirit). We measured brain activity during all of these conditions using functional magnetic resonance imaging (fMRI). During these experiments we measure something called BOLD signal. Essentially, we apply very strong magnetic fields to the brain, which allow differences in paramagnetic properties of oxygenated and deoxygenated blood to be detected. Regional brain activity creates a change in blood flow to that region to carry away deoxygenated blood and return oxygenated blood. The difference in the magnetic properties enables a proxy measure of brain activity, because blood flow is linked to brain activity. So we are not looking at the activity of individual neurons, we are looking at an indirect product of the net activity of many millions of neurons comprising brain tissue, and systems or networks of brain regions. Thus, in terms of the type of analysis that we do, we're interested in a measure of activation of these brain regions, but we can also tease out another property called 'functional connectivity'. This is a statistically derived measure of the functional coupling of different brain regions. In other words, brain regions which are distributed across the brain, but where their activity is correlated in time. This is important because it is never the case that some feature of cognition and behaviour is produced by a single brain region acting in isolation. There is always a network or a set, a kind of ensemble, of brain regions, cooperatively working together to enable a function to emerge. Therefore, functional connectivity gives us an insight into the extent to which different brain regions work together to produce a particular function. Changes in functional connectivity help us to understand

the types of cognitive functions which are brought together, potentially, in order to achieve a particular task or some other component of experience we're interested in. In summary, we are measuring regional brain activity, and functional connectivity or functional coupling.

**JA:** In the experiments, do you see particular areas of the brain being much more active than others?

**QD:** Yes. So, for example, in the case of the automatic writing experiment, we found very extensive non-overlapping or distinct changes in brain activity during thought insertion compared to alien control of movement. This is to be expected, because thought is different from movement. Yet we were very interested to find that there was a brain region that was overlapping between the two conditions. So when the volunteers had the experience that their thoughts were being externally controlled, and when they had the experience that their movements were being externally controlled, there was a reduction of activity in the supplementary motor area.

The supplementary motor area is a well-studied brain region which is known to be involved in action preparation and the formation of intentions to move. So it's a brain region that becomes active immediately preceding the conscious awareness of the intention to move. During an experience of alien control of movement, the reduced activation in this region is likely to underpin the loss of the experience of self-control, or self-initiation of movement. The brain regions involved in the execution of movement are active, but a brain region involved in the formation of motor intention, and the initiation of control of movement, has reduced its activity. What's interesting, though, is that the same region showed reduced activity during thought insertion. This suggests that the supplementary motor area's role may not be restricted only to movement, but it may have a broader role in different types of control and ownership of mental content. This was a novel finding, because the experiment was the first experimental model of thought insertion. What would be interesting, from a cognitive neuroscience view, is to see whether other types of so-called 'passivity' or alien control phenomena equally involve a reduction in the activity of supplementary motor area, because that potentially provides insight into a fundamental brain mechanism by which components of experience that we normally experience as under our control and ownership can dissociate and be experienced as not belonging to the self, or not under self-control.

## EXPERIMENTS WITH SUGGESTION AND RELIGIOUS GROUP ACTIVITY

These experiments have been conducted on particularly suggestible individuals. But religion and cultural practice is very often group activity. Thus, I wondered whether there is any research that would connect that suggestibility with collective behaviour. For instance, when I was young and attended an evangelical Baptist church, with very often large groups, some people would occasionally speak in tongues, and it seemed that there were particular settings in which they were apparently given this so-called gift, whereas if you met them individually they wouldn't speak in tongues. So is there any correlation between these things?

**QD:** There are a number of observations to make. In terms of conducting experiments using brain measurement techniques for people in groups, that's an extremely interesting question and difficult to achieve in practice. It's technically very difficult to do, but one approach is to measure brain activity in two people simultaneously while they're conducting a joint task or interacting with one another, and that potentially provides powerful new insights into the change in brain function by virtue of being embedded in a social context, an interaction or a relationship. Arguably, most brain-imaging experiments are extremely artificial, not just in terms of the way that the environment and tasks have to be simplified, but also the abstraction of the person from social interaction. So it would be very interesting, for example, to investigate how knowledge of oneself as interacting with somebody else alters brain activity, either in specific brain regions or more globally, and the extent to which the variation in the activity in one person's brain can be predicted or explained by the variation in the activity in another person's brain. Now that might sound a bit like telepathy or telekinesis, but it doesn't have to be viewed in those terms, because there's a huge amount of brain which is dedicated to social cognition and social representation, which, in a way, tunes us in and allows us to notice, represent, understand and respond to the social intentions of people around us quickly and automatically. This is partly what is sometimes called 'theory of mind', or mentalising, or perspective-taking, the brain networks of which are well characterised by now. This is the ability to make attributions of the content of the thought, understanding and perspective of somebody else. But there has been a great interest in so-called 'simulation' of other people's mental states, and

