

Institute for the Study of Christianity in an Age of Science and Technology

ISCAST BULLETIN 29

(incorporating VISCAST News)

Summer 2000.

(February 2000)

The views in this Bulletin are those of the individual authors or the editor. They do not necessarily reflect the official views of the ISCAST Board. To submit articles contact the editor. Articles are best submitted in an electronic format by e-mail.

Editorial:

What is Human?

At the recent ATF conference on Intelligence (see inside the Bulletin for conference content) the question of what is human was frequently raised. What is so special about Homo Sapiens? Is it the Sapiens (intelligence, wisdom)? If so what does that intelligence consist of? How do we recognise that intelligence in other species on earth and in intelligent life (if it exists) in deep space, and how do we respond to the intelligence we create in machines? Further if we define ourselves as thinking beings (Descartes famous *cogito ergo sum*, I think therefore I am) how does the thinking being inhabit the body we are in? Are we ghosts in a machine, phantoms in a brain, souls in a body or are we living beings, animated stardust? Do each of us have a soul or are we souls? What difference does it make anyway?

The differences while appearing slight are important. If we are embodied beings, intelligent in more than just language, who find who we are not just in ourselves but in community, these have enormous implications.

First we need to reflect deeply on what it means to develop a physical spirituality. This is in keeping with magnificent Leviticus 19 which describes how God's people can be holy as God is holy. To be holy calls on us to live righteous lives in the way we treat each other, harvest so as to leave something for the poor, cut our hair, weave our cloth, treat our aged, treat our strangers, care for our leisure..... such holiness is a strange and very earthy holiness, an engagement in the world rather than a withdrawal from the world.

Second, without denying the value of language or its importance in theological reflection (am I not crafting words now, and did not God speak through His Son the Word?), there is an intelligence beyond words. The crash of the waves, the thunder of storms, the glory

of the heavens, the solidity of the mountains, the depth of a look. O the gift and the distortion of the printing press!

Thirdly if humans are humans in community rather than singly, how will we express that community in the face of the rampant individualism of our society? How do we express community in both word and deed? How do we express it in an increasingly technological age where communication is more and more through disembodied electronic media?

Fourthly at the conference, much was made of the Imago Dei (Gen 1:26-28), which was not yet good, but becoming. However the dominion aspect was underplayed. In the past Christians have been accused of using this Scripture to exploit the earth, but current understanding of having dominion over creation, links this passage to our ecological accountability before God. We are not just embrained or embodied but we humans live in community in a fragile ecological environment, and the symbolism of humans naming the animals indicates the responsibility we have over the creation.

In this respect it is good to see Ecotheology being a strong research strand of the Centre for Theology, Science and Culture. This is a collaboration between the Flinders University School of Theology and the Adelaide College of Divinity. We wish them well, not just in word but in action, for we need to not just think about the world but change it. That is the gift and responsibility of being stewards of God's creation.

Finally there were discussions about how would we as Christians encounter aliens from another galaxy. Would Christ's saving work extend to them? Would they have their own Christ, their own Aslan? How would we communicate with them and what would we have in common with them? The question was posed, how would we be chaplains on Deep Space 9? There are a whole lot of missiological assumptions underlying such a question and I personally felt that the conference could have gained a lot from our missiological colleagues (Like Verkuyl, Neill, Newbigin) to reflect more clearly on how we would share our experiences of God in word and deed. I confess to a medical missions bias but there are other models. CTNS is taking up the challenge using the science-faith question to dialogue with other faiths. Ted Peters at the conference commented on the enormous intellectual debt the West has to Islam from the 8th to the 14th Century. When we go to other cultures we are challenged not just to give but to receive. How do we do so while continuing our loyalty to Christ the Lord of all?

Physical spirituality, the value and limits of language, humans in community, ecological responsibility, and missiology, not a bad weekend's discussion!

The Y2K Bug

Y2K has come and gone and as usual for preventive programs, nothing has happened. But neither did much seem to happen in those countries which did not have a preventive program. Were we sold a pup? Only the computing profession will know that, and we outside that profession will simply have to trust them. Meantime the GST looks like being the next opportunity for a professional group to either act with professionalism or

to cream off the public. Once again trust has to be exercised and once again one hopes for righteousness (advising justly and ethically) from professionals.

