

MALCOLM JEEVES**Changing Portraits of Human Nature¹**

Research in neuropsychology underlines the ever tightening links between mind and brain. A recent President of the Royal College of Psychiatrists, Robert Kendell, writes 'Not only is the distinction between mental and physical ill-founded and incompatible with contemporary understanding of disease, it is also damaging to the long-term interests of patients themselves'². At the same time advances in evolutionary psychology, revealing so-called 'mind reading' abilities in non-human primates, seem to reopen questions about what is unique about humans. Taken together neuropsychology and evolutionary psychology offer portraits of human nature that question some of our traditional Christian beliefs and have implications for Christian living. As in some earlier dialogues between science and faith, we are prompted to re-examine some traditional interpretations of familiar biblical passages. There are no easy answers but it is suggested that we need to return to a more holistic view of human nature that links our uniqueness to the God given capacity for a personal relationship with our Creator.

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1. Psychologising about God and religion**a) A topical issue**

A *Times*³ newspaper headline of August 1st, 2000 read 'Therapy is replacing religion says Carey'. Another, even bigger headline, the same day read, 'Why I have lost faith in God'. It referred to a comment by the radio and TV Psychiatrist, Professor Anthony Clare, who, commenting on the function of religion said, 'Part of the appeal is that religion helps with a sense of loneliness. It's as though you are part of a wider community, and it gives people the kind of

1 This article is based on a lecture given at Trinity College, Cambridge, on November 28th 2000, sponsored jointly by St Edmund's College and *Christians in Science* and generously supported by the John Templeton Foundation. A discussion based on the lecture may be found at <http://www.st-edmunds.cam.ac.uk/cis>.

2 Kendell, R.E. The distinction between mental and physical illness. Editorial. *Brit. J. Psychiatry* (2001), 178: 490-493.

3 *Times* Newspaper August 1st 2000 (Carey is the Archbishop of Canterbury).

ecstatic feeling they might find at a football match or a rock concert'. To cap it all, Clare's interviewer reported the widely read author Maeve Binchy as having said of her loss of belief in God, 'I woke one morning and suddenly he wasn't there, it was like not believing any more in Santa Claus'. Evidently, popular and media interest in psychologising about God and religion is alive and well.

Some of Clare's remarks echoed Freud's views of ninety years ago about belief in God being a comforting illusion. Other comments he made, for example those quoted above, recalled those of the psychiatrist William Sargant^{4,5} of *Battle for the Mind* fame. Binchy's account of the suddenness of her loss of faith also recalled William Sargant's comments on emotionalism and on the sudden conversions occurring at some large evangelistic meetings. All of which leaves us with the feeling that we've been here before. But as we shall see there is much that is new.

b) Learning from the past

Such recent reports illustrate how some of the long established specialist fields in psychology such as psychopathology, social psychology and physiological psychology, continue to enter into discussions of the origins and functions of religious beliefs and practices. Some have claimed that the accounts given have challenged the status of religious beliefs and/or questioned traditional views of some religious practices. In this way they remind us of the 'warfare' metaphor, used by some in the past to describe the interactions between science and religion. Although a view largely discredited by historians of science, it surfaces again from time to time, and in the present context is illustrated by the views of Freud⁶ at the beginning of the 20th century, of Skinner^{7,8} in the middle of that century, and of Crick at the end.

It is easy to forget that while Freud and Jung captured the headlines at the psychology and religion interface in the first half of the 20th century, there were others who wrote on the topic, such as R.H. Thouless⁹, and whose views also endure. Thouless's approach was highly constructive and contrasted with the warfare metaphor. He represented a tradition, continued since the second world war, with several noteworthy attempts to explore new insights about religion through the eyes of psychology. Typical of these are G. W. Allport's¹⁰

4 Sargant, W. *Battle for the Mind*, London: Heinemann (1957).

5 Sargant, W. 'The Physiology of Faith', *Brit. J. Psychiatry* (1969) 115, 505-518.

6 Freud, S. *The Future of an Illusion*, London: Hogarth Press (1934).

7 Skinner, B.F. Transcript from the TV Programme 'Firing Line', 17, October, 1971, p.4.

8 Skinner, B.F. *Beyond Freedom and Dignity*, New York: Knopf (1971).

9 Thouless, R.H. *An Introduction to the Psychology of Religion* 3rd Ed. London: Cambridge University Press (1971).

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

The Individual and His Religion (1951), Michael Argyle's¹¹ several books including *Religious Behaviour* and, with Beit Hallahmi^{12,13}, *The Social Psychology of Religion*. There are certainly some excellent books on the psychology of religion not infused with any notion of conflict. Because they are not confrontational, they tend only to be read by psychologists and those interested in deepening our understanding of the part played by religion in our thoughts and feelings.

Such, however, was not the case with B.F. Skinner's views on religion. In the mid-20th century, his views were the most widely publicised of the 'warfare' genre. This is understandable because of his well-deserved reputation as the leading behavioural psychologist at that time. Having achieved considerable success with developing techniques for shaping and modifying behaviour, Skinner went on to speculate about how such techniques might be harnessed to influence the future of society. He believed that similar principles, based on the effects of rewards and punishments, could explain how religious practices function psychologically. "The religious agency", he said, "is a special form of government under which 'good' and 'bad' becomes 'pious' and 'sinful'". He argued that good things, personified as a god, are reinforcing, whereas the threat of hell is an aversive stimulus; and that both these shape behaviour. Underlying Skinner's approach is a reductionist assumption. He speaks of concepts of god being 'reduced to' what we find positively reinforcing.

Skinner's views were challenged by an equally distinguished psychologist, who was also a neuroscientist, Roger Sperry¹⁴, who became a Nobel laureate. He criticised the bankruptcy of some forms of behaviourism and accepted the benefits of a positive relationship between psychology and religion as allies engaged in a common task. Having spent his career studying brain mechanisms, Sperry wrote that he detected amongst neuroscientists 'a move away from the mechanistic, deterministic and reductionistic doctrines of pre-1965 science to the more humanistic interpretations of the 1970's'. He argued that it was simplistic to try to reduce humans to 'nothing but' physico-chemical machines. This is an entirely different view from that of Francis Crick, a fellow Nobel laureate. Crick argued that, according to his interpretation of neuroscience, the idea of the soul is now redundant and discredited, and religious belief in the soul is meaningless.

This very brief backwards glance highlights two enduring and recurring issues. The first is the need to scrutinise carefully the nature of the explanations offered by psychologists of religious beliefs, experiences and behaviour. Some, like James, Thouless, Allport and Argyle, saw themselves as providing

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

12 Argyle, M. and Beit-Hallahmi, B. *The Social Psychology of Religion*, London: Routledge (1975).

13 Beit-Hallahmi, B. and Argyle, M. *The Psychology of Religious Behaviour, Belief and Experience*, London: Routledge (1997).

14 Sperry, R.W. 'Psychology's Mentalistic Paradigm and the Religion/Science Tension', *American Psychologist* (1988), 43(8), 607-613.

fresh glimpses into the mechanisms involved in the origins and maintenance of religious beliefs and behaviour. Others, like Freud and Skinner, believed that the explanations they offered were competitors with, and alternatives to, the accounts traditionally given in religious language. Their approach was, at times, unashamedly reductionistic and materialistic. For example, as when Freud wrote at the end of his psychological study of Leonardo da Vinci, 'Psychoanalysis ... has taught us that the personal God is psychologically *nothing other than* a magnified father; ...'. Elsewhere he wrote that religion is '*nothing other than* psychological processes projected into the outer world' (my italics). However, as a little thought indicates, regardless of whether the explanations are couched in psychoanalytic terms, or reinforcement theory, or Pavlovian conditioning, such explanations cannot, by their nature, explain away the meaningfulness or otherwise of the 'God talk' any more than the computer engineer's description, in electronic terms, of how the computer solves mathematical equations makes redundant the mathematician's reference to the mathematical equations. The psychological account can no more be presented as the refutation of the reality of the God whom the religious person claims to know, than can the electronic account be presented as demonstrating that mathematical concepts are now redundant and superseded.

The second recurring issue that this brief review underlines is the importance of being aware, as far as possible, of the pre-suppositions which any investigator brings to his task. If, as in the case of Freud and Skinner, these are reductionist and materialist pre-suppositions then, understandably, you will couch your accounts and explanations to be consistent with those pre-suppositions.

2. Positive promptings from earlier dialogues

2.1 Some examples

a) Faith and action

Any attempt by psychologists, or anyone else, to study religion immediately raises the question of how to define religion. And, more specifically, its Christian expression. In the past, church attendance was the commonest index of interest in religion. However, since many people who take little or no part in institutional religion nevertheless still describe themselves as religious, it is evident that such a definition is inadequate and for research purposes one needs a more subtle measure of religiosity. In the 1950's researchers proposed a distinction between 'intrinsic' and 'extrinsic' religious attitudes. An 'intrinsic' attitude is characterised by, for example, religion being an end in itself (not instrumental); an 'extrinsic' attitude finds church-going as supporting non-religious ends, such as providing comfort and social support. This distinction was

taken up by other researchers who began to refer to 'committed' religion versus 'consensual' religion. These were attempts to fractionate religiosity in a rather more subtle way and to begin to do justice to the widely different manifestations of the religious quest.