mirror neuron systems, the core idea of which is that the brain regions which are involved in, for example, producing an action by yourself, are also active when viewing an action in somebody else. In this model, perception of others allows us to 'simulate' their internal state through the automatic activation of the brain regions they are using to generate their behaviour. Mentalising and simulation accounts of social cognition point to a fundamental orientation towards the social world grounded in brain structure and function.

If we think about the example you gave, of an evangelical service where people speak in tongues, I think that illustrates the point that lots of things are going on at the same time, all of which may influence or constrain the behaviour and experience of individuals in that setting. You can see that many different research disciplines have important things to say about what's going on. There's a body of social psychology research, for example, stemming from Erving Goffman, about the importance of frames of behaviour, or implicit scripts. These dramaturgical analyses of behaviour rest on the idea that, in social contexts, we can be viewed implicitly as actors with roles following implicit scripts which structure our behaviour, and that validates it and makes it meaningful. Now that is by no means opposed to a cognitive neuroscience perspective, which would ask how those implicit social schemata are represented in the brain and how they contribute to action formation and experience. We do have some understanding of the brain regions comprising these mentalising networks, including the memory systems in the brain involved in storing or representing social scripts or schemata.

We might also consider the infectious quality of emotion that can occur in social settings, and the power of observing group action. The notion of simulation, or the mirror neuron concept, provides a potential mechanism for understanding how our brain activity can automatically be hooked up, as it were, to what's going on around us. If people around you are behaving in a particular way and expressing certain kinds of emotions, then all the brain systems in yourself that would be involved in that kind of behaviour, or expressing those kinds of emotions, are at least partially activated by the mere observation of it. Thus, you're already creating an internal template in order to enact or reproduce the behaviour of people around you, just by virtue of perception. This may not be sufficient for you to behave as your peers, but it creates a potential to share their experience.



Understanding social context and social role is really important in understanding behaviour within religious settings, including in ritual settings. For example, Gilbert Rouget, a French ethnomusicologist, wrote a book, *Music and Trance*, which is a very wide survey of different types of possession cross-culturally and historically.<sup>23</sup> He observed that within the annual feasts for Shango among the Yoruba, at least several dozen adepts among a large crowd are capable of being possessed by Shango. However, only one of these adepts actually embodies the god. By contrast, among the neighbouring Fon and Gun peoples, Khevioso, a homologue of Shango, can be embodied by several dancers simultaneously.<sup>24</sup> These examples illustrate how the trance behaviour of adepts conforms to shared implicit conventions – what Rouget called ideologies of possession, which we would call schemata – implicit models of how to experience and behave in ritual settings.

Rouget also points out that the performers of music in possession cults don't become entranced, not only because they are concentrating on producing the music but also because it is not their role to become possessed. However, in the case of shamanism, where the shaman dances *and* produces music, the musician is the creator of his own trance. So these modalities of response are highly structured and organised by implicit models. Of course, there is an important question about how we learn these implicit models, which can be partly answered by the study of memory, social perception, social interaction and, very importantly, the study of non-verbal communication and social modelling. Then one must examine how the brain systems which are involved in that learning and representation interface with other brain systems involved with the organisation of action and emotions, as well as other components like attention, memory or awareness. The research on suggestion is relevant here, because we have demonstrated that phenomena such as involuntary movement can be accompanied by different causal attributions and experiences depending on the suggestions we administer (for example, whether the hand movement is remotely controlled by an engineer, or caused by a malfunctioning machine). In other words, whether or not a change to the usual sense of self-control occurs, as well as the *type* of broader experience within which that change occurs, is exquisitely sensitive to belief, expectancy and context. Similarly, even within a group of people in the same religious ceremonial setting, there are different forms of experience that can accompany the performance of music,

listening to music, and other aspects of a ritual setting, including when and among whom altered states of consciousness or sensibility occur. These differences can be influenced by social role, expectancy and prior experience. Consequently, while cognitive processes such as mentalising or simulation may enable sharing of types of experience, cognitive processes relating to role, expectancy, prior experience and training also contribute to the responses of participant, performers and officiants.

