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The Boyle Lecture 2008: Psychologising and Neurologising about Religion: Facts, Fallacies and the Future¹

A leading article in the 14 June 2007 issue of *Nature*² proclaimed, ‘With deference to the sensibilities of religious people, the idea that man was created in the image of God can surely be put aside.’ In discussions of human nature such headline grabbing claims are, today, all too familiar. The *Nature* article added, ‘Scientific theories of human nature may be discomfiting or unsatisfying, but they are not illegitimate.’ With that I heartily agree. As we struggle to answer the perennial question, ‘What is my nature?’, I want to share with you my thoughts as a neuropsychologist about how best to answer that question whilst doing full justice both to scientific theories and to ancient wisdom.

As my title suggests, I shall summarise the relevant facts from psychological science and neuroscience, noting as I do the, at times, fallacious interpretations of the data. Then I shall ask how, by learning from past reactions, we may respond constructively to new challenges.³

Psychologising about religion

In the first three quarters of the last century the progress of the psychology of religion flowed mostly from developments within psychology that impacted religion. During that period most psychologists shared Michael Argyle’s⁴ 1958 working definition of religion as ‘a system of beliefs in a divine or superhuman power, and practices of worship or other rituals directed towards such a power.’⁵

In 1985, Argyle⁶ pointed out that for a long time ‘the psychology of religion

1 This article represents a shortened version of the Boyle Lecture given on 23 January 2008 at St Mary-le-Bow Church, London. The full text of the Lecture is available at: http://www.stmarylebow.co.uk/?Boyle_Lecture:2008.

2 Lead Article in *Nature*, 14 June 2007.

3 An extended account of the issues raised in this lecture has now been published in book form as Jeeves, M. & Brown W.S. *Neuroscience, Psychology and Religion*, Philadelphia & London: Templeton Press (2009).

4 Argyle, M. *Religious Behaviour*, London: Routledge (1958).

5 Argyle, M. & Beit-Hallahmi, B. *The Social Psychology of Religion*, London: Routledge (1958, 1975), p.1.

6 Argyle, M. ‘New directions in the psychology of religion, in Brown, L.B. (ed.) *Advances in the Psychology of Religion*, Oxford: Pergamon Press (1985), p.8.

tended to be rather parasitic on mainstream psychology'. At that time, however, he believed he had observed a change in which the situation was being reversed, so that, for example, social psychologists were becoming interested in religious sects and their conversion techniques, and cognitive psychologists were becoming interested in religious experience.

Broadly speaking, psychologists who have taken an interest in religion have concentrated on what we might call its roots and its fruits. Hearnshaw identified four significant influences at the end of the nineteenth century that provided the basis for later psychological studies of religion: (1) Francis Galton's studies of the manifestations of religion (e.g., prayer); (2) studies by anthropologists, such as Sir James Fraser, of comparative religion and the origins of religion; (3) the writings of theologians such as W.R. Inge on mysticism and religious experiences; and (4) the beginnings of the systematic psychology of religion (e.g., E. G. Starbuck). These in turn culminated in William James's⁷ classic, *The Varieties of Religious Experience* (1902).

Psychoanalysis and religion

As we move further into the twentieth century the picture changes so that by the time Sigmund Freud's radical views were becoming more widely known in society at large, the stage was set for a strong resurgence of the warfare metaphor to describe the relationship between science and religion. Despite Freud's own disclaimers that his accounts of the roots and fruits of religion were neutral as regards the truth value of specific religious beliefs which, he agreed, must be decided on other grounds, nevertheless his own accounts were soon seen as 'explaining away' religious beliefs and exposing the practices of religions as 'nothing but' the persistence of an interim social neurosis that we must eventually grow out of.

Another major figure in psychology during the first half of the twentieth century was Carl Jung. For a time Jung was a close collaborator with Freud though he subsequently developed his own views within the psychoanalytic tradition. Freud and Jung, as in matters psychological, ultimately differed radically in their views of religion. Whereas for Freud psychology pointed to religion as a neurosis that in time could be dispelled and the patient (the human race?) cured, for Jung religion was an essential activity of humanity. The task of psychology was not to explain away religion, but to try and understand how human nature reacts to situations normally described as religious.

Freud's and Jung's contrasting views were aptly summarised by G. S. Spinks⁸ when he wrote, 'For Freud religion was an obsessional neurosis, and at

7 James, W. *The Varieties of Religious Experience*, London: Longmans, Green (1902).

8 Spinks, G.S. *Psychology and Religion*, London: Methuen (1963).

no time did he modify that judgment. For Jung it was the absence of religion that was the chief cause of adult psychological disorders. These two sentences indicate how great is the difference between their respective standpoints on religion.’

Psychoanalysis a two-edged sword – a timely lesson

A major problem for the psychoanalytic treatment of religion as the product of unconscious wishes, is that it can apply equally well to the understanding of unbelief in those who wish to refute religion. This was penetratingly demonstrated by Rumke⁹ in his little book *The Psychology of Unbelief*. Rumke looked carefully at the history of Freud’s own life, such as his poor relationship with his father and his intense dislike of his Roman Catholic nanny and put these together to show how, on the basis of Freud’s own theory, a picture emerges from which we would predict that a person with such a background would, on reaching maturity, produce a rationalised set of beliefs in which he would reject religion and in particular a religion in which God was seen as a father figure. And Freud did just that.

While Freud and Jung captured the headlines and the public interest in what was happening at the psychology-religion interface in the first half of the twentieth century, there were others such as R.H. Thouless¹⁰ who were writing on the same topic and in many psychologists’ judgments making a much more lasting contribution, as evidenced by the 1971 reprinting of his book *Introduction to the Psychology of Religion*, first published in 1923. Thouless’s approach was primarily constructive and a complete contrast to the warfare metaphor.

Since the Second World War there have been several noteworthy attempts to offer new insights into religion through the eyes of psychology. Notable among these are G.W. Allport’s¹¹ *The Individual and His Religion* (1951), Michael Argyle’s several books, including *Religious Behaviour* (1958) and, with Beit-Hallahmi, *The Social Psychology of Religion* (1975). These, like Thouless’s book, are not confrontational and bear no mark of the ‘conflict’ approach. In his insightful psychological analysis of religious belief, Allport, in discussing constructive doubt notes that ‘if each person understood the doubting process, he would be in a better position to determine the cogency of his own grounds for belief or disbelief’ (p.115). This brings to mind Robert Boyle’s aphorism, ‘He whose faith never Doubted, may justly doubt of his Faith’.¹²

9 Rumke, H.C. *The Psychology of Unbelief*, London: Rockliff (1952).

10 Thouless, R.H. *An Introduction to the Psychology of Religion*, London: CUP (1923, 1971).

11 Allport, G.W. *The Individual and His Religion: a Psychological Interpretation*, London: Constable (1951).

12 Davis, E.B. ‘Robert Boyle’s life, attitudes and vocation’, *Science and Christian Belief* (2007) 19, 117-138, p.120.

Behaviourism and religion

There are many excellent books on the psychology of religion that are not infused with the warfare metaphor, but they are not newsworthy because they are not confrontational. Such, however, was not the case with B. F. Skinner's views of religion.

Having achieved considerable success in the development of techniques for shaping and modifying behaviour, Skinner¹³ went on to speculate about how such techniques might be harnessed to shape the future of society. He believed that similar principles, based on rewards and punishments, could explain how the practice of religion functions psychologically. 'The religious agency,' he said,¹⁴ 'is a special form of government under which "good" and "bad" become "pious" and "sinful". Contingencies involving positive and negative reinforcement, often of the most extreme sort, are codified – for example as commandments, maintained by specialists, usually with the support of ceremonies, rituals and stories.' He argued that the good things, personified in a god, are reinforcing, whereas the threat of hell is an aversive stimulus. Both are used to shape behaviour.

Underlying Skinner's whole approach is a reductionist presupposition. He speaks of concepts of god being 'reduced to' what we find positively reinforcing. There is no doubt that Skinner provided ready ammunition for anyone wishing to perpetuate the warfare metaphor of the relation of psychology and religion.