The need to distinguish between intrinsic and extrinsic beliefs was underlined when correlational studies in the USA showed clearly that those who were more involved in religion also tended to be more neurotic, more racially prejudiced, more anti-semitic and more anti-black. On the face of it, a disturbing discovery. When, however, an attempt was made to distinguish between those who held intrinsic beliefs versus those who held extrinsic beliefs, it turned out that the intrinsic believers were regular church-goers and also tended to be less prejudiced, less anti-Semitic, less anti-black and less neurotic. These findings also called for a rethink of the general assumption that our beliefs and attitudes determine our actions.

b) Behaviour and attitudes

If social psychology has taught us anything over the last 30 years, it is that we are as likely to act ourselves into a way of thinking, as to think ourselves into a way of acting. The way the social psychologist puts it is to say that it is now a fundamental rule of social psychology that behaviour and attitude generate one another in an endless spiral, like chicken and egg. This principle, as we all realise, affirms the biblical understanding of action and faith, or what Bonhoeffer called obedience and belief.

Much as conventional wisdom has insisted that our attitudes determine our behaviour, so Christian thinking has, at times, unduly emphasised faith as the sole cause of action. What this research has shown is that it is as important to remember the complementary view that faith is a consequence of action. In both the Old and New Testaments we are told that full knowledge of God comes through actively doing the Word. Faith is nurtured by obedience. Faith grows as we act on what little faith we have. 'Faith', said John Calvin, 'is born of obedience'. 'The proof of Christianity really consists in 'following' ' declared Kierkegaard. Karl Barth agreed: 'Only the doer of the word is its real hearer'. The outworking of this in the life of the church is all too obvious. Those churches that make their members active participants and not mere spectators are the ones that seem to be growing all the time. In this, as in everything else, the principle has its limits. It is possible to become so preoccupied with doing things that there is no time left quietly to receive God's word or God's gracious direction of our lives. It is clear that, here, biblical and psychological perspectives join together in reminding us that faith is like love. If we hoard it, it will shrivel. If we use it, exercise it, and express it, we will have it more abundantly. God comes through actively doing the Word. Faith is nurtured by obedience.

c) The power of pre-suppositions

Over many decades, research in visual perception has demonstrated how what

we perceive depends upon where our attention is focused, what is our prior experience, and what are our expectations. What is true of perception applies to experience generally, including what we label as religious experience. When you view the heavens you may or may not see them as declaring God's glory. Or, as Owen Gingerich¹⁵ put it in a recent Editorial to this Journal, 'Through the eyes of faith, physics tells us something after all about the Creator of the universe'. To report religious experience is to assign to sense experience a spiritual significance. It is to interpret phenomena with an awareness of the presence of God. What Jesus said and did was interpreted differently by different onlookers and continues to be so today. We shall see later how different pre-suppositions lead equally competent scientists to give different interpretations after reviewing the same field of research. And, it seems, the same happens, at times, when different Biblical scholars interpret the same texts. No surprises here for the psychologist studying perceptual processes.

In some instances, pre-suppositions take the form of the values we bring to any situation. In 1985, there was a considerable stir within psychology when Allen Bergin¹⁶ published a paper in the American Psychological Association's clinical psychology journal setting out his Judeo-Christian values and contrasting them with the values assumed or declared by other psychotherapists. As the co-editor of the influential *Handbook of Psychotherapy and Behaviour Change*, his paper provoked a vigorous response. Psychotherapists of whatever persuasion generally agreed that their values were important and should be acknowledged more openly. Some, however, complained that religious dogmatism and inhibitions are anything but healthy, and claimed that their clinical-humanistic values were more fully humanising. To this Bergin responded that, indeed, religion is diverse and not always benevolent and, yes, as a religious person he strongly supported the human values of love, freedom of choice, and honesty. His point, however, remained that values do permeate psychotherapy and should be openly declared. Bergin's point was amplified specifically two years later when Paul Vitz¹⁷ exposed the anti-religious assumptions of some secular psychologies. These, he said, included atheism or agnosticism, naturalism, reductionism, individualism, relativism, subjectivism and gnosticism. Vitz's point was taken up more recently by Dawes in his widely-acclaimed book *House of Cards*. Commenting on the intrusion of non-psychological influences into psychotherapy, Dawes¹⁸ argued that such influences are well illustrated by the contemporary influence of the New Age movement. Noting its great emphasis on self-esteem, Dawes writes that according to the movement's proponents, 'we all suffer from deficiencies in self-esteem, and the deficiencies

15 Gingerich, O. 'What does Physics tell us about God?' Guest Editorial in *Science and Christian Belief* (2001) 13(2), 98.

16 Bergin, A.E. 'Psychotherapy and Religious Values', *Journal of Consultative and Counselling Psychology* (1980) 48: 95-105.

17 Vitz, P. *Psychology as Religion: The Cult of Self-Worship*, Eerdmans, Grand Rapids (1977).

18 Dawes, R. *House of Cards: Psychology and Psychotherapy Built on Myth*, New York: Free Press (1994).

are responsible for our problems, definitely not vice versa'. In view of the contemporary importance of these New Age influences, it is worth quoting Dawes at greater length on this issue. He goes on: 'Poor self-esteem is often cited as the root cause for everything, from failing to learn in elementary schools to failure in business, to over achievement, to divorce or even to "sexual co-dependency"'. He later comments: 'Let me state categorically that there is no scientific evidence that people who have deep insecurities and self-doubts have nothing to contribute to the world. The most casual reading of biographies indicates that many admirable people, like Abraham Lincoln, often suffered from deep insecurities and self-doubts, and that many less admirable people suffered no self-doubts whatsoever, at least until they were caught or disgraced'.

2.2 Some reactions to past challenges

The first reaction of religious people when faced with such challenges to some of their cherished beliefs was to seek to deny them. A more considered view, on further reflection, was to realise that they might provide new insights into the nature and function of religious beliefs and practices. Seen in this way, such challenges prompted a re-examination of some beliefs and practices. Could it be, for example, that their beliefs were being subtly adjusted more to meet felt needs than to face up to the claims of a sovereign God? We face similar challenges today. Perhaps it is time to re-examine the biblical basis of some of our beliefs. Indeed, to believe in a god of our own creating and to give that god the characteristics that would prove most comforting, could be seen as yet another form of the idolatry of which we are warned so often throughout scripture. The result, at times, has become that the gospel of grace, mercy, and peace, is marketed as the idolatrous, counterfeit gospel of health, happiness, and prosperity, as portrayed by some tele-evangelists. In what follows we shall ask whether developments in psychology in the second half of the last century provided fresh challenges to some of our traditional understanding of religious beliefs and practices. I shall limit myself to those within the Christian tradition with which I am most familiar.

3. Promptings from cognitive psychology, neuropsychology and evolutionary psychology

a) Cognitive psychology

In North America in the 1950's it seemed that the only way for psychologists to smuggle in the concept of mind was to call it something else. Jerome Bruner¹⁹, one of the architects of the so-called 'cognitive revolution' in psychology, tells how Professor George Miller, a fellow architect, commented 'you're supposed to

19 Bruner, J.S. *In Search of Mind*, New York: Harper and Row (1983).

get at the mind through the eye, ear, nose and throat if you are a real psychologist'. Bruner noted how, at that time, to talk about thinking, for example, was considered to be 'too mentalistic, too subjective, too shifty', to be truly scientific. It was left to Bruner and his collaborators to begin to return the study of cognitive processes, such as thinking, to mainstream psychology. The earlier reticence to research into cognition was further documented by Bruner, who noted how the standard reference work in experimental psychology used in the 1950's, namely Stevens's²⁰ *Handbook of Experimental Psychology* devoted only 27 pages out of a total of 1,362 to a chapter on cognitive processes. This seems almost unbelievable now when cognitive psychology is so dominant.

