

THE DIALOGUE BETWEEN NEUROSCIENCE AND THEOLOGY

Dr. Alan J. Gijsbers

Specialist Physician, Turning Point Drug and Alcohol Centre, Epworth and St Vincent's Hospitals, The Melbourne Clinic, Richmond, Victoria, South Australia

The mind and its relation to the brain, is regarded by some as the next major frontier in science. This raises a number of issues about the traditional understanding of human beings and some specific challenges to Christian thinking.

The first challenge asks how a neurobiological mechanism or organism can express meaningful higher functions. We might regard the brain as a mechanism if we embraced a nineteenth century mechanical view of the world, or as an organism if we have a twentieth century organismic view of the world and its inhabitants. To rephrase the question, how can a system of neurons and networks provide for features like the freedom to reason and to decide? If our reasoning is simply a product of a deterministic neuronal state how does it conform to the rules of logic and consistency? If our decision-making is simply the product of our neuronal state how can we be held morally responsible for what we do? What motivates human beings? How do we develop consciousness, and with consciousness a sense of our own selves? All these features are traditionally regarded as issues arising out of our minds. There are other aspects of the mind, including our capacity to wonder at all that we see and understand. We are also passionate human beings affected strongly by our emotions. What role do they play? Where do they come from and where do they fit into our mental expressions?

Each neuroscientist or philosopher identifies certain key elements in their view of the mind. Searle¹ talks a lot about intentionality, in the German sense of “aboutness.” That is, our thinking is not just ideas in our heads, but also ideas about something: ideas that may be true (i.e., resonate with reality) or imaginary. Intentionality is wider than just intending to do something. Others, like Chalmers,² talk about qualia - that inner sensation that makes greenness green and music pleasing. Somewhat different from intentionality, one can see a similar subjectivity is trying to be expressed. How does intentionality and how do qualia arise?

From within neuroscience the question can be rephrased as, what freedom is there within a “deterministic” system? What is the role of top-down causation (mind affecting the brain) in the face of seeming bottom-up determinism (brain limiting the mind)? What is the relationship between the various levels in the neuronal hierarchy?

The second issue arising out of neuroscience is, what is human? In particular what is the soul? The soul has been traditionally regarded as the essence of a human being, and it has often been given non-material status. How do we understand persons now? In particular there has been a lot of recent work the development of our sense of self-identity, our inner world expressed not just in isolation but also in relationships and in community. Is the soul a ghost in the brain machine? Who am I?

Arising out of this is the third issue, the metaphysical issue. To put it at its most challenging, there are calls by some on the basis of neuroscience to abandon outmoded metaphysics such as an immaterial soul and a spiritual world³. Do we need to follow this call, and if we do, how then do we reinterpret spirituality and the spiritual world? Or do we see that some of them have an atheistic agenda, and do we need to challenge their so called science and recognize that they are using their science to develop a materialistic metaphysic which is beyond science and into the realm of philosophy and theology?

The fourth, related issue is how do we evaluate and challenge the new metaphysics? What tools do we use? This is the epistemological issue. Epistemology is the question of how do you know you know. Do we only use the “scientific method”? If so which scientific method (if there is one!)?⁴

From within science, it is appropriate to ask which tools to use in neuroscience. Is measurement and experiment all there is? How do you objectively measure subjective phenomena? Should Freud be sidelined for his lack of scientific rigor, or does his insight into the irrationality of the mind still have validity? Is neuroscience autonomous? And if we move beyond science, what tools do we use?

As Christians, we regard the Bible as authoritative. But how do we understand the Bible in the light of the findings of neuroscience? Are we bound to the Bible's metaphysics? And once we have interpreted the Bible, how do its insights impact on our view of humans? How do the "two books," the book of Scripture and the book of nature,⁵ dialogue with each other?

Epistemology is not easy. There was a very useful discussion in the COSAC 2003 workshop on the *Mind* on epistemological blindness. The story of the man born blind (John 9) illustrates the willful blindness of the Pharisees towards the man's healing and the hardening of their hearts towards Jesus. Insight is not just a question of perception, it is also about being willing to humble yourself to see.

The fifth issue is the immortality issue. How can the person - the results of neurobiological evolution and development - live beyond physical death? Because it is difficult to think beyond a physicalist framework, some Christians have called for the rediscovery of the doctrine of the resurrection of the body in place of the discredited and unsustainable doctrine of the immortality of the soul, but this has its own problems.

The sixth issue is the ethical issue. There is a body of opinion from the American conservative right⁶ who would claim that a defective view of humans (i.e., a rejection of their form of anthropological dualism) leads to a defective ethic dealing with humans in the human genome project, abortion, euthanasia and stem cell research.