Intellectual freedom

Quite a bit has been written about political control of academic debate and the need for intellectual freedom. This is not a new issue. The Israelite kings also tried to stifle prophets who refused to toe the party line. The prophets precisely because they were loyal to God and to Israel could only tell the truth as they saw it. Christ's disciples insisted they must obey God rather than man. The unfettered flow of information is essential to a robust intellectual community.

Or is it? Are there not subtle forms of censorship within every intellectual and most Christian communities? Would we in ISCAST be happy to see anything published? By what criteria would we decide to reject an article? Insincere, intellectually slack and defamatory articles of course would not be accepted but what about articles with which we disagree? I would be grateful for correspondence on this issue, and in the meantime encourage prophetic voices not to be intimidated by bureaucratic control.

Ed.

News

ATF Conference on Intelligence brings science-faith bodies together.

There were a number of firsts at the recent Australian Theological Forum Conference in Adelaide in from 27-29 January 2000. It was the first ATF conference in Adelaide, it was the first major ecumenical conference hosted by the Lutheran Church in Adelaide, and there was a confluence of Australian science - faith bodies. They were a superb host.

Here is a list of science-faith bodies at the conference:

ATF Australian Theological Forum. This ecumenical organisation seeks to relate the Christian Faith to Australian Culture. It has a much wider brief than just science-faith, being concerned for instance with theological reflection, health and Economics. One of its main vision (and the vision of its patron-in-chief, our Governor General) is to promote reconciliation between the Aboriginal and Torres Straits Islanders and the Australian Nation as a whole. A number of ISCAST fellows are members of the ATF.

Email: hdregan@camtech.net.au. Website: www.atf.org.au.

AUSREN the Australian Universities Science and Religion Education Network, Centred on the School of Theology, Charles Sturt University, (St Mark's National Theological Centre, Canberra) it seeks to provide a link for many people in Australian Universities who have an interest in the relationship between science and technology and the fields of religion and theology. Two ISCAST board members, Jonathan Clarke and Mark Worthing are associated with this network which seeks to initiate a conference in September 2000. There is currently a call for papers to Dr Anna Corbo Crehan at .

AUSREN maintains a listserv (ausren@acu.edu.au) which can be subscribed to by emailing with *subscribe ausren* in the body of the email.

CTSC the Centre for Theology, Science and Culture. This is a collaboration between the Flinders University School of Theology and the Adelaide College of Divinity. The latter is the Roman Catholic, Anglican and Uniting Church theological college in Adelaide. It has a number of research and development projects in progress including Ecotheology, the Earth Bible project, Spirituality and the Arts, Archaeology and the Spirituality of Disability. The CTNS Science and Religion Course program is situated here. There is an invitation for visiting scholars to join the centre and for and post-graduate students to apply for courses.

Their website is: <http://www.flinders.edu.au/CTSC>

CTNS Center for Theology and the Natural Sciences. Berkeley California. (www.ctns.org). This body is developing science and religion courses all over the world. There are courses in Oxford and California this year and the inaugural CTNS Science and Religion course in Australia will take place in Adelaide in January 2001. The CTNS course, while based within the CTSC, is a joint venture between CTSC, AUSREN and ISCAST and the course director is Dr Mark Worthing, ISCAST board member.

ISCAST With all the above networks, how would we describe ourselves and what will our distinctive contribution be? This is a challenge facing us. Thankfully so far we have been able to cooperate and encourage these bodies and hopefully with time we can see each making a specific contribution. But it does challenge ISCAST to think through its role in a now crowding field. Allan Day's challenge for ISCAST to clarify its strategy to meet its goals is even more acute. Tentatively I would suggest the following:

- ISCAST has an evangelical basis (we have explored this in Bulletin 24, and see correspondence in Bulletin 26). A commitment to the gospel is a commitment to the basic credal statements in the Apostle's and Nicene Creeds.
- That ISCAST be based more in science than theology ie mainly consisting of practising scientists in dialogue with philosophers and theologians, though the latter are necessary to help our thinking and action.
- That ISCAST has a commitment to disseminate academic discoveries to the wider church and community through schools, churches and teacher organisations, etc.
- That ISCAST pursues specific projects like the statement on Evolution and the Science of Addiction projects in Victoria.
- That ISCAST contributes to the other science-faith bodies and in particular encourages participation in the first CTNS workshop in Adelaide in January 2001.
- That ISCAST sponsors overseas speakers like Sam Berry, John Houghton, John Polkinghorne and John Bryant to various states.
- That ISCAST runs second yearly COSAC conferences to encourage science-faith reflection.
- That ISCAST continues with the *ISCAST Bulletin* (provided readers submit articles, reviews, news etc.) The vision for the Bulletin is set out in Bulletin 23.