It is only relatively recently that psychologists have begun to ask whether some of the things we learn from cognitive psychology about perceiving, thinking, remembering and knowing are relevant to some long-standing questions about religious knowing. For example, what, if anything, is special about religious knowing? Are there similarities between religious knowing and some other forms of everyday knowing? How do we acquire knowledge about the things of God? What about roles traditionally assigned to reason and to faith in this knowing process? Fraser Watts²¹ argues that cognitive psychology has shown that the faith–reason dichotomy is misleading. He writes (on page 53), 'the sharp cleavage between rational demonstration and voluntary faith that is assumed in much discussion of religious belief from Aquinas to the present day does violence to the actual nature of cognitive processes'. It fails to recognise how what we perceive is inextricably intertwined with our assumptions, hypotheses and preoccupations. Watts follows Kellenberger²² (*The Cognitivity of Religion*) in commending serious consideration in adding a third perspective to the over-simple dichotomy of faith and reason. Kellenberger calls it the way of discovery, which he believes has a long tradition in Judeo-Christian thought, and is seen clearly in the Psalms. The psalmist sees evidence of God all around him, but it is not merely the neutral evidence of rational argument or scientific data. It is certainly not evidence that stares everyone in the face. Kellenberger believes such knowledge is available only to those who 'open their hearts', and he traces what he calls this discovery tradition through a number of Christian writers. There is much that could be disputed and debated here. Watts recognises this and himself poses the question (page 59) 'if religious experience is so unusual and uncertain, how can we claim that it is based on everyday cognitive processes?' In tracing out possible answers to this question he suggests that aesthetic cognition is a helpful analogue of religious cognition. The book *The Psychology of Religious Knowing*, written by Fraser Watts with Mark Williams²³, is another more recent example of how we may glean new insights from psychology, in this instance from cognitive psychology. They believe it can

20 Stevens, S.S. *Handbook of Experimental Psychology* (1950).

21 Watts, F. and Williams, M. *The Psychology of Religious Knowing*, London: Chapman (1988) p.53.

22 Kellenberger, J. *The Cognitivity of Religion: Three Perspectives*, London: Macmillan (1985).

23 Watts, F. and Williams, M., *op.cit.*, (20)

help to understand the emotional component in religious knowing, the part played by self-knowledge as revealed in some forms of psychotherapy, the nature of prayer and a fresh analysis of some of our concepts of God. Thus developments within psychology not only challenge some traditional religious beliefs, but at times provide fresh insights into their nature and functions. Now, however, as we turn to neuropsychology, we face developments which some have seen as providing a direct challenge to what they understand to be long and deeply held religious beliefs about our own nature.

b) Neuropsychology

The decision of the US Senate to declare the 1990's 'The Decade of the Brain' and to pour substantial extra funding into brain research, followed from what had been happening in the previous decade in terms of developments in techniques for studying brain function, developments which Susan Greenfield has suggested should prompt us to label the current decade *The Decade of the Mind*. But why did the rapid advances in brain science occur when they did? And are we in danger of selective amnesia for the long and illustrious history of past thinkers no less clever than ourselves?

Most commentators on this area of science agree that it was the convergence of developments in three hitherto relatively unconnected areas of science which provided the impetus for the significant leaps forward. The first of these were developments in experimental psychology. New techniques were developed using computer-assisted methods. These were applied to non-human as well as human subjects and this, in turn, opened up new ways to address old questions. The second development was the so-called cognitive revolution referred to earlier, resulting in rapid developments in cognitive neuropsychology. It is interesting, as an aside, to remember that many trace the beginnings of the cognitive revolution to the work of the Cambridge psychologist Sir Frederick Bartlett. The third major development was due, as is the case in so many advances in science, to the basic researches of physical scientists. Thanks to their work we witnessed exciting developments in brain-imaging techniques. When these three lines of research were brought together, it made possible the study of how, when undertaking a particular cognitive task, specific areas or networks in the brain are mobilised. Let me now very quickly try to give you a feel for how recent advances point increasingly to the tightening links between mind, brain and behaviour.

Sensory processing

Forty years ago, Hubel and Wiesel demonstrated that there were cells in the visual cortex of cats which responded selectively to the orientation of bars of light. Not all cells were the same. Today we know that there is a remarkable specificity for the initial registration and processing of sensory information.

Almost two decades ago, David Perrett²⁴ and his co-workers in St Andrews reported that there were cells in the visual cortex of monkeys which not only responded selectively to faces, but also, in some instances, to particular orientations of those faces. We had known about regional localisation for some time from reports of patients who, following strokes, reported they could no longer recognise faces, including their own and those of close relatives, even though they had no difficulty recognising houses, cars, dogs, cats and so on. The then available scanning techniques (CT scans) enabled us to localise such damage to a particular region of the visual cortex.

David Perrett and his group extended the 1972 work of Gross²⁵ by identifying cells in monkeys that responded selectively to movement and to body parts such as hands. The specificity of some cells is such that they only respond if the hands cause the substrate to move. Thus there is a remarkable specificity in the registration and storage of sensory information.

Memory

Fifty years ago, as students, we were taught that learning and the retention of what had been learned, did not depend upon specific areas of the brain. Rather, that how the learning of a particular task was affected by brain damage depended on the extent of damage to the brain, not the specific areas damaged. This was as a result of the pioneering research of Karl Lashley²⁶ at Harvard University, expressed in his famous law of mass action presented in his classic paper 'In search of the Engram'.

This was surprising because, a century earlier, neurologists had been able to localise specific human abilities to particular areas of the brain. The neurologist Broca, for example, noticed that a patient who had damage in an area in the left frontal part of the brain could understand language, but was unable to speak. Not long afterwards, Wernicke reported that he had observed patients with damage in a more posterior part of the left hemisphere which resulted in his patients being able to speak, but not to understand language spoken to them. What has happened to change our views so radically from Lashley's time?

Fifty years ago it was the custom to speak simply of remembering or of memory. Today we are able systematically to fractionate memory, so that we realise that memory is not a single unitary entity but is, rather, made up of a series of memories that, in optimum conditions, work together to serve a wide range of

24 Perrett, D.I., Smith, P.A.J., Potter, D.D., Mistlin, A.J., Head, A.S., Milner, A.D., and Jeeves, M.A. 'Neurons responsive to faces in the temporal cortex: studies of functional organisation, sensitivity to identity and relation to perception', *Human Neurobiology* (1984) 3, 197-208.

25 Gross, C.G., Rocha-Miranda, C.E., and Bender, D.B. 'Visual properties of neurons in inferotemporal cortex of the macaque', *Journal of Neurophysiology* (1972) 35, 967-1111.

26 Lashley, K.S. 'In Search of the Engram', in S.E.B. *Symposia IV, Physiological Mechanisms in Animal Behaviour* (1950), pp. 454-482.

different functions. What they all have in common is that they provide a capability first to store and then, subsequently, to retrieve information. Subsequent studies, using functional imaging techniques have cast light on the anatomical basis of the component parts of one of the most widely used psychological models of memory. Alan Baddeley's²⁷ psychological model of working memory proposed three distinctive components: a visuo-spatial sketchpad, a phonological loop and a central executive. Using brain imaging techniques, Frith²⁸ and his co-workers have shown that the phonological loop involves two separate locations within the left hemisphere of the brain, the visuo-spatial sketchpad is distributed across at least four locations in the right hemisphere, and the central executive depends on a range of locations within the frontal lobes of the brain.

Personality and emotion

It is not only cognitive functions that are affected by brain damage. We are beginning to understand something of the neural substrate of personality and emotion. The classic case of this is the oft-told story of the railroad worker Phineas Gage. Gage had the misfortune to light a charge prematurely when clearing rocks on a railroad in New England which resulted in a tamping iron entering his cheek and exiting from the top of his head. The rod landed some fifty yards away with traces of brain and some blood on it. Surprisingly, Phineas Gage, though stunned temporarily, was not killed. He recovered, and the next day he was able to communicate with his carers. Why this particular case is so important is that a great deal was known about Phineas Gage before and after his accident. Beforehand he was conscientious, reliable, dependable, hardworking and a pillar of society. After the accident, whilst his cognitive functions such as memory and language were virtually unchanged, his personality changed dramatically. He was now totally unreliable, boastful, a gambler, and unable to devote himself consistently for any length of time to a particular task. In short, a reliable, morally upright, excellent character had become unreliable, morally irresponsible and a source of little good to the society he kept or within which he lived.

A series of similar adult cases, with damage to the same brain region but owing to disease and vascular accidents, has been studied and documented by Antonio Damasio²⁹ and his co-workers. They report, for example, the cases of two children who suffered brain damage – one a girl at 15 months, the other a boy at three months. The girl is now aged 20, the boy aged 23. They both display disruptive and reckless behaviour, lying, stealing, inability to make friends, insensitivity and lack of remorse. The classic picture of a psychopath.

27 Baddeley, A.D. *Human Memory: Theory and Practice* 2nd Ed. Hove: Psychology Press (1997).

28 Frith, C. 'Images of Memory', Summer 1994, MRC News.

29 Anderson, S.W., Bechara, A., Damasio, H., Tranch, D. and Damasio, A.R. 'Impairment of social and moral behaviour related to early damage in human prefrontal cortex', *Nature Neuroscience* (1999) 2(11), 1032-1037.

Whilst the Damasio paper was entitled 'Impairment of social and moral behaviour related to early damage in human pre-frontal cortex', the *Times*³⁰ had a large headline: 'Brain damage can produce psychopaths'.

A commentator on Damasio's patients wrote, 'It's as if the moral compass of these people has been demagnetised, causing it to spin out of control' (de Waal³¹). He went on, somewhat provocatively, 'What this incident teaches us is that conscience is not some disembodied concept that can be understood only on the basis of culture and religion'. Morality, he claimed, is as firmly founded in neurobiology as anything else we do or are. This tightening link between personality and emotion and their neural substrates has been further documented in studies by Robert Hare and his colleagues of a series of imprisoned psychopaths. He has been able to secure brain images of a group of psychopaths when they have been exposed to emotion-laden words. He was able to show how a normal functioning brain lights up when exposed to such emotion-laden words, whereas the brain of a psychopath appears to remain inactive, particularly in those areas linked with feelings and self-control. A related study of the brains of murderers again indicated less activity in the frontal cortex than in the brains of non-violent subjects of the same age and sex. In one study of 22 murderers, three-quarters of them had low frontal activity of this kind, believed indirectly to regulate aggressive impulses. These findings remain controversial and need replication and extension.