If Skinner wished to champion the warfare metaphor, another distinguished figure in psychology in the second half of the twentieth century took quite a different view. Psychologist, neuroscientist, and Nobel Laureate Roger Sperry wrote not only of the bankruptcy of some forms of behaviourism but strongly advocated the benefits of a positive relationship between psychology and religion viewed as allies engaged in a common task. Typical of Sperry's views is the following:¹⁵

The answer to the question, 'Is there convergence between science and religion?' seems from the standpoint of psychology to be a definite emphatic 'Yes.' Over the past fifteen years, changes in the foundational concepts of psychology instituted by the new cognitive or mentalist paradigm have radically reformed scientific descriptions of human nature, and the conscious self. The resultant views are today less atomistic, less mechanistic, and more mentalistic, contextual, subjectivistic and humanistic. From the standpoint of theology, these new mentalistic tenets, which no longer exclude on principle the entire inner world of subjective phenomena, are

13 Skinner, B.F. *Beyond Freedom and Dignity*, New York: Bantam (1972).

14 Skinner, B.F. from the TV programme 'Firing Line', 17 Oct.1971.

15 Sperry, R.W. *Bulletin of the Atomic Scientists* (1966) Vol. 22, 7, pp.2-6; Sperry, R.W. 'Psychology's mentalist paradigm and the religion/science tension', *American Psychologist* (1988) 43, no.8:609.

much more palatable and compatible than were those of the behaviourist-materialist era. Where science and religion had formerly stood in direct conflict on this matter to the point even of being mutually exclusive and irreconcilable, one now sees a new compatibility, potentially even harmony with liberal religion – defined as religion that does not rely on dualistic or supernatural beliefs, forms of which have been increasingly evident in contemporary theology.

From the above quotation, several things are clear. Whilst Sperry had once used the warfare metaphor to characterise the relation between science and religion he later believed that as far as psychology was concerned that was a thing of the past. However, he placed his hopes in a liberal theology that made no supernatural claims – hence some of Sperry’s views of religion would sound very strange to conventional Christian believers. Nevertheless what he wrote remains provocative and worthy of careful consideration.

The continuing search for a constructive partnership

There remains the widespread impression in some quarters today that psychology has ‘explained away’ religious experience and behaviour and that religious beliefs are ‘nothing but’ wishful thinking. In a way this is strange since two of the major figures in academic and applied psychology in the twentieth century, whose enduring contributions are increasingly acknowledged, held positive, sympathetic and constructive views of religion. Both Gordon Allport in the United States and Sir Frederic Bartlett in Britain made a point of emphasising the potential for a positive, cooperative relationship between psychology and religion, at the same time underlining the limits of psychological inquiry, at least when practised as a science.

Allport¹⁶ a major personality theorist, wrote that

different as are science and art in their axioms and methods they have learned to cooperate in a thousand ways – in the production of fine dwellings, music, clothing, design. Why should not science and religion, likewise differing in axioms and method, yet cooperate in the production of an improved human character without which all other human gains are tragic loss? From many sides today comes the demand that religion and psychology busy themselves in finding a common ground for uniting their efforts for human welfare.

Bartlett, described recently¹⁷ as making ‘one of the most substantial contributions to psychology of the past century’ and one of the architects of ‘the cognitive revolution’ in psychology, wrote:¹⁸

16 Allport *op. cit.*, (11).

17 Wagoner, B., Gillespie, A. & Duveen, G. ‘Bartlett in the digital age’, *The Psychologist* (Nov 2007), 680-681.

18 Bartlett, F.C. *Religion as Experience, Belief and Action*, Oxford: OUP (1950).

It is inevitable that the forms which are taken by feeling, thinking, and action within any religion should be moulded and directed by the character of its own associated culture. The psychologist must accept these forms and attempt to show how they have grown up and what are their principal effects... So far as any final decision upon the validity or value of such [claims] goes, the psychologist is in exactly the same position as that of any other human being who cares to consider the matter seriously. Being a psychologist gives him neither superior nor inferior authority.

Both Allport and Bartlett thus held a high view of the potential benefits of a developing science of psychology. They also recognised the distinctive approaches to the gaining of knowledge possible through the scientific enterprise – a view already well articulated by leading physical scientists of earlier generations.

If there were psychologists using the warfare metaphor who were antagonistic to religion there were also Christians who were antagonistic to psychology. Hendrika Vande Kemp¹⁹ noted that

the antipsychologists seem to regard psychology as offering alternative answers to the same questions answered by Christian theology and biblical revelation, questions concerning knowledge of God and salvation history and a proper human response to both.

Pervasive shared assumptions about the psychologist's task when studying religion

Though expressed in different ways the majority of the early figures writing on the psychology of religion shared a common approach to their task. It is well expressed in the opening chapter of Thouless's 1971 revision of his 1923 book when he wrote 'the essential function of the psychologist was to study and observe the phenomena of religion without concerning himself with making judgments as to the truth of its propositions or trying to appraise its values'.

Allport²⁰ set himself 'the task of discovering the place of religion in the life economy of the individual'. He noted that 'without a psychological understanding of the nature and functioning of the religious sentiment all talk of mutual policy on the one hand, or of "opiates" and "superstition" on the other, is prejudiced or empty'. Again he made it clear: 'I make no assumptions and no denials regarding the claims of revealed religion. Writing as a scientist, I am not entitled to do either.'²¹

19 Vande Kemp, H. 'The sorcerer as a straw man – apologetics gone awry: a reaction to Foster and Leadbetter', *Journal of Psychology and Theology* (1987) 15, no.1, 19-26.

20 Allport *op. cit.*, (11).

21 Allport *op. cit.*, (11), p. ix.

A similar approach was taken by Michael Argyle²² when he concluded ‘that psychological research can tell us nothing about the truth, validity or usefulness of religious phenomena: these are questions which must be settled in other ways’.

Contemporary writers in the psychology of religion such as Fraser Watts and Mark Williams echo these views. ‘We need to make absolutely clear here that we are not, as psychologists, commenting on whether or not religious beliefs are correct, whether they are justified by rational argument and empirical evidence. Our concern is rather with how people arrive at what they take to be religious knowledge.’²³

Work in progress – reminders of a rapidly changing scene

The last half century has witnessed rapid advances in neuropsychology and evolutionary psychology. Discoveries in both fields have implications for our discussions of religion. Anyone aware of the rate at which these two specialisations are advancing will need no reminding that any accounts such as mine today, must be of ‘work in progress’. Consider a few of the changes in only the last half century.

Fifty years ago few self-respecting North American ‘scientific psychologists’, concerned about their reputations as scientists, would dare to speak or write freely about the mind, only about behaviour. Behaviourism was dominant. Only with the cognitive revolution did it once more become scientifically respectable to carry out research on the mind. This new respectability is underlined on all sides today. For example, the publicity for a 2006 meeting of the Royal Society of London on ‘Mental Processes in the Human Brain’ boldly declared that ‘The scientific study of the human mind and brain has apparently come of age, with the advent of technologically advanced methods for imaging brain structures and brain activity... these advances promise sophisticated new accounts of how mental processes are implemented in human brain, but they also raise new challenges.’

Forty years ago psychoanalysis was fighting a vigorous rearguard action and it was confidently taught and widely believed that autism was the result of poor relations between the young child and his parents. Today it is clear that some forms of autism are the result of malfunctioning of specific neural substrates, some of which have already been identified.

Thirty years ago we taught our students that you made all your neurones before birth and spent the rest of your life with the supply of nerve cells you obtained during the earliest months. Today we know that the brain actually makes more neurones than it needs and there is a process whereby excess neu-

22 Argyle & Beit-Hallahmi *op. cit.*, (5), p.3.

23 Watts, F. & Williams, M. *The Psychology of Religious Knowing*, London: Chapman (1988), p.4.

rones are selectively removed, a process that shapes the adult brain. What we now know is that the brain makes new neurones, a process called neurogenesis, which is regulated by hormones.

Psychology, neurology and religion: converging interests

The converging and overlapping interests of psychology with those of religion arise naturally out of their shared interests in cognition and behaviour. Currently the most widely used textbook of psychology in North America is by David Myers.²⁴ In it he writes ‘Today we define psychology as the scientific study of behaviour and mental processes.’ He continues ‘Behaviour is anything an organism does – any action we can observe and record. Yelling, smiling, blinking, sweating, talking and questionnaire marking are all observable behaviours. Mental processes are the internal, subjective experiences we infer from behaviour – sensations, perceptions, dreams, thoughts, beliefs, and feelings.’ Thus, amongst other things, psychology studies, experience, belief and action. We have, of course, heard that before – in Sir Frederic Bartlett’s Riddell Memorial lectures referred to above, entitled *Religion as Experience, Belief and Action*.

Thus as the domains of religion and science converge, psychology can be an ally of religion in the shared search for truth. In religion we feel at times that we have intuitive insights into another realm of reality. At times we are too readily judgemental of those who do not share our views and, if we believe Freud a hundred years ago and Dawkins today, we are prone to illusory beliefs. Psychology can offer help in curbing such knee jerk reactions. Myers reminds us that ‘The story of psychology... enhances our abilities to restrain intuition with critical thinking, judgmentalism with compassion, and illusion with understanding.’ And in the same spirit, for their part he encourages psychologists to be ‘sceptical but not cynical, open but not gullible’. It is in that spirit that this lecture is offered.