The final issue is the issue of artificial and animal intelligence. If intelligence is a purely physical and biological system then cyber and animal intelligence could well be similar to human intelligence. This was discussed at a recent Australian Theological Forum (ATF) in Adelaide.⁷

Humans as Multi-level Beings

Engel's paper⁸ on the biopsychosocial model of understanding humans has been very influential in moving the medical profession beyond a simple biomechanical approach to patients. Engel describes a series of emergent systems from sub-atomic particles, to atoms, molecules, organelles, cells, tissues, organs/organ systems through the nervous system to the person. The model goes beyond the individual to identify two-person systems,⁹ families, communities, cultures and sub-cultures to society and nation to the biosphere. Engel uses the concept of emergence, whereby, as we move to the next level, new properties emerge which could not be predicted from understanding the state of the lower level. A useful slogan for emergence is, "We cannot experience wetness by looking at the isolated H₂O molecule," because surface tension comes about by the interaction of many water molecules together.

Engel uses systems analysis to describe the events surrounding the death of a Mr. Glover from a heart attack. When his coronary was occluded, Mr. Glover's heart muscle started to die, the heart started to pump poorly, and he started to experience pain. However because Mr. Glover was a conscientious person, he kept on working. It was only when his kindly boss commented that he looked pale and sweaty, that Mr Glover felt he had permission go to the hospital to check out his chest pain. While there, an inexperienced intern tried to insert an intravenous line. The procedure was so stressful that the surge of Mr Glover's adrenaline tipped the heart into ventricular fibrillation from which Mr Glover could not be rescued.

Here we not only have the coronary occlusion leading to chest pain as an example of bottom-up causation, but also interventions, a kindly one from his boss, and an unintentional malevolent one

from the intern, as examples of top-down causation having significant impact on the clinical outcome.

Arthur Peacocke, using the model by Bechtel and Abrahamsen, develops a similar hierarchy, but from the perspective of a taxonomy of the scientific disciplines.¹⁰ He does so within the context of understanding human beings. He has four levels, the physical world, the world of organisms, the world of the behaviour of living organisms and human culture. Each discipline finds its role, and its own methodology within the hierarchy. There are continuities and discontinuities between the levels

Neuroscientific Approach

The neuroscientific approach describes a more specifically neurological hierarchy.¹¹ This starts with synapses, has neurons at the next level, followed by networks, maps, and systems. Neuroscientists stop at this point although sociopsychologists would argue that the person exists only within a social network. Once again we are back to social constructs.

The basic building block in neurology is the synapse. At the nerve ending, electrical impulses are converted into packets of chemical neurotransmitter molecules which are released at the nerve terminal, cross the synaptic cleft and attach to receptors on the target nerve (or muscle) cell, where their effect may be re-translated into an electrical impulse. A recipient nerve cell has many nerve endings targeting it. These nerve endings contain neurotransmitters with different chemical structures. These can modulate the response of the receptors, or the response of the cell to receptor activation. Most drugs acting on the central nervous system are believed to work on altering receptor responses to neurotransmitters. There are hundreds of nerve synapses abutting dendrites and nerve cells, modulating the impact of nerve impulses. These networks are arranged into maps and systems.

Specific neurological functions are understood to occur at specific locations. This is confirmed by studying patients who have specific neurological deficits who are found, initially at autopsy and now with brain scanning, to have defects in defined regions in the brain. Similar studies can be done on animals, where lesions can be made in the animal's brains and the clinical defect identified. It seems a strange way to work out how a brain functions. Can you imagine working out how your computer functions by making specific lesions in parts of the machine? But that is how neurology has progressed. As a result we have maps of the brain showing where different functions are located. We have the coordination area in the cerebellum, vision in the occipital cortex, sensation in the parietal cortex, movement in the motor area and so on. The centres involved in addiction are located in the sub-thalamic region, the nucleus accumbens and the central tegmental nucleus.

Dynamic scanning has highlighted how the brain responds to addictive agents. Different regions respond differently depending on whether the person is naïve or habituated to the drug ingested. The reward areas in humans are in similar locations to the reward areas identified in rats. As a result a model of addiction has been developed consisting of control, reward, drive and memory locations. Addictive drugs are postulated to enhance the reward and drive circuits in the hypothalamus and to decrease the connections to the control centre in the frontal area.

However drug action and neurotransmitters are only part of the story. The WHO biopsychosocial model of addiction¹² uses a learning model to identify distal and proximal social and individual factors which enhance or inhibit a person's continued use of drugs. This is a very practical example of the application of the biopsychosocial model with contributions at many different levels in the hierarchies we described earlier, with Engel's schema.

The Tightening Link within the Hierarchy

What we are starting to recognize is the tightening link within the neurological hierarchy. A number of neurological conditions illustrate this. I will pick three from many. Alzheimer's disease describes a slow degeneration of memory and mental function with age. As neurons die, the person becomes less and less capable of remembering and functioning. It is almost as if aspects of the person are lost.

The second example is depression. This is a complex set of symptoms which can be caused by a number of different agents, but most simply, anyone given certain drugs will feel depressed, and people with depression from a number of different causes can feel better with anti-depressants. Here then simple pharmacological agents can profoundly alter a person's mood states.