Maintaining a balance: 'top-down' as well as 'bottom-up'

The brief review in the previous section indicates how with each new research finding in neuropsychology, we see a tightening of the links between mind, brain and behaviour, not simply linking to particular areas, but indicating how whole systems are involved, linking multiple sites.

The examples given above can easily leave the impression that the whole story depends on what we may call the 'bottom-up' approach. That is to say, we can see how changes to the neural substrate limit behaviour, and regulate and determine cognitive activity and the behaviour of which the organism is capable. To leave that impression would be a mistake. Whilst it is very much harder to do research on 'top down' effects, there is already evidence for the importance of the conscious top-down control of mental activity and behaviour, as emphasised repeatedly by Professor Roger Sperry. There are several studies which indicate how the behaviour in which one engages regulates the proportion of blood dedicated to a particular area of the brain and modulates brain activity.

Using brain-imaging techniques, Sadata³² and colleagues (1996) reported

30 Times Headline, October, 19th 1999. 'Brain damage can produce psychopaths'.

31 De Waal, Frans *Good Natured: The Origin of Right and Wrong in Humans and Other Animals*, Harvard (1997), pp. 216-217.

32 Sadata, N. *et al.* 'Activation of the primary visual cortex by Braille reading in blind subjects', *Nature* (1996) 380, 526-8.

that blind subjects showed activation of primary and secondary visual cortical areas during tactile tasks, whereas normal subjects showed deactivation. This study was an extension of an earlier one by Pascual-Leone and Torres³³ (1953), which showed that the region of the brain normally dedicated to somato-sensory processing is expanded in proficient Braille readers when compared with sighted subjects. It is evident that training and habitual use modifies the neural substrate in such a task. The results of such studies carried out with cerebral blood-flow studies in humans have been confirmed in studies using non-human primates trained to carry out tasks with one of their digits, and then by tracing out the cortical territory devoted to the task. The results show that the cortical area extends considerably beyond the normal area for such behaviour and into areas which would otherwise be used for other tasks. In short, the habitual behaviour engaged in, if you like the top-down direction of activity, determines the neural substrate devoted to that activity.

Evidence for 'top-down' effects, but now at the level of neurochemistry, appears increasingly in the scientific literature. An illustrative recent study is the work by Keith Matthews³⁴ and his co-workers (extending the results of studies going back four decades) which demonstrate how early environment exerts profound effects on mammalian behaviour and neural development. In their study, they describe how repeated neonatal maternal separation in rats produces changes in neurochemistry at adulthood. There are selective increases in the levels of dopamine, reduced levels in serotonin, increased levels of noradreniline (in females but not in males) which together '...provide evidence that, in addition to the adult behavioural consequences, repeated neonatal maternal separation leads to profound, region, and gender-specific changes in brain monoamine content'.

A study^{35,36} carried out in Italy illustrates the possible benefits of cognitive training in the form of early education in warding off the effects of Alzheimer's disease in later life. The background to the study is that primary school education in some parts of Italy was not made compulsory until many years later than in most other European countries. This, combined with widespread poverty in some areas, meant that few people could pay to educate themselves. The result was that significant numbers of Italians, in their sixties, seventies or eighties at the time of the study, had had little or no schooling at all. The researchers saw the opportunity to ask the question, 'Does the amount of education in early life have any effect on the state of the brain in old age?' One

33 Pascual-Leone, A. and Torres, F. 'Plasticity of the sensori-motor cortex representation of the reading finger in Braille readers', *Brain* (1993) 116, 39-52.

34 Matthews, K., Dalley, J.W., Matthews, C., Tung Hu Tsai, and Robbins, T.W. 'Periodic Maternal separation of neonatal rats produces region and gender-specific effects on biogenic amine content in post-mortem adult brain', *Synapse* (2001) 40, 1-10.

35 Bouainto, S. *et al.* 'Education and occupation as risk factors for dementia in a population based case-control study', *Neuroepidemiology* (1995) 14, 101-109.

36 Bouainto, S. *et al.* 'Survival and dementia: a 7 year follow-up of an Italian elderly population', *Archives of Gerontology and Geriatrics* (1995) 20, 105-113.

surprising result was that rates of Alzheimer's disease – the commonest form of senile dementia – were fourteen times greater among illiterate people with no education than among those who had had more than five years of education.

c) Evolutionary psychology

Developments in evolutionary psychology have recently been given wide publicity appearing on the front covers of *Time*³⁷ and *Der Spiegel*³⁸. They have also appeared prominently in serious scientific reporting, for example on the front cover of *Nature*³⁹. A review of one of the latest books by a leader in the field, Frans de Waal, starts, 'From the beginning, philosophers have agonised over the question of what makes us human. Is there a difference in kind or merely a difference in degree between ourselves and other animals?' It continues, 'direct comparisons between people and animals are often seen as demeaning, even offensive.' Such comparisons, however, are not new, even in theological circles. Pascal wrote, 'It is dangerous to show a man too clearly how much he resembles the beast, without at the same time showing him his greatness. It is also dangerous to allow him too clear a vision of his greatness without his baseness. It is even more dangerous to leave him in ignorance of both.' Evolutionary psychology can help to reduce that ignorance.

There is a chequered history of attempts to establish the uniqueness of humankind on scientific grounds. That there are no religious stakes in this should be apparent when Richard Dawkins, a declared atheist, can promptly list four things which illustrate human uniqueness. Richard Passingham⁴⁰, in *The Human Primate*, notes how man has always considered himself to be set apart from animals. He reminds us how the 19th-century anatomist Richard Owen (1858), on the basis of brain differences, put man in a separate sub-class, set apart from another sub-class containing all the other mammals. He called our sub-class the Archencephala or 'ruling brains', claiming that there were three structures unique to the human brain. In 1863, T.H. Huxley convincingly refuted these claims, demonstrating that all three structures, including the hippocampus minor, could be seen in the brains of other primates. Huxley was scornful of those who, as he put it, sought 'to base Man's dignity upon his great toe', or those who thought 'we are lost if an Ape has a hippocampus minor'. Others have sought to pin the uniqueness of humans on our possession of a soul, contrasted with the parallel assertion that animals do not have souls. Later we shall examine the biblical warrant for such claims. We have already noted how, in the realm of neuroscience, Francis Crick proclaimed that what he took to be the Christian view of the soul was made untenable by developments in neuroscience. Some see evolutionary psychology as similarly blurring what they

37 *Time*. 'Can animals think?' 29 March 1993.

38 *Der Spiegel*. 'Bruder Affe', 28 August 2000.

39 *Nature*. 'Chimpanzee culture', 17 June 1999.

40 Passingham, R. *The Human Primate*, Freeman (1982).

regard as essential distinctions between humans and non-human primates. There are certainly serious scientific issues here concerning whether, and in what ways, humans are unique. The title of a recent prestigious meeting in London, at the Institute of Cognitive Neuroscience, March 2001, 'What is special about human cognition?' exemplifies the topicality of this issue in science. It is important because recent developments suggest that similarities between humans and non-human primates may provide another avenue for tackling some of the more distressing mental illnesses.

Comparative psychology and evolutionary psychology

Since the time when psychology began to claim to be a science, there have been those who have made the study of animal behaviour the focus of their research. The first psychologist to be elected a Fellow of the Royal Society of London, Lloyd Morgan, worked primarily on animals. At that time the field was labelled 'comparative psychology', which in recent years has been largely superseded by the name 'evolutionary psychology'.

Many of the early studies by comparative psychologists looked for a neat natural scale in which changes in sensory processes and learning would parallel the position of an animal in the phylogenetic scale. This in turn led to a search for ways in which, with more complex nervous systems, more elaborate behaviours and learning capacities would emerge. Such studies were mainly carried out on animals which are easily kept in laboratories, such as rats, pigeons, cats and monkeys. Evolutionary psychology, as it is conceived today, has only tenuous links with such earlier comparative psychology. One of the best early examples was Norman Munn's⁴¹ 1971 book *The Evolution of the Human Mind*.

The careful study of animal behaviour in a natural setting took centre stage through the work of ethologists such as Lorenz, Tinbergen and Thorpe⁴². This work alerted us to the fallacy of believing that with the increased complexity of the nervous system there was a necessary parallel in the increasing complexity of learning capacity and social behaviour. Some of the animals with the simplest nervous systems, such as ants and bees, showed remarkably complex forms of social behaviour.