I hasten to add these are only my suggestion but I put these forward for debate. They may well change with changing vision and personnel within ISCAST. Different chapters may develop different emphases, but hopefully by continued cooperation we may see the tide turn and our society realise the error of the myth that science has disproved God and triumphed over Faith.

AG

First CTNS Workshop in Adelaide in 2001

At the end of the ATF conference Dr Ted Peters, director of the CTNS Science and Religion course program launched the Australian component to be run in Adelaide at the end of January 2001. Supported by ISCAST, ATF, AUSREN, and CTSC, and directed in Australia by ISCAST Board member, Dr Mark Worthing, this will be an opportunity for university, seminary and college faculty to learn how to teach interdisciplinary courses in science and religion. The program awards prizes for outstanding courses and it is hoped that the interest this program creates will increase the number of courses in Australian tertiary institutions. More details in subsequent Bulletins.

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Intelligence Conference Report

AUSTRALIAN THEOLOGICAL FORUM

Symposium on Science and Theology

Thursday afternoon 27 Jan - Saturday night 30 January 2000

Lutheran Laypeoples League and Luther Seminary, Adelaide.

LIFE, INTELLIGENCE AND THE UNIVERSE: SCIENCE AND THEOLOGY IN DIALOGUE

What is intelligence? How can we understand ourselves better as we seek to develop artificial intelligence, as we start to understand the varied animal intelligences and as we consider the possibility of intelligent life in outer space? These questions press as there are colleagues who would seek to use these questions to erode Christian faith. Their argument goes something like: "If robots behave as if they have a soul, this disproves Christianity's claim that humans have souls. If humans are like animals then we are not unique. If there is life on other planets then the Christian faith's claim of the universality of Christ's life and death is disproved." New scientific discoveries continually challenge

us to re-evaluate our understanding of our faith, and this happened at the Adelaide conference.

The ATF is to be congratulated for organising the conference and for bringing together a group of very stimulating speakers as well as networking a number of different science-faith bodies.

Dr Anne Foerst is both a theologian and an artificial intelligence researcher. At the Massachusetts Institute of Technology she helped develop two different robots, Cog and Kismet. Cog has an upper torso with micro-chips in each joint and without a central control unit. This body learns to perform in much the same way as a baby learns to move. Kismet has appealing face designed to interact with humans. Early days yet but Anne claims that embodied intelligence, socially acquired are the keys to developing modern robots. Further she claimed that if that robot on Mars had been trained in the ways of Cog it would have circumvented the rock that stopped it.

Anne started the science-faith discussion by developing a mythos-logos dialectic framework to understand the mis-match in communication between theologians and scientists. Drawing heavily on a Bultmanian understanding of the Christian gospel, she tried to see that even science, heavily logos based, sits within a mythos framework which she wanted her scientific colleagues to acknowledge and evaluate. There are aspects of this model that are helpful but the ambiguity of the word mythos and the ambiguity with which Anne herself used this, in my mind, limited its usefulness. Still, it was provocative.

Rev. John Puddefoot, Maths master at Eton in the UK and author of *God and the Mind Machine*, developed Donald Mackay's understanding of the mind-brain. Here the brain story is seen as the "you story" the "from the outside looking in" story and the mind story is the "I story" the "from the inside looking out" story. These two stories arise out of one kind of stuff but both are necessary to deal with the complexity of the human and the artificial mind. This (Equal aspect monism¹ model steers a middle ground between reductive monism on the one hand and dualism on the other. Starting from rocks, which John felt did not have any inside story he gradually moved up the plant and animal kingdom till he came to our favourite pets who have both intelligence and feeling. In the same way he argued, could it not be that when artificial intelligence is complex enough it will have its own internal world and we will not know whether that internal world is real or a very clever program. Much of the subsequent discussion centred on tests by which we could validate an 'inside story', but the problem of deciding how to do so on behalf of other species remained unresolved. There is a mystery about incarnation at this point and a further problem. If we do not know a human's inside story unless we are humans how do we verify when a human claims to be divine?