Despite the widely shared view of many of the earlier investigators whose views we looked at earlier that ‘psychology should not concern itself with making judgments of the truth of propositions’, it is evident that in recent years some of the most exciting developments at the interface of psychology and neuroscience have been interpreted as raising questions about the truth of certain core religious beliefs.

The most vocal and widely quoted exponent of the view that developments in neuropsychology directly challenge long and widely held religious beliefs was the Nobel laureate Francis Crick. Having reviewed recent work on mind-brain, Crick²⁵ in his book *The Astonishing Hypothesis*, argued that the evidence

24 Myers, D. *Psychology*, 7th edn., Worth (2007).

25 Crick, F. *The Astonishing Hypothesis*, Old Tappan, NJ: Simon & Schuster (1994).

from neuroscience made it clear that ‘the idea that man has a disembodied soul is as unnecessary as the old idea that there was a Life Force. This is in head-on contradiction to the religious beliefs of billions of human beings alive today.’ And he went on to ask the question, ‘How will such a change be received?’

As he rightly observed, this raises several questions about long and widely held traditional Christian beliefs about what constitutes the human person and specifically in what sense humans are made in the image of God. Other questions about core beliefs have been raised by another rapidly growing area of contemporary psychology, evolutionary psychology, a point not missed by the sociobiologist E.O. Wilson²⁶ who has boasted ‘We have come to the crucial stage in the history of biology when religion itself is subject to the explanation of the natural sciences ... Theology is not likely to survive as an independent intellectual discipline.’

Mind and brain: body and soul – relationships of irreducible, intrinsic, interdependence?

Francis Crick was right to say that part of the impact of advances in neuropsychology on wider beliefs about the human person will mean that a challenge has been mounted to a belief shared for centuries by the majority of people, Christians included, that they possess an immaterial immortal soul, a separate thing, that is somewhere attached to their physical body.

It is one thing to demonstrate the intimate interrelationship between what is happening at the conscious mental level and what is happening at the level of the brain and the body. The unanswered question is how we can most accurately characterise this intimate relationship without making claims or assumptions that have not yet been demonstrated about what we know about the relationship between the two.

Clearly there is a remarkable interdependence between what is occurring at the cognitive level and what is occurring at the physical level. We could perhaps describe this as a relationship of intrinsic interdependence, using intrinsic to mean that, as far as we can see, it describes the way the world is in this regard. Could we perhaps go further than this and say that on the basis of our present knowledge it is an irreducible intrinsic interdependence, by this meaning that we cannot reduce the mental to the physical any more than we can reduce the physical to the mental? In this sense there is an important duality to be recognised but it is not a duality that necessarily implies a substance dualism.

It is significant that equally committed Christians hold differing views about how to model this duality. Thus we have emergent dualism (William

26 Wilson, E.O. *Sociobiology*, Cambridge, MA: Harvard University Press (1975).

Hasker²⁷), non-reductive physicalism (Nancey Murphy²⁸), substance dualism (Stewart Goetz²⁹), a constitution view of persons (Kevin Corcoran³⁰), or dual aspect monism (Malcolm Jeeves,³¹ Donald Mackay³²). All share the view that eliminative materialism is inadequate in that it fails to give adequate weight to the primary data of conscious experience.

Very recently Thomas Nagel,³³ a leader amongst contemporary philosophers, had no doubt that, 'so far as we can tell, our mental lives and those of other creatures, including subjective experiences, are strongly connected with and perhaps strictly dependent on physical events in our brains and on the physical interaction of our bodies with the rest of the physical world.' Nagel had no doubts that 'we have to reject conceptual reduction of the mental to the physical'. But if that is the case how are we to think about it? He acknowledges that 'the mind-body problem is difficult enough so that we should be suspicious of attempts to solve it with the concepts and methods developed to account for very different kinds of things. Instead we should expect theoretical progress in this area to require a major conceptual revolution.' He believes this will require a change in our thinking at least as radical as relativity theory was in physics.

Some specific challenges to long held religious beliefs

The soul and humans made in the image of God

The notion that humans possess a soul was typical of the thinking of major figures from the past such as Plato, Aristotle, Origen, Demetrius, Augustine (who held a modified Platonic view) and Descartes. Until relatively recently in the Western world the dominant cultural influences have been the religious ones. As Stevenson³⁴ notes 'Under Aristotle's influence Aquinas thus retained an element of Platonism, arguing that the soul has a separate existence until the resurrection, and that this helps to solve the problem of maintaining personal identity but at the cost of incurring all the problems associated with dualism.' Similar strongly dualistic views are present in the writings of some of the Protestant reformers such as John Calvin³⁵ who wrote, 'It would be foolish to seek a definition of "soul" from the philosophers. Of them hardly one, except

27 Hasker, W. 'On behalf of emergent dualism', chap.3 in Green, J.B. & Palmer, S.L., (eds.) *In Search of the Soul, Four Views of the Mind-Body Problem*, Downers Grove IL: InterVarsity (2005).

28 Murphy, N. 'Non reductive physicalism', chap.4. in Green & Palmer *op. cit.*, (27).

29 Goetz, S. 'Substance dualism', chap.2. in Green & Palmer *op. cit.*, (27).

30 Corcoran, K. 'The constitution of persons', chap.5 in Green & Palmer *op. cit.*, (27).

31 Jeeves, M. *Human Nature at the Millennium*, Grand Rapids: Baker, Leicester: Apollos (1997).

32 Mackay, D.M. *Behind the Eye*, Oxford: Blackwell (1991).

33 Nagel, T. 'Science and the mind-body problem', chap.in *What is Our Real Knowledge About the Human Being?*, Vatican City: Pontifica Academia Scientiarum (2007), pp.96-100.

34 Stevenson, L. & Haberman, D.L. *Ten Theories of Human Nature*, 4th edn., New York: OUP (2004).

35 Calvin, J. *Institutes of the Christian Religion*, book 1, chap.XV, sec.6.

Plato, has rightly affirmed its immortal substance... Indeed from Scripture we have already taught that the soul is an incorporeal substance...'

Robert Boyle, according to Hooykaas, thought, as did his contemporaries, within a dualistic framework, so that he believed that, 'although in physical respects man is a tiny and negligible part of the universe, he alone has a rational soul'.³⁶ At the same time Boyle firmly believed that man is God's image bearer.³⁷

The second main account, stemming from Aristotle, had been taken over and Christianised by St Thomas Aquinas. In this account the soul, though incorporeal, was not simply a separate bit attached to the body, but was the form of the individual animal in question, whether human or not.

Today the accumulating evidence from neuropsychology makes it extremely difficult to maintain a view that there are two different substances interacting in the human person. All the emphasis rather is on the unity of the person, two aspects of which must be studied and taken seriously if a full account is to be given of the mystery of the human person.³⁸

Amongst theologians there seems to be now a general agreement that the *imago Dei* is not anatomical, genetic, neurological or behavioural, and that it combines functional and structural elements.³⁹ Chris Wright puts it well:

We should not think of the image of God as an independent 'thing' that we somehow possess. God did not give to human beings the image of God. Rather it is a dimension of our very creation. The expression 'in our image' is adverbial (that is, it describes the way God made us), not adjectival (that is, as if it simply described a quality we possess). The image of God is not so much something we possess, as what we are. To be human is to be the image of God.⁴⁰

Embodied Morality

If you hold a body-soul dualism view of the person, processes of moral decision-making are presumed to happen primarily in the domain of the soul, not the body. In contrast a non-dualist view of the person would presume that it is the brain/body doing the deciding. It is as yet not entirely clear what one might expect regarding the engagement of brain systems in such behaviours. So we

36 Hooykaas, R. *Robert Boyle: A Study in Science and Christian belief*, Maryland: University of America Press (1997), p.72.

37 *ibid.* p.78.

38 Berry R.J. & Jeeves, M. 'The nature of human nature', *Science and Christian Belief* (2008) 20(1), 3-48.

39 Middleton, J.R. *The Liberating Image: The imago Dei in Genesis 1*, Grand Rapids, MI: Brazos Press (2005).

40 Wright, C.J.H. *Old Testament Ethics for the People of God*, Leicester: IVP, (2004), p.119.

pause to ask what is known and being learned about brain systems and processes that contribute to the moral regulation of behaviour.

Studies of patients with damage to the frontal lobes of the brain frequently show that they typically have difficulty regulating their behaviour in order to abide by socially acceptable or moral norms. Such individuals may, capriciously and without malicious intent, violate social conventions, laws, ethical standards, or the rules of courtesy, civility and regard for the benefit of others.