Today some psychologists are so enthused by evolutionary psychology that they see it as mounting a take-over bid for the whole of psychology. For example, David Buss⁴³ subtitled his book *Evolutionary Psychology* (published in 2000) as *The New Science of the Mind*. He then proceeded to reorganise the whole of psychology within an overall framework of evolutionary psychology. Others are more modest in their claims. For example, courses in the Open University in Britain are content simply to note that 'Evolutionary psychology

41 Munn, N. *The Evolution of the Human Mind*, Boston: Houghton Mifflin (1971).

42 Thorpe, W.H. *Animal Nature and Human Nature*, Cambridge University Press (1974).

43 Buss, D.M. *Evolutionary Psychology: The New Science of Mind*, Allyn and Bacon (2000).

focuses on how human beings came to be the apparently special animal we are today'. They also note that one of the currently most researched areas of evolutionary psychology is its focus on the so-called 'theory of mind'. This they trace back to ideas by Premack and Woodruff⁴⁴ in 1978. They described animals who had the ability to understand the mind of another animal as possessing a 'theory of mind'. Essentially, according to this view having a theory of mind, or being able to mind-read, refers to the ability of an individual to respond differentially, according to assumptions it makes about the beliefs and desires of another individual, rather than by a direct response to its overt behaviour (Whiten and Byrne 1997, page 8). The 1988 book by Byrne and Whiten⁴⁵, followed by their second 1997 book *Machiavellian Intelligence*⁴⁶, illustrate well how evolutionary psychology is thought about in Europe today.

Byrne lists some of the central questions in evolutionary psychology as the following, 'When did a particular cognitive trait enter the human lineage? What was its original adaptive function? And has it been retained for the same reason, or is it now valuable for some different purpose? What is the cognitive basis for the trait? And how does its organisation relate to other mental capacities?'

Careful, geographically widespread field studies of monkeys and great apes have begun to provide materials to answer some of these questions. A typical quote from Byrne⁴⁷ (2000) illustrates some of the findings. He writes:

Monkeys and apes have long been known to show social manipulations that appear complex and clever to human observers: third party support to win resources, liaisons that rely on deception, long-term nurturing of friendships and reciprocal collaboration, targeted choice of allies and repairing structured relationships, and so on. In contrast, people who study limners and lorises, or indeed most other mammals, report nothing very similar. Moreover, the simian primates (monkeys and apes) have unusually large brains for animals of their size; limners and lorises, on the other hand, have brains of more typical size for mammals. This difference is principally expressed in neo-cortical volume and there is a direct relationship between neo-cortical volume and the amount of (clever looking) behaviours that researchers observe. That allies to deception, to innovation, and to tool use.

Byrne's reference to the possible importance of the size of the neo-cortex

44 Premack, D. and Woodruff, G. 'Does the chimpanzee have a mind?', *The Behavioural and Brain Sciences* (1978) 4, 515-526.

45 Byrne, R.W. and Whiten, A. *Machiavellian Intelligence: Social Expertise and the Evolution of Intellect in Monkeys, Apes and Humans*, Oxford: Clarendon Press (1988).

46 Whiten, A. and Byrne, R.W. *Machiavellian Intelligence II: Extensions and Evaluations*, Cambridge: Cambridge University Press (1997).

47 Byrne, R.W. 'Evolutionary psychology and socio-biology' (2000) Paper delivered at Royal Society of Edinburgh Millennium Meeting on *Human Nature* (in press).

links with what we have written earlier about advances in neuroscience. The careful and scholarly approaches of Byrne, and others like him, are exemplified in the following brief quotes from Byrne (2000):

Quite what benefits a large neo-cortex brings – the underlying cognitive basis of monkey and ape social sophistication – is not straightforward to answer. It is tempting, but may be utterly wrong, to assume that an animal that works over many months to build up a friendly relationship has some idea of the effect its behaviour is having on the mind of the other...We assume the agent realises that by producing a false belief in his victim may risk losing a friend or gaining an enemy. The alternative is a more prosaic mixture of genetical predisposition and rapid learning – and often this is more likely.

Researchers have to be very cautious, then, in attributing to non-human primates the ability to understand social behaviour or how things work in the mechanistic way of adult humans.

Rapid learning in social circumstances, a good memory for individuals and their different characteristics, and some simple genetic tendencies are capable of explaining much that has impressed observers as intelligent in simian primates.

It is evident that there are serious scientific issues to be addressed here and it may be tempting, in a search for human uniqueness to seize upon so-called ‘mind-reading’ behaviour as one way of uniquely separating off humans from non-humans. At the same time, when similarities between the behaviour of humans and some non-human primates are identified, there will be the ever present temptation to say that humans are therefore ‘nothing but’ unusually complex primates and to ignore the distinctiveness of the ethical, moral and religious aspects of human cognition and behaviour.

The book by Byrne and Whiten on Machiavellian Intelligence, referred to earlier, provided a new impetus to the study of ‘mind-reading’ behaviour, not only in non-human primates, but also in very young children and in autistic children. One way to link the beginnings of ‘mind-reading’ behaviour to its neural substrates was to follow the lead given by Baron-Cohen who argued that the direction of gaze can provide clues to what someone else is thinking because it indicates what they are attending to. In this sense, understanding gaze direction could provide the seeds for a theory of mind, consisting in part of ‘ideas about what someone else is thinking’. In a series of elegant experiments, Perrett, whose work was referred to earlier in the neuroscience section of this paper, discovered cells in the brains of monkeys which were selectively responsive to faces. He found different cell populations contributed to the coding of, for example, face identity, facial expression, and actions involving the face and body; in effect, particular cell populations seem to signal ‘social attention’. Subsequently, Perrett and his colleagues documented the neural mechanisms in the non-human primate which may underlie the evolution of social

understanding in the way envisaged, not only by Baron-Cohen^{48,49}, but also by Brothers⁵⁰ (1990). Perrett was able to map out the comparative neuroanatomy of primate social cognition, the neurophysiology of monkey social cognition and to link them both to neuropsychological models of autism. This work has important and natural links with the work of Rizzolatti⁵¹ and his colleagues who identified what were labelled, 'monkey see – monkey do'⁵² cells. These are cells in the pre-frontal cortex, which respond to the sight of a particular hand action, such as grasping or reaching, made by the experimenter. (The high profile neurologist V.S. Ramachandran⁵³ went so far as to say that 'I predict that mirror neurons will do for psychology what DNA did for biology'.) In humans, functional imaging techniques have begun to be used to examine the neural substrates of movement production, perception and imagery. Such recent studies indicate that witnessing real hand movements activate the human brain and the pre-frontal cortex in the left superior temporal sulcus: these are presumed to be homologous to those described earlier by Rizzolatti in the brain of the monkey. That it remains a complex issue waiting to be unravelled is evident from the facts (1) that it looks as if an important part of the neural substrate of such behaviour is the activity of 'mirror neurons', (2) that rhesus monkeys possess 'mirror neurons' but (3) that rhesus monkeys do *not* exhibit 'mind-reading' behaviour. Nevertheless, the activity of 'mirror neurons' has been demonstrated in humans and it is possible that the malfunctioning or absence of these may be linked with the presence of some forms of autism. This is not the place to go into further detail; the point is that mind-reading behaviour and its neural substrates is not a promising basis on which to attempt to establish a unique difference between humans and non-humans. Indeed, more importantly, if the early thinking of Perrett⁵⁴ and his colleagues turns out to be correct, we may be on the threshold of finding ways of investigating the neural substrates of that most distressing of conditions, autism, and looking even further ahead, to the use of stem cells to begin to combat the condition.

There is so much enthusiasm for this field, and there are so many exaggerated, untenable claims being made, that we are particularly indebted to leaders in the field such as Byrne, quoted earlier, and Frans de Waal, for their cau-

48 Baron-Cohen, S., Ring, H., Moriarty, J., Schmitz, B., Costa, D. and Ell, P. 'Recognition of mental state terms: clinical findings in children with autism, and a functional imaging study of normal adults', *Brit. J. Psychiatry* (1995) 165: 640-649.

49 Baron-Cohen, S., Leslie, A.M. and Frith, U., 'Does the autistic child have a "Theory of Mind"?' *Cognition* (1985) 21, 37-46.

50 Brothers, L. 'The social brain: a project for integrating primate behaviour and neurophysiology in a new domain', *Concepts of Neuroscience* (1990) 1: 27-51.

51 Rizzolatti, G., Fadiga, L., Gallese, V. and Fogassih. 'Premotor cortex and the recognition of motor actions', *Cognition, Brain Res.* (1996) 3, 131-141.

52 Carey, D.P. 'Monkey see, monkey do cells', *Current Biol.* (1996) 6, 1087-1088.

53 Ramachandran, V.S. 'The Third Culture', 1 June 2000. www.edge.org/3rd.

54 Emery, N.J. and Perrett, D.I. 'How can studies of the monkey brain help us understand 'theory of mind' and autism in humans?' In Baron-Cohen *et al* (ed) *Understanding Other Minds 2: Perspectives from Autism and Cognitive Neuroscience*, Oxford (2000).

tionary guidelines.

Frans de Waal in his book *Good Natured* (1996) cautions:

Even if animals other than ourselves act in ways tantamount to moral behaviour, their behaviour does not necessarily rest on deliberations of the kind we engage in. It is hard to believe that animals weigh their own interests against the rights of others, that they develop a view of the greater good of society or that they feel lifelong guilt about something they should not have done.

And he goes on, 'to communicate intentions and feelings is one thing; and to clarify what is right, and why, and what is wrong, and why, is quite something else. Animals are no moral philosophers'.

Of the moral sense he later writes, 'the fact that the human moral sense goes so far back in evolutionary history that other species show signs of it, plants morality firmly near to the centre of our much maligned nature', and he continues, 'human kind's uniqueness is embodied in a suite of features that include ethical behaviour and religious beliefs'.