Finally there is the example of Phineas Gage.¹³ Phineas was a hardworking foreman who injured his brain when a three-foot tamping bar exploded back pushing the bar through the left cheek and up through the top of Phineas's head. Although he did not lose consciousness, his personality changed. Whereas before he was described as conscientious, shrewd and able, after the accident he became unreliable and uncontrollable. He was no longer the Phineas he was before.

Here then are three examples where the mind has been affected by both temporary and permanent alterations in the brain.

What is the Relation between the Hierarchies?

We have already encountered two models, the model of emergence and the model of top-down as well as bottom-up causation. Just as we cannot infer wetness from isolated water molecules, neither can we infer consciousness from studying synaptic activity. Consciousness emerges from an intact functioning brain. Some neurophilosophers find the term supervenience helpful.¹⁴ Supervenience was a term first used in relation to St Francis. It postulates that a person of the same characteristics as St Francis would be regarded as having the supervenient quality of goodness. Nancey Murphy highlights that it all depends on the context. Thus a single person behaving like St Francis in giving all his money to the poor might be regarded as good, but a married person with children might not be regarded as good. Another example of supervenience is the five-dollar value of a five-dollar note.

Supervenience has been subject to a lot of high-powered technical discussion,¹⁵ not all of which is very helpful in sorting out the relation between various layers of the hierarchy in humans. I have had one philosopher telling me to abandon the concept of emergence because it is ambiguous, and another telling me to abandon supervenience because the concept is unclear! Those of us in clinical practice tend not to use either term, but move between the layers in an ad hoc pragmatic way.

I find the dimension of meaning helpful. Let me illustrate with a story from my own practice. I look after a private drug and alcohol practice in which patients pay bills and where I do the banking. One day I walked into the bank and said to the teller, "I am giving you these pieces of paper with scribble on them." He looked at me puzzled because to him these pieces of paper were cheques that represent money. (Was that a supervenient property?). But to me there was an extra layer of meaning, for the cheques represented patients who had recovered sufficiently to have their lives in order and to be able to pay their accounts. There was then a certain sense of satisfaction in that. But further as a Christian, these cheques represented the provision of God who had given us sufficient for my family and me to be able to live. Now we no longer give cheques to tellers. So depositing paper into an automatic teller machine is the nearest equivalent I have to a harvest thanksgiving!

Might this be a way forward in understanding spirituality? That the spiritual person sees the same event, but sees the deeper meaning of those events? That a tree is not just a tree but also the creation of our Heavenly Father? That the execution of a good man in the first century is not just another victim of injustice, but the very Son of God who died to save humankind?

Kandell's Principles

Eric Kandell, a Nobel prize-winning psychiatrist turned neuroscientist, has developed the following principles¹⁶ to bridge the relation between mind functions, like learning, to their structural correlates:

1. All mental processes derive from operations of the brain
2. Genes determine neuronal functioning
3. Social and developmental factors contribute importantly to the variance in mental illness. These factors express themselves in altered gene expression. Nurture is ultimately expressed as nature.
4. Altered gene expression induced by learning gives rise to changed patterns of neuronal connections, which give rise to different forms of thinking and behaviour.
5. Psychotherapy produces changes in long-term behaviour by learning which produces changes in gene expression, and hence changes in neuronal interconnection.

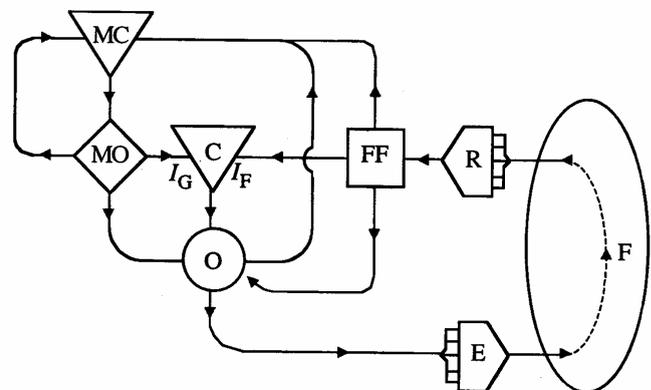
This is an impressive model – thought affects gene expression – but the model is rather foundationalistic, it sees neuronal causation affecting only the lowest layer. Why is gene expression the only way in which mental function affects brain function?

In the next year Kandell described some data to show how this is expressed in humans.¹⁷ If we measure the degree of cortical representation of the motor area of the little finger of the left hand we find that violin players have a larger representation than non-violin players. However violin players who started playing at the age of five have an even larger representation than those who started playing from the age of fifteen onwards. This illustrates that higher functions like practicing violin playing alter neurostructures like cortical representation. It also shows that the brain has a certain plasticity in that there are specific periods in neural development when the brain is ready to be programmed. If that moment is not taken, the brain is no longer as receptive. You can observe the same thing in children picking up a language. It is also well known that an embryo will differentiate into a male if the brain is stimulated by testosterone at just the right time. Subsequent exposure to testosterone is too late. There is a critical period when the brain is receptive.