In his next talk John explored the theological issues confronting spiritual dialogue with extra-terrestrials. He reminded us that God is not the God of any particular nation but the Lord of heaven and earth. He is not the God of our tradition but God universalised. He explored the assumed centrality of human reasoning and its limitations in inter-stellar communication especially what he dubbed the 'logocentricity' of so much of our thought.

He finished posing the question about being a chaplain on Deep Space 9, and Mark Worthing provided an imaginative liturgical response based on the wonder of Psalm 8.

Mark read two papers, one on extra-terrestrial intelligence and the other on animal intelligence. The first paper looked at the theological implications of extra-terrestrial intelligence on the doctrines of the uniqueness (universality) of the fall and the redemptive work of Christ and the second looked particularly at what made humans different from animals and what constituted the Imago Dei.

I have just skirted over the very basics of their paper but their combined efforts will be published by the ATF at the end of the year.

The dialogue idea of asking one of the other speakers to respond to the first speaker enhanced the debate - especially as it set the tone of appreciation and respectful agreement and disagreement. The overall predominance of papers read with few visuals and in the passive voice may well change as the next generation comes along. They are less logocentric and far more visual.

Finally there were some stimulating workshops. One very thoughtful one by Ian Barns looking at the film "*The Matrix*". *ET* and *Contact* were other sci-fi films discussed. Other workshops looked at the mind-brain problem from a clinical perspective, another looked at the souls or computers and another on Oliver Sacks.

Congratulations on the ATF on producing a splendid conference and since the core planners of that conference hope to plan COSAC 2001 we are in for a splendid odyssey!!

AG

Brian Edgar on therapeutic immortality

"A New Immortality?" is an article published by Brian Edgar, chair of ISCAST (Vic) in the October 1999 edition of the *Evangelical Review of Theology* (published by the World Evangelical Fellowship). It discusses the theological, ethical and social implications of scientifically enhanced life-spans. Brian discusses how telomere therapy has been postulated as a way of combating the body's fundamental aging mechanism and how, if successful, it could lead to virtually indefinite life spans. Telomeres are structures found at the end of chromosomes which progressively shorten as the cell reproduces. They appear to be the cell's reproductive timing mechanism and the expectation is that a process, which rebuilds the telomeres, will lead to indefinite cell reproduction. Some researchers suggest that such therapy could be available within fifteen years. So, if you have a desire to live to be four hundred then just wait a while! There are skeptics of telomere therapy but even a failure will simply mean that the search for "immortality" will move on to a new level with the benefit of the knowledge gained from this research.

Brian's article discusses the ethical implications of extended lifespan. For example, does someone have a right to this treatment? And if they have had it can they decide to reverse it? Or is that equivalent to euthanasia? Global population, social justice and equity, and social and family relationships are also dramatically affected by radically increased life

span. The article also discusses the theological implications of living for hundreds of years and shows how the theological concept of immortality as a qualitative existence with Christ can be influenced by less theological and more temporally orientated conceptions. Fellows and associates who would like an electronic version of the article are invited to contact Brian on .

Book Reviews

This set of reviews is inspired by the recent ATF conference on Mind-Brain issues. Should you be inspired by books addressing aspects of science and faith or clarifying scientific or faith issues, new reviews are welcome.
Ed.

Bloch S, Singh BS. *Understanding troubled minds: A guide to mental illness.* Melbourne University Press. 1997. pp332.

This book is an up to date layman's guide to the modern understanding of psychiatric disease. It has the same chapter headings as the authors' undergraduate text but has been designed for the educated non-medico. The book gives an interesting slant on the history of psychiatry and is enlivened by very sensitive Leunig cartoons. While this book does not have a religious perspective, it is a very useful guide to the convolutions of the mind and its complexity in disease. This is a very helpful corrective in the current mind -brain debate where the concept of the mind in many arguments has been reduced to consciousness. Those who are struggling with mental illness, either in themselves or in special others will gain a lot of useful understanding from this book.