Today there is a rapidly developing field in neuroscience which involves the mapping of the brain areas involved in different forms of interpersonal, economic and moral decision-making. The general approach in this form of research is to have persons engage in decision-making tasks while their brains are being scanned using functional magnetic resonance imaging (fMRI). For example, a number of studies have demonstrated the activation of the limbic (emotional) areas of the brain during what one would presume to be tasks requiring merely the 'cold' calculation of the likelihood of financial gains and losses. Limbic involvement is particularly intense when the financial decision also involves interpersonal variables such as trust.

Using similar techniques, Greene⁴¹ and collaborators have studied moral decision-making. First, they merely observed the enhancement of activity in different brain areas as the moral dilemmas that were presented became more difficult. They found that the lateral frontal lobes and limbic cortex became more active as moral decision became more difficult. A follow-up study involved moral dilemmas that required one to imagine either directly inflicting harm on one person in order to save the lives of many other persons, or indirectly allowing harm to come to one person in order to save the others. Functional brain imaging indicated that having to choose to directly harm another person in order to save many others was correlated with activation of a different pattern of brain areas (including the medial frontal cortex and parietal lobes) from those activated by imagining a decision involving indirectly allowing harm. Thus, decisions about whether or not to directly inflict harm activated an additional network of brain areas more involved in modulation of social action and representations of the self.

The general finding from this kind of research is that moral regulation of behaviour is an embodied process, and that different forms of moral decision-making involve different patterns of brain activity. The somatic marker theory suggests that important elements contributing to moral behaviour are the feelings elicited during interpersonal encounters – both feelings towards others (e.g., empathy and compassion) and feelings about the interpersonal nature of a situation (e.g., unfairness or social isolation). Like moral reasoning and religious experiences, various aspects of the experiences of human relatedness

41 Greene et al. 'The neural bases of cognitive conflict and control in moral judgment', *Neuron* (2004) 44, 389-400.

have been the subject of neuroscience research over the last two decades. This rapidly growing field of research is referred to as Social Neuroscience.

Neurologising about religion

What possible relevance can neurology have for understanding religion? The famous classical scholar Walter Burkert, influential for his work in anthropology and religious studies in the early Greek period, wrote about early theories to explain the phenomenon of religion through the activity in certain parts of the brain, claiming that religious thought belongs to an 'older' part of our brain.

A more tendentious attempt to link the brain to religion occurs when, commenting on the scientific hubris of some of his contemporaries, Robert Boyle described amongst the false pretensions they presented as established facts the claim that 'religion is founded on the imagination of an overheated brain' whilst 'science is based on reality perceived by cool minds with the aid of the senses'. Surely one of the first appeals to neurotheology in the scientific era!⁴²

Two centuries ago one of the leading anatomists of the day was Joseph Gall. Gall's motto was, 'God and the brain, nothing but God and the brain'. Why Gall used this motto is unclear. Robert Rieber⁴³ believes it is that Gall worked within the Pantheist tradition of religion, of holding the mirror up to nature. Rieber believed that it was Gall's desire to explain the order of the whole of nature that led him to his motto, not as is usually held, his way of placating the church and the Austrian monarchy. Gall was also one of the originators of phrenology, a new theory of how the mind and the brain were related which was regarded as the cutting edge of neurology. Today, for good reasons, it is in disrepute. At the same time, with the burgeoning field of neurotheology, aspects of religion, whether of experience, belief or action, are again being linked to specific areas or systems within the brain, using sophisticated brain imaging techniques. Already a volume exists with the title *The Neurology of Religious Experience*.⁴⁴

Against a background of how ancient and modern accounts of mystical experiences have been associated with the use of hallucinogenic drugs, and bolstered by the long-standing association in clinical neurology between a form of seizure activity and religious experiences, recent neuroscience research using functional brain imaging is making it increasingly clear that our religious and spiritual experiences, like all our experiences, are grounded in neural sub-

42 Hooykaas *op. cit.*, (36), p.58.

43 Rieber, R.W. 'The multiplicity of the brain, the unity of the soul and the duality of the mind: can you have it both ways?', in Stammand, H. & Maiera, W. *Contributions to Theoretical Psychology*, Canada (2003).

44 McNamare, P. (ed.) *Where God and Science Meet: vol. 2: The Neurology of Religious Experience*, Westport Conn: Praeger (2006).

strates. Consider some of the evidence.⁴⁵

Hallucinogenic Drugs and Religious Experience

Ancient religious rituals used plants to facilitate ecstatic and mystical states – for example, mushrooms (by the Aztecs), peyote cactus (by the Huicol of Mexico), and ayahuasca (by the natives of Northwestern South America), as well as substances from water lilies, mandrake, opium poppies, morning glories and marijuana plants. Since these drugs act on the brain to bring about their effects, study of these effects on various brain systems can reveal brain mechanisms relevant to our understanding more about experiences that people often describe as religious.⁴⁶

Chemicals that create the hallucinogenic experience fall into one of three categories (tryptamines, phenethylamines and ergolines). All three of these categories of drug have been found to activate the serotonin system of the brain via a specific receptor (the 5-HT_{2A} receptor). A complex array of interactive brain systems are known to be affected (directly or indirectly) by these drugs, although the relationship between the sites and mechanisms of action and the subjective (and, in some cases, religious) experiences elicited by the drugs is at this stage merely speculative. Hallucinogens affect the ventral tegmental area of the midbrain that projects dopamine-releasing axons to the cortical and sub-cortical structures.⁴⁷ The result of dopamine increase is to mark events as biologically significant and causing memory systems to be activated.

The relationship between the alteration of the brain serotonin systems by hallucinogenic drugs and the subjective qualities of either psychedelic or religious experiences is, at this point, somewhat speculative. However, based on what is known of the systems affected and the nature of the changes created by the drugs, it has been suggested that such drugs ‘perturb the key brain structures that inform us about our world, tell us when to pay attention, and interpret what is real. Psychedelics activate ancient brain systems that project to all of the forebrain structures that are involved in memory and feeling; they sensitize systems that tell us when something is novel and when to remember it.’⁴⁸ The common subjective experiences elicited by these drug-related changes in brain systems include: ‘altered perception of reality and self; intensification of mood; visual and auditory hallucinations, including vivid eidetic imagery

45 The following five sections draw heavily from material in Jeeves, M. & Brown, W.S. *op. cit.*, (3) and from Lecture 2, pp.9-13, of Warren S. Brown’s 2005 Fuller Integration Lectures, <http://documents.fuller.edu/sop/integration/Symposium/Symposium2005/Symposium2005.html>

46 A good summary of this information can be found in Nichols, D.E. & Chemel, B.R. ‘The neuropharmacology of religious experiences: Hallucinogens and the experience of the divine’, in McNamare, P. (ed.) *Where God and Science Meet: Vol. 3: The Psychology of Religious Experience*, Westport Conn: Praeger (2006), pp.1-34.

47 *ibid.* p.26.

48 *ibid.* p.3.

and synesthesia; distorted sense of time and space; enhanced profundity and meaningfulness; and a ubiquitous sense of novelty'. Whether these experiences are interpreted as a psychedelic 'trip', or as spiritual and transcendent, is hypothesised to be due primarily to one's experience-based expectations, the setting in which the drugs are taken, and the cognitive/theological network out of which one provides a *post hoc* interpretation of the experience.

Temporal lobe epilepsy and peak religious experiences

Fyodor Dostoyevsky⁴⁹ (who himself had a seizure disorder) gives a particularly graphic literary description of subjective feelings during some seizures in his account of the experiences of Prince Miskin in *The Idiot*. The following is a passage from this book in which Dostoyevsky describes (in the thoughts of Miskin) the sort of religious experiences that are sometimes associated with temporal lobe seizures:

he fell to thinking that in his attacks of epilepsy there was a pause just before the fit itself... when it seemed his brain was on fire, and in an extraordinary surge all his vital forces would be intensified. The sense of life, the consciousness of self were multiplied tenfold in these moments... His mind and heart were flooded with extraordinary light; all torment, all doubt, all anxieties were relieved at once, resolved in a kind of lofty calm, full of serene, harmonious joy and hope, full of understanding and the knowledge of the ultimate cause of things.

A recent literary reference to this phenomenon can be found in Mark Salzman's modern novel, *Lying Awake*.⁵⁰ Salzman writes about a nun with religious visions associated with temporal lobe seizures.

There is a significant literature in clinical neurology that suggests that in some cases, individuals with temporal lobe epileptic seizures experience intense religious states as a part of the aura leading up to a seizure. In these persons experiences of intense religious awe, ecstasy, or ominous presence appear to be a product of the abnormal electrical activity of the brain that constitutes their seizures. Although such cases are rare, they happen often enough to suggest something about the physical processes that may be associated with normal religious experiences.