## RELIGIOUS RITUAL AND POSSESSION

**QD:** To switch to a cross-cultural perspective for a moment, there are many possession cults that are associated with amnesia, which is connected to the logic of possession, because, if a person is 'possessed' by a different identity or agent, why would they remember what that different agent is experiencing? Logically, one doesn't normally have access to the memories of somebody else. (There is an exception, however, to this experience, which Oesterreich called 'lucid possession',<sup>25</sup> where the 'possessed' does have awareness of the thoughts and feelings of the possessing agent.) In our research modelling possession states we have measured brain activity during reduced awareness of suggested involuntary movement. So, for example, we identified reduced activation in Brodmann Area Seven (BA 7, which is part of the parietal lobe) during reduced awareness which is part of the parietal lobe, which we know from other research is involved in awareness of the control of movement in immediate extra-personal space. We also noticed reduced activity of the insula, which is involved in the processing of afferent sensory information from the body. So these are plausible brain mechanisms for understanding how it's possible to have a loss of awareness of immediate surroundings, of movements and bodily sensations during possession states.

These experiments study relatively 'downstream' changes in brain activity, which accompany specific alterations in experience. There's a very important question about what happens more 'upstream' at a higher level of control. What are the processes, and when do they happen, that reorganise brain activity into the late changes that underpin ritual or other religiously evoked experience? The question of what happens more upstream is not well understood and very difficult to study, because it pushes us up against trying to unravel the very rapid

and conceptually quite tricky alternations between different levels at which experience is organised. For example, the attributions and interpretations implied or expressed in our immediate social and physical environment; our underlying beliefs and expectations; and the way these 'higher level' processes are represented in the brain.

We bump up against not just the mind-body problem, but what we could describe as the mind-body-culture problem, as we try to create a causal model that can handle these complex and rapid adjustments or interactions between different levels at which we're organised.

**JA:** That's a very difficult challenge, absolutely. The areas of the brain that you were measuring, are they in any particular hemisphere, or predominantly in any particular hemisphere?

**QD:** There's a very long tradition of research about the role of different hemispheres in contributing to different forms of experience or styles of experience in cognition.

**JA:** So I'm thinking of McGilchrist's *The Master and his Emissary*.<sup>26</sup>

**QD:** Yes, among others going back some way (for example, Turner 1983).<sup>27</sup> In terms of our research using suggestions to model altered states of self-control and consciousness we're not making very strong generalisations about the contributions of respective hemispheres, but some research does point to different routes into altered forms of experience or altered sensibility.<sup>28</sup> This is both at the individual level, where different cognitive styles relate to the predominance of functions that are more supported by one or other hemisphere. But different cultural forms also engage distinct types of information-processing and hemispheric activity.

So, for example, there's good evidence that a more poetic mode of language-processing, where there's a greater emphasis upon evoking remote or indirect associations between words, would enlist a relatively greater engagement of right-hemispheric processing.

Also in musical-processing, there is some work that points towards a relatively greater engagement of right hemisphere. So entering more emotionally exalted states, through say poetry or the use of certain kinds of mental imagery, or icons or other types of visual imagery, or music and so on, engages the right hemisphere relatively more.<sup>29</sup> Equally, heightened emotion and significance can be evoked by sensory-affective stimuli.<sup>30</sup> Again, this shows the range of elements that can be orchestrated in ritual or religious settings to evoke heightened experience.

There are different routes, then, into altered experience in ritual and religious settings, but also different forms of experience and sensibility. This returns us to a critical phenomenology as a starting point for religious studies. It is important to move away from the idea of generic altered states of consciousness, aesthetic or religious experience. Hopefully this is a qualified and nuanced approach, which does justice to the complexity of experience and behaviour, and how it becomes embedded within cultural processes, but also, critically, how the experience varies across time, across development: through childhood, teenage years and early adulthood experience evolves, sensibility evolves.

### DEELEY'S RESEARCH AND PERSONAL VIEW ON FAITH

In Deeley's research, I wonder whether it has caused him to reconsider the nature of belief, and whether it has changed a philosophical or theological perspective for him.