AJG

Ramachandran VS, Blakeslee S. *Phantoms in the brain: Human nature and the architecture of the mind.* Fourth Estate, London. 1998.

This is one of those science books that makes its subject accessible to the lay person. It has a foreword by Oliver Sacks and it was sent to me after the COSAC99 conference by one of the Determinism workshop participants. I am very grateful. Ramachandran's enthusiasm for neurology and the scientific method in clinical medicine comes through all the time. The real clinical stuff is so challenging, so mysterious and so difficult. Starting from phantom limbs and our self-perception he proceeds through visual perception, the God-perception locus in the limbic system to the question of whether non-humans could perceive qualia. The God chapter is a gem of humility, humour, scientific insight and wonder. All the loose ends of the mind-body problem are described from a practising clinician's perception. In spite of Rama's digs at Francis Crick's atheism, Crick still recommends this book highly. So do I.

AG.

Brown WS, Murphy N, Malony HN *Whatever happened to the soul? Scientific and theological portraits of human nature.* Fortress Press Minneapolis. 1998. 252pp.

This book was stimulated by Malcolm Jeeves' visit to Fuller Theological Seminary in 1995. As a result a team of philosophers, theologians, psychologists and Biblical scholars

have come together to develop a consensus view on this difficult issue. Such a view is important to allay forestall the often repeated cliché that once again science has disproved theology by proving that there is no soul. The stance adopted by this book is "Non-reductive physicalism" - a view reiterated in Brown and Jeeves' summary of a seminar on this topic in *Science and Christian Belief* (S&CB 1999;11:139-50). This view rejects reductionism which states we humans are nothing but neurons, receptors and synapses and also rejects dualism which believes that the soul is a separate metaphysical non-material entity residing in the body (the ghost in the machine). They are prepared to admit that they cannot disprove dualism and they "honour the opinion of those who disagree with our premise." This book is full of thoughtful chapters but I was somewhat disappointed with the chapter on the Biblical basis of monism. This chapter seems to have been written while the author had his mind on other things and the selection of Biblical texts discussed is not exhaustive. Nor does the author of that chapter grapple with sufficient respect other view-points, especially those Biblical scholars who have carefully studied the issue Biblically and philosophically. Thus, both Green here and Jeeves in his *Human nature at the end of the millenium*, have referenced but dismissed Cooper's *Body souls and life everlasting* without really grappling with Cooper's carefully evaluated viewpoint. This is a real pity, for Cooper, a professor of philosophical theology at Calvin College Grand Rapids, deserves a more careful hearing.

AJG

Puddefoot J. *God and the mind machine: Computers, artificial intelligence and the human soul.* SPCK, London. 1996. 145pp.

John Polkinghorne in his foreword commends this book as clear, forthright and as a stimulating intellectual excursion, but at the same time somewhat distancing himself from some of Puddefoot's conclusions. Whatever one finally concludes on the question of computers having souls (or being souls?) this is a very helpful introduction to the concept of mind-brain interrelationships as illustrated from the field of artificial intelligence. It also addresses the wider science-faith interface in fields far removed from biology an evolution and point to the intellectual and practical challenges in the AI field. Highly recommended probably at the level of university undergraduate but I certainly also found it very worthwhile.

AG.

Wilkinson D. *Alone in the universe? The X files, aliens and God.* Monarch, Crowborough, 1997. 152pp.

This is a wonderful book to give to upper high school students and above. The author with quiet humour shows himself familiar with all forms of UFOlogy, the X-files, Roswell and other alien claims. This book deals with all issues of earth-alien dialogues fairly, including Paul Davies' popular writings. If there are other worlds God will no doubt have dealt with them appropriately. Readers will gain a lot of thoughtful science and good theology. Highly recommended.

AG.

Science and Christian Belief

The Journal of Christians in Science (UK). It comes out twice a year and contains many thoughtful articles.

Cost: Aust\$36 for one year's subscription

For subscription contact Helen Joynt, Administrative Secretary ISCAST (Victoria)

Reflections on Evolution and the Fall

By Dr Robert Stening, Secretary, ISCAST Board.

I have been fortunate to have been able to listen to two very different expositions in this area recently. One was Mark Worthing's presentation at COSAC99. The other was an all-day "Answers in Genesis" seminar.