Accounts of religious-like experiences associated with a temporal lobe seizure can be found in the modern neurological literature. Naito and Matsui⁵¹ present the following self-description (similar to Dostoyevsky's) from one of their patients of the experience of the aura preceding a seizure: 'Triple halos

49 Dostoyevsky, F. *The Idiot*, Carlisle, H. & C. (trans.), New York: Signet Classic (1969).

50 Salzman, M. *Lying Awake*, New York: Alfred A. Knopf (2000).

51 Naito, H. & Matsui, N. 'Temporal lobe epilepsy with ictal ecstatic state and interictal behavior of hypergraphia', *Journal of Nervous and Mental Disease* (1988) 176(2):123-124.

appeared around the sun. Suddenly the sunlight became intense. I experienced a revelation of God and of all creation glittering under the sun. The sun became bigger and engulfed me. My mind, my whole being was pervaded by a feeling of delight.’

Whatever the most appropriate statement of the meaning of this phenomenon, it is clear that certain patterns of electrical activity involving the temporal lobes (sometimes occurring during a seizure) can cause intense, personally significant experiences that some persons describe as religious.

Religious experiences elicited by brain stimulation

Abnormal activity of the temporal lobes can be induced artificially in non-epileptic individuals using a non-invasive procedure called Transcranial Magnetic Stimulation. Michael Persinger reports experiments where electromagnetic stimulation of the right temporal lobe resulted in the person reporting a ‘sense of presence’. This ‘sense of presence’ is sometimes experienced by the person as the presence of God or angels or other supernatural persons. This has led Persinger to suggest that all persons who have religious experiences are having microseizures of the right temporal lobe. A similar explanation is given by Persinger⁵² for other paranormal experiences, such as reports of encounters with aliens. While the extrapolation of this form of brain stimulation to an account of normally occurring forms of religious experience seems unwarranted, this research does suggest that magnetically induced physical changes in the temporal regions of the brain can result in experiences that, in some cases, are interpreted as religious in nature. These findings of Persinger’s should, however, be treated with caution since a recently reported attempted replication of Persinger’s studies, but using better controlled experiments including double-blind techniques, failed to replicate Persinger’s results.

Brain activity during religious states

Andrew Newberg⁵³ and his collaborators have studied brain activity during various religious states. In these studies they observed changes in regional cerebral blood flow using Single Proton Emission Computed Tomography (SPECT scans). They first studied religious meditation in both Buddhist monks

52 See Persinger, M.A., Makarec, K. (1987) ‘Temporal lobe epileptic signs and correlative behaviors displayed by normal populations’, *Journal of General Psychology* (1987) 1114: 179-195; and Persinger, M.A. & Makarec, K. ‘Complex partial epileptic signs as a continuum from normals to epileptics: Normative data and clinical populations’, *Journal of Clinical Psychology* (1993) 49: 33-45; Persinger M.A., ‘Religious and Mystical Experiences as Artifacts of Temporal Lobe Function: A General Hypothesis’, *Perceptual and Motor Skills* (1983) 557, 1225-1262.

53 Newberg, A., Alavi, A., Baime, M., Pourdehnad, M., Santanna, J. & d’Aquili, E. ‘The measurement of regional cerebral blood flow during the complex cognitive task of meditation: a preliminary SPECT study’, *Psychiatry research* (2001) 2, 113-122.

and Catholic nuns. In both groups the results showed increased bilateral frontal lobe activation, and decreased right parietal lobe activity, when the meditator reported reaching a state of total absorption and 'oneness'. Decreased activity of the right parietal lobe was interpreted as a neural correlate of the absence of a sense of self that is experienced in such meditative states.

Newberg et al. have recently extended this research to include another religious state that is very different from meditation – that is, the ecstatic religious state involving glossolalia (speaking in tongues). They compared this state to merely singing along with gospel music. Activity in the frontal lobes decreased significantly during glossolalia, consistent with the self-report of loss of intentional control of behaviour in this state. This change in the frontal lobes is opposite to that seen during meditation. Decreased activity was also observed in the left temporal pole and left caudate nucleus. In contrast to the reduced right parietal activity seen during meditative states, glossolalia was associated with increased activity in the left superior parietal area.

Thus, these studies suggest both that religious states are associated with identifiable changes in the distribution of brain activity and that different religious states are associated with different patterns of brain activity – in some cases quite opposite changes in brain activity.

Perspectives on Brain Function and Religious Experiences

Whether drug-induced, seizure-related, caused by magnetic stimulation, or simply brain changes associated with normal religious states, it is clear that the functioning of the brain is intimately involved in our religious states and experiences. The question is: What is to be made of such relationships?

Ramachandran⁵⁴ has made the strongest claim in maintaining that there exists within the temporal lobe a 'God module' in the form of a neural area dedicated to religious experiences. In essence, he believes that increased activity in this brain area would be necessary and sufficient for a person to have a religious experience. Thus, if this area becomes abnormally active during a seizure, the person will necessarily have a religious experience and not some other form of experience. This would be the case regardless of the person's prior life experiences, expectancies, habitual ways of interpreting their life experiences, the context in which the seizure occurs and so on. Thus, religious experiences are, in the view of Ramachandran, a unique and intrinsic class of experiences served by a unique brain structure.

A different interpretation of the same clinical data has been offered by

⁵⁴ Ramachandran, V.S. et al. 'The neural basis of religious experiences', *Society for Neuroscience Conference Abstracts* (1997), p.16.

Rabin and Saver.⁵⁵ They argue that certain temporal lobe seizures activate a brain system which marks mental processes with a quality of deep significance, harmoniousness, joy and so on. Whether or not the experience is described in religious terms is a product of the prior experiences and interpretive networks of the person having the seizure. This explains why some persons have temporal lobe seizures that have similar experiential qualities, but are not described or experienced by the person as religious. This interpretation is consistent with the theory of religious experiences offered by the early twentieth century American psychologist, William James. According to James, differences in the religious (or non-religious) interpretations given by persons to mundane or unusual experiences are related to culturally inherited 'over-beliefs'. Religious meaning is not intrinsic to the experience, but applied by the interpretive network of the experiencer. Thus, it is possible that a general-process neural system (not a 'God module') is activated by certain forms of temporal lobe seizure activity, and that when this area is subject to abnormal activation, it is fitted into wider brain cognitive systems that provide one or another sort of interpretation.

In this light, the work of Persinger also does not lend itself to an interpretation involving brain systems specifically involved in religious experiences. It is clear in Persinger's work that the primary experience is the experience of a sense of the presence of another person. However, it is more likely that this is a general purpose system that signals to our cognitive systems about the greater significance carried by the presence of another human being than by the presence of a chair or a dog. When this system is abnormally activated by magnetic stimulation, and when there is no sensory information suggesting the presence of an embodied human person and when the person whose brain is being stimulated has a world-view that accommodates the idea of a spiritual presence, then the person experiences the brain activity as indicative of the presence of a spiritual being – God, an angel, a ghost, an alien, or whatever. A particular form of over-belief is necessary for the experience to be given a religious interpretation.

Newberg's original understanding of the results of his studies of meditators indicated to him that the brain is wired for religious experiences and, as expressed in the title of his book, that is why 'God won't go away.' However, his studies of glossolalia do not support the idea of a particular and unique brain module or system for religious experiences. Rather, the brain activities associated with different religious experiences are different. There is no single brain area where greater or lesser activity is necessary and sufficient for one to have an experience that is understood as religious. It is not necessary to interpret any of the changes in brain activity found in these imaging studies as unique to the religiousness of the experience, but as manifestations of the operation of

55 Saver, J.L. & Rabin, J. 'The neural substrates of religious experience, *Journal of Neuropsychiatry* (1997) 9, 498-510.

more general systems commandeered as a part of the neural realisation of a particular religious state and interpreted as religious by the context of the experience and the personal history of the experiencer.

Van Huuysteen⁵⁶ has perceptively reminded us that

d'Aquila and Newberg's speculations on the kind of meta and megatheologies that might be derived from this is bad science as well as bad theology. Ultimately biology or neuroscience cannot explain religious experience completely. It is indeed only the human person experiencing something within a highly specific cultural context, and his or her interpretation or identification of this experience as religious, that qualifies an experience as a religious experience.

Embodied spirituality

The research we have surveyed suggests that brain function, brain damage, brain stimulation, or even genetics can in various ways affect, or give some account for, our moral, religious, and interpersonal experiences and behaviour.

Such a view sits uneasily with the beliefs of many people that such experiences are manifestations of nonmaterial human minds, souls, or spirits. Even though we might rationally agree that our brains and bodies are involved in these experiences, we implicitly feel that such experiences are not physical and, thus, should not be affected by, or be the products of, our bodies or our brains.