Murphy's Depiction of MacKay's Model of Mind-brain Interaction

In this model (Fig. 1), Murphy¹⁸ describes the neurological system as monitoring the field of operation and comparing the input from the field with some ideal state that sits within the nervous system. This comparison triggers an operator which acts in the field to bring about the goal state. She further postulates a hierarchy of meta-comparators and meta-operators, which react to and in the field of activity to alter the lower

Fig. 1. Start with the comparator C, which compares the indication of the field F (I_F) with the input of the goal state (I_G) and changes the organizer O to effect the change E in the field F. R is the receptor which monitors the field. FF is a feed-forward system with filter features. MC and MO are meta-organizers and comparators. They in turn can have higher organizers and comparators.



operators so that in the end the goal of the organism can be achieved. What is unclear from such a model is how the meta structures can eventually attain reason consciousness, intentionality and other mental functions.

The Christian Responses to the Tightening Link between the Mind and the Brain.

The most obvious point is that the mind and the body are inextricably intertwined. Most people, even with different mind-brain models, agree to holism. At one end of the spectrum there are some neuroscientists who advocate reductionism. They contend that mind-properties are ultimately brain properties and will be reduced to neuronal function. They call for the abandonment of concepts like the soul and the abandonment of dualism. There are an influential body of Christian thinkers, both scientists and theologians who embrace holism and reject dualism. Others feel called to defend what they see as the traditional view. The debate continues. This has led to a plethora of positions on mind-brain relations. I have tabulated some of these positions in an appendix. I am sure there are others. Whatever position one takes, this discussion calls for a review of Biblical anthropology.

Holism with its emphasis on the unity of mind and brain does not preclude that there is a difference between mind and brain or that clinical problems can be wrongly construed. The classic example is a person with a somatization disorder. Here mental problems or conflicts present to the medical practitioner as physical symptoms. In this understanding there is clearly a distinction between the mind and the body. The problem is not in your body, it is mental. Likewise a person's depression can be due to physical causes such as the drugs they have been taking, or an influenza they have been having, or due to psychological causes like recent losses or bereavements or even spiritual causes like a loss of faith and hope. Although there is an acceptance of holism, there is also still a distinction between the various aspects of a person's composition.

Reductionism

The most antagonistic response to Christian viewpoints on mind brain is to embrace reductionism. This is classically expressed by Francis Crick: "that "You," your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and their associated molecules."¹⁹ I suspect the quote is ironic.

However we need to define reductionism. Although Murphy describes five types,²⁰ from our more simple perspective there are basically two types. Methodological reductionism is a recognised technique in science whereby a complex problem is solved by being reduced to its components. Ontological reductionism believes there is no "whole" but that a phenomenon is nothing more than its components. In the mind-brain debate it denies entities like vital forces and souls, and some, like the older behaviourists, would even deny the existence of a mind.

However is reductionism really reductionism, as reductionists claim it is? This is Patricia Churchland's comment:

"Most simply, a reduction has been achieved when the causal powers of the macrophenomenon are explained as a function of the physical structure and function of the microphenomenon. That is, the macroproperties are discovered to be the entirely natural outcome of the nature of the elements at the microlevel, together with their dynamics and interactions. For example, temperature in a gas was reduced to mean molecular kinetic energy.

"A common misunderstanding, especially among philosophers, is that if macro-theory about α is reduced to micro-theory features β, γ, δ , then α must mean the same as β and γ and δ . Emphatically, this is not a requirement and has never been a requirement of science. In fact, meaning identity is rarely, if ever, preserved in scientific identification."²¹

Or again:

"When a teacher sincerely compliments a student's essay as insightful, well-researched, and clearly written, he esteems the student's accomplishment. In consequence she is entitled to self-esteem, and it would be utterly irrelevant to add, "Too bad, though, this paper is just a product of your brain" as a deflationary remark."²²

It would seem then that even reductionists are not truly reductionists: supervenience, emergence and meaning are alive and well even in this reductionist approach.

What Are the Arguments Against Dualism?

Goodman put forward the following objections to dualism.

- Dualism is unable to be falsified by empiric data.
- The additional entities postulated by dualism are unnecessary.
- Dualism fails to identify “mental substance” which must (if it is true to dualism) be of a different substance to physical substance.
- How can a mind with no spatial existence give rise to physical changes without violating the laws of conservation of mass, energy and momentum? How can a non-material entity act on the material world?²³

These arguments carry considerable weight. However they also carry the seeds of materialism in them, and need to be evaluated carefully. The last objection, the question of the conservation of energy, is challenging, but I believe it can be refuted. If on other grounds we believe in an unseen world acting (somehow) on the seen world, then our failure to see how that should be, does not rule out that the unseen world can act on the seen world. Medical students commonly make that mistake in clinical practice. A physiological phenomenon occurs, but the student does not see how it could occur. The student is then tempted to say that therefore the phenomenon does not occur. The student’s conclusion is incorrect. Failure to understand the mechanism by which a phenomenon occurs does not negate the fact that the phenomenon does occur.