Frans de Waal's views can be paralleled by those of Richard Byrne. Byrne (2000), commenting on the so-called evolutionary stable strategies, writes, 'these are not carefully thought out by beasts; and nor are any genes really self-ish or altruistic, they are no more than pieces of DNA molecules; nor is an understanding of kinship likely to be remotely similar to our own'. And he goes on, 'these are human applied labels based on the superficial appearance of the actions of individual animals whose behaviour is partially governed by genes'. He continues, 'natural selection is a mechanistic process and thus morally neutral; discovering a genetic influence on murder does not condone it' (this he writes with reference to the trend that has been noted for step-fathers⁵⁵, who move in to murder babies under three years old). 'Human social behaviour is influenced by our culture and our extensive information transmission by spoken and written language in ways not well described by biology'.

He further notes, 'Evolutionary psychology will benefit by broad interpretation... When confronted with a puzzling human trait, theorising its likely effect in the environment of Pleistocene hunter-gatherers, is sometimes useful', and, 'Important insights can be gained from comparing ourselves with other species and looking for the ancient origins of modern human behaviours'.

Despite the concern that some Christians may have about the apparent narrowing of the gap between ourselves and some non-human primates, I believe that there are no great issues at stake in this research. As the quotes above demonstrate, the scholarly and careful workers in the field are often dismayed by some of the media reporting of their findings. A Christian can be enthusi-

55 Daly, M. and Wilson, M.I. 'Violence against stepchildren', *American Psychological Society* (1996) 77-81.

astically open-minded about developments in evolutionary psychology without being gullible, ready to glimpse fresh pointers to the greatness of the Creator in the wonders of his creation. We may see this as another area of science where we may be able to exercise the stewardship to which we are called, by engaging in new research on such distressing mental conditions as autism and in this way showing care and compassion.

To summarise, from evolutionary psychology we may note:

1. That the study of animal behaviour and cognition has a long history within Psychology. In the past, the emphasis was on tracing out how the capacity of an animal to learn and perceive developed and changed as the animal's central nervous system increased in complexity. Identifying the similarities and differences between the nervous systems of animals and humans was an important scientific topic in its own right, and has within it no special stakes for a Christian^{56,57}.

2. There were, however, attempts from time to time, for scientific reasons, to look for differences between animals and humans which would uniquely set humans apart from non-humans. Frequent candidates in the past were language and symbolic processes. Some of the leaders in comparative psychology in the second half of the 20th century argued (without any religious axe to grind) that whilst animals could be taught sign language, the difference in their capacities when fully developed and those of, for example, a very young child, were so great that it was meaningful to describe such differences as qualitative rather than quantitative.

3. That a sophisticated aspect of human cognition, called 'mind-reading', could also be observed in some non-human primates. I suggested that there are no theological stakes here, only some very interesting science.

4. Relevance to some Christian beliefs

a) Souliness – human and animal

Talk about souls is widespread in the Christian tradition. Our hymns and liturgy are full of it. It is a natural way of talking about what we regard as distinctive about ourselves as human beings, especially when we think about our continuing after physical death. It is 'natural' to appeal to our possession of a soul as 'proof' that we are not mere animals. The belief that a human being possesses a soul has been part of the foundation of our dignity and of the sacredness of human life. Often the focus of how we think about the divine image in

56 Jeeves, M.A. 'The Status of Humanity in Relation to the Animal Kingdom'. Chapter 7 in Brummer, V. (ed) *Interpreting the Universe as Creation* Pharos (1991) pp. 113-122.

57 Thorpe, W.H. *Biology, Psychology and Belief*, London: Cambridge University Press (1961).

humans has been the possession of a soul. It is not surprising, therefore, that anything that seems to question one of our most treasured beliefs faces strong challenges and is, quite properly, put under close scrutiny. That is what happened in the past when other widely accepted beliefs were confronted with challenges from science. We all remember the strong and sustained reaction to the views of Copernicus and Galileo which displaced our earth from the centre of the universe. How much more of a reaction, then, may be expected to anyone seeming to question our possession of a soul as a hallmark of our being made in the image of God.

Theologians and biblical scholars remind us that when we talk of souls we are talking about whole persons: body, mind and spirit. One might say 'we are souls, we don't have souls'. Such a view contrasts sharply with views of soul and body in, for example, Socrates' discourse on death. He wrote 'Does not death mean that the body comes to exist by itself, separated from the soul, and that the soul exists by herself, separated from the body? What is death but that?' (Socrates, Plato's *Phaedo*, fourth century BC). In the end, Plato records that Socrates lived out his own teaching by drinking the poison hemlock in the serene conviction that his immortal soul would now find release from its bodily prison. For Socrates and Plato, bodily death was a welcome liberation. Indeed, it was actually not dying.

In the centuries after Christ, theologians combined this Greek doctrine of the immortal soul with biblical images of human nature. When Origen, a third-century Platonic philosopher, became the father of theology, he built into Christian doctrine Plato's idea of the soul. In the early fifth century, Augustine thought Plato to be the most bright in all of philosophy. And in the sixteenth century, John Calvin, who was heavily influenced by both Plato and Augustine, declared that Plato alone 'rightly affirmed' the immortal soul that 'lies hidden in man separate from body'.

Confronted with Galileo's challenges, our forbears went back to look again at those passages of scripture which, at the time, to them were the natural and irrefutable proof that the earth could not, as the astronomers were saying, be rotating on its own axis in space. The hard-learned lesson was that it is possible to take seriously what Scripture says but to be mistaken in interpreting it. However, we should perhaps remember Kidner's⁵⁸ comment that 'the telescope of Galileo did more to interpret Ps. 96 v.10...than the pen of the theologian' and ask whether it may today be the case that the discoveries of the neuropsychologists and evolutionary psychologists may do more to interpret Biblical references to the soul than the comments of the philosophical theologians. The Bible never presents the material and the spiritual as opposites, as Descartes did, in contrasting the immaterial with the material, but rather it stresses that the spiritual aspect of our person is our relation to God and all that God has created, both human and non-human. Francis Crick may well be right in claiming

58 Kidner, *D. Genesis – Tyndale Old Testament Commentaries*. Leicester: I.V.P. (1967) p.31.

that the idea of a disembodied soul is a belief held by billions of human beings alive today. But is it a relic of our philosophical and religious past rather than a proper exegesis of Scripture?

Neuropsychology stresses the unity of the human person, evolutionary psychology points to the emergence of aspects of souliness in the non-human primates. If we are to take seriously the views of biblical scholars over the past hundred years, neither arguing for an immortal soul, nor denying souliness to animals should be on our agenda. This is not to pretend that there is not an important and continuing debate on this matter amongst those who take scripture equally seriously. The views, for example, of Cooper⁵⁹ in his book *Body Soul and Life Ever Lasting*, and Moreland and Ray⁶⁰ in *Body and Soul*, make it clear that there are alternative interpretations of the biblical data. There are certainly no knock-down arguments here. The need for care when interpreting Scripture is underlined by New Testament scholars such as N.T. Wright⁶¹, who, writing about talk about death and the Christian hope, says:

The language of soul is telling us a story; the trouble with shorthand is that they can become absolutised. The story is of a person as a person living with God and towards God, 'departing and being with Christ'. I prefer not to go beyond where scripture takes us on such things; Paul does not speculate as to what more precisely happens when one has thus departed. In II Corinthians 5, verses 1-5 he is stressing that the eventual goal is a totally renewed body, not a disembodied spirit. It is natural for us to use the language of separation of body and soul, in order that we then have a word available to talk about the person who is still alive in the presence of God while the body is obviously decomposing. But we should not think of 'the soul' as 'a part' of the person that was always, so to speak, waiting to be separated off like the curds from the whey.

John Cooper⁶² sees things differently, writing, 'against the objection that scripture is monistic, our study has demonstrated that the Biblical view of human nature is both holistic ... and dualistic – asserting that persons are held in existence without fleshly bodies until the resurrection'.

Another New Testament scholar, Joel Green⁶³, disagrees; for him, '...the dominant view of the human person in the New Testament is that of ontological monism, with such notions as 'escape from the body' or 'disembodied soul' falling outside the parameters of New Testament thought'. Green's views are paralleled by those of Old Testament scholars such as Rex Mason⁶⁴, who has

59 Cooper, J.W. *Body, Soul and Life Everlasting*, Eerdmans (1989).

60 Moreland, J.P. and Ray, S.B. *Body and Soul*, I.V.P. (2000).

61 Wright, N.T. 'New Heavens, New Earth' In Colwell, J. (ed) *Called to One Hope*, Paternoster (2000), pp. 31-51.

62 Cooper, J.W., *op.cit.*, (58)

63 Green, J. 'Scripture and the Human Person: Further Reflections', *Science and Christian Belief* (1999) 11(1) 51-64. See also Green, J. 'Eschatology and the Nature of Humans', present volume.