All of this has implications for theology as the theologian Wolfgang Pannenberg⁵⁷ has noted, asking, 'When the life of the soul is conditioned in every detail by bodily organs and processes, how can it be detached from the body and survive it?' Pannenberg believes that the consequences of neurological damage and disease, as well as the growing number of laboratory studies of human brain functions associated with the most human aspects of our behaviour (including our moral, religious, and interpersonal experiences and behaviour), together suggest abandoning dualism. How then can personhood, moral agency and the truth of religious experiences and theological reflection be preserved in the face of the scientific research we have just reviewed?

The answer, I believe, is by returning to a Hebrew-Christian view of the person, as biblical scholars over the past century have advocated increasingly. They have urged us to remember that within Scripture the question posed is never simply: What is a human being? 'There is always more to the question',

56 Huuysteen, W. Van, 'Human Uniqueness and Symbolisation, The Global Spiral', <http://www.metanexus.net/magazine/tabid/68/id/10167/Default.aspx>

57 Pannenberg, W. *Systematic Theology*, vol. 2, Grand Rapids: Eerdmans (1944), p.182, as quoted by Green, J. 'What does it mean to be human?', in Jeeves, M.A. *From Cells to Souls – and Beyond*, Grand Rapids: Eerdmans (2004), p. 180.

writes Old Testament scholar Patrick Miller,⁵⁸ ‘so that the answer offered in each instance is indirect in that it is in response to the more specific formulation of the question rather than to a generalised and abstracted request for a definition of human existence, of human being.’ Miller illustrates this from the Psalms. In each instance where it occurs,

the question is ‘What is a human being that you regard /care for/ think of/ test/ visit?’ the question is never asked in the abstract, never posed as a theoretical question. It is always asked in dialogue with God, and its formulation is a basic clue to the fact that the Psalms are not going to answer the anthropological question about who and what we are as human beings except in relation to God.

When Patrick Miller’s fellow Old Testament scholar Bill Arnold⁵⁹ posed the same question as that posed by Miller, but now specifically with reference to the early chapters of Genesis, he had no doubts but that:

- human personhood can only finally emerge as God intended through creation in the framework of relationship, not out of some inner possession or part of human nature;
- that Genesis 2 joins Genesis 1 in defining human existence principally in terms of standing under the divine word. Humans receive commands that are clearly statements of vocation;
- that whatever else humanity shares with the animal world, humanity alone can look into the face of the Creator and say ‘No thanks’ and
- that if the Bible does not in fact demand, nor even support, a classically dualist reading of human nature as ‘matter’ and ‘spirit’ perhaps this is a mercy. We would not be scandalised by discovering that depressed people can grow spiritually when taking medication.’

These views resonate with recent thinking about embodied spirituality.

Sarah Coakley⁶⁰ helpfully reminds us that since ‘spirituality’ has become so much of a ‘buzz’ word in the hand-waving category, it is doubly important that anyone using it must be clear about their meaning. She points out that, for some, ‘spirituality’ is a sort of controlled religious ‘high’ frequently devoid of almost all the precise content which it would entail if one were talking about the ‘spirituality’ of institutionalised Christian churchgoers holding clear doctrinal beliefs.

58 Miller, P. ‘What is a human being? The anthropology of scripture’, chap.5, in *What about the Soul?*, Green, J.B. (ed.), Nashville: Abingdon Press (2004).

59 Arnold, W.T. ‘Soul-searching questions about 1 Samuel 28: Samuel’s appearance at Endor and Christian anthropology’, chap.6, in Green, J.B. *op. cit.*, (58), Nashville: Abingdon Press (2004).

60 Coakley, J.F. (ed.) *Spiritual Healing: Science, Meaning and Discernment*, Grand Rapids: Eerdmans, in press, to appear 2008.

Coakley has questioned a widely held assumption that a belief 'has negligible intellectual let alone neurological significance'. We have already made the point that religion may well be a contextual variable that controls the interpretation of the neural events, not a primary outcome of the neural state itself. In discussing research on the neurology of religion, we have asked whether the same neural events would be considered religious by a participant if that person had no religious background whatsoever, or was not currently in a context that semantically primed religious interpretations.

Spirituality involves experience, belief, and action, the study of which, as we saw at the beginning, is the bread and butter and staple diet of psychologists. Experience in terms of our awareness of the transcendent, beliefs in terms of what we believe about God, about ourselves and about the world in which we live, and action in terms of how we live our lives. The evidence we have reviewed repeatedly highlighted the intimate interdependence between brain processes, cognitive processes and behaviour, and this is relevant to understanding how those aspects of spirituality which mobilise and depend upon cognitive processes are not free floating but firmly embodied. Such embodied beliefs and expectations, we suggest, are major factors in understanding some of the spiritual dimensions of life. At the same time we recognise that cognitive processes such as beliefs and expectations, are frequently held within social contexts, and that reminds us that spirituality is also firmly embedded.⁶¹

The spiritual dimensions of our lives are both firmly embodied so that they do not remain immune to the effects of changes in the brain and also embedded so that they may sculpture our brains and be efficacious in bringing about some of the observed subjective benefits of religious beliefs and practices. Such a view finds strong support from recent studies demonstrating the efficacy of 'top-down' effects on the brain and the immune system.

Thus whilst there is little doubt that spirituality is firmly embodied in our biological make up, any wider discussion under headings such as 'the neurology of religion' must be seen as no more than a convenient label for what is in reality a neurology of the cognitive contributions to specific behaviours and experiences regarded by the individual as religious, and these latter result from personal beliefs and behaviours in social contexts.

Except in very rare instances such as the lonely hermit, the spiritual dimensions to life and experience are lived out in community. In a word, as with all other aspects of our daily existence, our spirituality develops, is maintained and manifests itself in community. It is fully embedded in our physical, cultural and social environments. Embeddedness becomes important when, for example, discussing the spiritual dimensions of healing for which there is a sub-

61 The embodied – embedded distinction is also made by Murphy, N. & Brown, W.S. in *Did My Neurons Make Me Do It? Philosophical and Neurobiological Perspectives on Moral Responsibility and Free Will*, Oxford: OUP(2007), p.209.

stantial body of social psychological research, extending over many decades, linking personal and group beliefs with well-being.

Exaggerated claims and overinterpretation of some of the findings from neurotheology call for the kind of sober assessments given by writers such as Jeremy Groopman and Mario Beauregard. Jeremy Groopman,⁶² a distinguished Jewish physician, wrote: 'Why do we have this strange attempt, clothed in the rubric of "neurotheology", to objectify faith with the bells and whistles of technology?', later adding, 'Man is a proper subject for study in the world of science...God is not.' Similar views were echoed by Mario Beauregard, who works in the departments of radiology and psychology at the Université de Montréal and who was reported by Christopher Stawski,⁶³ as saying: 'Obviously, the external reality of God can be neither confirmed nor disconfirmed by delineating neural correlates of religious/spiritual/mystical experiences. In other words, the neuroscientific study of what happens to the brain during these experiences does not tell us anything new about God.'

Social neuroscience

Within the space of twelve months several major volumes of collected papers on what has come to be known as social neuroscience have appeared. *The Neuroscience of Social Interaction*⁶⁴ edited by Chris Frith and Daniel Wolpert, a reprint of a meeting held at the Royal Society in London, *The Cognitive Neuroscience of Social Behaviour*⁶⁵ edited by Alexander Easton and Nathan Emery, and *Social Neuroscience*⁶⁶ edited by John Cacioppo and Gary Berntson, are typical examples. A common theme runs through them, well captured in Simon Baron-Cohen's⁶⁷ chapter in *The Cognitive Neuroscience of Social Behaviour*. In the early and formative years of cognitive neuroscience it followed a parsimonious approach of assuming that the brain is a general information processor. It made sense therefore to seek to identify for example the general operating principles of memory systems within the brain. The second possible explanation suggested by Baron-Cohen is that cognitive neuroscientists were natural scientists and thus sought to isolate variables in a system under as controlled conditions as possible. Such an approach reaped great benefits.

There was a similar story in psychology. There was a nonsocial cognitive psychology exemplified by the work of the Swiss psychologist Piaget. In due course however cognitive psychology added the field of social cognition rather as cog-

62 Groopman, J. 'God on the Brain', *The New Yorker* (Sept. 17, 2001) 165-168.

63 Stawski, C. *The Spiral* (March 2004) 4, no.3: 4.

64 Frith, C. & Wolpert, D. (eds.) *The Neuroscience of Social Interaction* Oxford: OUP (2004), p.329.

65 Easton, A. & Emery, N. (eds.) *The Cognitive Neuroscience of Social Behaviour*, New York: Psychology Press (2005), p.325.

66 Cacioppo, J. & Berntson, G. (eds.) *Social Neuroscience*, New York: Psychology Press (2005).

67 Baron-Cohen, S. 'Autism and the Origins of Social Neuroscience', chap. 9, in Easton & Emery *op. cit.*, (65), p.328.

nitive neuroscientists had embraced the cognitive neuroscience of social behaviour within their remit.