Brown and Jeeves’s objection to dualism is more weighty: “There is a decreasing residue of left-over higher human functions which have not been demonstrated to have neuro-cognitive correlates and can therefore constitute evidence for a non-material soul.”²⁴ Embracing dualism seems to be embracing a God-of-the-gaps theology, and the gaps are rapidly shrinking.

What Then Do We Make of the Soul?

It depends how the soul is understood. It could simply mean the essence of a person, the equivalent of the self. Thus, whereas the Authorized Versions renders Luke 12:19 as “I will say to my soul, “Soul thou hast much goods laid up for many years; take thine ease, eat drink and be merry,” ” the NIV renders it, “I will say to myself, “You have plenty of good things laid up for many years. Take life easy, eat, drink and be merry.” ” Interestingly though, the NRSV follows the AV rather than the NIV. I would have thought that, “Now is my soul troubled,” (John 12:27, AV) could translate to “Now I am troubled,” (my version!), but the NIV translates ψυχη (psyche) not as soul but as heart: “Now is my heart troubled,” (NIV), whereas the NRSV reverts to soul. Translators then are torn between ancient and modern views of humans, but still seem to want to express that there is an inner quality to a person.

When we look at formal word studies we find a divide between those who can interpret the soul monistically^{25 26} and those who interpret the soul dualistically.^{27 28 29} Christians are divided on this subject. Both appeal to Scripture and state that the other side is interpreting the issue through their hermeneutic grid. Most commentators from both schools argue against a Platonic/Cartesian soul, that is a mind or soul which is completely distinct in substance from the physical. Most embrace a form of body-soul holism. The difference is in accepting or rejecting an ongoing disembodied existence beyond death (see Cooper, below).

What Is This Self?

There is a lot of discussion in the literature on the nature of the self. Charles Taylor has written a monumental philosophical work on the subject³⁰, which argues strongly that the self is an agent of

choices, and that ethics is fundamental to the person. He strongly resists morally neutral naturalism. Kerr,³¹ gives a useful overview in terms of particularity, contingency, society, dependence, dialogue and tradition. Socio-psychologists particularly challenge the enlightenment ideal of the autonomous, self-referential isolated individual which unconsciously dominates so much secular and even theological thinking. They caricature the enlightenment self as:

“The self is an abstract individual equipped with a fixed set of abilities and needs (e.g., self-enhancement and self-verification)... a person endowed with a mind unaffected by the symbols that it processes...abstracted from its social structure and symbolic context. [Further a] naïve realist epistemology and methodology dominate scientific investigation of self and identity...[with the theorist] an autonomous abstract epistemic agent largely unaffected by sociocultural contexts.”³²

The self, they would argue is socially developed. The other self that is studying the first self, also comes with a whole lot of socio-cultural accretions. They move on to argue that humans may not have a self-conscious central processing unit but that the self may be found more globally in the brain.

Patricia Churchland makes a similar point:

“The self is not a thoroughly coherent single unified representational scheme about which we have a thoroughly coherent, unified belief. Rather the self is something like a squadron of capacities flying in loose formation. Depending on context, it is one or another of these capacities, or their exercise, to which we refer when we speak of the self... The fundamental capacity, however, probably consists in coordinating needs, goals, perception, and memory with motor control. The self then in this scheme is a cluster of self-representational capacities.”³³

There is only one problem with Churchland’s point: who made this quotation? Patricia Smith Churchland. Although it could be argued that it was Churchland the neuroscientist who was making that comment, and not Churchland the mother, or wife or atheist, each of these other roles in the squadron of capacities has a bearing on the subject (her husband and offspring collaborated in making her book).

The discussion on the self then is a huge topic, and work is still in progress. It has obvious ramifications in dealing with issues of self-esteem, self-assertion and self-understanding with obvious theological ramifications in self-denial and self-love.

A Suggested Biblical Approach to the issues

When we come to the Bible, we find: “There are resources in the Christian faith for an understanding of human nature which has been lost in modern culture.”³⁴ The Bible may have been written before neuroscience, but it has a lot to say about human beings.

Imago Dei The first introduction to humans is that they are created in the image of God (Genesis 1:26ff). There has been much discussion on what this phrase might mean.^{35 36 37} Blocher makes the point that an image is not the real thing, hence the doctrine first puts humans (particularly Pharaohs) in their place. On the other hand it sets humans apart from the animals as having an “alien dignity” (Thielicke) which is important for ethics. From the context we find the thought that humans are God’s vice-regents on the earth, stewards of creation. Together, as male and female they produce off-spring in their likeness, continuing the creation that God as plural started. The problem with the last phrase is that it implied that humans as individuals were not in the image of God until they had offspring. However it is important to remember that this chapter is discussing humankind more than individuals.

Genesis 2:7. This verse can be put as a formula:

Body + God’s breath (Spirit) = Living soul (living being - Nephesh Chaim).