The AiG seminar was disturbing because here was a room full of more than 300 people who mostly seemed to agree with the ideas so persuasively presented but which I, as a scientist, could not possibly agree with. Their basic argument is that, if the Earth is millions (or more) years old, then there are millions of years of death, disease and destruction before the advent of sin at the Fall. Yet Genesis 1:31 says that God saw his creation as "very good". How can this be so with death and disease rampant before the Fall? To get around this they say that we must see disease, as observed in dinosaur fossils, as being after the Fall and so of fairly recent origin (no more than 10 000 years). This does not fit in with ideas of evolution, which takes much longer to operate, and so macroscopic evolution must be wrong.

It is this basic idea that death could not exist before the Fall that Mark Worthing challenges. He draws on the writings of Teilhard de Chardin who remarked on "a single perfect being put to the test on only one occasion, the likelihood of the Fall is so slight that one can only regard the Creator as having been extremely unlucky". Teilhard prefers "evolutionary creation and statistical origin of evil". The very statistical nature of evolution must necessarily give rise to states of disorder and suffering which are transmitted on to future generations and so spread. It is only with the advent of humanity, with its moral discernment derived from its godly image, that these disorders or moral transgressions become sin.

Furthermore humans belong to both the biosphere and the noosphere. They have a physical and a spiritual component. Desmond Morris has well compared the similar behaviour of humans and non-human animals in "The Naked Ape". So many of the drives towards survival, remain in our make up. This tendency towards sin, sometimes called "original sin", is at war with our spiritual natures. Can we then say that, in this sense, "original sin" is indeed genetically inherited? The selfishness, which is a survival mechanism in an animal, is a sinful tendency in a being created in the image of God.

As a physicist I find this statistical description attractive since physics has revealed nature to be statistical at its roots. Quantum mechanics tells us only the probabilities of events in

space and time. For example we can only state the probability that a radioactive sample will emit an alpha particle during a certain time interval.

Scientists have discovered that God has created his universe with this inbuilt probabilistic character. It can still be "very good" even though the probabilities can throw up sin, suffering, earthquakes and genetic malformations.

This last came home to our family in a very poignant form when our son was born with Down's syndrome. Instead of reacting to this event by asking God 'Why has this happened to us?', we said 'Why not?'. With our knowledge of statistics, we knew that about one in 400 births were Down's. Why should it not be us? We were better able to cope with such a situation than many families and we had God's strength to sustain us. So that, living in God's statistical world, we were still able to acknowledge his sovereignty, love and caring. As the AiG people point out, these ideas are very important for evangelism. Their viewpoint is that we must clear the ground of evolutionary ideas before we can sow the gospel seed.

I think most people in ISCAST would say rather that we need to clear the ground of philosophical materialism - the idea that science has shown that the spiritual world does not exist at all. Humans are just a highly evolved animal. AiG wants to break through into the unbelieving mind by discarding mountains of scientific evidence. We, on the other hand, would want to emphasise the mountains of spiritual evidence. Not only would we point to the ways God has spoken to us through the prophets and through his Son (Hebrews 1:1,2) but also we would point to the unselfish, un-animal-like acts of those people in whom their spiritual nature has triumphed over their fleshly nature through the power of the Spirit.

God did not have to create a statistical world. But that's what we have found he did.

Comments on Biological Evolution.

By Prof Ken Campbell. ANU. *Jonathan Clarke writes: "As one of Australia's most eminent palaeontologists and a world authority on evolution of Devonian lungfish his views warrant careful attention."*

An attempt should be made to distinguish between the concept of biological change over time, that is the record of change; and then the mechanism(s) to account for the changes observed. It should be possible to outline the earliest form of life known, the appearance of micro-organisms, the arrival of the Ediacara Fauna, the invertebrates, the chordates, and then the evolution of the fishes, the amphibians, the reptiles and the mammals. This is well known and well dated.

Secondly we should acknowledge that the genomes we use to interpret the formation of structure are largely evolved genomes which have had many years to develop. It is inappropriate to use such genomes as a basis for the interpretation of early changes.

Thirdly we should acknowledge that change in structure has not proceeded uniformly through time. At the Cambrian-Precambrian boundary there was a flurry of change of a kind not repeated since. At the Permian- Triassic boundary there were massive extinctions followed by changes which are of an enormous scale. These irregularities must be accounted for. Perhaps some will be the result of environmental change, and others from genetic changes.