As long as cognitive neuroscience occupied itself with the mind-brain unity as a general-purpose information processor concentrating on, for example, basic perceptual processes and on memory mechanisms, there were no obvious points of contact or overlap with the concerns of religion. However, things have begun to change. The massive amount of cognitive neuroscience work on face perception, for example, only relatively recently began to study the neural substrates of the ways in which social interaction partly depends on how we appraise others on the basis of their facial appearance. Once research of this kind was embarked upon, words began to appear in the social neuroscience literature which hitherto had been more familiar in the literature of personal religious beliefs. For example, just as the Psalms have much to say about 'seeking the face of the Lord', they equally have much to say about trust. 'Put your trust in the Lord' exhorts Psalm 4 verse 5. In Proverbs 3 verse 5 there is the call to 'Trust in the Lord with all your heart'. Trustworthiness is attributed to God and his precepts. Psalm 111 verse 7 tells us that 'all his precepts are trustworthy'; Psalm 93 verse 5 reminds us that 'Your decrees are trustworthy'. But now we find similar terms appearing in the titles of scientific papers. For example, one paper in the book on Social Neuroscience referred to above, has the heading 'Automatic and Intentional Brain Processes during Evaluation of Trustworthiness of Faces'.⁶⁸

In this paper the authors describe how they determined the neural basis for trustworthiness judgments using event-related functional magnetic resonance imaging. But trust and trustworthiness are familiar and important words in the religious domain where, for example, a key aspect of the sense in which humans are made in the image of God is, according to theologians, the human capacity for a personal relationship with God, and personal relationships depend upon trust and trustworthiness. In a word, this further underlines how some of our most basic religious activities are firmly embodied in our physical make-up.

As, once again, we find familiar terms used in the two different domains of science and theology, we face the challenge to maintain semantic hygiene. Otherwise we have a recipe for confusion. This is similar to the need to make a distinction between altruism, as studied intensively by evolutionary psychologists, and the agape love central to the Christian life. For a further discussion of this distinction see my chapter, 'The nature of persons and the emergence of kenotic behaviour', in *The Work of Love* edited by John Polkinghorne.⁶⁹

68 Winston, J.S., Strange, B.A., O'Doherty, J. & Dolan, R.J. Reading 19 in Cacioppo, J. & Berntson, G. (eds.) *op. cit.*, (66), pp.296ff.

69 Polkinghorne, J. (ed.) *The Work of Love*, London:SPCK & Grand Rapids: Eerdmans (2001), pp. 66-68.

In the volume edited by Cacioppo and Berntson⁷⁰ there is a final section which includes a set of readings demonstrating that biological does not mean fixed or predetermined regardless of environmental influences and demonstrates that socio-cultural and biological processes have reciprocal influences. As the editors write, 'In some ways this is so blatantly obvious as to be trivial. The culture in which we live influences what will be deemed to be valuable and beautiful, and these learned evaluations in turn modulate activity, for instance, in the reward circuitry in the brain.'⁷¹

All of this is very relevant to any discussion of the neurology of religion since the practice of religion is both a private and a social activity. Let us explore this further.

Religion embodied and embedded

Let me suggest some ways in which the fruits of psychologising and neurologising about religion can help us towards a deeper understanding of religion itself.

It is simplistic to believe that religion can be reduced to a primary form of cognitive activity such as language or speech and then linked with identifiable neural systems and structures. Within the Christian tradition it is 'together with all the Lord's people' that we are able 'to grasp how wide and long and high and deep is the love of Christ' (Eph. 3:18). I should like to recapture this emphasis by borrowing from and adapting a metaphor suggested by Warren Brown,⁷² that 'religion' is more like 'football' (for Warren Brown it was baseball) – a cultural and sociological concept that summarises a wide variety of group and individual activities, events, and experiences.

Brown suggests that games such as baseball, or in the British context football, encompass group participation as either spectators or players. For participants there is a form of group activity involving particular sets of motor skills. For the spectator and fan, it is a topic of continual interest, conversation, and occasional attendance at games. It is evident from watching the crowds that football can involve moments of intense emotional experience (for some, for example, when a decisive goal is scored, it seems, not unlike a moment of religious ecstasy), and certain ritual-like participations (e.g., pre-game warm-up for players, singing songs well known to the supporters, 'You'll never walk alone' and such like). Clearly football involves many complex layers of interpersonal and social organisation. By analogy, we should consider the possibility that religion is not itself a basic cognitive process like language or speech,

70 Cacioppo, J. & Berntson, G. (eds.) *op. cit.*, (66).

71 *ibid.* p. 239.

72 Brown, W.S. 'The rain, religion and baseball. Comments on the potential for a neurology of religion and religious experience', chapter in Macnamare, P. (ed.) *The Neurology of Religious Experience*, Westport Conn: Praeger (2006).

but rather is a more broadly inclusive social phenomenon like football.

If then football is a better model for religion than a basic form of human cognitive activity like language or speech, what would be the implications for neurological study? First, as Brown asserts, we would not expect to find a specific 'neurology of football' – that is, no unique neurological systems that would contribute specifically to football and not to other forms of life. Football is neither sufficiently unitary as an experience or event, nor sufficiently temporally bound for study at the level of neurology. Secondly, we would not expect a neuropathology specific to football, although many forms of neurological disorder might have an impact on different forms of participation in, or appreciation of, football. Thirdly, it would be somewhat far-fetched to imagine an evolution of the specific capacity for football, or to argue for the survival advantages of football to individuals or social groups, or to argue that the specific capacity for football is 'hard wired'. Rather, football is a complex social emergent of many more basic sociocultural systems involving a wide variety of activities and experiences that, in turn, piggy-back cognitively, neurologically and evolutionarily on a large number of more general cognitive capacities and skills.

This leads to the further question as to whether religion is essentially individual or corporate – within individual persons or between persons (or persons and social contexts). As C. S. Lewis⁷³ notes when reflecting on the ancient Hebrews, 'The individual, as such, seems to have been less aware of himself, much less separated from others, in those ancient times,' so that 'it is not always easy to know whether the speaker in a Psalm is the individual poet or Israel itself.' Anyone taking the doctrine of the church seriously knows how important is belief in the importance of fellowship in the body of believers.

As Brown explains it,

If religion is primarily corporate – that is, if it exists in the interpersonal, social, and cultural domains,

a point emphasised recently by my fellow psychologist David Booth⁷⁴

then any study at the level of neurology cannot be about religion, but must be about the neurology of more general cognitive and psychosocial functions that are engaged by a very particular form of interpersonal and social interactions in particular contexts. There would, therefore, not exist a unique neurology of religion, per se, nor would there be a distinctive neurology of particular forms of religious behavior or experience, but rather a neurology of contributory neuropsychological systems which interact within the individual to allow for the emergence of religious behaviors and experiences,

73 Lewis, C.S. *Reflections on the Psalms*, London: Bles (1958). p.43

74 Booth, D. 'Biological and cultural inheritance of the image of God and of original sin', lecture at the CiS/ASA Conference, Edinburgh, (2007).

within social contexts.⁷⁵

Hitherto neuroscience has focused heavily on the nature of extraordinary religious experiences. However, the evidence suggests that even extraordinary religious experiences do not appear to involve any unique brain areas or any uniquely identifiable pattern of nervous system activity. Extraordinary religious experiences involve a combination of religious mental content and high levels of activity in systems involved with the recognition or attribution of significance and the consequent triggering of affective subjective experiences. There probably does not exist within the nervous system a 'religion nucleus' or a 'God module' that switches on during unusually intense religious experiences. Thus, the neuroscience data on extraordinary religious experiences does not appear to constitute a unique neuroscience – the phenomena demonstrated are largely overlapping with neural phenomena occurring in other non-religious forms of experience that elicit certain forms of subjective experience, and are perceived as particularly significant to the self.

Facts, fallacies and the future

In what I have already written I have tried, for the nonspecialist, to give a feel for the relevant facts entailed in psychologising and neurologising about religion. In so doing I have also, from time to time, pointed out some of the fallacies that creep into the interpretation of the facts. In closing may I briefly underline some of the salient points that I have tried to make and briefly glimpse the future.

Facts

Psychologising and neurologising about religion has moved from being parasitic to a field in its own right. It will however most likely continue to reflect major developments within the fields of psychology and neuroscience. Already there are those who are speculating about the next shift in emphasis in the focus of psychology. For example, at a national psychology conference in Scotland at the end of 2007 one speaker entitled his lecture 'Psychology: from its behavioural and cognitive past to its emotional future'.⁷⁶ Not really news to this evening's respondent to my lecture, Fraser Watts,⁷⁷ who fourteen years ago wrote a book with the title *Neuropsychological Perspectives on Emotion!*

Psychology can continue to help us to check and to validate some of our deepest intuitions. It should inculcate within us a greater compassion for those

⁷⁵ Brown, W.S. *op. cit.*, (72), p.234.