From this it can be seen that the word for soul is used of the animated body. The soul is the body/spirit complex, an embodied being. Paul Davies uses the wonderful phrase that humans are

“animated stardust” and Polkinghorne describes humans as “Spirit/body amphibians.” Before we get too carried away with the poetry of these expressions, we need to remember that the phrase *nephesh chaim* is used in Scripture of animals also. Nevertheless the tenor of this passage here is towards identifying humans as special (they name the animals) and holistic, although various commentators read either monism or dualism into this passage.

Covenantal being in community. The dominant idea in the Old Testament is that humans are in some sort of covenantal relationship with God. The Noahic covenant is with the whole of creation whereas the Abrahamic, Sinai-ic and Davidic covenants are particularly with the people of God. The Jews find their role by taking the covenant between God and God’s people for themselves. There is a strong sense of community and dignity in this concept. This again has strong ethical implications but does not add to the monism dualism discussion, except to say that ethics is about beings in covenantal community, rather than their ontological makeup.

Flesh/Spirit divide. The New Testament most commonly described humans in terms of a war between the flesh and the spirit. A careful study shows that the flesh is not simply a physical entity, but is more akin to the person as an embodied whole oriented against God. The spirit in this situation is usually the Holy Spirit who enlightens and empowers the believer. This is applied practically to encouraging holy living (Gal 5:16-26) as well as to epistemology (1 Cor 1:17- 2:16, and John 3:1-36). Nowhere do we find the instruction to embrace either dualism or monism. Scripture does not place much teaching on this subject.

The natural and the spiritual body. When Paul discusses the resurrection of humans in 1 Cor 15, he makes a distinction between our current life in *Σωμα ψυχικον* = Natural body, and the risen life when we will be in *Σωμα πνευματικον* = Spiritual body. Some see this simply as a body empowered by the spirit rather than by the flesh, but others see this as an ontological change from mortality to immortality. It is fascinating that the natural body is described as the psychic body in contrast to the spiritual body. But what is meant by a spiritual body? How does a spiritual body differ from a natural body, and in what way is this a change of some sort? Does the acceptance of a resurrected immortal spiritual body deny physicalism?

Our anthropology arises out of our Christology (Barth). In Christ we see the true image of God (Col 1:15ff). Price looks at the implications of this,³⁸ especially in terms of dynamic relations between persons. We are not isolated thinking individuals, but loving relating people, to God and to each other. Christ came in the flesh. Docetism denies that fact. Christ in the flesh showed us what a truly spiritual person is like, dependent and obedient to the father, bearer of the sorrows of the world, the true servant of God with whom God is well pleased, who shows the love of God in practical expressions in the physical world.

None of the above observations say anything about monism or dualism. The value of human beings does not reside in their ethereal eternal status as disembodied souls, but in their intrinsic worth as created in the image of God.

What Promotes Dualism?

John Cooper states in his introduction:

“Body, Soul and Life Everlasting was written to remind thoughtful Christians that some sort of “dualistic” anthropology is entailed by the biblical teaching of the intermediate state, a doctrine that is affirmed by the vast majority in historic Christianity...The Old Testament notion of ghostly survival in Sheol, eventually augmented with an affirmation of bodily resurrection, is developed by the Holy Spirit into the New Testament revelation of fellowship with Christ between each believer's death and the general resurrection at Christ's return. Thus the Bible indicates that humans do not cease to exist between death and resurrection, a condition sometimes euphemistically termed “soul sleep,” or that final resurrection occurs immediately upon death.”³⁹

The theologians at the conference disagreed, and felt that Cooper had overstated his case. There are certainly alternative ways of understanding the time between death and resurrection. But a more fundamental question is whether we are bound by a Biblical metaphysic. The Bible has no thought of neuronal activity. According to the Bible, the heart is the seat of will, the kidneys are the seat of motivation and the bowels the seat of emotions. The head just simply sits on top. Embracing a Biblical metaphysics would call on us to believe in a geocentric cosmology. What then is essential and what is peripheral in developing a modern worldview consistent with Biblical thought?

Peacocke's Worldview

Arthur Peacocke has developed the following model of God's interaction with the world (Fig. 2). Thus a Christian worldview is of a spiritual world where God reigns, and of an invisible world wider than human perception, as well as the visible world. Further Christians believe God continually sustains the visible world and continually acts within it (immanence) as well as being beyond it (transcendence). The one thing I would add to the diagram is the idea that humans by their prayer can influence God's influence on the world.

Fig. 2. God is the whole diagram – infinity stretches out in every direction.