**QD:** In a narrow scientific sense, it's changed my sense of belief, because it's made me think of belief, on the one hand, as a very important category of psychological phenomena, which has explanatory relevance, while at the same time prompting me to think about how belief is fractionated into different processes. In terms of my philosophical and theological orientation, it has strengthened my sense of the importance of culture. We use the term 'biography' as a way of embedding an individual within society, within relationships with other people, within context. I'm going against a grain, the trend of neuro-reductionism, which sees the brain as the first cause of experience. The explanation of a phenomenon, it says, begins with the brain. But the approach that I'm taking points towards the notion of reciprocal causation and a more systems-based approach. This involves thinking of human life as organised at different levels, in which there are complex interactions all the time, over different timescales, across development, prenatally, postnatally, from infancy throughout life. Thus, in order to understand any particular phenomena, you have to delimit the frame of explanation to pick out causes or constraints which are most immediately relevant. But what counts as immediately relevant partly depends on the question you're asking - if it's a question about development, for example, or if it's a question about immediate causation, or even if it's a question about evolution. But also it underscores the importance of environment broadly conceived to

brain structure and function, as well as the importance of brain structure and function to the explanation of behaviour.

It is a scientific point that I'm making, but it's also a philosophical point, because it's about recognising the richness and complexity of human life and experience and sensibility, the primacy of relationship and social involvement in terms of what we are. It resists a kind of simplistic reductionism, which devalues experience and, if used as a basis for policy or medical treatment, can be very harmful to people. For the sake of argument, let's say that, in order for you to have a sense of greater connectedness with the world around you, there is an attenuation of the sense of oneself as being strongly separate from the rest of the world. Let's also say that that sense, when it occurs, can be experienced as inherently valuable. There may be, then, an ethical implication that you should love your neighbour, or you should help people, however you want to think about it. So if you say that, in order to have that experience, your parietal lobe, among other brain regions, has to function within certain parameters, does that diminish the value accorded to that experience? Now this is an important question, and I think the question here is answered not by whether or not a brain region or network has to be active to have a certain type of experience. I think how one evaluates those experiences involves broader considerations which aren't about whether or not a particular brain region is active, or indeed whether or not a certain type of brain behaviour is necessary for certain types of experience. In order to know that 'one plus one equals two' requires a certain type of brain behaviour, so the actual judgements about truth, even narrowly conceived, require certain types of brain behaviour in order to have the competence to make them. Yet the truth or value of a mathematical operation is given by the criteria for determining its truth, and is not based on the various ways it might be implemented in a brain – or even a machine. Judgements about other types of value, such as beauty, are not just conceptual, nor are they as easy to demonstrate in terms of the self-evidently correct application of a system of rules such as you get in logic or mathematics. Nevertheless, you can see within communities of people, who form judgements about the aesthetic value of something, that there are criteria applied. There are local consensuses that can be reached, and that extends to art or music: it may be a very general sense, but you do get community consensus. It also extends to sporting prowess – a good goal, a good tackle, etc. So we apply these judgements all the time.

The fact that experiences have accompanying brain activity doesn't, in a general sense, dictate the truth or value of the judgements we make – even if they are necessary for given types of judgement to be made. The same is generally true of religious experience. But there is a particular relevance of a scientific anthropology to particular questions. So, for example, a thousand years ago it was easier for people, including intellectuals, to operate with what you might call a naïve realism about the content of religious experience, such as sensations of ascent into heaven, a return to earth, prophetic or inspired speech. The demonstration that some forms of experience – which are subjectively very convincing – can be produced through entirely natural mechanisms does have bearing upon any naïve interpretations of what those experiences are. I think it makes it less plausible that they can be taken at face value, and makes it more likely that they have to be considered as a product of brain behaviour dependent on ideas and context in very particular ways. With respect to religious experience, this is partly to do with understanding the relationship between the brain and experience, but I think it's also, perhaps even more importantly, to do with broader changes in philosophy. Philosophies, for example, following on from Immanuel Kant, which underscore the idea that we don't have an unmediated access to a world of experience and understanding independently of cognition. I think that point is absolutely fundamental, because it argues very strongly against a naïve realism. It means that the types of religious experience that may be consistent with, for example, belief in God, don't carry the weight of self-evident truth that has historically been ascribed to them. It becomes more a question of inference in a much weaker epistemological sense than was in the main accepted in premodern religious traditions.