64 Mason, R. 'Life before and after death in the Old Testament' In Colwell, J. (ed) *op.cit.*, pp. 67-82.

written, 'the Hebrews thought of human beings as what we might call a psychic whole, or even a psychosomatic whole. They did not have the Greek dualistic concept of a human life consisting of a distinct entity, the soul, imprisoned in a physical body. We should speak either of an animated body or even of an animated spirit and be fairly close to the way they understood human life'.

b) *The image of God*

Concerning the search for ways uniquely to distinguish humans from animals, we should re-examine a commonly held biblical interpretation of Genesis chapter 2, verse 7, which reads, 'and the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life and man became a living soul.' This has been read as implying that man was made in the image of God by being given an immortal soul in contradistinction to the animals. I would suggest that this is better read as a further comment on Genesis chapter 1, verses 1-27. A little thought indicates that the word translated 'soul' in Genesis chapter 2, verse 7, has already appeared in Genesis chapter 1, verses 20, 21, 24 and 30, and in every case in reference to animals. Thus both man and animals are souls. They are living beings as distinct from inanimate objects, which have no life. This point is underlined when we remember that there are a further 19 passages in the Old Testament, and one in the New Testament, where the word translated 'soul', or its Greek equivalent, appears in connection with animals.

If the possession of the soul is not the distinguishing mark which separates human beings from the rest of creation, then what is? The account in Genesis chapter 1 makes the point that, unlike other members of creation, whether animate or inanimate, humanity is created by God 'in his own image'. A crucial point here is that this does not define humanity in terms of its make-up, but in terms of relationship, identifying human beings as God's partners. In creating humanity, God made people with whom he could interact and with whom God could share his own life. The important spiritual aspect of our nature comes out in our relations. Our spirituality concerns our relation to the natural world (the clues given early on in Scripture of our calling to name the animals and to take responsibility for the care of the earth in Genesis 2), to other people and to our natural environment. The language of divine image plays little role in the rest of the Old Testament. One aspect, however, which is of importance is the quality of care that the human family is called upon to exercise with regards to the creation, acting as God's representative, and in this sense humans are called to model the personal character of God. If the 'image of God' plays little role in the Old Testament it is, according to Green, mentioned in Jewish literature from the Second Temple period, including the letters of Paul. Green suggests that the apostle's thought is closest to the interpretation of the divine image expressed in the Wisdom of Solomon. Paul's special contribution is to develop the idea of Christ as the 'image of God', and the corollary to that is the conforming of human beings to the image of Christ. It is thus, in Christ, that

Christians have access to the ultimate purpose of God for humanity set forth in the creation of human life. Green concludes that in the apostle Paul's anthropology, the image of God functions as a concept that points to the transformation of believers in resurrection. Thus both the affirmation of human beings as bearing the divine image, given in Genesis, and the interpretation of the *Imago Dei* tradition at the hands of Paul, point unquestionably to the uniqueness of humanity in comparison to all other creatures. Neither, however, locate this distinctiveness in the human possession of the soul, but in the human vocation, given and enabled by God, to relate to God as God's partner in covenant, to join in companionship with the human family, and in relation to the whole cosmos in ways that reflect the covenant love of God. Humanness, says Green,⁶⁵ in this sense, is realised in and modelled by Jesus Christ.

A timely reminder of this aspect of the image of God in humankind is given in Messer's⁶⁶ recent paper in this Journal. He writes, 'while many Christian accounts of the *Imago Dei*, have stressed rationality, self-awareness and so on in similar terms to Locke, some recent writing has emphasised communion or relationship as central to the image of God.' He cites the writings of the orthodox theologian John Zizioulas, who has argued that 'human personhood 'in the image of God' is fulfilled by membership of the Church, which is entered by baptism and whose life is constituted by the Eucharist'. Messer points out that a similar theological anthropology has been developed by Alistair McFadyen in the Western Protestant tradition, quoting McFadyen as writing, '(persons) are somehow the product of their relations'. McFadyen makes the further helpful point that seeing the capacity of relatedness as a key feature to the image of God can be further viewed in its 'vertical' dimensions and its 'horizontal' dimensions. The former refers to divine-human relationships and the latter to the dimension of our relationships with one another.

c) Immortality or Resurrection

If, as I have argued above, our human distinctiveness is not established by the fact that we are immortal or that we possess an immortal soul, then what of the widespread belief in the immortality of the soul? The immortality of the soul is absent from the great creeds of the Christian church, for example, the Apostle's creed and the Nicene creed. They speak of the resurrection of the dead and the life of the world to come. The emphasis is on resurrection, not on immortality. The Bible makes no claim that the Christian's hope for the future is bound up with any idea of possessing a natural, immortal soul; on the contrary, its firm assertion is that our hope is fully embedded in the resurrection. The final resurrection will be a divine, creative act, just as much as our original coming into existence was also due to God's gracious creative act.

65 See Ref. 63.

66 Messer, N.G. 'Human Genetics and the image of the Triune God', *Science and Christian Belief* (2001) 13(2), 99-112.

I Corinthians 15, v. 44, indicates a clear discontinuity between our 'natural' and 'spiritual' bodies.

Thus the Hebrew Christian view of human beings is a message about our calling, our nature and our destiny. We are called to worship and honour our creator, to exercise a stewardship over the creation as an obedient child to a father, and to enjoy fellowship with our Father Creator while standing in awe of him as creature to Creator. We are thus encouraged to recognise the many-sidedness of our mysterious nature. We are called upon to hold in a delicate balance three key aspects of our nature, highlighted by Old and New Testament writers alike: our physical make-up; our capacity for mental life; and our ability to make moral decisions, including an appreciation of the importance of a spiritual dimension to life.

5. Implications for Christian living

Any ideas we have about the nature of persons ultimately affect the way we treat ourselves and one another. What we understand about human nature impacts on our ethics. Are there any consequences of the views I am putting forward which might start us on a slippery slope of ethical or moral decline? In the past, dualist views have certainly sustained a sense of caution about what can appropriately be done to besouled bodies of other individuals. If an immortal soul is present, does not this force one to continue to honour and love the seriously mentally defective or demented? The medical ethicist Stephen Post, whilst recognizing that in the past dualism has played a protective role within ethical systems, suggests that the fundamental biblical motive for the care of those who have little ability to reciprocate, is not to be found in a dualist consideration of the soul of the other person. Rather, he argues, it emerges from the ethos of bestowed love and from the narratives of Jesus amongst the most vulnerable. Thus a narrative of love and consideration to helpless, dying or deficient persons is sufficient motive, and perhaps a more purely biblical motive, than the consideration of a separate substantial soul. There are, in addition, three more specific implications of the holistic view that we have set out above.

a) Embodied spirituality

By emphasising the unity of the human person, we are, by implication, suggesting that the spiritual dimension to a person's life is no more immune to changes in the brain than other aspects of mental life. Such a suggestion, at times, seems to surprise and trouble some Christian people. I do not believe that it should. Let me illustrate why I think this is the case. There are a number of well-documented cases of what happens to devout Christians when they develop Alzheimer's disease. The psychologist professor Glenn Weaver⁶⁷ docu-

67 Weaver, G. 'Senile Dementia and Resurrection Theology', *Theology Today*, pp. 44-56.

ments the spiritual pilgrimage of a devout Christian lady who, after a life of regular attendance at church services, where she was well known as a gentle Christian with a deep concern for her fellow Christians, began to develop the tell-tale symptoms of increasing forgetfulness. She struggled with the problem in the way that many people do, but she was fighting a losing battle. She found that she could no longer remember the names of those she wanted to pray for, and her letters became verbose and lost much of their content. This in turn made her increasingly anxious; and her anxiety led onto depression, and the classic textbook description of developing Alzheimer's disease became evident. Glenn Weaver, however, points out that in her case there was much more to her experience than the usual textbook account. She was deeply troubled about her relationship with God. She felt she was personally responsible for falling away from her former close walk with God, and that she was deserting her friends through her friendship and prayers. She concluded that because of her lack of faith, God was setting her aside because she was no longer fit for his service. As she continued, she became more confused and began to lose control of her natural processes and away from the security provided by her home and husband. She would wander about, violating the commands of her nurses and then describing bizarre sexual disturbances in an explicit way. She came to believe she had committed sins that provoked God's wrath and the continued deterioration of her condition and the fact that the doctors could not help her, confirmed her in her beliefs. Eventually she lost all interest in her daily devotions and prayer. The main point here is quite simple: with neural changes there are psychological consequences and these in turn affect spiritual awareness. Such is the unity of the human person.

b) Mystical experiences and 'neurotheology'

The second implication is well exemplified by attempts to explore the association of some forms of religiosity and the occurrence of mystical experiences with their possible neural substrates, an attempt which has continued from time to time over the last thirty years. Many who write on the topic begin with the apostle Paul's Damascus Road experience and then quickly move on to talk about the religiosity of the typical epileptic patient, something which has been recognised since at least 1838 by Esquirol. The debate will continue as more evidence becomes available. However, as one recent study reported, 'the data indicates that hyper-religiosity is not a consistent interictal trait of individuals with temporal lobe epilepsy. Further, although hyper-religiosity and temporal lobe epilepsy may co-occur in a few individuals, it does not appear to be a direct causal relationship between repeated seizure discharge in the temporal lobes and hyper-religiosity.' Despite this, attempts to link religious experience generally, and religious awareness in particular, with selective brain activity, continue.