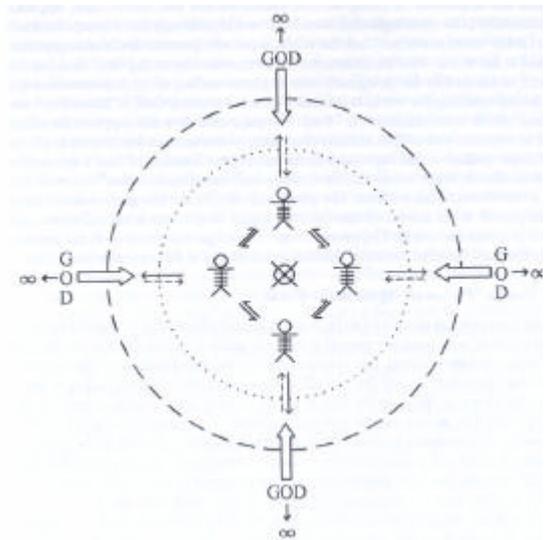
The dotted line is the created order – humanity and systems of non-human entities, structures and processes.

The finer dotted line is the world humans perceive. Major arrows indicate God's interaction with and influence on the world and its events.

Middle diagram depicts the tip and the feather of double-shafted arrows perpendicular to the page indicating God's influence and activity within the world.

Arrows between the seen and unseen world indicate the effect of the non-human world on humanity and human agency on the non-human world.

The dense two way arrows indicate personal interactions, both individual and social, between human beings, which have been so drawn to show their multi-layered essence.



What of the Issues?

Neuroscience has not obviated the need to consider higher-level phenomena, even if we don't fully understand the relations between the layers. Mind activity, while dependent on brain activity, cannot be reduced to brain activity. Even reductive scientists would agree to such a statement. While we have some difficulty describing the exact relation between the layers in the hierarchy, there is a relationship, described variously as emergence, supervenience, top-down as well as bottom-up causation, and levels of meaning.

Reinterpreting the soul as the self can be a very fruitful exercise. There is a lot of discussion on the fragmentary nature of the self, and its conditioning by its social milieu, but that does not deny that there is such a person – a biopsychosocial person, a me and a you, called into community, relationship and covenant by God.

Biblical anthropology has a lot to say about the value of people in today's world, but this lies better in considering the Biblical metaphors of the image of God, the person-in-relationships and an anthropology based on our Christology. Any of the various types of dualism are unnecessary to insist on the value of human beings.

What of Spirituality?

Godliness (=spirituality) will be seen to be a far more physical activity in the light of the holistic understanding of persons- irrespective of the position taken on the dualism/monism question. Spirituality under such an understanding becomes a holistic exercise – including honouring God in our bodies. A good example is Deut 23:12-14, where Moses gives specific instructions about faeces disposal to the children of Israel so that their camp might be holy. Naturally there is much more to spirituality, but since the word has become flesh our spirituality too must be an incarnate, engaged spirituality, spirituality not only of word and tongue, but of deed and of truth (1 John 3:18).

What of Life After Death?

There are a number of ways of understanding the time between death and the resurrection of the body. It could be that humans move out of the realm of our time into the timeless realm of eternity. It could be that, just as time seems to stand still when we sleep, so time for us stands still from the time we die to the time we are raised. It could be that we are “in the mind of God” between death and resurrection. Cooper’s postulate is but one of a number of suggestions, but these are speculative and beyond Biblical data. However if we do embrace monism and the resurrection of the body, we still need to explain the mystery of *Σωμα πνευματικον*, (spiritual body). That again is extrapolation beyond Biblical data.

Do Animals and Computers Think?

Do animals think in the same way as humans? Animal studies are full of surprises.⁴⁰ Animals may think to some extent, but their linguistic ability does not bear the degree of abstraction humans have. The story of computers is also complicated. Artificial intelligence is a subject in its own right. However, for computers to think like humans requires from them the same degree of logical leaps, intuitions, emotions, auditory, olfactory, visual tactile and gustatory input with the linguistic, artistic and relational flairs and flaws that humans have. They have a long way to go. Whether artificial intelligence will get there and whether these machines will then appear to “have souls” is an intriguing speculation.⁴¹

What then is Human?

Humans are a source of great wonder. The greater wonder is that we can wonder at that wonder! Humans are biopsychosocial beings firmly grounded in the physical, dependent on the environment, but reaching up into the world of God, who, in Christ, gave us life, love, purpose and meaning, and calls on us to live in a community of love with other humans.

An appendix and footnotes follow

Appendix: Taxonomy of Mind-Body Positions

Monism	Dualism			Monism				
Eastern Mysticism	Cartesian Dualism	Thomist Dualism	Emergent Dualism	Emergentist monism	Anti-reductive social naturalism	Non-reductive Physicalism	Organic Unity Theory	Reductive Monism = Eliminative materialism
Physical world is the world of illusion	Mind and brain separate entities. Pineal gland Allows the body to be treated as a machine to be fixed, and gives the mind “freedom”	The soul can exist separate from the body, but not vice- versa. The soul is <i>diffused as the essence of the body</i> in every part of the body. Mind and soul are not synonymous.	Matter generates a field of consciousness which modifies the function of the physical brain. That disembodied self lives on beyond death, prior to the resurrection of the body.	Denies physicalism but also denies two types of “stuff” a new order developed with consciousness, spiritual higher in the hierarchy	Marriage of Wittgensteinian linguistic analysis with an Aristotelian naturalism to recognise the symbolic nature of language and its impact of the person’s understanding of the world	Accepts emergent properties of mind/soul, but these are aspects of brain function	Two aspects of the one “stuff”	Said to reduce mind to brain function only, but Churchland would probably reject a totally reductive approach
Some forms of Hindu and Buddhist mysticism. Christian Scientists	Based on Plato, this view is said to have dominated the intellectual scene in the 17-20 Century	Conservative evangelical school of the United States: Moreland and Rae	William Hesker	Philip Clayton	Grant Gillett	Nancey Murphy Malcolm Jeeves	Donald MacKay	Churchlands? Crick