When I say that it's a question of inference, I do *mean* it's a question of inference. For example, some versions of theology incorporate religious experience as part of the abductive inference of God – using cumulative arguments for the existence of God. This involves looking at numerous lines of evidence which cumulatively point towards the idea that believing in God makes sense: God as an omniscient, omnipotent creator of the world, and so on. I think certain kinds of religious experience more readily support those kinds of inference. For example, I was at a conference called 'Cognitive Approaches to Ancient Religious Experience', and Rowan Williams was talking about Christian monasticism and certain types of religious experience which arose for some

of the early desert practitioners. He was discussing the case of Evagrius and I pressed him quite closely as to what he thought was going on in between the attenuation of symbolic thought and its resumption; modes of experience which were essentially non-verbal, and which are consistent with apophatic theology, in which there is a profound reluctance to make positive statements about what religious experience points to. Rowan said that his sense was that these modalities of experience, to the extent that one can discuss them, were about what he termed 'connectivity', by which I think he meant an altered sense of self, or an attenuation of the normal sense of self, a kind of intimate, profound relationship with the universe, which is experienced as inherently valuable, and which has ethical implications. Within one way of thinking, this is the nearest a mere mortal can come to the direct intuition of God. I think this makes sense within its own terms, and it is certainly a mode of experience which has evoked and reinforced the inference of God – even if this is not the only ontological inference that can be made on the basis of this form of experience.

### THE BRAIN AND REVELATION

**QD:** Revelation is much more problematic. Revelation, in the sense of direct control of mental and vocal apparatus by God or other supernatural agents to introduce messages about the nature of the world into the world, is a different case. It seems to me that the fragility of human cognition, of the human mind, is evident in how, with astonishing ease, it is possible to evoke comparable experiences in many people by simply administering suggestions to them. I think that raises a challenge as to how we interpret those experiences. There are accounts in the Christian tradition of revelation as 'divine dictation' which are perhaps theologically most problematic. But a tradition that the Holy Spirit works concurrently with the human mind in the production of revelation allows for the idea that there is an evocation or inspiration rather than direct control of human communication by God. It therefore also makes greater space for epistemic limitations – the influence of the human mind on what is communicated. In this latter tradition, one could argue that it is an evangelist's own understanding, in some deep sense, which is being communicated, but which is nevertheless being influenced by an apprehension about the nature of the world. Even then that's problematic, because that's not what they thought they were doing, and it has never consistently been interpreted as such within the respective traditions.

An alternative view is not to be troubled by this, because it's in the nature of the divine agent that they can intervene in the world, and enlist the cognitive resources of mere mortals to speak through them. If that argument is made, then that requires a different kind of world picture, and a different sort of theological view, which is not mine. So I do think questions are raised, and the naturalistic approach to the world, in broad terms, continues to pose a profound challenge to theological realism.

When you break theological realism down into particular issues, it requires radical revision, compared to premodern understandings of the world. There's no doubt about that. Now whether what you're left with after that is the same religion as the one of former ages is a matter of individual judgement, I think. But you end up in a very different place and the people you may find yourself closest to, in terms of their sensibility about the world, may not even be religious. If you think about religion as a kind of umbrella term, which encompasses all sorts of subsystems, experiences, practices, ethical orientations and different resources that people draw upon to navigate and make sense of the world, then there'll be subsystems in Christianity, as it now is, that are much closer to subsystems within Islam, some forms of Sufism and some forms of Buddhism, Hinduism, than they are to most of their co-religionists, and indeed, also to romantic poets.

**JA:** And to secularism as well?

**GD:** We're in an odd stage of history, where many traditions are being pulled in different directions, and arguably quite radically fragmented. People are asking: what do you have to believe and how do you interpret the world in order to be a genuine inheritor of a tradition, without self-contradiction or dissimulation? In that context, it doesn't make a lot of sense for a Christian to be a kind of social worker who practises out of a church. There has to be meaningful institutional continuity, otherwise the Christian project is lost.

Modes of experiencing oneself as part of the totality of being, as Ricoeur put it, are a source of value, and they do point towards forms of understanding, relationship with oneself, with the world, with fellow human beings, which have been tracked within different traditions and identified as a source of value. There are local characteristics and interpretations within different traditions, so different schools of thought within Buddhism are not the same, different forms of Hindu tantras are not the same, different forms of Sufism are not the same, etc. Those



variations do make a difference, but I can see family resemblances between different sensibilities that point towards a kind of common resource, which one can recognise across different forms of life, including the secular.