In recent years, what were occasional comments on the co-occurrence of brain pathology, such as temporal lobe epilepsy, with visions and hallucina-

tions, have developed into more sustained attempts to link the brain with religious experiences, leading to a search for the 'god module'. The book *Where God lives in the Human Brain* by Carol Allbright and the late James Ashbrook⁶⁸ is one example, another is the book by Andrew Newberg and the late Eugene d'Aquili⁶⁹ *Why God Won't Go Away: Brain Science and the Biology of Belief*. Typical of the studies that the latter reports, are those mapping brain activity in Tibetan Buddhists and Franciscan nuns whilst they were meditating. For example, they report that during peak feelings of transcendence there was selectively reduced activity in the posterior superior parietal lobe on the left side of the brain. They interpret this as a marked decrease in spatial perception, which occurs as the sense of spiritual communion rises, often accompanied by mystical experiences. This is certainly an interesting observation, but they wish to go further. Whilst acknowledging that the experiences are 'not outside of the range of normal brain function', they wish to argue that 'in other words, mystical experience is biologically, observably and scientifically real'. Later they wish to claim that 'if we do trust our perceptions of the physical world, we have no rational reason to declare that spiritual experience is a fiction that is 'only' in the mind.' This rather unsubtle mixing of the methods and language of science and religion amounts to a veiled attempt to confer the popularly perceived authority of science upon that of religion. They even suggest that the left posterior superior parietal lobe is one neural pathway through which 'God gets into your head'. But, as we saw earlier, everything that happens 'in the mind' has its brain correlates. It is all 'real' if by real we mean observable changes in the flux of electrons along neurons and the flow of neurotransmitters at synapses. You can observe similar changes in brain activity when a person takes a hallucinogen such as peyote, long used by some Native Americans in their religious rites. If you stick strictly to what is happening in the head, the use of words such as 'real' and 'illusory' become meaningless. And, in any case, why elevate one unusual religious experience and try to give it pride of place. God may be encountered equally through reason as through ecstasy, as much through morning prayer in the Anglican tradition as through clapping and dancing in the Pentecostal tradition.

Making inferences from brain states could become a risky business. Consider, for example, the likely state of the brain of Sir Henry Wotton, poet, diplomat and, according to Isaak Walton, 'the compleat angler', when he was fishing. Wotton described fishing as 'a rest to his mind, a cheerer of his spirits, a diverter of sadness, a calmer of unquiet thoughts, a moderator of passions, a procurer of contentedness ...'. Such a description might suggest a brain state similar to some forms of religious meditation. However, it would be hazardous to suggest that because Sir Henry Wotton's selective brain activity resulted from his focus on fish, therefore it proved the existence of fish. Yet that appears

68 Albright, C.R. and Ashbrook, J.B. *Where God Lives in the Human Brain*, Pilgrim (1999).

69 Newberg, A. and d'Aquili, E. *Why God Won't Go Away: Brain Science and the Biology of Belief*, Ballantine (2000).

to be the logic of some of the claims by Newberg and d'Aquili, and by Allbright and Ashbrook.

'Why' asks the Jewish physician Jerome Groopman⁷⁰, 'do we have this strained attempt, clothed in the rubric 'neurotheology', to objectify faith with the bells and whistles of technology?' And he goes on, 'Man is a proper subject for study in the world of science. God is not'. Whilst acknowledging the possibility that we are intrinsically wired for spirituality cannot be dismissed, Groopman wisely notes that 'as has been the case with all past attempts to 'prove' the presence or intent of God, SPECT (brain) scans and cerebral anatomy fall far short of doing so'. And he concludes, 'indeed to believe that science is a way to decipher the divine, that technology can capture 'God's photograph', is to deify man's handiwork. And that, both religious mystics and scholars agree, is the essence of idolatry'.

c) 'Treasure in Earthen Vessels'

Third, I suggest that a return to a more holistic view of the human person, prompted in part by recent developments in neuroscience, has helpful implications for understanding the spiritual distresses that are well documented in the experiences of Christian leaders and from which we all, from time to time, suffer. It means that the spiritual dimension to our personality is not immune to the changes in our biological and neural substrates. I have already given you one example of this in the specific instance of Alzheimer's disease. The psychiatrist Gaius Davies⁷¹ has documented how some of the outstanding men and women of God, whom all acknowledge have been greatly used by him, are also often found on close study to be those who have endured significant swings in the immediacy of their felt awareness of the presence and power of God. Davies shows how in the case of some of these people it is possible for us, with the benefit of hindsight, and informed by the advances in psychiatry at the end of the 20th century, to be fairly sure that some of their experiences were pathological in the sense that today we would classify them in accepted categories of psychological illness. Some were obsessive compulsive, some were manic depressive, some struggled with specific phobias, and so on. Among those studied by Gaius Davies were John Bunyan, Amy Carmichael, William Cowper, C.S. Lewis, Martin Luther, Gerard Manley Hopkins, J. B. Phillips and Lord Shaftesbury. The relevance of his studies to us today is that there are those amongst them whose illness probably had a significant biological and biochemical etiology, and these would include Luther, Cowper, Shaftesbury and Phillips. Luther was probably an obsessive compulsive/depressive; Cowper suffered six serious depressive breakdowns and made several suicide attempts; Shaftesbury was

⁷⁰ Groopman, J. 'God on the Brain', *The New Yorker*, Sept. 17, 2001, 165-168.

⁷¹ Davies, G. *Genius and Grace: Sketches from a Psychiatrist's Notebook*, Hodder and Stoughton (1992).

probably a manic/depressive suffering from a bi-polar affective disorder. Phillips was probably an obsessive-compulsive and this very trait may have contributed to the detailed accuracy of his modern translations of the Scriptures. Despite all these things they triumphed to our lasting benefit. We do indeed 'have this treasure in earthen vessels'.

6. Conclusions

My Christian beliefs convince me that humankind is part of nature. The various biblical injunctions to care for the creation and to seek to study and understand it and to be a good steward of it applies as much to humankind as to any other part of creation.

More specifically this means that there is something intrinsically interesting about what comes from our efforts, as psychologists, to understand human nature. The findings of psychologists who study the psychological origins of the religious quest, the functions of religious beliefs and practices, are not only interesting in their own right, but can present us with challenges and insights we should critically evaluate and take seriously. Historically, reactions to the pronouncements of psychologists have varied widely. They range from a knee-jerk reaction of hostility, a denial of what is being said, to, on the part of some, an uncritical over-enthusiastic welcome verging on the gullible, for example, the current search for the so-called 'god-module'. For a scientist who is a Christian, none of these reactions is appropriate.

At the turn of the last century, a distinguished Professor of Theology in Cambridge, Professor Sanday⁷², posed the question of whether, what was then understood in psychology, could have anything to contribute to a specific theological issue preoccupying him at that time, namely, the theological understanding of the two natures in the one person of Jesus Christ.

His general approach to the relation of psychology and theology is worth remembering. He suggested that the views of psychologists were destined to be of importance and value in the future of theology and, specifically, he wrote concerning anything that was asserted by psychologists that, 'it ought, however, to be worked out on the ground of psychology first by the disinterested methods of psychological science and then on the foundations thus laid the theologian may build'. Sadly, all too often, the comments that are made are not based on 'the disinterested methods of psychological science', but rather on some preliminary speculation with little evidence to support it. What psychologists choose to study at any particular time naturally reflects the currently dominant emphasis in psychological research. As I have indicated, it may be social and personality psychology, behaviourist psychology, psychophysiology or, as more recently, cognitive psychology, neuropsychology and evolutionary

72 Sanday, W. *Christologies Ancient and Modern*, Oxford: Clarendon Press (1910).

psychology. I also indicated that there are occasions when aspects of psychological research may remind us of things we knew but had forgotten. I gave the example of action and faith in the Christian life. At other times, the researches of psychologists may call for a re-examination of some long and widely held traditional Christian beliefs. The specific example I gave was the understanding of the nature of the human person in the light of developments in neuropsychology and evolutionary psychology.

I have also suggested that we have to keep clearly in mind the status of the statements made by psychologists about religious beliefs and behaviour. Fifty years ago, Sir Frederic Bartlett,⁷³ at that time Professor of Psychology in Cambridge, wrote, '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. Should he appear to succeed in doing these things he is tempted to suppose this confers upon him some special right to pronounce upon the further and deeper issues of truth and value'. In this regard, however, Bartlett goes on, '... 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'. This applies to the psychological scientist and neuroscientist as we try to take seriously what we learn from our faith as well as from our science. I believe there is no excuse for compartmentalism even though to avoid this may at times require long, hard thinking and serious reappraisal of some of our traditional Christian beliefs. We should remember the late Donald Mackay's advice in such circumstances, to keep our minds open and our mouths closed. And we must be ready to discover that, on occasions, there are no easy answers and we must continue to wrestle with the issue and await further evidence.

In the meantime, however, as the lives of Christians down the years have shown, we have been given more than enough to inspire, guide and live in a manner which befits those who, recognising that this is their Father's world, seek in his strength and with his companionship to be 'workmen who do not need to be ashamed'. No arrogant triumphalism here, rather treading humbly where the Master leads.

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73 Bartlett, F.C. *Religion as Experience, Belief, Action*, Oxford: Oxford University Press (1950).