⁷⁶ Bulletin of the Scottish Branch of the British Psychological Society, Nov. 2007. No. 32, p.1., Autumn 2007.

⁷⁷ Watts, F.N. *Neuropsychological Perspectives on Emotion*, L. Erlbaum (1993).

whose embodiment is compromised through disease and ageing. It will serve as a constant reminder against jumping to simplistic conclusions about profound issues about our mysterious nature such as the dualism-monism debates.

There are many beneficial outcomes of psychologising and neurologising about religion in addition to the way it prompts us to greater compassion, such as the need to recognise that our spirituality is both embodied and embedded. It will afford us new insights into the nature of religious knowing as has already been demonstrated by Fraser Watts and Mark Williams.⁷⁸ It may help us to fresh insights into understanding the words of Christ himself as Fraser Watts⁷⁹ has recently suggested.

It may also, as one of today's leading international New Testament scholars has shown, be able to shed new light on enduring issues about the interpretation of the ancient texts, about the extent to which they are, as was claimed last century, inevitably encrusted with traditions and the extent to which they are still properly to be regarded as eyewitness accounts. Richard Bauckham⁸⁰ in his most recent book, *Jesus and the Eyewitnesses*, has a most insightful chapter in which he draws upon the very latest evidence from psychological studies of memory to give profound new insights into the way in which the evidence points to the text as giving eyewitness testimony to the person of Jesus.

Such an approach would surely have been warmly endorsed by Robert Boyle who wrote that, 'We know a revelation through testimony, not through ratiocination'.⁸¹

Fallacies

Whenever we are offered a new psychological or neurological account of some facet of religious experience, cognition or behaviour we shall do well to remember the ever present temptation to slip into 'Nothing buttery', a term used by Donald Mackay in his debate with B.F. Skinner⁸² who from his underlying reductionist presuppositions, said that when listening to someone talking about God, he 'ran a translation inside'. The translation was from 'God talk' to what he regarded as the original version, namely statements in terms of schedules of reinforcement. At the time Mackay pointed out to Skinner that what he was saying was tantamount to asserting that a 'No Smoking' sign is nothing but ink on cardboard and therefore it is perfectly alright to go on smoking. It is like saying that what is going on in a computer when it is solving a mathematical equation is nothing but electronics.

78 Watts, F.N. & Williams, M. *ibid.*

79 F.N. Watts, *Jesus and Psychology*, London: Darton, Longman & Todd (2007).

80 Bauckham, R. *Jesus and the Eyewitnesses: The Gospels as Eyewitness Testimony*, Grand Rapids: Eerdmans (2006).

81 Hooykaas, R. in section headed 'The Nature of Boyle's Faith', in Hooykaas, *op. cit.*, (36), p.122.

82 Skinner, B.F. *op. cit.*, (14).

As we saw earlier, the same fallacy was evident in Freud's 'explaining away' of religious beliefs and exposing the practices of religions as 'nothing but' the persistence of an interim social neurosis that we must eventually grow out of. Is God then 'nothing but' the fantasy father figure – another of Freud's claims? For some people he may be; in which case that will tell us something interesting about the person who holds that belief. But it will certainly not tell us anything about the existence of God. If we want an answer to that question we shall not find it by studying the psychological differences between people in the way in which they hold their religious beliefs.

One would have hoped that the fallacy of nothing buttery had by now been exposed by the oft repeated statements of writers like Gordon Allport⁸³ that, 'The plain truth is that origins can tell nothing about the validity of a belief', and Bartlett's⁸⁴ comment that 'So far as any final decision upon the validity or value of such a claim (about the truths of religion) goes, the psychologist is in exactly the same position as that of any other human being who cares to consider the matter seriously. Being a psychologist gives him neither superior nor inferior authority.'

We shall find the answer to questions about the existence of God by considering the relevant evidence with a critical and open mind, with a readiness to be confronted with the truth when it, or as we would prefer to say He, is presented to us. Our task, as one high profile Christian⁸⁵ reminds us, is to continue our 'personal search for the face of the Lord', so as to 'help foster the growth of a living relationship with him'. In this he is echoing the voice of the devout Hebrew in Psalm 27 who exclaims, 'You have said "Seek my face"', and responds 'Your face Lord I will seek.' A view further underlined by the Old Testament scholar Patrick Miller,⁸⁶ who, after reviewing the evidence from the Psalms concerning what it means to be a human being and comparing this with the book of Hebrews wrote,

The writer to the Hebrews hears in the Psalms the word that whatever we say about the human reality must take into account the face of Jesus Christ... [But] the Hebrews writer says the critical words 'But we do see Jesus'. We do see Jesus, who for a little while was made lower than the angels, crowned with glory and honour because of the suffering of his death, so that by the grace of God he might taste death for everyone (Heb. 2:9)... Whatever therefore is to be said about the human cannot be confined to general statements about humanity apart from God. It cannot be said apart from the discovery that in Jesus Christ we see who we are and we also see God for us. And what he said about the human cannot be said as a general

83 Allport, G.W. *op. cit.*, (11).

84 Bartlett, F.C. *Religion as Experience, Belief and Action*, Oxford: OUP (1950).

85 Ratzinger, J. *Jesus of Nazareth*, London: Bloomsbury (2007), pp.xxiii-xxiv.

86 Miller, P. *op. cit.*, (58).

statement that assumes that what we see now is all there is to see. The answer to the question about who we are is finally eschatological, where tears are no longer part of the human reality, where joy is the order of eternity, and where our transience disappears in the disappearance of death. We cannot see that yet. But we do see Jesus. That will have to do. I think it is enough.

And speaking personally, for me it certainly is.

The future

What about the future? Recently it was reported that the UK's largest medical research charity was going to, 'plough £1 million into the search for the nerve mechanisms that explain beauty – and with it love, truth and happiness'. The leader of the project is to be Professor Semir Zeki already with a distinguished reputation as a neuroscientist with experience 'in using functional MRI brain scanning to study the "neural correlates of subjective mental states" – in layman's terms what happens in the brain when we experience strong feelings'.

The author of the Times⁸⁷ report had interviewed Zeki and raised the question, 'What if this is all, to use the words of Keats, unweaving a rainbow – a momentous endeavour that in the end removes the mystery and awe from the things that make life worth living?'

Zeki responded that 'he had pondered this possibility at length'. He went on, 'I don't see it like that, my sense of awe of Michelangelo's pieta isn't diminished by knowing that there is a part of my brain that responds to the human body and another part that responds to the face. There is still a feeling of wonder. What we gain is the knowledge of the characteristics of the human brain that give us our common humanity.'

Zeki is here underlining yet again a point I have tried to make several times earlier that at times more than one level of explanation is necessary to do full justice to a phenomenon. Sadly, reflecting on some of the interactions between science and religion over the past century, it is difficult to avoid the conclusion that all too often we have witnessed theologians seeming to spend much of their time playing 'catch up' with science. It is as if they were standing on the seashore rushing around filling sandbags in an attempt to stem perceived new threats from science carried in on the incoming tide. Rather, what we need to do is to see science as flowing over the shore on which we stand and washing away some of the litter of ignorance and false ideas left by the past and giving us fresh and clearer insights into the wonder and majesty of creation, including ourselves. In so doing we shall be following in what MacIntosh and Anstey⁸⁸

87 *The Times* 10 Nov 2007.

88 MacIntosh J.T. & Anstey, P. 'Robert Boyle', in Zalta, E.N. (ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2007 edn); URL = <http://plato.Stanford.edu/archives/fall 2007/entries/boyle/>

remind us was Boyle's aim. They write, 'He viewed his theological interests and his work in natural philosophy as forming a seamless whole and constantly used results from the one area to enlighten matters in the other.'

However successful we are in identifying the psychological and neurological roots of various aspects of religion we must resist the temptation thereby to claim that we have now shown that religion is nothing but this or that facet of our neuropsychological make-up. Equally when we get a deeper understanding of what is happening in the brain when we are behaving religiously or pondering deep religious truths we must resist the temptation to claim that therefore the truths being pondered are nothing but the eruptions of our brains. Perhaps this message will come home most clearly in the future when brain imaging techniques have become so miniaturised and so mobile that you will all be able to sit in a lecture such as this and be told afterwards which parts of your brains were most active (and when you went to sleep!). You will also have available at the end a readout of what was happening in the brain of the lecturer. What I think no one will believe is that their judgment of the truth or falsehood of what was said can be read off from any of this information about your own or the lecturer's brain activity. That must be judged against the relevant evidence.

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