Like many people, I find myself in this position that I can see a great deal of value and good in religions, along with a great deal of harm, while not belonging to that religion. The question: 'are you religious or not religious, or are you an atheist or not atheist' is a very nineteenth-century question. We're in a kind of multi-polar Hegelian dialectic, the outcome of which is not known, and may not be known, because we may all have destroyed ourselves before we get there, which at the moment is starting to look a bit more likely than not. The people who will shout loudest on our way to the whole thing spinning really out of control will of course be the people who see themselves as the inheritors of the traditional systems. We're in a world in which people are shouting at each other through megaphones all the time. That seems to have happened very quickly, because I don't remember such a pervasive sense of this growing up: it's just changed. We're dealing with all sorts of fundamentalisms, including secular and nativist fundamentalisms, and we find our societies fragmenting and some being attracted to extremism. That's creating very new dynamics and predicaments for people.

I think there is more work of imagination, partly poetic work and partly philosophical work, needed to understand how to recognise and articulate a vision of the world other than a sort of simple subjectivism. People who've given up premodern ontologies often don't feel that there's a shareable discourse about the world, and about the structure of our place in the world, which can form a common basis for value orientation. I'm not sure that that's the case, but the really powerful thing about religions is that they're very, very good at concretising beliefs and ontologies and making them externally very compelling. Ideologies like fascism and communism have, at times, also been very good at that.

The other place I think problems with naturalism come up is in cosmology. We're in this odd position where the scientific account of the universe is, at one level, extraordinarily impressive as an intellectual and scientific achievement, even though there are bits of it that clearly are still matters of profound uncertainty, and changing very rapidly. But scientific discourse doesn't function simply as descriptive or explanatory; it tends to be read as an effort after a broader or even ultimate

meaning. At the same time, science struggles to convey a total vision of the world, because it's not designed to do that. This illustrates the power as well as the limitation of the scientific and naturalistic ambition, not least because we encounter the question: why is there something, rather than nothing? I'm not proposing that there would be an answer to that either. I'm saying that there's an epistemological limitation around the project, and also a question about the sufficiency of scientific language for human beings – for articulating radical awe, or ontological shock – because the language is not really designed to do that. When you see science documentaries and read science journalism, they're often framed as an encounter with some awe-inspiring feature of the universe, but this points to a problem of epistemic limitation to do with the sufficiency of the causal explanation about why this world exists. This is not just to do with the restricted focus of explanatory discourse or explanation in science, it's also the symbolic, linear, temporally and spatially bound nature of understanding that is problematic. What is epistemologically disruptive is the troubling intuition of the vastness and complexity of a world that we cannot fully grasp or understand; to intuit that is to be awestruck, and perhaps, at times, to be fearful as well. Not fearful of damnation, but just fearful of mystery.

### AFTERTHOUGHT

Quinton's sense of intuitive awe, and even fear, in the face of a vast and complex world brings me back to the importance of music within the mental and physical processes involved in our human experience of encounter and relationship, with the world around us and with each other, as well as experiences that shape our perception and reception of reality. Music, especially when used in the intense arena of trance-inducing ritual, as Quinton has explained, can be a powerful psychological and neurological stimulant. When examined within the realm of religion, we find that music, in this context, is part of a more powerful experience than mere cognitive belief in a creator god. As John Gray has written, 'A godless world is as mysterious as one suffused with divinity, and the difference between the two may be less than you think.'<sup>31</sup> Moreover, as Anthony Storr concludes, 'Although music is not a belief system, I think that its importance and its appeal also depends upon its being a way of ordering human experience.'<sup>32</sup> It is this experience, for Storr, both physical and neurological, that helps him make sense of the 'fearful mystery' that takes the listener beyond both of these embodied processes:

Music exalts life, enhances life, and gives it meaning. Great music outlives the individual who created it. It is both personal and beyond the personal. For those who love it, it remains as a fixed point of reference in an unpredictable world. Music is a source of reconciliation, exhilaration, and hope which never fails ... It is irreplaceable, undeserved, transcendental blessing.<sup>33</sup>

Storr here refers not to a transcendence that is imagined, but to a real hope that allows for the 'vastness and complexity of a world that we cannot represent to ourselves.' In this context it leads not to a vague 'transcendence' of a meaningless 'other,' but substantial influence on the genuine process of reconciliation and exhilaration, leading to a greater optimism for the future. Through this experience we approach, with meaning, the awesome mystery of our existence.