Fourthly we must point out that any hypothesis must take into account the long continued changes and the irregularities of change rates. We are forced as scientists to consider these changes to be composed of considerable ongoing processes, or alternatively we have to consider them to be independent and discontinuous processes which do not involve changes to the organisms. The latter is difficult to accept because every change would then need to have a separate explanation.

MECHANISMS

Firstly, the mechanism of natural selection proposed by Darwin, is the one generally assumed to be all that is necessary. The material on which natural selection works is thrown up by genetic changes. Such changes are not may be affected by the environment, but they can be shown to occur in shielded environments.

Secondly, simple mutation is not likely to be the main cause of genetic changes. Modular change is the norm for many organisms, and selection can take place on any stage of development of an organism. Although Darwinian change is no doubt important, it is only one of the many possibilities available.

Thirdly, Darwinian change may be possible in its interpretation of small species-to-species changes, but it is unlikely to be the cause of many of the main structural changes which produced the basic design patterns. By this we mean the patterns in invertebrate designs. These latter seem to have taken place mainly early in the Palaeozoic, and they have not been repeated since.

Fourthly, the influence of genetic changes vs environmental changes have been varied with time. This is important when we discuss changes as being the result of modifications in the environment.

Finally, we should acknowledge that our knowledge of evolutionary mechanisms is undergoing a major change at present as we begin to understand something about development and the role played by genetic changes. Do not let anybody think that we have the process solved, and all we have to do is to see how we can fit this into some theological pattern. I think to introduce Michael Behe's views in the present context would be incorrect. The processes of evolutionary mechanisms are still being studied, and will continue to be studied for a long time yet.

METAPHYSICS, SOCIETY

This falls into two main groupings. The first is the way in which wider science may be involved in evolutionary change. The second is the impossibility of transferring organic change into social theory.

Science & Metaphysics

First, the opportunity now exists to show how the wider aspects of science, such as the Anthropic Principle, may allow us to take an initiative in showing how the basic chemical and physical constants were set to produce organic matter, and ultimately self consciousness. This is possible only if organic matter can produce something like a human brain which is necessary for rational, moral, spiritual, aesthetic understanding. This is what makes us in the Image of God.

Secondly, we should be able to do something about the rough and tumble world and the way in which this allows us to develop into humans. Sure there is competition between individuals and societies, and some of this results in bad outcomes from a moralistic point of view. Maybe the process of evolution has led us into such outcomes, but it is not the only process operating.

Thirdly, the we should not be worried about the influence of evolutionary thinking on our wider world views. All advances in knowledge will cause us to reinterpret our ways of thinking. If they don't, there is something wrong with us a humans. Perhaps Scripture has to be reinterpreted on some doctrines, but a dead religion is a dead religion.

Social Policy

Now we should make clear that it is not possible to transfer biological evolution into social policy. Biological evolution is concerned with genetic change at least partly sorted out by the physical and biological environment. Most attempts at employing these ideas concentrate on the "nature red in tooth and claw" aspects of evolution. This is really taking one part of evolution and using it to permit personal sin to take a leading role in social change. Even Grandfather Huxley saw that morals added a new dimension to the environment, and that the development of human society depended on allowing our humanity to overcome the effects of "nature red in tooth and claw".

Finally we should keep in mind the fact that the talk of decline in society as a result of fundamentalist views promulgated by "Answers in Genesis" cause great difficulty to those who want to develop their God given gifts to understand the world. Like it or not, we have to stand out against these people, and it is useless to say that they are also Christians and we should respect them. Error must be confronted no matter what is its source.

ISCAST (Vic)

The Science of Addiction

Expert Colloquium

Saturday 19 February 2000

What is scientific methodology in relation to addiction?

Are humans simply receptors?

Is depression simply serotonin deficiency?

How far do animal models work?

What is the neuro-biology of addiction?

Are moral dimensions helpful?

What of spirituality?

Chair: Dr Denise Cooper-Clarke

Discussants:

Dr Alan Gijbbers Specialist Physician in Drug and Alcohol Studies.

Assoc. Prof David Clarke Psychiatrist Monash University.