There is also a pluralistic approach, which is a common sense belief that there are many separate things (Bertrand Russell). This is also the approach adopted by William James, who objected to the emphasis on totality. This tended to exclude individuality and free will. In fact, there are many ways in which entities can be categorized. This rejects models like **Monism**, **Epiphenomenalism**, **Dualism** and the **Psychophysical Parallelism** of Leibnitz.

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- ¹ Searle JW. Mind, language and society: philosophy in the real world. Phoenix, London UK. 1999.
- ² Chalmers DJ. The conscious mind: in search of a fundamental theory. Oxford University Press. 1996.
- ³ Eg Churchland PS. Brain-wise: studies in neurophilosophy. Bradford. MIT. Cambridge, Mass. 2002.
- ⁴ Abraham Kaplan has a very useful chapter on the scientific method especially in the behavioural sciences. He makes a strong distinction between knowledge in use and reconstructed knowledge, and between the science of discovery and the science of justification. He suggests that the subject under investigation will determine the method used, and when the subject is a person with values, this will have to be considered as part of the inquiry. Kaplan A. The conduct of inquiry: methodology for behavioural science. Chandler, Scranton. PA 1964 Ch1 Methodology, pp. 3-33.
- ⁵ Hess PJ "God's two books:" revelation, theology and natural science in the Christian west. Ch 2 in Regan HD, Worthing M. Interdisciplinary perspectives on cosmology and biological evolution. ATF Adelaide. 2002, pp. 19-49.
- ⁶ Moreland JP, Rae SB. Body and soul: human nature and the crisis in ethics. IVP. 1996. The executive director of the CMDS (the US equivalent of the CMDFA) heartily endorses the book.
- ⁷ Kelly TJ, Regan HD. God, life, intelligence and the universe. ATF Adelaide. 2002.
- ⁸ Engel GL. The clinical application of the biopsychosocial model. American Journal of Psychiatry 1980. Vol. 137, pp. 535-544.
- ⁹ There is a lot of work on "social constructivism" which finds the subjective psyche in the incidental hurly-burly of human encounters. This has led to a "new" dialogical or relational paradigm. See Shotter J. <http://www.massey.ac.nz/~alock/virtual/inner.htm>
- ¹⁰ Peacocke A. God and science: a quest for Christian credibility. SCM Press. 1996, pp. 46-70.
- ¹¹ Churchland PS op cit. p. 3 Fig 1.
- ¹² Pols RG, Hawks DV. Is there a safe level of daily consumption of alcohol for men and women? NHMRC. Australian Government Publishing Service. 1992, pp. 27-28.
- ¹³ There are a number of interesting websites about poor Phineas. A most detailed website is <http://www.deakin.edu.au/hbs/GAGEPAGE/index.htm> Other sites show the graphics in more detail.
- ¹⁴ Murphy N. Supervenience and the downward efficacy of the mental: a non-reductive physicalist account of human action. In Russell RJ, Murphy N, Meyering TC, Arbib MA. Neuroscience and the person: scientific perspectives on divine action. Vatican Observatory Foundation. 1999, pp. 147-164.
- ¹⁵ Ibid., pp. 148-152.
- ¹⁶ Kandell ER. A new intellectual framework for psychiatry. American Journal of Psychiatry 1998, vol. 155, pp. 457-469.
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- ¹⁸ Murphy N. The problem of mental causation: How does reason get its grip on the brain? Science and Christian Belief. 2002, vol. 14, pp. 143-157.

Dr Alan J. Gijbers, MBBS, FRACP, FACHAM, DTM&H, PGDipEpi.

Alan is a Specialist Physician in Drug and Alcohol Studies at Turning Point Drug and Alcohol Centre, and the Epworth and St Vincent's Hospitals, Victoria. He is a foundation fellow in the chapter of Addiction Medicine of the Royal Australasian College of Physicians. He is a Senior Associate at the St Vincent's Hospital Clinical School, University of Melbourne. He has lectured in Science and Faith at Ridley College and the Bible College of Victoria and is a Fellow of ISCAST. Alan is the past national chairman of the Christian Medical and Dental Fellowship of Australia. He has published the Zadok Paper S96 *The Nature of Humans: Mind and Brain; Body, Soul and Spirit*, 1998/1999.

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